

Engin Balin, Billur (Ed.); Mumcu Akan, Hatice Dilara (Ed.); Karagoz Ozenc, Ferda (Ed.); Garan, Ozcan (Ed.)

## Book

# Pursuing Sustainable Development Goals: The Performance of Türkiye in the Centennial of the Republic

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# PURSUING SUSTAINABLE DEVELOPMENT GOALS

## THE PERFORMANCE OF TÜRKİYE IN THE CENTENNIAL OF THE REPUBLIC



### Editors

Billur ENGİN BALIN  
H. Dilara MUMCU AKAN  
Ferda KARAGÖZ ÖZENÇ  
Özcan GARAN





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**PURSUING SUSTAINABLE  
DEVELOPMENT GOALS**  
*THE PERFORMANCE OF TÜRKİYE IN THE  
CENTENNIAL OF THE REPUBLIC*

---

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# CONTENTS

---

PREFACE.....	vii
--------------	-----

INTRODUCTION.....	ix
-------------------	----

## Sustainable Development Goal 1: No Poverty

### CHAPTER 1

The History and Dimensions of Poverty in Türkiye

Ayda Rona Aylin ALTINAY .....	3
-------------------------------	---

### CHAPTER 2

No-Poverty Goal of Türkiye on the Basis of Leaving No One Behind Principle

Emine TAHSİN .....	33
--------------------	----

## Sustainable Development Goal 2: Zero Hunger

### CHAPTER 3

Food and Environmental Security in Türkiye: To End Hunger and Promote Sustainable Agriculture

Hatice Dilara MUMCU AKAN.....	87
-------------------------------	----

## Sustainable Development Goal 3: Good Health and Well-being

### CHAPTER 4

Nudging in Behavioral Development Economics: An Evaluation of Preventive Health Services  
in Türkiye

Hatime KAMİLÇELEBİ .....	115
--------------------------	-----

## Sustainable Development Goal 4: Quality Education

### CHAPTER 5

Women Empowerment Through Compulsory Schooling Reform: The Case of Türkiye

Emine Kübra USTA, Elif ERBAY .....	143
------------------------------------	-----

### CHAPTER 6

Regulations in the Compulsory Education System in Türkiye and Government Support

Ezgim ÇARBOĞA, Nazan SUSAM .....	169
----------------------------------	-----

## Sustainable Development Goal 5: Gender Equality

### CHAPTER 7

Progress on Sustainable Development Goal 5 in Türkiye: Prevention of Violence Against Women  
and Girls and Promotion of Gender Equality

Adviye Damla ÜNLÜ BEKTAŞ .....	193
--------------------------------	-----

### CHAPTER 8

Gender Equality as a Sustainable Development Goal: Women's Participation in Decision-Making  
Mechanisms in Türkiye

Gizem BİLGİN AYTAÇ, Ayda SEZGİN .....	221
---------------------------------------	-----

## CONTENTS

---

### Sustainable Development Goal 6: Clean Water and Sanitation

#### CHAPTER 9

A Detailed Analysis of SDG 6 and Türkiye

Özlem YORULMAZ.....243

### Sustainable Development Goal 7: Affordable and Clean Energy

#### CHAPTER 10

Renewable Energy Potential of Türkiye and Policy Recommendations to Improve Energy Efficiency

Damla ÖZEKAN.....263

#### CHAPTER 11

The Role of Geothermal and Hydraulic Energy in Türkiye's Achievement of Sustainable Development Goal 7: Potential, Opportunities and Barriers

Kenan KOÇ, Yüksel BAYRAKTAR.....283

### Sustainable Development Goal: 8 Decent Work and Economic Growth

#### CHAPTER 12

From the Perspective of Inclusive Growth, the Examination of Türkiye's Economic Growth After 2002

Hülya DENİZ KARAKOYUN, Safa Eymen YORULMAZ .....307

#### CHAPTER 13

Multiple Disadvantages in the Labor Market of Türkiye: A Qualitative Study of Women with Disabilities

İlhan DOĞAN, Ezgi ÜNAL.....343

### Sustainable Development Goal 9: Industry, Innovation and Infrastructure

#### CHAPTER 14

A Critical Evaluation of Sustainability Criteria in Large-Scale Infrastructure Projects and an Overview of Türkiye's Infrastructural Investments Through Critical Thinking

Ferda UZUNYAYLA, Bülent HOCA.....371

#### CHAPTER 15

Evaluating the Significance of Research and Development (R&D) Activities in the Turkish Economy: A Comparative Study in the Context of SDG 9 - Target 9.5

Güzin Emel AKKUŞ.....403

### Sustainable Development Goal: 10 Reduced Inequalities

#### CHAPTER 16

Dimensions of Income Inequality and Evaluation of the Redistributive Role of Fiscal Policies in Terms of Functional Public Expenditures in Türkiye

Aysel ARIKBOĞA.....457

#### CHAPTER 17

Reducing Income Inequality in Türkiye: What Has Changed and What Can Be Done?

Betül MUTLUGÜN .....477

## CONTENTS

---

### Sustainable Development Goal 11: Sustainable Cities and Communities

#### CHAPTER 18

The Quadruple Helix into the Effort of Sustainable Cities and Communities: The Case of Marmara Urban Forum in Türkiye

İrem GÜNEŞ, Özcan GARAN..... 511

### Sustainable Development Goal 12: Responsible Consumption and Production

#### CHAPTER 19

Green Practices and Responsible Consumption by the Hotel Industry in Türkiye: A Qualitative Study on Hotel Managers

Büşra KESİCİ, Mert ÖĞRETMENOĞLU, Gürkan ÇALIŞKAN ..... 553

### Sustainable Development Goal 13: Climate Action

#### CHAPTER 20

Combating Climate Change in Türkiye: Integration of Market-Based Instruments to the Environmental Policy

Billur ENGİN BALIN..... 581

#### CHAPTER 21

The Role of Green Bonds in Achieving SDG 13: The Case of Türkiye

Güzhan GÜLAY, Korkmaz ERGUN..... 597

### Sustainable Development Goal 14: Life Below Water

#### CHAPTER 22

Towards a Sustainable Blue Economy in Türkiye: An Overview of Key Sectors and SDG 14 Targets

Gülşah KOCAKAYA..... 627

### Sustainable Development Goal 15: Life on Land

#### CHAPTER 23

The Political Economy of the Conservation of Biodiversity and Biodiversity-Based Trade: The Case of Türkiye

Ferda KARAGÖZ ÖZENÇ..... 655

#### CHAPTER 24

Sustainable Land and Forest Management in Türkiye

Ufuk DEMİRCİ, Idris DURUSOY, Atakan ÖZTÜRK, Bekir KAYACAN ..... 703

### Sustainable Development Goal 16: Peace, Justice and Strong Institutions

#### CHAPTER 25

Türkiye as an Actor in Sustaining International Peace: The Case of Ukraine War

Pınar ERKEM GÜLBOY, Elifcan ÇORUK..... 731



**CONTENTS**

---

**Sustainable Development Goal 17: Partnerships for the Goals**

**CHAPTER 26**  
Possible Impacts of Innovation on Employment  
Sayım YORGUN.....769

## PREFACE

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As the centennial commemoration of the establishment of the Republic of Türkiye draws near, it is opportune to reflect upon the advancements achieved thus far and the challenges that persist in our endeavour to construct a sustainable and prosperous nation. This editorial book represents a collective effort to examine, assess, and comprehend Türkiye's advancements in relation to the Sustainable Development Goals (SDGs) during a significant juncture coinciding with the nation's centennial commemoration. It encompasses a wide range of disciplines, such as economics, sociology, history, education, international relations, political science, tourism, environment, and the natural sciences, among various others. In doing so, it adopts an interdisciplinary approach to address the complex societal aspects of sustainable development.

The 2030 Agenda for Sustainable Development, endorsed by all United Nations (UN) member states in 2015, has 17 Sustainable Development Goals (SDGs) at its core. This agenda serves as a compelling appeal for both developed and developing nations to collaborate in a global partnership. The underlying concept posits that sustainable development necessitates the harmonious integration of economic, social, and environmental dimensions.

Türkiye, a nation characterised by a rich historical background and diverse cultural heritage, has diligently strived to achieve these worldwide objectives since the 1990s. Türkiye has demonstrated significant advancements in its efforts to achieve the Sustainable Development Goals (SDGs), combat poverty, inequality, and environmental degradation, as well as foster economic growth and social inclusion. Considerable effort has been dedicated to formulating and implementing the 2030 Agenda for Sustainable Development, with a primary objective of achieving the Sustainable Development Goals (SDGs). Substantially, most of these goals have been included in legislative and policy frameworks.

However, the 2023 Sustainable Development Report highlights that there is still room for improvement in implementation and projects. According to the report, Türkiye is positioned at 72<sup>nd</sup> place among 166 nations in the Sustainable Development Goals Index, with a corresponding score of 70.8. The report highlights that Türkiye faces significant challenges in 10 out of the 17 goals while encountering substantial barriers in 5. In this respect, this book is dedicated to exploring the various dimensions of Türkiye's achievements within the framework of the Sustainable Development Goals. It offers critical insights, data-driven analyses, and a nuanced understanding of Türkiye's performance, successes, and areas for improvement.

We hope this book will serve as a valuable resource for policymakers, scholars, practitioners, and the global community by providing thorough research, critical analysis, and intellectual contributions. The contributors of this book anticipate that the perspectives presented within its pages will stimulate well-informed discussions, encourage the formulation of policies grounded in empirical evidence, and foster collaborative efforts to achieve a more sustainable future for Türkiye and the international community.

We would like to extend our sincere appreciation to the authors and referees who have generously shared their expertise and dedicated efforts toward developing this essential scholarly work. Their collective efforts have enriched the discourse on sustainable develop-

## **PREFACE**

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ment and positioned Türkiye on the global stage as a nation committed to realising a better, more equitable, and sustainable world for all. Furthermore, we would like to express our special gratitude to Prof. Anil Markandya for authoring our introductory chapter. Finally, we would like to thank Istanbul University Press for their contribution in releasing this book.

### **Editors**

**Billur Engin Bahn**  
**H. Dilara Mumcu Akan**  
**Ferda Karagöz Özenç**  
**Özcan Garan**

## INTRODUCTION

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The Sustainable Development Goals or SDGs are key drivers of an international effort to achieve sustainable development across several dimensions. The 17 goals and associated indicators allow countries to track progress, evaluate actions taken, and propose policies to improve performance.

This volume is a welcome discussion of trends of all SDGs in Türkiye over recent years. As a country that has made great progress in some areas of development but less so in others, a serious evaluation of its performance is a great contribution to the debate on directions of policy for sustainable development in the country.

Doubtless, a key goal in Türkiye as it is elsewhere is to eliminate poverty. The volume rightly gives central consideration to success this goal. While much progress has been made in eliminating extreme poverty in the country, recent events have resulted in some setbacks. As the book notes, poverty reduction also has strong spillover effects on other SDGs.

The next goal is to reduce hunger and increase food security. A chapter is devoted to policies to address these issues, especially in light of the recent COVID-19 epidemic, which is affecting supply chains and causing a food crisis.

The third goal is to ensure healthy lives and promote well-being for all at all ages. While Türkiye has a relatively good record on life expectancy, there is room to increase the use of preventive health services. A chapter looks at ways of doing so through ‘nudge’ policies and their possible effectiveness.

The fourth goal is related to inclusive and equitable education. Two chapters are devoted to this, including one focussing on the effects of compulsory schooling reform on women’s empowerment (which has had relatively little benefit with regard to empowerment-related outcomes. Clearly, more needs to be done in this regard with regard to reducing the large disparities in performance between schools in different regions and across different kinds of schools.

The related goal of gender equality (goal 5) has three chapters devoted to it. The first notes that while schooling rates of girls have improved, forced marriages have decreased, and the number of women in leadership positions has increased, gender equality has not been achieved in Türkiye. In this, the country is not alone: the same applies across the whole world. A second chapter identifies successful strategies, policies, and initiatives to promote gender equality and enhance women’s representation. Finally, a third focuses on the role of working standards in improving the lives of disabled women in the workplace.

Progress toward the goal of clean water and sanitation (goal 6) is investigated over the period 2000-2020 for Türkiye relative to other OECD countries, and an analysis was carried out looking at links between this goal and the goals of poverty reduction, health, education and gender equality.

Goal 7 relates to access to affordable, reliable, sustainable, and modern energy for all. The volume examines the development of affordable and clean energy with a specific focus on proposals for increasing energy efficiency. Another chapter looks at the potential for geothermal and hydro power in contributing to this goal in Türkiye.

## INTRODUCTION

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Inclusive growth is a key goal (SDG8). It has been evaluated for Türkiye for two periods (2002-2011 and 2011-2019). The authors find that while the growth structure of the country had more inclusive features in 2002-2011, and it dramatically declined after 2011. This is an important finding that should spark debate on actions needed to reverse that decline.

Growth is also affected by efficient investment in the right kind of infrastructure. One chapter looks at the ways in which such projects are selected and evaluated in Türkiye. It concludes that present methods of appraisal do not give enough importance to sustainability concerns, and others are high-cost and involve conflicts with other SDGs.

Goal 9 relates to building resilient infrastructure, promoting inclusive and sustainable industrialisation, and fostering innovation. A chapter in the book finds that despite a substantial increase from 2000 to 2021, Türkiye still lags behind the majority of selected countries in terms of the proportion of gross domestic R&D expenditure in GDP and the number of researchers per one million inhabitants, both of which are crucial indicators for monitoring progress towards this goal. This should start an active debate on how the gap can be closed.

Goal 10 seeks to reduce inequality within and between countries. A chapter devoted to this goal focuses on the role of government policies, especially fiscal, wage and social protection policies, in the pursuit of achieving greater equality. As the development goals cannot be met unless the required improvements in certain indicators, such as education, health, and material standard of living, are achieved, the analysis of functional public expenditures provides insights into evaluating current problems and developing relevant policy proposals. Another chapter on this goal asks what can be done to reduce inequality in Türkiye. A key factor behind the increase in inequality is the rise in capital income relative to wage income. On this basis, the chapter identifies the potential for reversing income inequalities in Türkiye. It formulates several policy reforms and institutional arrangements to reduce inequalities and flags policy areas that might conflict with tackling widening economic inequality targets.

Goal 11 aims to make cities and human settlements inclusive, safe, resilient, and sustainable. The volume contains a case study that evaluates the university-industry-government-civil society cooperation for the realisation of this development goal in the context of the Marmara Urban Forum (MARUF19) organised by the Marmara Municipalities Union in 2019.

Goal 12 aims to ensure sustainable production and consumption patterns. Tourism and hotels have an important role in this regard, so one of the chapters looks at green practices by hotels and their responsible consumption. As a result, four main components of hotels' green practices and their responsible consumption are revealed: recycling, energy-saving, training, and encouragement and preferring sustainable products.

Goal 13 is to combat climate change and its impacts. This chapter emphasises integrating climate change measures into national policies and strategies. It notes that despite some efforts in regulations and action plans, the country's greenhouse gas emissions have more than doubled since 1990, driven by rapid industrialisation, urbanisation, and population growth. Implementing market-based instruments in Türkiye is evaluated as a means of addressing the increase in emissions. These instruments can provide the right incentives in a cost-effi-

## INTRODUCTION

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cient way. The key priority areas for the country's environmental policy and market-based instruments are the electricity, industry, and transport sectors. Mitigating emissions requires increasing renewable energy in the electricity sector, improving industrial efficiency, and promoting sustainable transportation practices. Finance for such investments, however, is a challenge, and innovative ways of raising it will be paramount. Here there is a role for both global support as well as green bonds, which, as one chapter shows, when issued under the right terms, can make an important contribution.

Goal 14 is to conserve and sustainably use the oceans, seas, and marine resources for sustainable development. As a chapter devoted to this topic notes, marine tourism, fisheries and aquaculture, and maritime transport sectors are the leading areas of the Blue Economy in Türkiye. While significant economic benefits are realized by these sectors, the country's blue economy strategy also faces challenges in protecting the marine environment and ensuring sustainability. These include marine pollution, overfishing, technological gaps, and diplomatic and legal barriers. Given the targets and indicators of SDG 14, Türkiye needs to strengthen its policies and efforts, particularly in protecting marine and ocean resources, promoting sustainable fisheries, conserving marine biodiversity, and investing in marine technologies.

Goal 15 seeks to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. A chapter in the book looks at this problem from the perspective of the political Economy of the Conservation of Biodiversity and Biodiversity-based Trade. It notes that international trade is one of the main drivers of biodiversity loss since colonialism. By using the UNCTAD and CITES databases on bio-trade, the study shows that biodiversity-based production and trade contribute significantly to the Turkish economy. Although some progress has been made in the sustainable utilization of biodiversity, however, Türkiye lags far behind in comparison to its peers. The efforts to mitigate biodiversity loss are relatively limited and the environmental performance indicators of the country are below the world average.

Another chapter addressing this goal focuses on sustainable land and forest management. Due to the increasing population, urbanization, and industrialization, forest areas are under pressure. In spite of this, the total forest area of Türkiye has increased from 20.7 million hectares to 23.1 million hectares in the last two decades, mainly thanks to the reforestation of abandoned arable lands and afforestation activities. Moreover, erosion control and pasture improvement activities have enabled the country to achieve success in combating desertification and land degradation. Notwithstanding this considerable progress, there are still significant challenges in achieving some of the targets and indicators outlined in SDG-15. These challenges require management of land and forest resources with a holistic approach, enhancement of collaboration among relevant institutions, provision of financial support, and establishment of a monitoring and evaluation system.

Goal 16 aims to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. A chapter looks at the role of Türkiye as an actor in sustaining international peace,

## INTRODUCTION

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with reference to the Ukraine war. This study sheds light on the current debate on the international conflict from a different perspective and evaluates and analyses Türkiye's Sustainable Development performance in terms of contributions to international peace.

Overall, there is a great deal of material here that should provide a strong basis for a policy dialogue on how actions by governments, the private sector and civil society can promote the SDGs in Türkiye, recognizing the strong links that exist between the different goals and how policies designed to impact on goal can have both synergistic and negative impacts on others.

**Professor Anil Markandya**

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Leioa, Spain

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







# CHAPTER 1

## THE HISTORY AND DIMENSIONS OF POVERTY IN TÜRKİYE

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### **Abstract**

Türkiye is celebrating its one-hundredth anniversary and implementing policies to promote sustainable development at the same time. With nearly 82 million citizens, Türkiye stands as a dynamic nation that has a distinct historical context that shapes the country's trajectory. As the nation's accomplishments and potential are reviewed, sustainable development goals, including the pioneering goal of ending poverty, must be examined. This complex phenomenon hinders human potential, maintains inequality, and slows the advancement of inclusive and equitable societies. The UNDP and its partners in Türkiye<sup>1</sup> are working towards achieving the Sustainable Development Goals (SDGS) by 2030, and the first goal is to end poverty by that time. After 25 years of steady progress in reducing poverty, the COVID-19 pandemic has reversed that progress, with the number of people living in extreme poverty rising for the first time in a generation. In comparison to predictions made before the pandemic, the combined crisis with the Ukrainian war could result in an increase of 75 million to 95 million people living in extreme poverty in 2022 (UN, 2022; 26). When compared globally between the years 2000 and 2016, Türkiye was one of those nations that has significantly reduced poverty and showed delicate success in eradicating severe poverty (BM, 2019; 35). Unfortunately, that was a fragile progress and today poverty is still a serious problem in our country. Elimination of poverty in all its forms and dimensions is an indispensable requirement and the policies aimed at reaching this requirement will be the focus of this chapter.

**Keywords:** UNDP, Sustainable Development Goals, no poverty, Türkiye, history of poverty

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<sup>1</sup> The United Nations Country Team (UNCT), in close consultation with the Government of Türkiye, has developed a new cooperation framework for the 2021-2025 period. The framework, known as the United Nations Sustainable Development Cooperation Framework (UNSDCF) is a core instrument defining how the UNCT in Türkiye contributes to the national development priorities set out by the Government of Türkiye in the National Development Plan 2019-2023 and the 2030 Agenda for Sustainable Development. (UNCT Results Report: 2021)

## 1. Introduction

The Republic of Türkiye is a diligent nation that has achieved a significant milestone by commemorating its centenary and has been exertive in implementing effective policies to promote sustainable development. With a current population exceeding 82 million, Türkiye has experienced significant changes that have led to its emergence as a dynamic and intent nation. As one contemplates the advancement and prospects of the country, it becomes imperative to explore the goals of sustainable development, with a particular emphasis on the commendable objective of eliminating poverty. In evaluating Türkiye's accomplishments, it is crucial to recognize the intricate and dynamic character of poverty and the distinct obstacles that the country encounters. With a Gross Domestic Product (GDP)<sup>1</sup> of approximately 807 million U.S. dollars as of 2021 and 905 million dollars in 2022, Türkiye's economic struggle and significant human resource potential continue. Türkiye is an OECD member that has made significant strides in its economic development. (TURKSTAT, 2023)

The complex nature of poverty presents a significant obstacle for countries worldwide. The elaborate nature of this phenomenon hinders the realization of human potential, sustains disparities, and obstructs the advancement of societies that prioritize inclusivity and equity. The establishment of the Sustainable Development Goals (SDGs) was a response to the pressing need to address this issue and was undertaken by the United Nations Development Programme (UNDP). The SDGs serve as a framework for achieving a more sustainable and improved future.

The present chapter aims to provide insights into Türkiye's efforts to eliminate poverty, examining the country's undertakings, advancements, and obstacles in achieving the first goal of "No Poverty". Through an analysis of Türkiye's history, policies, and strategies, our objective is to acquire a deeper understanding of the nation's endeavors to enhance the well-being of its populace and establish a community in which all members can prosper and make valuable contributions to the country's advancement. In analyzing this vital goal, we will try to consider the economic and social facets of poverty, enabling individuals, households, and societies to overcome its entrenchment. When examining the issue of poverty, it may seem necessary to delve into the causal context of poverty formation and the fight against poverty based on different economic and political temporal characteristics. However, as to the scope of this chapter, this causal context will be excluded.

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1 GDP increased by 4.0% compared with the same quarter of the previous year in the first quarter of 2023.

As we commence our investigation into the elimination of poverty within the framework of Türkiye's sustainable development trajectory, it is crucial to acknowledge the importance of our collaborative endeavors in constructing a society where poverty is relegated to history, and all members of the populace can participate in the country's centennial festivities as a symbol of human worth, perseverance, and advancement. Just like in the phenomenon of poverty, the causal context is also important in the fight against poverty. In the context of causality, the inevitability of a systemic problem in income distribution and poverty issues is extremely significant. However, it should be stated that in this study these will not be covered, and the explanation will be limited to the historical drift of the mere phenomenon of poverty.

## **2. Poverty in Türkiye**

Türkiye's foundation as a republic in 1923 marked the beginning of a transformative era under the leadership of Mustafa Kemal. The young republic sought to enhance its political and economic foundations, aiming to establish a modern and prosperous society. Türkiye has witnessed substantial economic changes from the early 1920s. It should be underlined that poverty in Türkiye has been influenced by various factors, including economic growth, industrialization, urbanization, and government policies. In the early years of the Turkish Republic, efforts were made to modernize the economy and society, which impacted poverty levels. Over the decades, the country experienced significant economic changes, transitioning from a primarily rural and agrarian society to a more urbanized and industrialized one. The government policies carried both successes and shortcomings, in addressing poverty. While Türkiye made progress in improving living standards and reducing extreme poverty, there were also periods of economic instability that affected vulnerable populations. This study delves into the challenges of measuring and defining poverty across different periods and contexts in the history of poverty in Türkiye.

### **2.1. History of Poverty in Türkiye**

One of the significant features of the 19th-century Turkish economy was the low average income compared to the second half of the 20th century, and a substantial portion of the population remained below the absolute poverty line defined by the standards of the latter half of the 20th century (Pamuk, 2014: 155, 326). To understand the socio-economic conditions of the early Republican period, it is necessary to evaluate the late period of the Ottoman Empire. Since the young Turkish Republic did not inherit a rich legacy from the Ottoman Empire. The Ottoman economy was predominantly agricultural, with agricultural production being carried out through traditional methods. Additionally, the economy could be defined as an exporter

of raw materials and an importer of industrial goods. (Boratav, 1995; 268) Furthermore, the external debts the Ottoman Empire was obliged to pay, and the successive wars had brought the empire to the point of collapse. The Young Turkish Republic inherited the Ottoman Public Debt Administration which was a \$65 million external debt burden (Yılmaz, 2014). The capitulations had frequently plagued the Ottoman Empire's late period, the status of being an exporter of raw materials and food, and an importer of industrial production. This was the typical economic structure that had ended the monetary sovereignty and started more of a colonial period. (Tezel, 2015; 75)

### **2.1.1. The End of the Ottoman Period**

Looking at the income distribution of the Ottoman throughout the 19<sup>th</sup> century, the key processes influencing this indicator are the decline of traditional crafts in a free trade environment with low tariff barriers and the economy's increasing specialization in agriculture. The tendency of relative prices of manufactured goods in global markets to decline after the Industrial Revolution led to a general favoring of agricultural prices within the country as well. The Ottoman Empire's integration into European capital control during the opening of the economy and the centralization of Ottoman finances was marked by significant turning points. These included the signing of a foreign trade agreement in 1838, the initiation of a foreign borrowing process in 1854, and the granting of privileges to foreign capital for railway construction from the 1850s onwards. The favorable development of prices in agriculture resulted in sectors engaged in market-oriented production, especially medium and large-scale agricultural producers and traders in Western Anatolia and coastal regions, receiving a larger share of income. (Pamuk, 2005; 208-9, 240-1)

It has been estimated that between 1880 and 1913, the average annual growth rate of per capita income was less than 1 percent in the Ottoman Empire. Furthermore, it is approximated that during the span of approximately one century, from 1820 to 1913, the total increase in per capita income was over 50 percent. Nonetheless, over the identical timeframe, the economies of Europe were experiencing more rapid expansion, thereby exacerbating the disparity between their economy and that of the Ottoman Empire. However, the data suggests that the Ottoman economy experienced growth while adhering to a model that was based on agriculture and external trade (Pamuk, 2008; 27). In 1925, the newly established government eliminated the agricultural tithe, which was widely feared by the populace<sup>2</sup>. Fiscal policies

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2 The decision to abolish the tithe tax was made during the Economy Congress held in Izmir in 1925, and its abolition was realized in the same year. However, the cattle tax (ağnam resmi) rates were increased, and it continued to be implemented as the Republic's number one law.

implemented during the Ottoman era resulted in a substantial reduction in the overall tax burden and marked a significant departure from the previous tax regime. Fiscal responsibility is imposed on individuals residing in rural areas. The current administration prioritized the mitigation of destitution among the small and medium-sized producers, who constituted the predominant demographic within the rural populace. Over an extended period, the elimination of the tithe and tax farming facilitated the consolidation of small-scale peasant ownership. The revitalization of agricultural practices played a significant role in bolstering the urban economy, and the Gross Domestic Product (GDP) per capita had reached the same levels as those observed before World War I by the conclusion of the 1920s. (Pamuk, 2010; 23)

Since 1913, and particularly since 1950, Türkiye has exhibited levels and advancements in life expectancy that are analogous to those observed in other developing nations with corresponding income levels. Since the years 1913 and 1950, education indicators such as literacy rates, years of schooling, and school enrollment in Türkiye have consistently fallen behind those of developing countries with comparable levels of GDP. Simultaneously, Türkiye has exhibited a lower prevalence of poverty in contrast to developing nations that possess comparable income levels. The rate at which rural poverty and population decline in the coming decades will be contingent upon the extent to which institutional transformations occur and the amount of education and capital that is infused into rural areas. (Pamuk, 2007: 272-6)

### **2.1.2. The Early Years of the Republic and World War II**

In the early years of the Republic, the state pursued a series of policies for both political and economic institutionalization. Tezel (2015) argues that the impact of these policies on people's living conditions is debatable, based on per capita consumption rates of essential goods such as wheat, sugar, factory-made cotton textiles, cement, and primary energy consumption. The study found that there was no significant increase in per capita consumption levels of these basic goods over 15 years. It was determined that the occasional increases were due to improvements in climatic conditions, and overall, there was no notable increase, particularly in wheat, which is the most consumed product by the people. (Tezel, 2015; 600)

There is almost no data on the dimensions of poverty during the first years of the republic. Therefore, some research is based on newspaper and magazine articles of that period. Çavdar (1983: 74) for example analyzed the writings of the newspapers and magazines of those years, and found an article in a magazine to report:

“Yesterday morning, two men were found in the basin of the fountain across from Gülhane Park, one of them sick and the other dead. The examination revealed that the deceased had died

of hunger. (...) While the police officers were dealing with the body of this man, they heard a moan from the other basin and found that the poor man was experiencing his last moments there. (...) The life of the man who lived off the fruits of trees in the forests was more secure. At least he could satisfy his hunger with the fruits he possessed and would not die of starvation in the forest". Another newspaper article is related to child poverty: "Some children in the outskirts of Istanbul engage in small crafts to help their families during school holidays. These children make griddles and earn 15-20 kuruş per day." (Çavdar, 1983)

During the 1930 Great Depression (like previous general crises), when monetary incomes declined, impoverished peasants were forced to sell their lands and tools, leading to an increase in sharecropping and tenancy. This jeopardized their independence. However, the emerging dependency would be a temporary development that could be reversed when prices started changing in favor of the farmers. The increase in agricultural prices, the availability of cheap credit, and the rapid introduction of tractors enabling extensive land cultivation led to a decrease in the significance of sharecropping in agriculture in the post-war period and the 1950s. The dominant trend observed both in poor and wealthy villages was the expansion of peasant ownership. The number of farms owned by their operators increased from 2.3 million in 1950 to 2.5 million in 1952 and reached 3.1 million in 1961. This indicates an approximately 30 percent increase in the number of small-scale production units during the 1950-1960 period. The proportion of landless peasant families decreased from 16 percent in 1950 to 10 percent in 1960. It is a bit more challenging to demonstrate the indirect impact of the agricultural structure. However, it is certain that from the perspective of the capitalist sector, the peasantry has become an important segment of the domestic market. Those who migrated from villages to cities did not have to leave their villages because they were landless and impoverished. In other words, when they arrived in the city, they were not without belongings or property; they were not deprived. The average migrant had land in their village that they either leased out or left to their family members in exchange for something. In most cases, they had enough money to start building a house in a makeshift settlement closed off by relatives or fellow villagers from the same village. (Keyder, 2014; 160-5, 195)

### **2.1.3. Post-World War II Period**

President İnönü ensured the submission and approval of a land reform project in 1945 to the Parliament that aimed to distribute state lands to landless and impoverished peasants. This shows the desire of the bureaucracy lies in establishing a new alliance with impoverished peasants in response to the increasingly strengthening opposition of the bourgeoisie. It could be said that the most affected group by statist policies and mobilization was the impoverished

peasantry. Therefore, even if they did not independently demand land reform, it would be logical to select the impoverished peasants as the group whose hearts needed to be won over. It might have been possible to gain the support of impoverished peasants; however, it became apparent that in the 1950s, while not to the same extent as middle and wealthy peasants, impoverished peasants also preferred the opportunities evaluated by the free market. (Keyder, 2014; 153-8)

The accumulated wealth of merchants during World War II reached significant proportions and became a significant factor in the dissolution of the alliance between the bourgeoisie and the bureaucracy. Voices against profiteering in the black market and speculation by merchants began to rise. Bureaucrats whose salaries were falling behind prices and industrialists who had limited opportunities for profiteering expressed their discomfort. It became evident that the regime lacked the means to prevent these profiteering activities. The rationing of bread and other essential goods in cities proved to be an ineffective and sluggish practice. Parallel markets emerged where the well-off could engage in trade. Newspapers were filled with news of lucrative activities. In the atmosphere of general scarcity and poverty, the knowledge that certain individuals were making significant profits quickly turned into opposition against the government, and the search for culprits began. This search once again directed the government to confront the non-Muslim commercial bourgeoisie in Istanbul. Throughout the Republican era, the former capital had been associated with undesirable colonial connections and the comprador bourgeoisie. The new mentality represented by Ankara had become the essence of national development. In this ideological framework, it was not difficult to confront the commercial capital of colonial Istanbul with the national industry of Ankara (Keyder, 2014; 143)

With the increase in economic growth after World War II, the absolute poverty rate also began to decline. The poorest segments within the country were peasants with limited or no land in less economically developed regions such as Eastern and Southeastern Anatolia. Therefore, it is not easy to determine the direction of regional inequalities during this period. The tendency of decreasing inequalities between the agricultural and non-agricultural sectors suggests that the difference between the Eastern and Southeastern regions, where agriculture has a higher weight, and the western regions may not have increased. On the other hand, the concentration of industrialization in the northwest of the country and the inability of the Eastern and Southeastern regions to benefit from industrialization may have led to an increase in regional inequalities. (Pamuk, 2014)

In the 1950s, during the rule of the Demokrat Parti [Democratic Party], a growth strategy based on agriculture was pursued. In the early 1950s, nearly 80% of the country's population



derived their livelihood from agriculture. During this period, intra-agricultural inequalities had a significant weight within the overall inequality framework of the country. However, with the acceleration of rural-urban migration, the importance of agriculture both in the economy and in the income inequality landscape began to decrease. The analysis of the relative price movements also reflects the weight of agricultural producers' votes after the transition to a multi-party-political regime. The Demokrat Parti and its successor, the Adalet Partisi [Justice Party], attempted to direct product and input prices in favor of agriculture through expanding support programs. The relative price favorability towards agriculture benefited large-scale producers the most, particularly increasing inequalities between those engaged in market-oriented production within the agricultural sector and those who were not. The trend favoring agriculture in relative prices also brought medium and small-scale producers into market relations. (Keyder, 2014; 154-9)

Despite the trend of industrialization and rapid productivity growth in the urban economy, the decrease in inequalities between the agricultural and non-agricultural sectors can be observed, partially attributed to significant numbers of people transitioning from agriculture to the urban economy. In other words, significant productivity and income increases occurred in the urban economy. However, productivity and income increase in the agricultural sector did not lag the urban economy. In fact, with the acceleration of the shift of labor from agriculture to non-agricultural sectors, labor productivity, and average incomes in agriculture began to increase at a faster pace than in the urban economy. The third key indicator reflecting income distribution within the urban economy, the wage-to-average income ratio, also showed an increase during this period. Wages, which remained suppressed in the previous period and did not rise as much as average incomes in the urban sector, increased faster than the average income growth in the urban economy during this period. If we had a series for manufacturing industry wages as well as for regular wages, we could more accurately determine the dimensions of the trend favoring labor. Nevertheless, labor's share in total income increased significantly within the urban economy. Moreover, we know that protectionism and state intervention led to increased profits for medium and large-scale industrialists who could benefit from quotas and allocation processes during this period. Pamuk (2014; 330-3)

#### **2.1.4. The Liberalization after the 1980s**

The World Bank report of Derviş and Robinson (1978) indicates that Türkiye's per capita income in 1977 was approximately \$1000, which placed it below the average income of most semi-industrialized countries. The report also underlines the low wages of traditional labor and consequent urban poverty. (Derviş and Robinson, 1978; 2, 24). In the early 1980s,

Türkiye implemented an orthodox stabilization program that subsequently transformed into a structural adjustment model. This marked a distinct departure from the policies of previous decades. The continuity of economic leadership during the specified period was exemplified by Turgut Ozal, the current prime minister, who served as the dominant figure in economic affairs, except for a brief period of sixteen months in 1982-83. Extensive research has been conducted on the constituents of the contemporary policy framework that prevailed in the economy throughout the 1980s. Therefore, there is no need to reiterate them in this context. In brief, the model has undergone a structural reorientation towards greater liberalization both domestically and internationally, with reduced state involvement in productive activities, including privatization measures, and prioritization of export orientation in resource allocation. The traditional stabilization package has taken a backseat since 1984. Boratav (1990) underlines that the structural adjustment program of the 1980s aimed to modify and redefine the policy parameters that govern and influence the distribution of income concerning labor. It must be acknowledged that this objective was not among the stated goals of the program during the 1980s in relation to distribution. Nevertheless, when objectives that carry political implications that are sensitive and unfavorable are integrated into a significant policy reorientation, their presence can be validated. (Boratav 1990; 199)

The urbanization process that began in the 1950s gradually reduced the share of the agricultural sector in the total economy and labor force with each passing decade. After 1980, the inequalities between the agricultural and non-agricultural sectors showed medium-term fluctuations. The increasing inequalities, following the removal of support programs for agriculture during the military regime, began to decrease in the mid-1990s, coinciding with the acceleration of migration from rural to urban areas and the shift of relative prices in favor of agriculture. As for the income inequalities between regions or between Eastern and Southeastern Anatolia and the western part of the country, we can say that they increased in the 1980s due to national economic policies and later in the 1990s due to the war in the Southeast, but decreased somewhat in subsequent years. By the end of the 20th century, while the weight of internal inequalities within the agricultural sector decreased significantly in the income distribution framework at the national level, inequalities within the urban economy began to emerge.

The crisis of 1994 was primarily attributed to the financial vulnerability associated with an outward-oriented approach, which persisted during the crisis management phase. The aforementioned phenomenon has resulted in a significant disparity in the distribution of income, with rent incomes being favored over labor incomes. This has had a notable impact on the national economy,

leading to a contraction of 6% in overall income. Furthermore, the pursuit of stability has come at the expense of impoverishing certain segments of the population. The year 1994 denotes a period of stability that was attained through a significant reduction of 6% in the national income, which consequently led to impoverishment. Apart from a decline of 6% in the gross domestic product, the fiscal year of 1994 also witnessed an outflow of at least \$6.5 billion to foreign entities. This quantity approximately correlates to 5% of the Gross Domestic Product. Consequently, the populace of Türkiye encountered a mean rise of 11% in poverty during the year 1994. The surge in poverty did not have a significant impact on major capital and financial institutions, as they were able to successfully navigate through the initial crisis. Conversely, the current year has proven to be a lucrative period for financial sectors that have the potential to reap rewards from elevated interest and rental revenues dispensed by the Central Bank and the Treasury. On the contrary, the escalation of unemployment and the significant decline in real wages, approximately 35%, have predominantly impacted the strata of wage earners. (Boratav, 2000; 201)

The poverty rate in Türkiye was assessed by the World Bank in 1994, utilizing the one-dollar-a-day methodology. The resulting report indicated that 2.4% of the population was classified as impoverished. This information is documented in the World Bank's 2000 report. Nevertheless, when the approach is increased twofold to two dollars per day, approximately 18% of the populace descends below the poverty threshold. (TÜSİAD, 2000; 100)

<b>Table 1.</b> Income Distribution between 1963-1994								
	1963	1968	1973	1978	1983	1986	1987	1994
Lowest 20%	4.5	3.0	3.5	2.9	2.7	3.9	5.2	4.9
Second 20%	8.5	7.0	8.0	7.4	7.0	8.4	9.6	8.6
Third 20%	11.5	10.0	12.5	13.0	12.6	12.6	14.1	12.6
Fourth 20%	18.5	20.0	19.5	22.1	21.9	19.2	21.2	19.0
Highest 20%	57.0	60.0	56.5	54.7	55.8	55.9	49.9	54.9
Gini Coefficient	0.55	0.56	0.51	0.51	0.52	0.50	0.43	0.49
<b>Source:</b> Gürsel et al. (2000).								

Dağdemir (1992) incorporated assessments of the issue of poverty and the socio-economic framework of poverty in their research. The statement underscores the imperative of enhancing the living standards of impoverished groups to promote equitable distribution of income. Additionally, the research presents poverty thresholds and poverty rates that were derived from income distribution analyses carried out in 1968, 1973, and 1987. A decline in poverty rates was noted between the years 1968 and 1987. The proportion of individuals belonging to the lower 40%- and 60%-income brackets, who are classified as impoverished based on the overall income, has experienced a rise of 2.9% and 2.1%. (Dağdemir, 1992; 94)

**Table 2.** Households at the Poverty Line

	1968	1973	1987
<b>Poverty threshold (in TL)</b>	6,940	12,000	1,357,000
<b>Share of total income received by the poorest 40% (%)</b>	9.5	11.5	14.8
<b>Share of total income received by the poorest 60% (%)</b>	20.6	24.0	28.9
<b>Percentage of poor households earning less than half of the average income (%)</b>	49.1	41.6	34.2
<b>Absolute poverty rate (%)</b>	51.5	38.4	22.5
<b>Poverty threshold (in TL)</b>	6,940	12,000	1,357,000

Source: Dağdemir (1992).

The poverty rates signify the proportion of the populace whose consumption or income levels, modified for purchasing power parity at 1993 prices, fall below one dollar or two dollars per day, in comparison to the entire population. Traces of the strategy that predominated in Türkiye's Five-Year Development Plans after the 1960s, which ignored the income distribution problem, will also be seen in the Strong Economy Transition Program, which was put in place following the 2001 financial crisis. This program seems to have placed a significant amount of reliance on the economy beginning a rapid growth process in the face of the severe social effects of the crisis. (Önder and Şenses; 2006)

### 2.1.5. The Crisis of 2001

Neoliberal policies have increased poverty in many countries around the world, prompting the need to address poverty and implement social policies. The same thing happened in Türkiye. After transitioning to market-oriented policies in the 1980s, the decline in agricultural incomes and wages, as well as limited employment growth, and in the 1990s, the slowdown in economic growth, escalating inflation, and interest rates, led to a more unequal income distribution and the spread of poverty. The trend was further reinforced by the migration of numerous Kurdish families, who were forced to leave their villages due to the war in the Southeast, to cities in the Mediterranean, Aegean, and Marmara regions. (Yükseker, 2009) As a result, both rural areas and cities experienced increasing inequality and poverty, reaching its peak with the 2001 crisis. However, not only in rural areas but also in cities, a large portion of workers were excluded from the social security system. The AK Party approached the issue by combining neoliberal, market-oriented methods with the conservative tradition of charitable work. Social security was seen as a form of assistance to the poor rather than a right for all sectors, and it was regarded as a charitable act performed by those who were well-off. Instead of relying on weak state channels, assistance to poor families was targeted through civil society organizations, local party organizations, local governments controlled by the party, and

religious and sectarian networks. Rather than having defined programs, arbitrary or selective practices, and individual relationships gained importance. (Buğra, 2008) Nevertheless, on one hand, because of the restoration of the fiscal balances of the public sector, the state's interest payments decreased, while on the other hand, the economy's recovery and economic growth led to increased state revenues. As a result, significant increases were made not only in resources allocated to combating poverty but also in education, health, and infrastructure expenditures. As the central government budgets grew, military expenditures decreased while the share of education and health expenditures increased.

In rural areas, immediately after the 2001 crisis, the government, under the influence of pressures from the IMF, decided to abolish the practice of supporting prices for agricultural products. However, while this practice, which had been widely used for over half a century, was abandoned, new policies that would increase productivity and provide employment could not be put in place. This situation also encouraged the migration of the rural population, which worked with low productivity in the agricultural sector, to urban areas. Thus, the trend that started after 1980 strengthened, and rural areas began to transform into places where a declining population, diminishing political power, and increasingly impoverished, older, and less educated people resided. Furthermore, due to the decline in the rural population, there was a significant labor shortage not only during cotton picking but also during the harvest seasons of hazelnuts, tobacco, and many other products, as they used to be in the past.

Regarding the distribution of income within the urban economy, we know that during this period, the purchasing power of wages in the urban economy lagged the income growth in the urban economy. In other words, there was a significant decline in the share of labor in the income generated in the non-agricultural sector during this sub-period. However, this trend that characterized the entire period did not occur in a continuous straight line. Real wages, which were much lower during the military regime compared to the previous period, rapidly increased in the late 1980s due to increased political competition and rising labor resistance and demands. However, in the following years, the ratio of wages to average income in the urban economy started to decline again. The increasing budget deficits in the 1990s, along with rising inflation and interest rates that outpaced them, and frequent economic crises, played a significant role in the increase of income inequalities in the urban economy. During the AK Party era, the increase in average incomes and the increase in health and social assistance expenditures in the public sector contributed to a reduction in poverty that had increased in the 1990s. However, the fact that the purchasing power of wages increased much less than per capita incomes after 2001 indicates that the additional income generated by economic growth was shared unequally within the urban economy. (Pamuk, 2014)

## 2.2. Measurement of Poverty in Türkiye

After the establishment of the Turkish Republic, the Central Statistical Department was founded in 1926 and went through many organizational and structural changes over the last hundred years. Finally, in 2005 Turkish Statistical System and the Institute were reorganized, and the name of the Institute was changed to the Turkish Statistical Institute (TURKSTAT). The first measurement of the national accounts data related to the period of 1923-1947 was done by the collective work of T. Bulutay, Yıldırım, and Tezel (1948). The data presented by TurkStat from 1923 to 1947 is taken from that research. GDP calculations are being done according to the expenditure approach by the division of expenditure accounts since 1993 and the income approach by the division of income accounts since 1996. Poverty calculations started by Celasun's leading work which used income distribution and domestic terms of trade in Türkiye for the years 1978-1983 and came up with estimated measures of inequality and poverty. After that, research on quantifying the parameters of poverty in Türkiye has been conducted in very recent years, albeit in a limited capacity. In 2002, TURKSTAT released the Household Budget Survey, which included the initial disclosure of the poverty line and poverty rate. After its initial investigation on poverty, TURKSTAT conducted further research which is called The Income and Living Conditions Survey. It was initiated in 2006 and subsequently released data on individual poverty rates in Türkiye, categorized according to various segments over several years. Generally, two different approaches emerge in measuring poverty: monetary and non-monetary poverty indicators. The monetary indicators, which are based on income or expenditure, are traditional poverty approaches. The traditional approach is based on the assumption that individuals' well-being is determined by their material living standards. These indicators are known as "absolute poverty" and "relative poverty" which include the calculation of rates for individuals earning 1 USD, 2.15 USD, and 4.3 USD per person per day. These internationally recognized indicators enabled a comparison of poverty levels in Türkiye with those of other countries. However, as Önder and Şenses (2006: 12) also mentioned, "poverty should be seen not only as an income insufficiency where everything else remains equal but as a holistic category that includes income insufficiency and encompasses capacity and the breadth of options". In this regard, non-monetary poverty indicators have also been developed. Thanks to Sen's (1993) "capability" and human poverty approaches, new methods have started to be developed in the poverty literature. Based on these studies, it is widely accepted in the poverty literature that poverty is not one-dimensional; it is a multi-dimensional phenomenon closely related to various areas such as health, education, and the labor market. (Altınay, 2015)

The report titled “Growing Unequal” by the OECD in 2008 examines the trends of income inequality and poverty from the 1980s to the 2000s. According to the OECD, Türkiye is among the nations that exhibit significant income inequality; however, this gap has been decreasing at a rapid pace. In contrast, Türkiye stands out among the member states of the Organization for Economic Cooperation and Development (OECD) due to its reduction in income inequality during the 1990s, a period in which most OECD countries experienced a rise in income inequality. The OECD report exclusively addresses the topic of poverty relative to income poverty. The data indicates that individuals residing in large agricultural households with limited education and dependent children experienced higher poverty rates in 2006 as compared to 2003. (Demir and Jenkins, 2013; 5)

Before 2002, there was a dearth of official statistics about income distribution and poverty in Türkiye. The Household Income and Consumption Expenditure Surveys (HICES) were conducted by TURKSTAT in 1987 and 1994, to obtain nationally representative data. Thresholds can vary significantly across countries and regions, leading to challenges in making cross-national or cross-regional comparisons of poverty rates and trends. The rates that were obtained through their utilization were initially disclosed in 2004, after an examination of the 2002 Harvard Business School dataset. Before 2004, many studies were primarily concerned with establishing poverty lines, assessing poverty rates, and characterizing impoverished populations, as there was no universally accepted definition of poverty or official poverty thresholds. The determination of poverty lines was based on the concept of fulfilling basic needs, which involved considering different studies that looked at the composition and costs of the food basket. When establishing the food basket, calorie requirements were also considered. However, most of these studies only focused on a short period of one or two years and did not analyze longer-term trends or examine data beyond 1994. The analysis conducted by the World Bank (2000) specifically looked at changes in poverty levels between 1987 and 1994. They used data from the 1987 and 1994 Household Income and Expenditure Surveys (HICES) to establish poverty lines based on both absolute and relative measures. Using the 2002 Household Budget Survey (HBS) as a reference, TURKSTAT started providing consumption-based absolute poverty thresholds. These thresholds include values like US\$1, US\$2.15, and US\$4.3, as well as poverty lines for food and both food and non-food items. The methodology used for establishing the last two lines was developed in collaboration with the World Bank (World Bank and TURKSTAT 2005) and employed a cost-of-basic-needs approach. The study used data from the 2003 HBS to create a food basket consisting of 80 items that would meet the dietary requirements for a daily food intake of 2100 calories. By

evaluating the cost of each item annually, the prices for the entire basket were determined, thus establishing the food poverty threshold. To determine the cost of non-food essentials, the cost of the food basket was divided by the proportion of food consumption among individuals slightly above the poverty threshold. The proportion of non-food consumption varied from year to year, with a recorded percentage of 60% in 2003 and 65% in 2009. As a result, the proportion of food consumption also fluctuated accordingly. It's important to note that the official poverty lines in Türkiye vary from year to year and are not strictly considered absolute poverty lines like the US\$1 per day line. Since 2006, TURKSTAT has been releasing income-based relative poverty statistics derived from the Turkish component of EU-SILC, which complement the poverty estimates obtained through the basic needs approach. (Demir and Jenkins, 2013; 4)

Table 3 shows the percentage of the population subsisting on less than \$2.15 per day at prices adjusted for 2017. This measure is defined by the World Bank's methodology as the proportion of the population that makes less than \$2.15 per day in international prices in 2017. Using data from household surveys in 22 countries, the World Bank created its first estimates of worldwide poverty for developing nations for the World Development Report 1990: Poverty<sup>3</sup>. Looking at Table 3, one can observe that we have experienced a nearly continuous reduction in poverty from the early 2000s onwards. However, this progress slowed down or stabilized from the mid-2010s. The economic challenges faced in 2018-2019 led to an increase in poverty rates, causing approximately 1.5 million more people to fall into poverty. (World Bank, 2023)

<b>Table 3. Poverty headcount ratio at \$2.15 a day (2017 PPP) (% of population)</b>									
<b>Years</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>% of population</b>	2.10	3.86	2.01	2.34	1.77	1.31	0.56	0.72	0.77
<b>Years</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>% of population</b>	0.13	0.09	0.30	0.20	0.21	0.20	0.14	0.04	0.36
<b>Source:</b> The World Bank, Poverty, and Inequality Platform (2023)									

Looking at Table 4, relative poverty is defined as the state of individuals whose incomes fall below a certain threshold in comparison to the wider population. From 2013 to 2022, the at-risk-of-poverty rates based on different poverty thresholds were as follows: 7.6% for the poverty threshold set at 40% of the median equivalised household disposable income (a decrease of 0.9 points from the previous year), and 29.3% for the poverty threshold set

3     Martin Ravillion was the first one to come up with the idea of comparing levels of poverty based on household surveys.



<b>Table 4. Poverty rate by equivalised household disposable income (%), 2013-2022</b>										
<b>Survey Year</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>Income Reference Year</b>	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>40% of the median equivalised income</b>	9.1	8.7	8.7	8.4	7.4	7.9	8.3	8.9	8.5	7.6
<b>50% of the median equivalised income</b>	15.0	15.0	14.7	14.3	13.5	13.9	14.4	15.0	14.4	14.4
<b>60% of the median equivalised income</b>	22.4	21.8	21.9	21.2	20.1	21.2	21.3	21.9	21.3	21.6
<b>70% of the median equivalised income</b>	29.5	29.4	29.5	28.7	28.1	28.5	28.5	29.0	28.8	29.3
<b>Source:</b> TURKSTAT, Income and Living Conditions Survey (2022)										

at 70% of the median equivalised household disposable income (an increase of 0.6 points). Analyzing the poverty rates based on household types and the poverty threshold set at 50% of the median equivalised household disposable income, the at-risk-of-poverty rate was 7.5% for one-person households (an increase of 1.0 points), 11.7% for multi-person no-family households (an increase of 2.6 points), 19.6% for extended family households (an increase of 1.1 points), and 13.9% for one-family households (a decrease of 0.3 points) compared to the previous year. The TURKSTAT data also shows that the poverty rate among children is particularly high, standing at 12.2% in 2021, a decrease from 12.7% in 2020. This highlights the importance of addressing poverty among children, as it can have long-term effects on their social and economic well-being. In terms of income inequality, the data shows that the Gini coefficient, which measures the distribution of income among individuals or households within a country, decreased from 0.41 in 2019 to 0.40 in 2020. The Gini coefficient stood at 0.39 in 2021, a decrease from 0.40 in 2020. This indicates that income inequality in Türkiye has slightly decreased. However, the Gini coefficient remains relatively high, indicating that income inequality is still a significant issue in the country.

The TURKSTAT data also shows that access to basic services and social protection in Türkiye has improved in recent years. The poverty rate of households with access to basic services such as electricity, water, and sanitation is lower than that of households without access to these services. Moreover, the poverty rate of households receiving social protection benefits is lower than that of households not receiving these benefits. In terms of access to affordable and adequate housing, it can be observed that the percentage of households living in inadequate housing decreased from 5.2% in 2019 to 4.5% in 2020. This decrease can be attributed to the government's efforts to improve housing conditions and provide affordable housing options for low-income households. In terms of access to social protection,

the percentage of households receiving social protection benefits increased from 17.3% in 2019 to 18.3% in 2020. This increase can be attributed to the expansion of social assistance programs, such as the FISP and CCT, which have provided targeted cash transfers to families and individuals living in poverty.

The below data is based on the Income and Living Conditions Survey report for 2022 of TURKSTAT which pertains to the income information for the year 2021. In this survey, poverty and living conditions statistics are calculated based on household income. The income is converted into equivalent household disposable income, considering the household's size and composition. Relative poverty is defined as the state of individuals with incomes below a specified line compared to the general population. According to the poverty threshold set at 50% of the median equivalised household disposable income, the at-risk-of-poverty rate remained unchanged at 14.4% compared to 2021. However, when the poverty threshold was set at 60% of the median equivalised household disposable income, the at-risk-of-poverty rate increased by 0.3 points to reach 21.6% compared to the previous year.

Regarding education status, among individuals with incomes below the poverty threshold set at 50% of the median equivalised household disposable income, 27.7% of illiterates and 24.4% of literates without a degree were classified as poor. The corresponding figures for individuals with less than a high school education and high school graduates were 13.8% and 7.8%, respectively. Higher education graduates had the lowest poverty rate at 2.6%.

The persistent at-risk-of-poverty rate, which measures individuals living below the poverty threshold for at least two out of the preceding three years, was 14.0% in 2022, representing a 0.2-point increase compared to the previous year.

Table 5 presents the poverty rates based on the poverty threshold set at 50% and 60% of median equivalised household disposable income, with consideration given to various household types. The process of determining income and poverty involves converting the household's income into an equivalent household disposable income, which is adjusted based on the household's size and composition. The findings indicate that the at-risk-of-poverty rate for one-person households increased by 1.0 points to reach 7.5%. Similarly, multi-person no-family households experienced an increase of 2.6 points, resulting in an at-risk-of-poverty rate of 11.7%. Extended family households had an at-risk-of-poverty rate of 19.6%, which increased by 1.1 points. In contrast, one-family households experienced a decrease of 0.3 points, resulting in an at-risk-of-poverty rate of 13.9% compared to the previous year.

**Table 5.** Number of the poor and poverty rate by household type and equivalised household disposable income, 2022

Household Type	50%			60%		
	Poverty threshold (TL)	Number of the poor (Per thousand people)	Poverty rate (%)	Poverty threshold (TL)	Number of the poor (Per thousand people)	Poverty rate (%)
<b>Total</b>	17,747	12,000	14.4	21,296	18,030	21.6
<b>One person household</b>	17,747	382	7.5	21,296	560	10.9
<b>One-family households</b>	17,747	8,925	13.9	21,296	13,511	21.0
<b>Couple without resident children</b>	17,747	370	4.2	21,296	657	7.4
<b>Couple with at least one resident child</b>	17,747	7,991	15.8	21,296	11,990	23.7
<b>Lone parents with at least one resident child</b>	17,747	564	11.7	21,296	863	17.9
<b>Extended-family households</b>	17,747	2,580	19.6	21,296	3,810	28.9
<b>Multi-person no-family households</b>	17,747	113	11.7	21,296	150	15.5

Source: TURKSTAT, Income and Living Conditions Survey (2022)

In Table 6 we see the poverty figures calculated based on equivalent household disposable income and household types, poverty rate, and poverty gap; the poverty figures, poverty rate, and poverty gap based on the relative poverty line was calculated using Purchasing Power Parity (PPP). Underlining the date for 50%: In Türkiye, as of 2022, a total of 11,163 per thousand people remained below the poverty line (17,219 TL) determined using PPP. The poverty rate, on the other hand, experienced fluctuations until 2012, and then started to decline, reaching its lowest point since 2006 at 12.3 % in 2017. The poverty gap ratio serves as an indicator of the extent of poverty within a given population. The metric denoting poverty severity reaches a critical level when approaching “100”, while a decrease in this metric indicates a lower degree of poverty risk. The formula:

Poverty gap = ((Poverty threshold-Median income of poors by EII)/Poverty threshold)\*100

The poverty gap, which is the difference between the poverty line adjusted by PPP and household income, was 20.5% in 2022.

Eurostat has updated the definition of material deprivation by incorporating social deprivation criteria. The variables pertaining to the household level were utilized in the computation

Table 6. Number of the poor, poverty rates, and poverty gap by poverty thresholds adjusted by PPP for Türkiye, 2006-2022																	
	Years																
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
40%																	
Poverty threshold (TL)	1, 849	2,348	2,460	2,735	2,886	3,167	3,515	3,897	4,312	4,826	5,517	,166	6,918	8,354	9,621	10,884	13,775
Number of poors (Thousand person)	8,228	5,920	6,241	6,869	6,801	6,664	6,759	6,128	5,929	5,970	5,749	,197	5,712	5,942	6,674	6,505	5,729
Poverty rate (%)	12.2	8.6	9.0	9.7	9.5	9.2	9.2	8.2	7.8	7.8	7.5	6.6	7.2	7.4	8.2	7.9	6.9
Poverty gap	28.4	23.3	22.5	23.9	22.3	24.3	22.3	21.4	21.3	21.8	19.6	19.8	20.1	20.5	22.4	23.9	22.9
50%																	
Poverty threshold (TL)	2,311	2,935	3,075	3,419	3,608	3,958	4,394	4,871	5,390	6,032	6,896	,707	8,647	10,442	2,026	13,605	17,219
Number of poors (Thousand person)	12,096	10,007	10 613	11,391	11,461	1,058	11,131	10,321	10,451	0,503	10,296	,690	10,647	10,833	1,424	11,233	11,163
Poverty rate (%)	17.9	14.6	15.3	16.1	16.1	15.3	15.1	13.9	13.8	13.8	13.4	12.3	13.3	13.4	14.0	13.6	13.4
Poverty gap	30.7	25.0	25.0	26.1	25.3	25.7	26.0	24.5	23.6	23.8	23.0	21.5	22.1	22.4	25.4	24.7	20.6
60%																	
Poverty threshold (TL)	2,774	3,522	3,689	4,103	4,330	4,750	5,272	5,845	6,468	7,238	8,275	,249	10,377	2,531	14,431	16,326	20,663



of the rates of material and social deprivation. These variables included the incapacity to afford unforeseen financial expenses related to automobiles, the ability to take an annual holiday away from home for a week, the payment of mortgage or rent, the consumption of a meal containing meat, chicken, or fish every other day, the provision of adequate heating to the home, the replacement of worn furniture, and the possession of an automobile. The contemporary definition has undergone modifications by excluding the possession of a washing machine, a color TV, and a telephone, which were previously included. The recently incorporated variables at the individual level encompassed the following: the incapacity to acquire new clothes to replace worn-out ones, the lack of access to two pairs of appropriately fitting shoes, the inability to engage in leisure activities outside the home that require monetary expenditure, the failure to meet with family or friends at least once a month, the absence of a weekly allowance for personal expenses, and the unavailability of a personal internet connection at home.

Table 7 shows the rate of severe material and social deprivation, characterized by the inability to afford at least seven of the thirteen items specified. The data pertaining to the variables utilized for computing social deprivation indicators were first gathered in 2015, therefore 2006-2014 are null. The severe material deprivation rate (%) showed a steady fall throughout 2006-2022. Severe material and social deprivation rate (%) decreased between 2015 and 2020. Then in 2021, probably with the impact of COVID-19, it increased to 18.1% but decreased to 16.6% in 2022.

### **3. Sustainable Development Goals: “No Poverty” in the World and Türkiye**

Prior to the onset of the COVID-19 pandemic, advancements toward the attainment of Goal 1 had decelerated, and the global community was not making sufficient headway in eradicating extreme poverty by the year 2030. In light of the current global climate, with the looming possibility of severe economic repercussions comparable to those experienced during the Great Depression, it is expected that a significant portion of the global population will be forced into poverty, thereby reversing the progress made in poverty reduction over the past several years. The significance of resilient social protection systems in protecting individuals who are impoverished and susceptible is increasingly evident as the economic consequences of the pandemic intensify. The necessity for proficient emergency preparedness is imperative for both pandemics and other perils that result in calamities. The proportion of individuals residing in severe destitution across the globe experienced a reduction from 15.7% in 2010 to 10.0% in 2015. Nevertheless, there has been a slowdown in the rate of global poverty reduction. According to current estimates, the global poverty rate in 2019 was 8.2%. (UN, 2020)



Türkiye has experienced a consistent decline in poverty rates since the early 2000s, however, this trend has exhibited a deceleration or plateauing effect since the mid-2010s. The period of economic decline observed between 2018 and 2019 increased poverty rates, as measured by consumption-based welfare aggregates and the upper-middle-income poverty line, from 10.9 percent to 12.6 percent in 2019. This led to an estimated 1.5 million individuals falling below the poverty line. Türkiye experienced the impact of the COVID-19 pandemic in close succession, leading to significant employment reductions that disproportionately affected individuals employed in informal, low-skilled, and youthful occupations. The Household Budget Survey, which encompasses consumption microdata, was not gathered during the years 2020 and 2021. However, the Survey of Income and Living Conditions (SILC) for the same period indicates that the poverty rate based on income remained stable in 2020. This can be attributed to the augmented government transfers that counterbalanced the adverse impact of the reduction in labor and investment incomes. (World Bank, 2023)

The phenomenon of inequality has experienced an upward trend in Türkiye in the past. The Gini index exhibited a decline from 0.42. in 2003 to 0.39 before the onset of the economic crisis in 2008. However, it subsequently experienced an upswing, reaching 0.41 in 2019. The level of income-based inequality in the year 2020 was observed to remain unaltered, owing to the augmented government transfers. In 2022, there is evidence of a rise in inequality, which can be attributed to the distribution of national income being skewed towards gross operating surplus as opposed to compensation of employees. In 2022, the proportion of employee compensation in GNI attained a historic minimum of 23.7 %, which is a notable decline from the 31.3% recorded in 2019. It is estimated that the impact of the earthquake on regions with higher poverty rates than the national average will exacerbate measures of inequality in the upcoming years. (World Bank, 2023)

Related to the achievement of SGD 1 in Türkiye, one can assert that poverty remains a significant issue, with an estimated 19% of the population living below the poverty line in 2019. The government of Türkiye has implemented various policies and programs to address poverty, including social assistance programs, employment policies, and education and training programs. One of the main poverty reduction strategies in Türkiye has been the expansion of social assistance programs, such as the Family Income Support Program (FISP) and the Conditional Cash Transfer Program (CCT). These programs provide targeted cash transfers to families and individuals living in poverty, to increase their purchasing power and improve their standard of living. Another key strategy has been the implementation of employment policies and programs, such as the Employment Strategy for the EU Harmonization Period



and the National Employment Action Plan. These policies aim to increase the participation of disadvantaged groups in the labor market, such as women and young people, and to improve the quality and productivity of jobs.

Historically, poverty in Türkiye has been high and persistent, with the poverty rate remaining above 20% for most of the 20th century. The poverty rate began to decline in the early 2000s, reaching a low of 12.5% in 2008 before increasing slightly in the aftermath of the global financial crisis. However, the poverty rate has remained relatively stable in the 2010s, hovering around 19%. The Turkish Statistical Institute (TURKSTAT) data also shows that poverty rates vary significantly across regions in Türkiye. The highest poverty rates are found in the eastern and southeastern regions of the country, where over 30% of the population lives below the poverty line. In contrast, the western and central regions of Türkiye have the lowest poverty rates, with less than 15% of the population living in poverty.

These regional disparities in poverty rates can be attributed to several factors, including differences in economic development, access to education and training opportunities, and employment opportunities. The eastern and southeastern regions of Türkiye have traditionally been less developed economically and have had lower levels of educational attainment and higher unemployment rates compared to other regions of the country. To address these disparities, the government of Türkiye has implemented several poverty reduction strategies, such as the expansion of social assistance programs, the implementation of employment policies and programs, and education and training programs. The Family Income Support Program (FISP) and the Conditional Cash Transfer Program (CCT) are two examples of social assistance programs that have been implemented to provide targeted cash transfers to families and individuals living in poverty, to increase their purchasing power and improve their standard of living.

The Employment Strategy for the EU Harmonization Period and the National Employment Action Plan are examples of employment policies that have been implemented to increase the participation of disadvantaged groups in the labor market, such as women and young people, and to improve the quality and productivity of jobs. Education and training programs have also been a significant focus of poverty reduction efforts in Türkiye. The government has implemented various initiatives, such as the Education Transformation Program and the Lifelong Learning Program, to improve access to education and training opportunities for disadvantaged individuals and families.

Table 8 shows Türkiye's distance only to the first goal, covering the poverty targets and recent trends in OECD. The institution remarks data availability as a challenge for measuring

Table 8. Türkiye's Distance to Poverty Targets and Recent Trends						
Goal	Target	Short Label	Distance to Target (s.u.)	Trend Assessment	OECD Average distance (s.u.)	OECD Trend Assessment
1	1.1	Extreme poverty	0.00	Target is achieved or on track to being achieved	0.00	Target is achieved or on track to being achieved
1	1.2	Poverty in all its dimensions	2.96	Progress has been made, but is insufficient to meet the target	1.41	No progress or moving away from the SDG target
1	1.3	Social protection coverage	2.14	No progress or moving away from the SDG target	0.80	No progress or moving away from the SDG target
1	1.4	Access to basic services	0.00	Target is achieved or on track to being achieved	0.00	<b>Target is achieved or on track to being achieved</b>
1	1.5	Resilience to shocks	0.91	n.a.	1.00	n.a.
Source: OECD (2022)						

distances to targets in Türkiye, as in many other OECD countries. However, data for 123 out of 169 targets can be covered in Türkiye based on the available data on different indicators. Specifically, six goals within the People, Planet, and Prosperity categories have high coverage, with more than 80% of their targets being covered. Therefore, the poverty target is among the ones that provide a high coverage of data. Türkiye is one of the rapidly expanding economies within the OECD. Over the previous 15 years, there has been an average increase of over 3% in GDP per capita, accompanied by a yearly growth of nearly 2.7% in productivity. Unfortunately, the equitable distribution of benefits stemming from economic growth has not been achieved. The mean income of workers denominated in USD PPP 8 per hour in 2014, is below the median of the OECD. Insufficient social protection coverage (as per Target 1.3) and restricted redistribution through taxes and transfers have been observed to lead to suboptimal pro-poor growth and elevated poverty levels (as per Targets 1.2 and 10.2).

Overall, while Türkiye has made progress in reducing poverty, there is still much work to be done to reach the goal of ending poverty by 2030. This requires a comprehensive approach that addresses the economic, social, and cultural factors that contribute to poverty, and the active participation of government, civil society, and the private sector.

#### **4. Conclusion**

The globe has lived such a big crisis –COVID-19- that resulted in a reversal of the consistent advancements made in poverty reduction over the last 25 years, leading to a rise in the number of individuals experiencing extreme poverty for the first time in a generation. The potential escalation of inflation and the ramifications of the conflict in Ukraine have the potential to impede advancements. The concurrent crises have the potential to result in an increase of 75 million to 95 million individuals residing in conditions of extreme poverty by 2022, as compared to pre-pandemic estimates. In response to the crisis, the majority of nations have implemented novel social protection measures. However, a significant proportion of these measures were temporary, and a considerable number of individuals who are susceptible to adverse effects have yet to receive the benefits of these measures. The current state of affairs indicates that the global community is not making sufficient progress towards the eradication of poverty by 2030. To achieve this objective, underdeveloped nations require an unparalleled degree of pro-poor economic growth. (UN, 2022)

In its 100th year of the republic, a snapshot of Türkiye's economic performance would start with a modestly positive growth rate of 1.9 percent in 2020. Then, in the subsequent years of 2021 and 2022, there was a significant increase in growth, with rates of 11.4 percent and 5.6 percent, respectively. In 2022, employment levels across all demographic groups ex-

ceeded their pre-Covid levels. In October 2022, the Consumer Price Index (CPI) inflation rate reached its highest level in 24 years, reaching 85.5 percent, before decreasing to 64 percent in December. This trend can be attributed primarily to base effects. Conversely, the minimum wage and average wage of registered employees experienced a slightly greater increase, thereby constraining the extent of actual income reduction for formally employed laborers. It is anticipated that the poverty rate based on consumption will decrease to 11.4 percent and 10.6 percent in 2021 and 2022, respectively. (World Bank, 2023)

Now within that global panorama and local situation of our country, Türkiye is committed to achieving the Sustainable Development Goals (SDGs) set forth by the United Nations. This chapter focused on the first goal of the SDGs, “No Poverty,” and examined Türkiye’s efforts to address poverty since the establishment of the republic in 1923. Türkiye’s pursuit of economic and political stability faced numerous challenges, including the aftermath of World War I and World War II, which significantly impacted the nation’s wealth and led to widespread poverty. Through a rigorous analysis of the present situation and a careful consideration of both achievements and challenges, it is possible to devise a strategy for advancing towards a Türkiye that is characterized by inclusivity and prosperity, and where all individuals are afforded equal opportunities. This chapter explored the measures taken by the Turkish government to alleviate poverty, the consequences of war-induced economic hardships, and the subsequent rural-urban migration that ensued. As Türkiye celebrates its 100th year of the republic, it remains committed to implementing policies and programs aimed at reducing poverty and ensuring a better future for its citizens. The first SDG, “No Poverty,” serves as a guiding principle for Türkiye’s continued efforts to create an inclusive and equitable society, where no individual is left behind. By learning from its history and building upon the progress made so far, Türkiye can pave the way for a more prosperous and poverty-free future.

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## CHAPTER 2

### NO-POVERTY GOAL OF TÜRKİYE ON THE BASIS OF LEAVING NO ONE BEHIND PRINCIPLE\*

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#### Abstract

The primary purpose of this article is to define interactions between sustainable development goals based on inclusiveness in the case of Türkiye. Inclusiveness plays a key role in sustainability and even inclusiveness is directly linked with the ‘leaving no one behind’ principle, that is defined among the guiding principles led by the sustainable development goals. In this context, a no-poverty goal is an important indicator in achieving inclusiveness based on these universal principles of the SDGs’ given that the synergies and trade-offs between SDG1 (no-poverty) and other goals are an important priority in the assessment of achievements through the SDGs. As the empirical findings indicate the importance of the synergies among SDG targets, it is also outlined that the no-poverty goal has strong spillover effects on other SDGs. In this context, this study aims to outline whether these facts are relevant to Türkiye’s SDG performance. For this purpose, PCA (principal component analysis) methods, which are among the main tools that analyze the performance of SDGs based on synergies and trade-offs will be implemented. Within this framework, Türkiye’s development plans and an overview of the relevant SDGs will be summarized to set up the links between the past and present performance of the development policies based on inclusiveness and the ‘Leaving no one behind’ principle. The main objectives of the development plans and the strengths and weaknesses of the policies relevant to given SDGs will be taken into account. As a final result of the analysis, the priorities among the SDG goals and the scope of possible policies for the achievement of the SDGs will be discussed.

**Keywords:** LNOB and SDGs, SDGs performance of Türkiye, No-poverty goal and Türkiye, PCA, poverty and inequality in Türkiye

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## 1. Introduction

In the pursuit of sustainable development, the United Nations introduced 17 Sustainable Development Goals (SDGs) as a comprehensive framework, addressing diverse aspects of global challenges (UN, 2015). SDGs cover three broad categories and three basic bottom lines (economic development, environmental sustainability, and social inclusion) (Sachs, 2012) and are classified under 5 principles (5 Ps, people, prosperity, planet, peace and partnerships). Their achievement depends on the governance of these goals under this guidance of principles. In this context, the primary goal is known as the no poverty target (SDG 1) and mostly addresses material deprivations (Sachs, 2012). However, the scope of achievements for human development along with economic growth and the compatibility of this progress within a sustainable environment is defined as an important topic, especially in terms of people-centered goals.

In 2015 the UN declared that this framework has an *“underlying commitment to create conditions for sustainable, inclusive and sustained growth, shared prosperity and decent work for all”*. It is stated that *“on this collective journey... no one will be left behind”* (UN, 2015). These targets emphasize the need to ensure that progress and development are accessible to all individuals, especially the most vulnerable and marginalized populations. For this purpose, universal values in achieving sustainability were defined. Among the 17 SDGs, the principles of inclusiveness and leaving no one behind have gained significance regarding the 2030 targets. LNOB (Leaving No One Behind) is defined as one of the six “Guiding Principles of the United Nations Sustainable Development Cooperation Framework “and a specific target of 2030” (UNSDG, 2023).

The scope of the sustainable development goals and the fact that global efforts are decisive in these topics have brought about transformations in the framework of both global and national-based development goals. Although this study partially excludes discussions on these dimensions (see Mensah, 2019), the SDG targets are considered to be an important paradigm change in that they define the development efforts of countries in line with common principles at the international level. The SDG goals, their scope, and practical implementation imply the adaptation of the principles underpinning 21st-century modernization theory through “goal” oriented policies. Hence, these modernization interventions through SDGs might be challenging and controversial. While SDGs behave in all countries as “similar” units in some aspects, dimensions of the public-private partnership and project-led financing and macroeconomic governance are among the main controversies.

Türkiye has also accelerated its efforts to comply with the SDG targets since the Rio +20 Conference (2012). Based on these facts, the study aims to analyze the SDG targets for Türkiye by taking into account the principles of inclusiveness and LNOB. The phenomenon of growth together with human development has been an important topic throughout the history of the Republic of Türkiye. Despite advances in income level, Türkiye's performance in human development and persistent inequalities, reveal opposite trends.

This paper seeks to contribute to the understanding of inclusiveness and leaving no one behind in Türkiye by utilizing PCA methodology and growth with equity approach to explore historical poverty dynamics. By examining Türkiye's progress, challenges, and policy initiatives, the paper aims to provide insights that will support the global pursuit of sustainable development.

Accordingly, this chapter's structure is based on three main sections. In the first section, the importance and scope of the no-poverty goal are considered. Following that the chapter covers the evolution of Türkiye's poverty dynamics over time and the SDGs' links. Thirdly, taking into account the literature on SDG interactions, the chapter will focus on analyzing the links between the no-poverty goal and the LNOB in Türkiye. In this context, the PCA (Principal Component Analysis) method is applied to identify Türkiye's synergies and trade-offs within the scope of SDG targets, based on SDG-based data (Sachs et al., 2022; Lafortune et al., 2022) for the period 2000-2021.

## **2. No-Poverty Goal and its Challenges**

As the first goal of the SDGs, pillars of the “no-poverty” target are built on the goal of “ending extreme poverty and hunger”, which was previously defined under the MDG (Millennium Development Goals) targets and includes broader dimensions. The MDGs related to poverty aimed to halve the proportion of people living in extreme poverty by 2015, compared to the baseline year of 1990 (UN, 2015). In contrast to MDGs, SDG1, aims to end poverty in all its forms and dimensions (UN, 2015) and as seen in Table 1, goes beyond ending extreme poverty.

<b>Table 1.</b> No-poverty Goal Targets Under SDGs
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day.
1.2 By 2030, reduce at least by half, the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions.
1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.
1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.
1.A Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions.
1.B Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions.
Source: UN (2015).

The conceptualization of poverty in SDG1 is in line with a theoretical framework that emerged from the World Bank in the 1990s and the UNDP's human development approach. The definition of "extreme poverty" is defined according to poverty thresholds identified by the World Bank. In these targets, the choice of extreme poverty threshold-headcount ratio \$1.25 at a day- as a yardstick is questioned (Ravallion, 2022: 47). It is argued that focusing on the fact of poverty based on this context may lead to underestimation of poverty and create certain limits in achieving the targets.

No-poverty target; ending poverty means decreasing the poverty rate by 3% by 2030 could be also challenging (Ravallion, 2022: 46). During this period, the cost of decreasing poverty is another fact that needs to be evaluated in detail. Additionally, it is claimed that some goals are "unattainable" (Easterly, 2015a, 2015b). Reinert (2020: 126) brings up the idea of relative poverty and claims that it is unrealistic to expect to eradicate all forms of poverty worldwide. Easterly (2015a), on the other hand, draws attention to the fact that the specific timetables (2030 target year) set for the SDG targets may limit their realization. Even this, he points out that the goal of ending extreme poverty could potentially be more easily attained than many other goals. Also, he draws attention to the boundaries of the threshold values set within the scope of this target as a measure of poverty and reminds us that extreme poverty values have already been on a downward trend in recent years.

Besides, the definition of some of the targets is found to be unclear. For the case of target 1.3, it is argued that social protection can have different scopes and practices for different countries. The definition and dimensions of social services in target 1.4, need to be clarified. At the same time access problems in reaching these services are thought to be considered specific to countries' conditions (Reinert, 2020:126). The scale of poverty may differ across countries and the "homogeneous" character of these targets may impede the specific characteristics of the countries. Such as, focusing on poverty in rural areas may require the implementation of country specific, holistic policies. On the other hand, for countries problems in measuring poverty can make it difficult to measure the performance of policies in this area. Another challenging dimension in achieving the poverty target is the lack of political and financial commitment to the formulation of holistic policies (Cichos and Salvia, 2018).

All these covered targets under SDG 1 (no-poverty goal) make it vital to discuss the scope of poverty alleviation strategies. Ravallion (2022) argues that rather than focusing on extreme poverty, pro-poor growth is more important in reaching these targets (see target 1. B in Table 1). The pro-poor growth target highlights the necessity of growth, inequality and poverty linkages and emphasizes the need for countries to implement more holistic policies specific to their conditions. The fact that there is no linear relationship between growth and poverty (Easterly, 2009); growth dynamics might not always lead to recovery in poverty conditions, needs to be tackled for the countries.

Sachs' vision of the SDGs is based on a reorganization of the goals based on certain principles in the transition from MDGs to SDGs. In this context, the SDG targets should be organized, particularly to secure basic material needs and human rights. Sachs' (2012) vision emphasizes the required bottom lines for the success of the SDGs. These bottom lines are categorized into the three broad categories of economic development, environmental sustainability and social inclusion, and their success depends on each other. Accordingly, the economic dimension should build on the MDGs, which have helped to advance the world's agenda in the fight against poverty, hunger, and disease, and SDGs should include basic material needs and human rights. In this framework, the fact that the no-poverty target has been identified under the first goal is related to the indication that it is one of the elements that should be provided as a minimum within the scope of meeting basic needs (Sachs, 2012: 2208). Given this approach, it is possible to argue that the no-poverty target constitutes a "red line" in terms of basic needs and in achieving sustainable development goals in general.

The outcome of these approaches is discussed in terms of which fundamental principles will be adopted under the SDGs. Human rights and capabilities-based approaches are also

considered within this framework. A multidimensional poverty approach is included in the analysis so it is possible to go beyond income deprivation in setting up no-poverty goals. Education healthcare and social protection matters for the no-poverty goal. The no-poverty target also considers environmental vulnerabilities, pro-poor growth (growth and inequality), and gender-sensitive developments. More importantly, reference is made to vulnerable people as a separate category- “other than being poor”- under the no-poverty goal. Paragraph 23 of the 2030 Agenda defines vulnerable peoples as:

“all children, youth, persons with disabilities (of whom more than 80% live in poverty), people living with HIV/AIDS, older persons, indigenous peoples, refugees and internally displaced persons and migrants and people living in areas affected by complex humanitarian emergencies and in areas affected by terrorism” (UN, 2015).

Leaving no one behind principle, which will be introduced in the following section, comes to the agenda as a result of these dimensions included in the no -poverty goal.

## **2.1. The No-Poverty Goal at the Interaction of Inclusiveness and LNOB**

The no-poverty goal as one of the key indicators of the interactions between the SDG targets, is also one of the main indicators guiding the principles of inclusiveness and leaving no one behind (UN, 2015). The principles of “to create inclusive societies is among the main targets”, which defines the vision of the SDGs, and “Leaving no one left”, which is among the central transformative promises of the 2030 Agenda (UN, 2015), can also be considered complementary to each other. Inclusiveness and leaving no one behind are mutually reinforcing principles.

Although inclusiveness is a controversial concept, it is generally used in the SDG targets as a goal of creating an inclusive society (see Table 2, Goal 16). Unlike the inclusive growth (Anand et al., 2013), the inclusiveness defined under the SDGs refers to a broader set of concepts. As seen in Table 2, the SDGs are based on four dimensions of inclusiveness; social, economic, political, and environmental. Relevant to these dimensions, inequality, exclusion, and vulnerability for sustainable development are the main principles that are covered under inclusiveness (UNDP, 2018). Inclusiveness ensures that the most marginalized and vulnerable individuals have equal opportunities, rights, and access to resources. This is an important step in ensuring conditions that guarantee respect for human rights and fundamental freedoms for all, respect for cultural and religious diversity, and social justice in line with the goal of achieving an inclusive society (UN, 1995)<sup>1</sup>.

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1 Inclusive society as “a society for all”, in which every individual, each with rights and responsibilities, has an active role to play (United Nations, 1995, para 66).

According to Gupta and Vegelin (2016), the inclusive development concept, which comprises social, ecological, and relational inclusiveness, mostly covers the dimensions of inclusiveness in the SDGs. According to them, the definition of inclusive development per sé calls for leaving ‘no one behind’, which means equitably including the most vulnerable people in the development process within countries and internationally (Gupta et al., 2014: 3).

This principle underlies rights-based (Klasen and Fleurbaey, 2019) approaches as a commitment of all UN members to eradicate poverty in all its forms, end discrimination and exclusion (Stuart and Samman, 2017), and reduce inequalities and vulnerabilities, including the impact of climate change and environmental degradation. The United Nations’ approach to leaving no one behind entails “reaching the poorest of the poor” and seeks to “combat” discrimination and rising inequalities within and amongst countries and their root causes (UNSDG, 2019).

<b>Table 2.</b> Inclusiveness concept in the SDGs
<b>Inclusiveness and SDGs</b>
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable. Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
<b>Source:</b> UN (2015)

Leaving no one behind aims to address two related concerns: ending absolute poverty in all its forms and ensuring that those who have been ‘left behind’ (in relative or absolute terms) can ‘catch up’ with those who have experienced greater progress (Stuart and Samman, 2017:2). The lack of choices and capabilities that enable others to participate in or benefit from human development is defined as the consequence of leaving left (UNDP, 2018). In this context, absolute deprivations and relative disadvantages may occur. As a measurement of absolute deprivations, multidimensional poverty or below other minimally accepted standards of security, income, income public service, infrastructure, or well-being are considered. Given the no-poverty goal, for material deprivation, a multidimensional poverty (Alkire and Foster, 2011) approach is considered rather than extreme poverty indicators (UNDP, 2018: 9). Relative disadvantage is defined as facing exclusion, discrimination, and/or entrenched inequalities that make people less able to gain influence, get educated, survive setbacks, acquire wealth, access job markets or technologies, have shorter riskier lives, and rank below the median in SDG outcomes and opportunities (UNDP, 2018: 7).

Summing up, discrimination, inequality, governance, socio-economic status, shocks, and vulnerability are defined as the key reasons for being left behind. Across countries, women and girls, people in rural areas, indigenous peoples, ethnic and linguistic minorities, people with disabilities, migrants, gender and sexual minorities, youth, and older people are disproportionately among those left behind (UNDP, 2018: 9). However, the measurement of LNOB and inclusiveness is still methodologically controversial. The development of different criteria for assessing progress in this area has also come to the fore. The LNOB index score is among these indicators. This index tracks the inequalities based on 4 main dimensions; poverty, services, gender, and income. The relevant SDG targets are sub-categorized under these given 4 dimensions of inequalities, as can be seen in Table A.2.

Extreme poverty and material deprivation is the first category that focuses on the goal of eliminating poverty, which is extreme poverty and material deprivation (Mackie and Allwood, 2022). SDG 1 offers a transformative vision to eradicate poverty. First of all, this goal cannot be achieved without embracing inclusiveness and leaving no one behind. Secondly, income inequality addresses inclusiveness based on economic growth and income distribution. Thirdly, “access to and quality of services” is considered. In this framework, social inclusiveness requires ensuring that all individuals have equal access to essential services such as healthcare, education, housing, transportation, and legal assistance. It also involves improving the quality of these services to ensure they meet the diverse needs of the population (Lafortune et al., 2022). Finally, gender inequality includes SDG indicators that focus on discrimination and vulnerabilities regarding gender (Appendix, Table A.2).

The definition of leaving no one score as a quantitative indicator could be a complementary indicator produced within the SDGs. This index assesses who is excluded or discriminated against and outlines the basis of discrimination and the dimensions of discrimination and inequalities. The method of constructing LNOB index is similar with SDGs index (for details see the methodology section).

### **3. Growth, Inequality and Poverty Links in Türkiye**

The dimensions of poverty alleviation strategies in Türkiye could not be interpreted independently from the emerging international literature and practices. More precisely, the policies that have come to the agenda within the scope of poverty alleviation strategies have theoretical and practical indicators of the World Bank (WB, 1990, 2001) -based poverty alleviation strategies developed since the 1990s. The history of poverty in Türkiye certainly does not begin with the 1990s. As a phenomenon inherited from the Ottoman Empire to the Republic,

poverty, as Çavdar (2015) emphasizes, refers to the living conditions of the “silent majority” of Anatolia’s population, which is dependent on agricultural production. The fact of the poor–rural Anatolian population and their living conditions is one of the specific initial conditions in analyzing poverty dynamics depending on the economic transformation stages in Türkiye.

Hence, the basic framework of poverty dynamics is not shaped independently of growth dynamics. Changes in the dynamics of distribution with growth in Türkiye essentially determine the scope of the phenomenon of equality with growth and, as a consequence, the dynamics of poverty. When we focus on Türkiye’s growth and distribution dynamics within the framework of the equality phenomenon, and in particular on the changes in “poverty” as a result of this, different dynamics emerge. The dynamics of poverty, the links between income-based inequalities and poverty, changes between agricultural and non-agricultural sectors, differentiation of urbanization dynamics, and migration waves have taken on different dimensions through time.

According to the analytical framework defined by Pamuk (2005), intra-agricultural distribution, average income differences between the agricultural and non-agricultural sectors, and the dynamics of distribution within the non-agricultural sector have determined the growth and distribution dynamics of income distribution for 200 years.

In the early years of the Republic, instead of policies that directly addressed income distribution, surplus transfers between sectors and interventions to markets for these purposes were decisive. As a result, income distribution mechanisms developed as a result of preferences based on political economy. Price intervention policies and taxation policies were directly or indirectly influential on income distribution mechanisms in this process. For example, among these taxation policies in the agricultural sector was the abolition of “*âşar* (tithe)”, which altered income distribution mechanisms (Önder, 2019).

The land reform debate that came to the agenda in the mid-1940s is considered to be an attempt at direct intervention in income distribution mechanisms, although the links from growth to income distribution have been decisive (Özbudun, 1980).

While in the 1950s and 1960s the main source of income inequality was explained by changes in the productivity of the agricultural and non-agricultural sectors, with the industrialization taking place in the 1970s, urban dynamics changed. Under these phases of the economy, inequalities also increased within the industrial struggle for shares between capital and labor (Dervis and Robinson, 1980: 83). Although, intersectoral terms of trade and agricultural distribution remain important (Dervis and Robinson, 1980: 121) inequalities among



non-agricultural groups became more determinant in the post-1980 period due to the increasing weight of cities in the economic structure and differences in the employment structure.

Gini data for Türkiye can be found for the post-2001 period in a continuous trend. However, when certain calculations made by different institutions and researchers are taken into account, it is observed that income distribution improved between 1968 and 1987, but deteriorated in the 1990s<sup>2</sup>.

The impact of the Özal years on the dynamics of distribution, together with the opening up stage of the Turkish economy, is also called a specific period that causes the differentiation of secondary (re-distribution) distribution relations (Boratav, 1991). In this period, beyond taxation practices as a component of the redistribution policies, the dynamics that have altered rent-interest earnings have had a decisive role.

According to Boratav, who defines distribution relations as the sharing of the surplus obtained in capital accumulation and analyzes income sharing between classes, the changes in the sub-groups of the ruling /dominant classes<sup>3</sup> differed markedly in this period. In the 1990s, the allocation of title deeds to urban slums and zoning amnesty practices are also identified among the policies affecting the dynamics of distribution (Boratav, 1991). While it has also been described as a populist policy for the poor, the allocation of title deeds has led to the creation of new rental opportunities.

As a result of the growth strategies implemented in this period, going beyond traditional rural-agricultural poverty also meant the emergence of new forms of poverty (Buğra and Keyder, 2003). During this period, the emergence of the financial crisis also contributed to the phenomenon of urban poverty becoming more visible. Türkiye reached the highest Gini coefficient in 1994 (DPT, 2001).

The new urban poor reveal the inability of growth strategies to create new employment in the post-80s period and the spatial spread of poverty (Önder and Şenses, 2006). During this period, the rural-urban divide with new types of urban and poor started to characterize the poverty dynamics. In particular, urban poverty increases in cities where precarious living conditions are transferred from rural areas through migration (Şenses, 2005). Şenses (2005) emphasizes that the differences in income distribution in this period were mainly determined by the differences in sectoral structures in the city. Labor and non-labor income, skilled and unskilled labor on the other hand determines the disparities on the urban scale. Evidently, the

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2 For a review of these pioneer studies, see DPT (2001: 16).

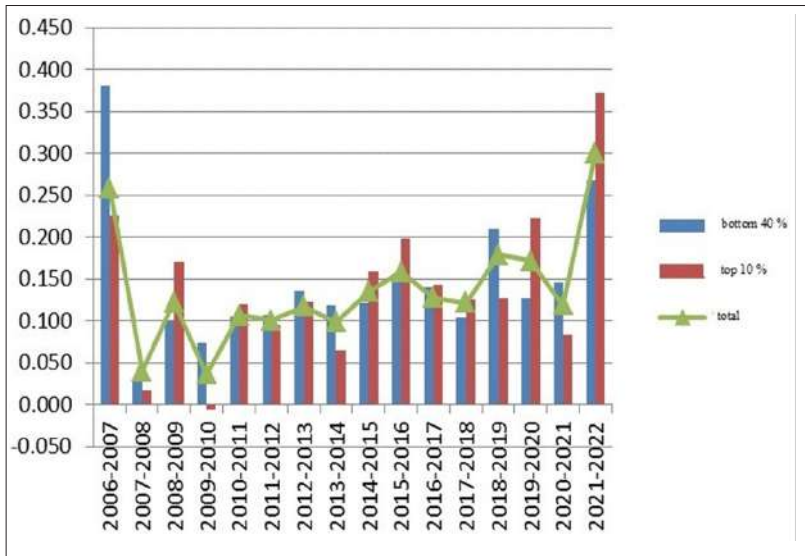
3 industrial-agricultural, financial, commercial capitals, and rentiers.

so-called the neoliberal era in the 2000s has had a negative impact on social inequalities in the case of Türkiye. Macroeconomic policies led under the structural adjustment policies harmed social welfare. Şenses (2008) underlies that these policies have affected broad sections of the population, particularly small agricultural producers, the unemployed, the underemployed, and the self-employed in urban areas are those with high vulnerabilities.

Buğra and Keyder (2003) define new poverty dynamics under the approaches of social exclusion. Apart from the rural-urban divide, the new poor of the cities are those who cannot be covered by market mechanisms and who are socially excluded. As a result of social exclusion, the new poor are considered as forming a “new social stratum” in cities (Buğra and Keyder, 2003; Adaman and Keyder, 2006), a segment that does not integrate with the system. Hence, it is suggested that rather than household-based metrics related to poverty, their living conditions, deprivations, and vulnerabilities need to be focused on in detail. The spread of the phenomenon of social exclusion also highlighted the weaknesses of the social welfare regime. In this period, it is emphasized that instead of unemployment being temporary, the conditions for insured employment disappeared and the institutional structure of social welfare regimes became dysfunctional (Buğra and Keyder, 2003).

The post-2001 crisis period also marks many firsts in the context of the growth-inequality-poverty nexus. After the 2001 crisis, the implementation of World Bank orientated poverty reduction strategies in Türkiye has gained momentum. Following the crisis, the JDP (Justice and Development Party) came to power in 2003 with promises of strong economic growth and stability and an emphasis on respect for socio-economic values in a “Muslim country based on conservative and liberal principles”(Tahsin, 2003). These principles were followed with the aim of creating new ruling elites and comprehensive mass politics in this regard, the “neoliberalism setting with a human face” (Bozkurt, 2013) provided favorable conditions for the JDP. The way in which the “new poor” were “covered” during the JDP era, which will be discussed in the following sections, added a different dimension to the poverty-growth-inequality nexus in Türkiye.

The growth process achieved during this period had a limited capacity to create employment. Despite the improvement in the level of the minimum wage in the first years of the JDP government, the increase in the share of labor in income remained very limited in the following years (BSB, 2015). As a result of the macro policies implemented; also the emphasis on regressive taxation policies implemented in this period has been decisive in income distribution mechanisms (Yilmaz et al., 2019).



**Figure 1.** Shared prosperity in Türkiye

**Source:** Author's calculation based on Turkstat (2023)

Nevertheless, the relative increase in interest-rent income, which has been decisive in terms of changes in income distribution since the post-1990 period, has continued in this period as well. The financialization process, which gained momentum in the 2000s with the impact of the changes in the global economy, brought results in favor of the top income groups (Boratav and Orhangazi, 2022). Credit expansion through this period has contributed to wealth accumulation and on the other hand has also increased the indebtedness levels of households (Güngen, 2022). Credit expansion has also come to mean the financial inclusion of low-income households through indebtedness under conditions of jobless growth (Boratav and Orhangazi, 2022).

In the 2000s, the average Gini coefficient for Türkiye was realized between 0.40-.0.39 (Turkstat, 2023). As a consequence of these policies, the distribution of income has been tilted against wage earners (BSB, 2015; Boratav and Orhangazi, 2022). When evaluated together with all these changes, even though the recovery in growth in the post-2001 period, based on the shared prosperity<sup>4</sup> (WB, 2014), the relative mean income growth for the bottom 40 percent has stayed limited (Figure 1). Based on Figure 1, it could be suggested that poor households have benefited from the growth process although comparing the mean incomes with the top income groups, however, the rate of their mean income growth has not accelerated.

4 The average annual growth rate in income or consumption of the bottom 40 percent of the population in a country.

### 3.1. Poverty Dynamics of Türkiye

Depending on the methods of defining poverty, it is possible to develop different answers to the question of who the poor are. Celasun's article (1986), which is also considered a pioneering study in terms of poverty calculation in Türkiye, took into account and considered the changes in the average income level of agricultural and non-agricultural sectors and revealed that the changes in the terms of trade negatively affected the average income level of those in the agricultural sector. As can be understood from this approach, finding income changes between agricultural and non-agricultural sectors are decisive in the analysis of the poverty phenomenon.

The income and living conditions and household budget data, which have been continuously collected by Turkstat since the 2000s, have led the poverty literature to focus on these data. While poverty measurement methods beginning from the late 1990s were based on household-level analyses (income and consumption-based metrics) the functional income distribution dynamics in developing relevant metrics have been methodologically relegated to the background. Based on the World Bank poverty lines approach (Ravallion, 2008), absolute and relative poverty rates are taken as the basis. Multidimensional poverty approaches have also been used commonly in recent years.

In addition to the changes in poverty measurement methods, the way the poverty-growth relationship is defined has also changed, which has triggered an important debate in the poverty literature. On the other hand, it should not be neglected that the WB-based poverty literature and development strategies have been shaped under the influence of neoliberal globalization dynamics. These approaches have certain links incomplete (Şenses, 2008). Although the methods developed for pro-poor growth (Ravallion, 2004; Kakwani, 2001; Kakwani et al., 2003) or inclusive growth (WB, 2009) include the growth-poverty nexus, the fact that these forms of analysis define poverty as a separate category and do not focus on the causes of poverty, in general, can lead to criticism (Saad-Filho, 2010; Şenses, 2008). The question of who is poor, which is answered through poverty metrics, may be incomplete in terms of analyzing the causes of poverty, which may be an important criticism in terms of the goal of alleviating poverty rather than the goal of alleviating poverty (Saad-Filho, 2010).

Under the given poverty metrics, according to absolute poverty data, the problem of extreme poverty has been overcome in Türkiye. After the 2001 crisis, although there was an increase in the level of extreme poverty, it is observed that the absolute poverty data became zero in 2009 (Turkstat, 2022). However, relative poverty data and the extent of horizontal inequalities do not show similar trends to Türkiye's growth performance. While changes in the relative poverty

rate follow a stable trend, Türkiye is above the OECD average in terms of relative poverty risk. Throughout the history of the Republic, gender-based inequalities and regional dynamics have been among the main persistent problems of human development (Pamuk, 2012). Those historical patterns still outline that Türkiye has rural, regional, and gender-based differences.

Poverty in Türkiye can be both transient and chronic, with individuals and households experiencing different levels of vulnerability over time (Şeker and Dayıoğlu, 2015; Şeker, 2011). It is found that exit from poverty is mostly based on employment dynamics (Şeker, 2011). Studies conducted in Türkiye since the early 2000s have started to define the profile of “the poor” with specific characteristics. The level of vulnerable groups at risk of poverty may also vary. Wage differentials in Türkiye largely determine poverty. Differences in education, occupational status, and gender reflect the main reasons for wage differentials (Özcan, 2003: 29). People who are deprived of regular employment conditions find themselves in low productivity and low-earning jobs. Those people are mostly, with low levels of education, no education, the disabled and the infirm, or the homeless. These conditions increase vulnerabilities and the probability of engaging in informal sectors. Also, migration from the villages due to political or economic reasons has created insecure urban environments for migrants (Şenses, 2005:206). In addition, in rural areas people with little or no land in rural areas face risks of entering poverty higher than others (Şenses, 2005; Akder, 1999).

Female-headed households, and household living in rural areas with higher numbers of children are found to be more vulnerable groups (WB, 2003). Women’s poverty, rural poverty is predominant among small-scale producers and young people and women living in rural areas. Children and the elderly are at high risk of poverty in Türkiye (VNR, 2019; Yapar, 2019). Poverty among the illiterate and those who did not complete school is higher. At the regional level, regions with higher agricultural migration (Mediterranean Region) and regions that have disparities historically (divergence in Eastern regions) still face vulnerabilities (Yapar, 2019; Aşık et al., 2023).

Overall, regional inequalities, unemployment, a lack of education, a lack of access to basic services, and gender-based conditions determine poverty dynamics. These dynamics also signify that poverty alleviation could not be altered without improvements in income distribution. It could be underlined that in Türkiye to alleviate poverty; production structure and employment dynamics play a critical role. Despite the improvement in the data on unregistered employment under the JDP government, this rate continues to be around 30 percent (Orhangazi, 2020: 189). The expansion of flexible forms of employment, such as part-time and temporary work, with the legal regulations that came to the agenda, has brought with it the expansion of precarious working conditions. This period also marks de-unionization (Boratav and Orhangazi, 2022). The percentage of those making “low wages” has increased during this time even as the number

of wage and salaried workers has increased (Orhangazi, 2020: 196). The limited job creation capacity of growth is also accompanied by an increase in youth unemployment (Gürsel et al., 2020). Differences in employment conditions have also brought about increasing earning gaps between educated and uneducated labor, both across regions and sectors (Orhangazi, 2020).

### 3.2. Inequality and Poverty in Development Plans of Türkiye

According to the search results using the keywords; inequality, income distribution, and poverty, given in NDPs of Türkiye (SBB, 2023) are considered to analyze the growth-inequality and poverty nexus. It is found that until the 7th Five-Year Plan (1996-2000), “poverty” based policies were not defined directly. The first development plans that followed a balanced growth approach defined the problem of income distribution and inequalities in this context. As illustrated in Table 3; the purpose of establishment a social security system is covered as a part of income distribution policies rather than poverty alleviation policies.

<b>Table 3.</b> Usage of income inequality and poverty concepts in NDPs	
I. NDP(1963-1967)	Tax policy-social justice. Establishment of a social security system. The problem of income inequality is linked to education, health and social security policies.
II. NDP(1968-1972)	Fair income distribution. Balanced growth across regions. Increasing the standard of living of low-income groups through education, health. Housing and social security policies.
III. NDP (1973-1978)	Income inequality is defined as the main problem. Improving income gaps between regions and individuals. Expanding the scope of the social security system.
IV. NDP(1979-1984)	Rural development. Elimination of the disparities among rural and urban. Investments to reduce unemployment. Expansion of reconstruction and development projects Acceleration of measures to eliminate inequality of opportunity in education. Measures to eliminate imbalances in tax liability, income distribution and social security.
V.NDP(1985-1990)	Adjusting income distribution in favor of low-income groups. Given priority to specific regions for development. Wage, price and incomes policies to improve income distribution.
VI. NDP(1991-1996)	Implementing social policies that improve income distribution as a priority. Southeastern Anatolia Project (GAP). Reducing regional disparities. Expansion of social security system. Social and economic empowerment of middle income groups; farmers, civil servants, tradesmen, workers and pensioners.
<b>Source:</b> Doğan (2014:44-45) and Author's own elaboration.	

“Poverty” is included in the development plans by the 7th (1996-2000) plan as a part of income distribution policies. In this plan, the necessities of institutional reform related to (Social Assistance and Solidarity Encouragement Fund are mentioned to focus on the governance of poverty. As of the 8th Development Plan (2001-2006), the strategies related to “poverty alleviation” is defined more concretely as a component of the income distribution. In the 8th Development Plan, the fight against poverty was defined for the first time under the title of “Improving income distribution and combating poverty and increasing social welfare”. In the Ninth Plan (2007-2012), improving income distribution is addressed under the scope of social inclusion and combating poverty. It is envisaged that poverty and imbalance in income distribution will be permanently reduced through sustainable growth and employment, education, health, and working life policies. In this plan, it is important that anti-poverty policies are addressed together with the phenomena of empowerment and social inclusion and that policies for the institutionalization of these policies are decisive. In the Tenth Development Plan (2013-2018), increasing the participation of segments at risk of poverty and social exclusion in economic and social life and improving their quality of life by facilitating their access to opportunities, improving income distribution, and reducing poverty are stated as one of the objectives (Doğan, 2014: 45). In the Eleventh Development Plan (2019-2023), the scope of combating poverty is defined together with social services and social assistance. In this plan, employment growth and qualified job opportunities are considered the main means of combating poverty and improving income distribution. As a 2030 target, increasing the number of households benefiting from social assistance to 5 million and improvement in relative poverty data are defined among the main targets. The phenomenon of rural poverty and studies on this area have been given special importance (SBB, 2023).

Along with the changes in the poverty literature that have an impact on international politics and practices related to inequalities, the direct inclusion of poverty in development plans was also brought along. However, the fact that “poverty” became more visible in urban areas rather than rural areas beginning in the 1990s, and reached one of the highest poverty data (officially declared) in Türkiye’s history. Especially the 2001 crisis, was also decisive in this. The figures have an increasing trend in the mid 1990s and after the 2001 crisis between 2001 and 2003. Since then the poverty alleviation programs also became part of institutional reforms and reforms in social welfare regime practices were also brought into the agenda.

### **3.3. Poverty Alleviation Programs and Institutional Setting**

Post-2001 poverty alleviation strategies are based on the WB-based anti-poverty programs. The World Bank’s poverty reduction strategies are basically targeted assistance to

the most vulnerable populations, such as cash transfers, food subsidies, and conditional cash transfers (Cammack, 2004). The aim is to empower the coping mechanisms of the poor and meet their basic needs. Social safety nets are considered an important parameter that mitigates poverty (World Bank, 2001). In this framework, it is assumed that the poor have risks against certain phenomena and lack the conditions to cope with these risks. A lack of social security mechanisms and a lack of public support against risks such as natural events, health, etc. make them vulnerable to risks (Zabcı, 2003; Şener, 2015).

In 2001, the Social Risk Mitigation Project (SRMP) was launched to contribute to poverty reduction in Türkiye in the short and medium term (Zabcı, 2003; WB, 2003). With the effects of the 1999 earthquake and the 2001 crisis, it is envisaged to contribute to the development of protection mechanisms for those affected by the crisis. An emergency assistance policy and a rapid assistance component were put in place.

The main purpose of SRMP is outlined as follows.

a. Building up the capacity of state institutions providing basic social services and social assistance to the poor (social risk management); b. Implementing a social assistance system (Conditional Cash Transfers - CCT) targeted to the poorest 6 percent of the population conditional on improved use of basic health and education services (social risk mitigation and prevention); and c. Increasing the income generation, employment opportunities, and social service access of the poor (social risk prevention) (Turkey SRPM, 2008:2).

The SRMP was the pioneering policy framework that formed the basis for today's poverty strategies. This project is also the first implementation of conditional cash transfers in Türkiye. Since the introduction of this program, the institutional structure of anti-poverty programs in Türkiye has also undergone fundamental changes. The scope of social welfare regime practices has differentiated. Institutional transformation and poverty strategies have resulted in the development of assistance-oriented strategies instead of social welfare state practices. The focus has been on improving inclusion and achieving empowerment mechanisms.

The primary fundamental institutional change is related to the re-establishment of the SASF (Social Assistance and Solidarity Encouragement Fund, 1986). When the structure of the social security<sup>5</sup>, system in Türkiye is examined, it can be seen that social policies for the

5 The social security system for pensions and health insurance consists of the 'retirement chest' for civil servants, established in 1949; the Social Insurance Institution, established in 1945 to cover workers, and Bağ-Kur, which was founded in 1971 to cover the self-employed. The scope of Türkiye's social security system resembles that of Southern European welfare regimes in its highly hierarchical and fragmented structure and corporatist features. In particular, the systems provide health and pension benefits to formally employed heads of households according to their employment status. Self-employment, unpaid family labor and informal employment practices



segments not covered by the social security system have been on the agenda since the end of the 1970s. The scope of social assistance, which was first introduced in Türkiye in 1976 aimed to help the elderly and disabled poor, and latter the framework of the assistance was expanded in 1986 under the name of SASF (Buğra, 2017). The Social Assistance Foundation was established with the aim of gathering the social services that had already been led by “Çocuk Esirgeme Kurumu” and “Emekli Sandığı” under a more centralized structure. Temporary assistance for citizens who are in “poverty” and in need and who are unable to receive any income from official social security institutions. In 1992, the “Green Card” program was launched for the poor who were outside the scope of the social security system.

SASF (1986) was defined as the main coordinator of the SRAP (Şenses, 2015). Social assistance was managed nationally by the Fund Secretariat General within the Prime Minister’s Office and administered locally by the SASFs. In 2011, with the establishment of the Ministry of Family and Social Policies<sup>6</sup>, the directorate was incorporated into this ministry.

The other specific transformation that has been observed in the health system, is the social security system that is funded by WB credits. Under the Health Transformation Programme launched in 2003, family practitioners were assigned to families to strengthen basic health services, with primary and emergency health care provided free of charge. In 2004, benefits under the Green card program were expanded. Green card holders have started to benefit from both outpatient and inpatient services at Ministry of Health and university hospitals. Through these changes, green card holders benefited from all health-related services without having to make any payments and family practitioners provide free public services to the households (Tahsin, 2013). In 2005, the Government expanded and enhanced the Universal Health Insurance program, which was Türkiye’s largest targeted social assistance program up to that time. Also outpatient prescription drugs were included in the benefits of Green card holders in line with Universal Health Insurance program. In 2006, within the framework of the Health Transformation Program, the Social Insurance Institution, the Pension Fund and Bağ-Kur (social security organization for artisans and the self-employed) were merged under a single umbrella under the name “General Health Insurance” (GHI) (SYGM, 2010).

Along with these reforms; low-income artisans and craftsmen, unpaid family workers, domestic workers, etc. the steps to be taken for the registration of groups where unregistered

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are not covered. This feature also increases the centrality of the family in welfare regimes (Buğra and Keyder, 2006; Buğra, 2017).

6 In 2018, the ministry was merged with the Ministry of Labor and Social Security and renamed as the “Ministry of Family, Labor and Social Services. And recently with the establishment of the Ministry of Labor and Social Security in 2021, the name of the ministry was changed to the “Ministry of Family and Social Services”.

work still defined as a political priority. The registration of groups where informal work is widespread remains unsolved. It should be underlined that health reforms come with privatization in these sectors and encourage private insurance in health (Cosar and Yegenoglu, 2009).

Practices under the green card also bring up certain challenges regarding the scope of the social security and health system. The expansion of coverage has also increased demand for a green card, by 2011, the number of beneficiaries reached 9.1 million (that is 12.7 percent of the total population). In 2003, only about a quarter of the population in the poorest decile had been covered by some kind of health insurance plan (of which about half had been covered through the Green Card), this share rose to 82 percent in 2008 (with over two-thirds of these having access to the Green Card scheme) (Menon et al., 2013:8). The health expenditure of the Green Card was used to be compensated by the payment from the general budget to the Ministry of Health until 2012. After 2012, these expenses started to be covered by the Universal Health Insurance Program. The Green Card scheme was terminated in 2012 and since then the poor have been included in the system through income determination tests<sup>7</sup> held by the Ministry of Family and Social Policies (Social Assistance, 2022).

<b>Table 4. Social assistances in Türkiye</b>		
<b>FAMILY BENEFITS</b>	<b>SHELTER-FOOD AIDS</b>	<b>DISABLED –ELDERLY AIDS</b>
- Maternity Benefit	- Food Aid	- Old Age Pension
- Multiple Maternity Benefit	- Lunch Assistance	- Home Care Pension (The works and procedures related to Home Care Assistance have been transferred to the General Directorate of Services for Disabled and Elderly)
- Regular Cash Assistance Program for Deceased Women	- soup kitchens	- Disability Pension
- Orphan and Orphan Aid	- Shelter Assistance	- Disabled Relative Pension
- Regular Cash Assistance Program for Military Families	- Social Housing Project	- Elderly and Disabled Care Projects (VEFA Projects)
- Military Child Aid	- Fuel Aid	- Disabled Needs Assistance
- Terror Damage Assistance	- Electricity Consumption Support	- Elderly-Disabled Home and Personal Care Program (National VEFA Program)
- Disaster-Emergency Aid	- Social Cohesion Assistance (SCA)	
- Job Orientation Assistance - Induction Assistance	- Complementary Social Cohesion Assistance (T-SUY)	

7 Green Card beneficiaries are identified based on an income measurement test; according to G0 category; households with per-capita income less than one-third the minimum wage (Menon et al., 2013:10).

<b>Table 4. Continued</b>		
- Aids for Martyrs' Relatives and Veterans	- Natural Gas Consumption Support	
- Death Benefit		
- Türkiye Family Support Program		
<b>HEALTH ASSISTANCES</b>	<b>EDUCATION GRANTS</b>	<b>PROJECT SUPPORT</b>
- General Health Insurance (GHI) Premium Payments	- Free Textbook	- Family Support Center (ADEM Projects)
- Conditional Health Assistance (Health and Pregnancy)	- Conditional Education Assistance	- Social Solidarity Center (SODAM Projects)
- Participation Fee Payments	- Conditional Education Assistance for Foreigners (CEA)	- Homeless Accommodation Project
- Chronic Disease Assistance	- Free Transportation of Disabled Students	- Social Service Projects
- Payments to Silicosis Patients	- Educational Material Assistance	- Social Support for Young People Leaving Institutional Care Project
- Uninterruptible Power Supply Support and Accumulated Electricity Debt Support for Chronic Patients	- Student Housing-Transportation-Food Aid	
	- Dormitory Construction	
	- Kindergarten/Nursery School Support Program	
<b>Source:</b> Ministry of Family and Social Services, 2022: 134.		

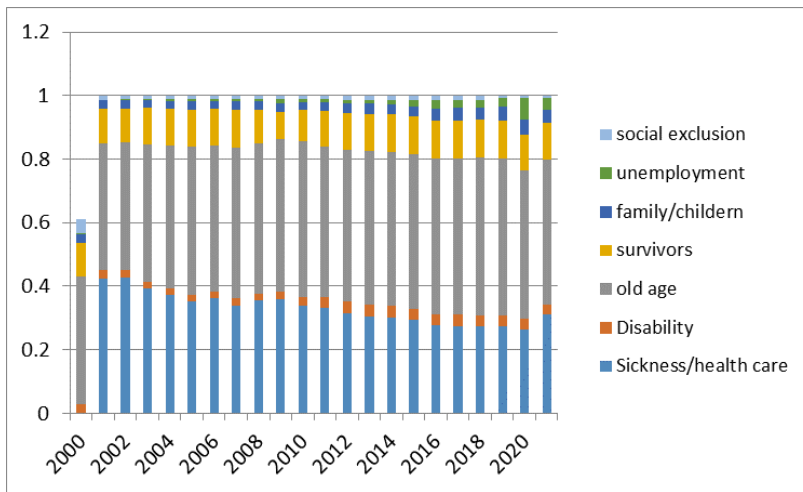
Another significant controversy with the relevant reforms is whether the Green card practices, as a result of these policies, encourages informal employment. According to empirical findings, it is found that the fact that access to health services is an important requirement for poor households has reduced the likelihood of household heads working in formal jobs (Aygün, 2022). This phenomenon keeps the importance of the links between the scope of social policies, employment conditions and social security, relevant.

It is evident that during the 2000s the social expenditure share tripled (Tahsin, 2013). Social protection expenditures' share in GDP has increased. While this ratio was 7.5 in 2000 it has increased to 12.4 in 2019 (OECD, 2022). Although the share of Social Assistance in GDP is only 1.74% in 2021. Table 4 includes irregular and regular transfers and benefits distributed to households based on the means test and owning social insecurity. The number of Households Benefiting from Social Assistance is given as 4,419,286 (2022), that is approximately 17% of total household in Türkiye<sup>8</sup>. This number changes according to those that benefit from

8 Author's calculation based on Turkstat (2023) data on the number of the total households in Türkiye.

regular Assistance (2,476,457) and those from Temporary (Temporary) Assistance (5,276,998) (Ministry of Family and Social Services, 2022).

Figure 2, illustrates how social protection spending have changed over time as a percentage distribution. According to this, social protection for the family/children, followed by disability and sickness/health care assistances , provided the majority of the means-tested benefits. By 2021, the old age function accounted for 70.1% of cash payments, followed by the survivors function (17.6%) and the unemployment function (5.7%) (Turkstat, 2022).



**Figure 2.** Social protection in Türkiye % share of social protection in total  
**Source:** Turkstat (2022)

Yentürk (2018) emphasizes that when the scope of social expenditures is analyzed, the coverage rate of certain aids to the poor remains low. The poor in informal employment are employed without premiums and cannot benefit from transfers. The coverage of the in-kind and cash assistances need to be investigated in detail. The extent to which social assistance improves the income conditions of households is questioned. Başlevent (2014) investigated the redistributive effect of social assistance payments and reached the conclusion that they alleviate income inequality. Furthermore, a different condition emerges when we look at the distribution and scope of social expenditures on a regional scale that comes with uneven patterns (Tekgüç, 2018).

Although during this period, social transfers in Türkiye have contributed to the decrease in poverty rates, the largest transfer item is “pensions.” Başlevent (2014: 38) reveals that households in the top quintile receive half of all jobless benefits and approximately a third of all

retirement payments. Şeker (2018) emphasizes that the social transfers' effect is modest and that its impact in permanently reducing poverty is weak. She also underlies that "pension" is not an item directly aimed at reducing poverty. On the other hand it is observed by the time of the B type transfers<sup>9</sup> and it also has been increasing especially for unemployed people both in urban and rural areas. Additionally, a large proportion of the incomes of subsistence farmers is provided by transfers (Kose and Bahce, 2010: 505).

Overall the poverty alleviation programs and this "new poverty regime" addresses changes in re-distribution policies through transfers. With the social assistance fund, an institutional transformation has taken place in which the concept of social assistance has come to the fore instead of the social security system. Under these given conditions, whether the scope of social expenditures actually covers poor households is a controversial issue. An institutional framework has emerged in which the social security regime is structured on two basic segments. Those who have formal, registered employment conditions have rights and coverage arising from their earned status and those who are included in the assistance based social protection system, are the "poor".

These practices resulted in the re-structuring of social policies and changed the pillars of the welfare regime in Türkiye. Nevertheless, the fact that over 4 million households benefit from this assistance is the most concrete indicator of the emergence of a new "poverty" regime. An aid-oriented social regime has come into effect in which those outside the scope of social security are supported through social assistance. The relationship between citizenship rights defined within the scope of social assistance policies on the basis of "aid orientation" also means that neoliberal policies are carried out through "charity state" (Kose and Bahce, 2010) practices.

At the same time, the widespread use of social assistance policies opens space for populist and clientelistic policy practices (Bozkurt, 2013) for JDP. Göçmen (2014) investigates the role of religiosity in social assistance and points out that during this period, religion took on a greater role in the Turkish welfare system. These practices mobilize civil society in terms of aid-based policies that have taken on different functions through non-government organizations and government municipalities under JDP rule (Yazıcı, 2012 cited by Başlevant, 2014: 25). Buğra and Keyder (2006: 224) underline that under this new poverty regime municipal governments act as 'brokers in charity' who channel the resources, in kind or cash, provided by charitable donations. This policy raises some problems and serves as an environment for negotiations with those who give to municipal charity funds that are of questionable legality or legitimacy.

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9 A type transfers; retired wages, tax refund, survivors wages. B type transfers; elderly wages, social assistance fund and family assistances, scholarships for students, war veterans' salaries, state assistances in kind, foreign exchange income from abroad, donations and inkind assistance, alimony payments.

Summing up, the widespread implementation of these practices at the institutional level has meant that the phenomenon of “inclusion” has been based on an “aid-dependent” framework, which has been embedded in the social sphere through the JDP’s political practices.

### 3.4. The Sustainability and No-poverty Goal in Development Strategies

The Sustainable Development agenda was first mentioned in the 7th 5-Year Development Plan (1996). With the agenda of the Rio conference (1992), attention was drawn to the changes in environmental policies and subsequent plans started to take sustainability as a component of environmental policies. Although sustainability was covered in subsequent development plans, the definition of strategies for SDG targets started in the 11th Development Plan. SDG in the eleventh program is based upon 5 pillars; a stable and strong economy, competitive and efficient production, qualified human development for a strong society, a sustainable environment with livable cities and the rule of law for democratization and good governance (SBB, 2023). Additionally, Türkiye published Voluntary National Plans for SDG targets in 2017 and 2019. However, there is no direct commitment item distributed to SDGs targets in the national budget.

<b>Table 5. Approaches to no-poverty goal in Türkiye VNR’s</b>	
<b>No-poverty goal and targets</b>	
Target 1.3 Target 1.5	The 7th Plan included the policy of establishing an effective structure of the Social Assistance and Solidarity Incentive Fund with a new organization, and subsequent plans have made progress in policies to improve social protection systems and measures.
Target 1.2 Target 1.4	Relative poverty; considering rural-urban, child-adult, women-men, disadvantaged groups such as the elderly, the disabled and those under temporary protection, the need for policy development and implementation focused on these groups continues.
Target 1.1 Target 1.2 Target 1.4	“Reducing poverty by addressing regional inequalities and vulnerable groups”. Reducing relative poverty and empowering disadvantaged groups. Increasing employment, particularly women’s participation in the labor force, needs to be strengthened.
Target 1.2	In terms of the target of halving the proportion of people living in poverty, it is considered important to focus particularly on policies and practices related to rural areas. Disadvantaged groups, in particular women and child poverty, are areas where Türkiye needs to make progress. Address regional inequalities and increase the effectiveness of social protection systems.
Target 1.3 Target 1.5	Regarding “improving social protection systems”, significant progress has been achieved. The issue of making social protection expenditures more effective
Target 1.5	The need for legislation in line with the strategy to combat climate change and the development of projects in this field are important.
Target 1.a and 1.b	Türkiye has the potential to share its national experience with other countries, particularly less developed countries, on “building global cooperation and sound policy frameworks to fight poverty. This can be considered in the context of enhancing international development cooperation under SDG 10, SDG 16 and SDG 17.
<b>Source:</b> Yapar (2019) and VNR( 2019).	

According to the studies conducted in Türkiye within the scope of SDG targets - SDG 1 (no-poverty), SDG 3 (good health and well-being), SDG 5 (gender equality) and SDG 10 (reduced inequalities) stand out as targets that are strongly influenced by other SDG targets. SDG 4 (quality of education), SDG 8 (decent work and economic growth), SDG 9 (industry, innovation, infrastructure), SDG 13 (climate action), SDG 16 (peace) and SDG 17 (partnerships) cover the themes of strengthening physical and human infrastructure and improving the legal and institutional structure. When considered together with Türkiye's level of economic, social and cultural development, these targets stand out in the baseline analysis as the "targets" that should be prioritized (VNR, 2019).

However, the main needs under the SDGs that include expanding the scope of assistance to disadvantaged vulnerable groups, increasing support to bring people who are able to work into the labor market, and making social protection expenditures more effective. remind us of the importance of the poverty-inequality and growth nexus. The SDG progress report (VNR, 2019: 52) describes the "eradication of extreme poverty, one of the most tangible goals of the 2030 Agenda, as an achieved target for Türkiye". However other targets under the no-poverty goal remain priorities. The goals for 1.2 and 1.3 are found to have higher distances to their targets (OECD, 2022). Bayazıt and Önsal (2017) significantly define the priorities under SDG 1 as goals 1.3 and 1.4.

With regard to goal 1.2 and goal 1.4 on "poverty reduction", it is considered that there is still a need for policy development and implementation focused on disadvantaged groups such as rural-urban, child-adult, female-male, elderly, disabled and those under temporary protection. In the context of relative poverty, target 1.4 is detrimental. Policies to reduce relative poverty require medium to long-term structural measures other than fiscal policies and social transfers (Yapar, 2019; VNR, 2019).

The scope defined under the Leaving no one left principle (Yapar, 2019; VNR, 2019) is in line with the principles of the distribution of social assistance programs. It envisages improving the conditions of vulnerable groups through empowerment, access to certain services and legal arrangements. The effects of the education-based policies described here, as well as the scope and implementation results of policies to reduce child poverty, remain a hot topic. The need to set separate targets for children, women and persons with disabilities in line with the 2030 perspective and to strengthen differentiated policies and practices has been identified (Yapar, 2019).

Vulnerable groups are defined as children, women and especially those living in rural areas and those at risk of poverty in urban areas. However, recent Syrian migration makes it necessary to update the relevant data. Among vulnerable groups, Syrian immigration, and es-

pecially the education and health conditions of migrant children, may determine the conditions for Türkiye to achieve poverty eradication and other targets. Regarding these vulnerabilities, specific sub-SDG targets may need to be adopted for Syrian migrants (Çavlin, 2019).

#### 4. The Framework for Analyzing Interactions in SDGs

The SDGs' theoretical underpinnings imply that the goals of development are interconnected (Tosun and Leininger, 2017; Mensah, 2019; Moallemi et al., 2022a, 2022b). Pradhan et. al (2017: 1169) defines the characteristics of interactions among the SDGs as the actions taken to achieve one objective having an impact on the achievement of one or more of the others (Pradhan et al., 2017: 1170). According to Nilsson et al. (2016, 2018) the SDGs are multidimensional and highly interrelated networks that led formation of socio-technical and socio-ecological systems (cited by Moallemi et al., 2022: 1). For achieving the SDGs, the management of cross-sectoral interactions comprehensively is crucial (Nilsson et al., 2016). Under these approaches the interconnections among the SDGs are emphasized. The competing interests or complementarities might create tensions and spillover effects so this can be evaluated as their potential of creating synergies and trade-offs (Kroll et al., 2019; Pradhan et al., 2017; Moallemi et al., 2022a, 2022b).

Overall, analysis based on these approaches indicates that the positive interaction processes within the SDG targets and the differences between countries are significant. Nevertheless, it should be recognized that analysis of the mutual exchange and interaction of SDG targets do not have strong theoretical foundations (Cling and Delecourt, 2022; Sin et al., 2019). The need to identify priorities alignment with the 2030 goals has led to the development of different methods for analyzing SDGs interactions. Besides, the complexity of the data leads to focusing on statistical techniques to simplify these complexities to understand the steering effects of the SDGs (Pradhan et al., 2022).

There are several methods for mapping the degree of interactions between various SDGs. Analysis based on (historical or extrapolated) data (Kroll et al., 2019; Pradhan et al., 2017), monitoring SDG interactions (Singha et al., 2021), or quantitatively projecting their trajectories under future scenarios (Gao and Bryan, 2017; Soergel, Krieglner, Weindl, et al., 2021) are defined among the main methods. (cited by Pradhan et al., 2022: 178-179).

In this paper, the monitoring approaches are being followed. The scope of these developed methods and their focus on relevant problems is not discussed in detail. It is predicted that data monitoring methods contribute to linking and interpreting the interactions between the SDG targets comprehensively and could contribute to the measurement of the progress towards achievements and reveals the dimensions of leading SDGs (Pradhan et al., 2022).



Considering the pioneer studies based on these approaches, it is possible to mention stylized tendencies. Gupta and Vegelin (2016) outline that strong sustainability, which implies no trade-off between economic, social, and ecological goals, is rare. On the global scale, governance, time horizons, geography and technology might create differences among the interactions (Nilsson et al., 2016, 2018). Pradhan et al. (2017:1170) found that some SDGs particularly reveal synergetic relations. These goals are found to be SDGs 1 (no-poverty), 3 (good health and wellbeing), 4 (quality education), 10 (reduced inequalities), 12 (responsible consumption and production), and 13 (climate action) (Pradhan et al., 2017:1171). Beyond these, some goals are defined as systematic buffers. SDG 1 (no-poverty), SDG 3 (good health and well-being), SDG 5 (gender equality), and SDG 10 (reduced inequalities) are accepted to be fundamental goals that can benefit from the implementation of the other goals of the agenda. However, their co-benefits and multiplication effects present another challenging topic. It is pointed out that the concentration on these SDGs could restrict progress toward other goals of the 2030 Agenda.

This also indicates the importance of coherence among the SDGs is important (Nilsson et al., 2016). Goals may be reinforcing and cancelling. In this context Nilsson et al. (2018:1491) suggest that 7 points of the scale of the SDGs interactions. In this analysis positive interactions significantly outweigh negative ones for the first six goals. According to Nilsson et al. (2018) findings, goals SDG 1–8 and SDG 11 (sustainable cities), correlate strongly and positively, pointing to synergies between reaching these goals. SDG 10 correlates negatively with most other goals. Negative interactions are in fact an indication of institutional weakness, and a lack of legal rights and governance that increase vulnerabilities and marginalize groups (Nilsson et al., 2016).

Furthermore, some goals can act as multipliers of trade-offs as in the case of SDG2 and SDG8. A rapid boost of these goals could create unintended side effects that also limit achievement and overall progress. Moreover, several goals can act as multipliers and accelerators of change. In particular SDG 7 (energy), SDG 9 (industry, innovation, infrastructure), SDG 11 (cities), and SDG 13 (climate action) are classified as multipliers. Hegre et al. (2020:8729) finds out that the first 8 SDGs, respectively goals 11 and 17 are predominantly strongly and positively correlated with each other. Oppositely SDG 10 (reduced inequalities) is negatively correlated with most of the other SDGs. Specifically, several goals might have characteristics of behaving as “safe” multipliers of positive systemic effects without creating risks of producing trade-offs. These goals are; SDG 4 (quality of education), SDG 6 (water), SDG 12 (responsible consumption and production), SDG 14 (oceans), SDG 15 (land and ecosystems), SDG 16 (peace), and SDG 17 (partnerships).

Pradhan et al.'s (2017) analysis underlines the achievements created under the no-poverty goal, and creates important synergies. On the other hand, SDG 1 has trade-off with SDG 12 (responsible consumption and production) and SDG 15. The no-poverty goal represents great synergies especially with SDG3 (Good health and wellbeing), SDG 4 (quality education), SDG 5 (gender equality), SDG 6 (clean water and sanitation), and SDG 10 (reduced inequalities) (Pradhan et al., 2017: 1174). Progress among these SDGs has contributed to overall progress. Also, SDG 1 is a goal that is determined based on the improvements in SDGs. For example, eradicating poverty cannot be achieved without ensuring food and nutrition security for all. SDG 2 (zero-hunger) is found to be a strong enabler for SDG 1 (Nillson et al., 2018). No hunger target that is based on improving the nutritional needs of people and considers agricultural production and productivity and rural environments, complements the targets of no-poverty goal.

#### **4.1. Methodology of the Principal Component Analysis**

The number and scope of the underlying data related to the SDG targets naturally necessitate multivariate analysis methods (Johnson and Wichern, 2002; Rencher, 2002). Principal Component Analysis (PCA) which is among the data monitoring methods, is one of the methodologies used to generate a composite SDG score index (Lafortune et al., 2018). The PCA methodology is used to evaluate the performance of SDGs while considering existing trade-offs and synergies among them (Hegre et al., 2022). It is also used to analyze the links across sub-indicators of relevant goals, focusing on specific SDG targets (Megyesiova and Lieskovska, 2018; Cling and Delecourt, 2022; Lamichhane, et al., 2021). Thus, it is aimed at predicting which targets will be prioritized in the design of policies related to SDG targets through these forms of analysis. However, this method cannot be explanatory in terms of testing a specific hypothesis or examining the causal relationship between data (Pradhan et al., 2017).

The origins of PCA date back to the work of Pearson (1901) and Hotelling (1933), and with the development of application programs over time, it has become widely used in many fields (such as biomedicines) and has also become applicable to large datasets (cited by Jolliffe and Cadima, 2016:2). This method is mainly considered as being a simple machine learning technique that monitors the general trends of interactions between data and makes projections accordingly (Lumivero, 2023).

The core of PCA is to simplify the complexity of high-dimensional data and standardize the data while preserving trends and correlations (Vidal et al., 2020). It is believed that this

method can effectively eliminate correlations between large data sets by using orthogonal variables (Johnson and Wichern, 2002). The main objective is to extract the important information from the data table (matrix) and transform this information into a set of new orthogonal variables called principal components (Jolliffe and Cadima, 2016: 3). Each principal component is a linear combination of the original variables, and thus it is often possible to attribute meaning to the components (Ringnér, 2008). Overall, the PCA method helps to uncover the most meaningful relationships between data while removing the potentially distorting effects of multicollinearity between variables with newly created principal components (Lafortune et al., 2021; Joint Research Centre-European Commission, 2008).

Basically, PCA analyzes a table (matrix) representing observations described by several dependent variables, which are, in general, inter-correlated. PCA can be based on either the covariance matrix or the correlation matrix. The choice among these methods depends on several factors (Jolliffe and Cadima, 2016). Pearson correlation, automatically standardizes or normalizes the data to avoid inflating the impact of variables with high variances on the result (Lumivero, 2023). As a result, a coordinate system with linearly uncorrelated dimensions was created. Consequently, the Pearson correlation matrix will be considered through the analysis and will follow the same methodology in analyzing SDGs interactions.

A data matrix comprises of  $n$ - observations (entities/years) and  $x$ - variables. As a projection method, PCA uses the observations from a  $z$ -dimensional space with  $x$ - variables and transforms the given space into a  $p$ -dimensional space (where  $p < z$ ). This new  $p$ -dimensional space is based on the total variance of the observed data. In the analysis, a new dimensional space is created based on this information. The new space comprises a set of  $p$ - uncorrelated factors. The variables in the new dimensional space are linear functions of those in the original dataset, that successively maximize variance and that are uncorrelated with each other (Jolliffe and Cadima, 2016).

For this purpose, XLSTAT (Lumivero, 2023) software was conducted. XLSTAT is a statistical software that can be employed to perform multivariate analysis (Vidal et al., 2020), suggested to be practical and compatible with Excel.

For our sample,  $n$ - observations (years) and  $x$ -variables (SDGs relevant indicators) are taken into consideration. The number of the used variables varies in each sample in all samples;  $n > x$ . The matrix with  $n$ - observations (rows) and  $x$ -variables (columns) is outlined. The following steps are extracted by using the relevant samples.

Primarily the continuity and quality of the data sample is considered and organized. In the XLSTAT (Lumivero, 2023) package while choosing the PCA command; a Pearson correlation matrix and standardization of the data and the relevant tests options is also chosen.

To perform the PCA, Bartlett's sphericity test and Kaiser-Meyer-Olkin (KMO) tests need to be considered. The Bartlett's test of sphericity is a test performed on the correlation matrix to verify how close it is to the identity matrix: the closer the correlation matrix is to the identity matrix, the more the variable indicators are uncorrelated (Tabachnick and Fidell, 2007). The Bartlett's sphericity tests (significance level of 95%) the hypothesis that the correlation matrix is an identity matrix. The p- values smaller than 0.05 reject the null hypothesis.<sup>10</sup> The KMO is a measure of sampling adequacy. The KMO measure ranges between 0 and 1. For PCA overall KMO above 0.5 is more appropriate (Lamichhane, et al.,2021).

In this context, the data matrix of the n -variable in the p- measurement is standardized based on the Pearson correlation. The Pearson correlation matrix of the standardized data is outlined. For the analysis of the SGDs, the Pearson correlation with a p-value of less than 0.05 is considered as statistically significant (in our samples in bold). The positive correlation values greater than 0.6 indicate positive synergies between the two indicators, and a p-value less than -0.6 indicates trade- offs between the variables (Hegre et al., 2022).

After that, the eigenvalues of the correlation matrix and standardized eigenvectors are computed. The percentage variation of each principal component in the entire dataset is shown by the eigenvalue, also known as the variance. Eigenvalues reflects the quality of the projection from the z-dimensional initial table to a lower number of dimensions. After that, the standardized data matrix with the transpose of each eigenvector was multiplied to find principal component values (factor loadings/component loadings). According to Kaiser's criterion, components with eigenvalues greater than one are considered (Tabachnick and Fidell 2007).

PCA linearly transforms the data and loads the maximal proportion of the variances to the first PC and then a maximal proportion of the remaining variance loads on the second PC (XLSTAT,2023). In the analysis, PCA dimensions are also called axes or factors (in this case, F1 and F2). It is suggested that the explanatory power of the first two factors represents sufficient explanations for the data (Vidal et al., 2020; Abdi and Williamson, 2010).

Finally, the squared cosines table is outlined. The squared cosines indicate the variables between the observation vectors and factor axes. Squared cosines of the variables smaller than 0.5 for the 2 first factors are not used. The greater the squared cosines define the greater the link with the corresponding axis. Given that the explanatory power of the relevant data with synergies and trade-offs is evaluated based on the principal components. In XLSTAT (Lumivero,2023) it is also possible to figure out correlation circle (variables chart) and observations charts with axis F1 and F2.

10 H<sub>0</sub>: There is no correlation significantly different from 0 between the variables.

Ha: At least one of the correlations between the variables is significantly different from 0.

## 4.2. Data Used for Principal Component Analysis

Observation years of 2000-2021 for Türkiye was used to monitor the interactions among the SDG scores. Data for the samples is derived from Sachs et al. (2022) and Lafortune et al. (2022). An analysis of the 17 sustainable development goals with relevant sub-indicators (71 sub-indicators out of 125 indicators) is performed. Additionally, the LNOB index score values and relevant sub-indicators are included (Lafortune et al., 2022).

The SDG target is a composite index and was derived from the arithmetic mean of the sub-targets (17 SDGs) scores. In determining the score values of the targets, the arithmetic average of the sub-data (indicators) constituting the relevant targets was taken into account. The sub-data of the relevant targets was created by testing the consistency among themselves. In the preparation of these data, the max-min method was used and then the data were standardized considering weighting according to a given scale. The variables were transformed linearly to a scale between 0 and 100 after the upper and lower bounds were established. Based on the scoring method; a country receiving a score of 50 on a variable is halfway to obtaining the ideal value (in our case SDG target), while a country receiving a score of 75 has gone three-quarters of the distance from the worst to best (Lafortune, et al., 2018).

All data used in the study were standardized data reported according to this scale. As an exception, the continuity of LNOB sub-indicators was limited. For this sample, 2010-2021 period was considered. The raw data provided was standardized by following the same methodology for the calculation of SDG index scores.

In the study, it was foreseen to conduct PCA by evaluating the SDG targets, SDG targets' sub-indicators, and LNOB sub-indicators. However, it could not be possible to cover data on all sub-indicators due to the limitations of the distribution and quality of the data. Three main samples were used to perform the PCA. Accordingly, the first sample aimed to analyze the interactions between SDG targets. In this sample, sub-indicators of the SDGs were used. Within this sample, 4 SDG targets (SDG 6, SDG 10, SDG 3 and SDG 17) could not be included in the analysis. In the second sample, no-poverty goal, and sub-indicators relevant to the SDGs targets were used. Thus, the interactions between the no-poverty goal and other sub-indicators rather than the overall SDGs index score were outlined. In this stage the research focusses on dimensions of the SDGs. Given that, there are 3 basic bottom-lines (social, economic and environmental) and 5 main principles (people-centered, prosperity, planet, partnerships, and peace) (UN, 2015) used for the classification of the SDGs that can also be seen in Table A.1 (Appendix) In this case PCA was conducted for the people-centered, prosperity (economy), planet (environmental-climate), and peace (social) dimensions.

mate) and partnerships and peace related SDGs. In the third sample, the interactions between the LNOB score and the SDG targets and sub-components used to determine this indicator were considered. In this category, sub-indicators linked with extreme poverty and material deprivation and access and quality of services were analyzed under the PCA.

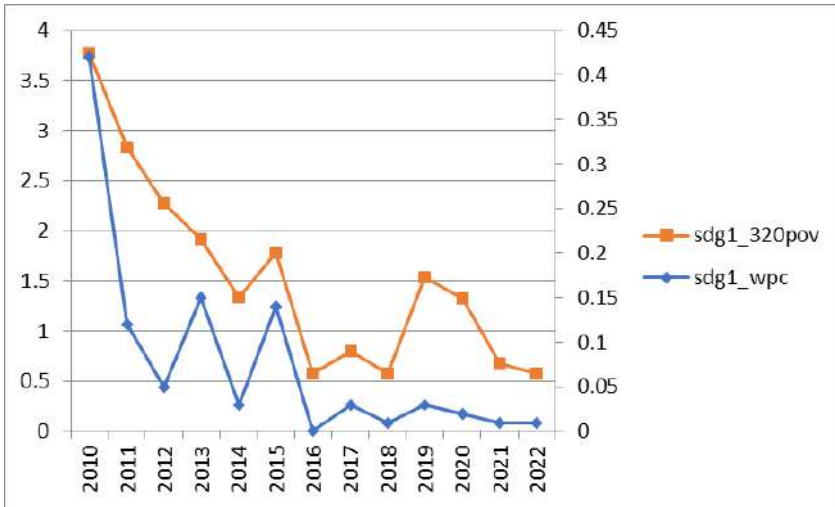
After obtaining the Pearson correlation matrix of all PCA for all samples, Bartlett's sphericity test and Kaiser-Meyer-Olkin (KMO) tests were followed to interpret the results (Table A.3 in Appendix).

### 4.3. The Results of Principal Component Analysis

The descriptive data in Table 6 summarizes Türkiye's performance in achieving the SDG targets for the period of 2000-2021. Türkiye's average score value was realized as 67, while the value for 2023 was announced as 72. Accordingly, Türkiye ranks 70.78 out of 166 countries (SDG,2023). The LNOB reveals a weaker performance for Türkiye compared to the SDGs scores even its average value compared to other European countries the gap with them increases in this score. The low performance of the relevant indicators lowers the LNOB rank for Türkiye (LNOB, 2023).

<b>Table 6. Descriptive statistics</b>					
<b>Variable</b>	<b>Obs.</b>	<b>Min.</b>	<b>Max.</b>	<b>Mean</b>	<b>Std. deviation</b>
SDG Index Score	22	30.396	36.032	33.172	1.961
LNOB	22	37.770	46.610	40.691	2.993
Goal 1 Score	22	26.352	29.748	27.620	1.396
Goal 2 Score	22	-11.406	-8.216	-9.652	0.871
Goal 3 Score	22	53.869	68.509	62.638	5.054
Goal 4 Score	22	55.850	73.739	66.224	7.051
Goal 5 Score	22	22.901	41.485	32.032	7.159
Goal 6 Score	22	-85.702	-84.013	-84.766	0.473
Goal 7 Score	22	17.822	22.266	19.492	1.369
Goal 8 Score	22	18.415	24.285	21.413	1.532
Goal 9 Score	22	28.022	59.869	43.404	11.176
Goal 10 Score	22	24.157	32.647	27.966	2.238
Goal 11 Score	22	41.321	49.065	44.666	2.606
Goal 12 Score	22	-82.768	-81.431	-81.814	0.514
Goal 13 Score	22	10.314	14.506	12.433	1.174
Goal 14 Score	22	31.107	42.801	38.334	3.290
Goal 15 Score	22	53.680	54.010	53.880	0.093
Goal 16 Score	22	40.545	51.189	45.861	3.562
Goal 17 Score	22	22.569	27.658	24.745	1.524

The SDG targets below the average SDG score are; SDG 5 (gender equality), SDG 9 (industry, innovation, infrastructure), SDG 13 (climate action), SDG 14 (life below water), and SDG 8 (decent work and economic growth). However, the overall trends of the other targets were realized above the average value of the SDG score. Considering the SDGs targets, it is seen that Türkiye's performance in certain areas is positive. The no-poverty goal represents the highest value among the SDG scores. This is driven by the improvement in absolute poverty data. Figure 3 illustrates the two main sub-variables included in the analysis through the no-poverty goal; poverty headcount ratio at \$2.15/day (2017 PPP, %) and, poverty headcount ratio at \$3.65/day (2017 PPP, %). These data include the areas where Türkiye has been successful in poverty performance concerning the absolute poverty data.



**Figure 3.** No-poverty goal indicators  
**Source:** Sachs et al., (2022)

In this case, PCA was carried out taking into account the SDG goal score values. However, within the scope of the PCA, the values of SDG 6 (clean water and sanitation) and SDG 10 (reduced inequalities) could not be included to the analysis, considering their correlation with other SDGs. They might be thought of as outliers. Since the Gini ratio and Palma ratio used to measure income inequality were included in the SDG 10 (reduced inequalities) target, their distribution may have had a different trend than that of the other targets (Lafortune et al., 2018). Due to multicollinearity, SDG 3 (good health and well-being) was not included. Additionally, it has been noted that there is a strong correlation between health (SDG 3) and no-poverty goal (SDG 1) and their interactions are essentially decisive regarding the basic needs. SDG 17 (partnerships) is thought to be negligible in order to overcome multicollinear-

ity constraints among the SDGs. In this context the PCA includes 13 SDGs (SDG 3, SDG 6, SDG 10, SDG 17 not included).

Table 7 illustrates the Pearson correlation matrix for the SDGs. This matrix primarily underlies that there are strong correlations among the SDGs that are used in the sample. Given this fact, it could be suggested that the SDGs in our sample are interlinked and their interactions matter. Pearson correlation matrix outlines those positive correlations mostly occur among the people-centered SDGs. However, SDG 2 (Zero Hunger) significantly has negative correlations with other specific people-centered targets like no-poverty goal (SDG 1) and health (SDG 3). Environmental SDGs are mostly negatively correlated with the other SDGs. Economic goals have weak interactions. Additionally, people-centered goals and SDG 8 (decent work and economic growth) have negative correlations that need to be considered for the linkages between economic growth and human development.

For the case of the no-poverty goal (SDG 1), it can be seen that there is a negative correlation between zero hunger (SDG 2), and SDG 8 (decent work and economic growth), SDG 12 (responsible consumption and production), and SDG 15 (life on land). Quality of education (SDG 4), gender equality (SDG 5), and industry, innovation, and infrastructure (SDG 9) have a high positive correlation with the no-poverty goal (SDG 1).

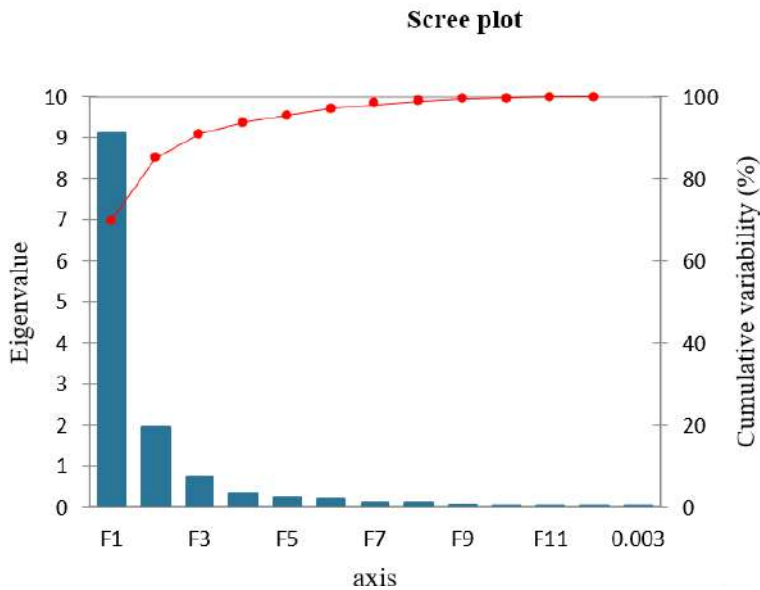
**Table 7.** Pearson correlation matrix of the SDGs

Variables	Goal 1 Score	Goal 2 Score	Goal 3 Score	Goal 4 Score	Goal 5 Score	Goal 6 Score	Goal 7 Score	Goal 8 Score	Goal 9 Score	Goal 10 Score	Goal 11 Score	Goal 12 Score	Goal 13 Score	Goal 14 Score	Goal 15 Score	Goal 16 Score	Goal 17 Score
Goal 1 Score	1	-0.343	0.728	0.471	0.912	-0.780	0.343	-0.577	0.009	-0.330	0.209	-0.764	0.474	-0.164	-0.598	-0.014	0.205
Goal 2 Score	-0.343	1	0.010	0.074	-0.070	0.007	0.386	-0.018	0.121	0.209	0.070	-0.213	0.457	0.484	-0.301	0.138	0.791
Goal 3 Score	0.728	0.010	1	0.359	0.884	-0.803	0.812	-0.884	0.082	-0.711	0.201	-0.897	0.701	-0.044	-0.677	-0.008	0.332
Goal 4 Score	0.471	0.074	0.359	1	0.691	-0.072	0.631	-0.187	0.666	0.114	-0.230	-0.697	0.559	-0.662	-0.555	0.780	0.493
Goal 5 Score	0.912	-0.070	0.884	0.691	1	-0.801	0.772	-0.747	0.781	-0.538	0.202	-0.916	0.661	-0.291	-0.694	0.026	0.301
Goal 6 Score	-0.780	0.007	-0.803	-0.072	-0.801	1	-0.878	0.761	-0.396	0.573	-0.617	0.756	-0.509	-0.127	0.487	0.485	-0.425
Goal 7 Score	0.343	0.386	0.812	0.631	0.772	-0.878	1	-0.791	0.721	-0.289	0.346	-0.926	0.906	-0.111	-0.821	0.387	0.810
Goal 8 Score	-0.577	-0.018	-0.884	-0.187	-0.747	0.761	-0.791	1	-0.468	0.742	-0.688	0.760	-0.550	-0.126	0.458	0.141	-0.425
Goal 9 Score	0.009	0.121	0.082	0.666	0.699	0.781	-0.396	0.721	-0.468	1	-0.331	-0.043	-0.812	0.688	-0.433	-0.781	0.398
Goal 10 Score	-0.330	0.209	-0.711	0.114	-0.538	0.573	-0.289	0.742	-0.231	1	-0.170	0.427	-0.166	-0.210	0.248	0.417	0.059
Goal 11 Score	0.209	0.070	0.201	-0.230	0.202	-0.617	0.346	-0.688	-0.043	-0.170	1	-0.240	0.163	0.192	0.094	-0.292	0.328
Goal 12 Score	-0.764	-0.213	0.897	-0.697	-0.916	0.756	-0.926	0.756	-0.812	0.427	-0.240	1	-0.862	0.146	0.864	-0.103	0.780
Goal 13 Score	0.474	0.457	0.701	0.359	0.661	-0.339	0.906	-0.330	0.688	-0.103	0.346	-0.862	1	-0.021	-0.816	0.354	0.904
Goal 14 Score	-0.164	0.484	-0.044	-0.662	-0.291	-0.127	-0.111	-0.120	-0.423	-0.210	0.163	0.146	-0.021	1	0.016	-0.691	0.159
Goal 15 Score	-0.598	-0.301	-0.677	-0.555	-0.694	0.487	-0.821	0.458	-0.781	0.348	0.604	0.854	-0.816	0.016	1	-0.233	-0.698
Goal 16 Score	-0.014	0.138	-0.008	0.780	0.026	0.485	0.387	0.141	0.398	0.417	-0.292	-0.163	0.254	-0.691	-0.233	1	0.300
Goal 17 Score	0.205	0.791	0.332	0.493	0.301	-0.425	0.810	-0.423	0.343	0.053	0.328	-0.780	0.904	0.153	-0.698	0.309	1

Values in bold are different from 0 with a significance level alpha=0.05

The scree plot in Figure 4 illustrates the eigenvalues for the PCA. The eigenvalues (F1 and F2) greater than one explain 85.6 % of the cumulative variations for 13 SDGs in the sample.





**Figure 4.** Scree plot for SDGs

Overall estimation of the PCA in Table 8 based on factor loadings (PCA components) indicates that SDG 9 (industry, innovation and infrastructure), SDG 5 (gender equality), SDG 4 (quality of education), and SDG 1 have the most important interactions in a positive trend. SDG 15 (life on land) has the highest negative spillover effect. Following that, SDG 12 (responsible production and consumption), SDG 14 (life below water) and SDG 8 (decent work and economic growth) and SDG 2 (zero hunger) goals have negative overall interactions. The results for Türkiye reveal the importance of no-poverty goal (SDG 1). Among the people-centered goals; SDG 2 (zero hunger) creates negative spillovers that affect the overall performance of the SDGs. The environmental performance of Türkiye is suggested to be poor. Apart from environmental goals, negative spillover effects of SDG 12 (responsible consumption and production) and SDG 8 (decent work and economic growth) lead us to question the sustainability of the economic growth.

Based on the Pearson correlation matrix results and factor loading values, it is possible to argue that overall, the positive synergies between SDG targets have stronger effects. The synergies and tradeoffs related to the SDG scores outline that people-centered goals are among the most important goals that create positive synergies for the overall performance of sustainable development. The results for Türkiye reveal the importance of SDG 1.

**Table 8.** PCA dimensions of the SDGs

	Factor loadings		Contribution of the variables(%)		Squared cosines of the variables	
	F1	F2	F1	F2	F1	F2
Goal 1 Score	0.936	-0.002	9.631	0.000	<b>0.877</b>	0.000
Goal 2 Score	-0.720	0.560	5.699	15.941	<b>0.519</b>	0.314
Goal 4 Score	0.929	-0.287	9.488	4.190	<b>0.864</b>	0.082
Goal 5 Score	0.977	-0.065	10.493	0.212	<b>0.955</b>	0.004
Goal 7 Score	0.838	0.492	7.710	12.318	<b>0.702</b>	0.242
Goal 8 Score	-0.696	-0.326	5.314	5.398	<b>0.484</b>	0.106
Goal 9 Score	0.968	-0.033	10.300	0.055	<b>0.938</b>	0.001
Goal 11 Score	0.775	-0.183	6.603	1.704	<b>0.601</b>	0.034
Goal 12 Score	-0.902	-0.386	8.939	7.568	<b>0.814</b>	0.149
Goal 13 Score	0.205	0.926	0.461	43.599	0.042	<b>0.858</b>
Goal 14 Score	-0.836	0.353	7.680	6.346	<b>0.699</b>	0.125
Goal 15 Score	-0.923	-0.172	9.367	1.502	<b>0.853</b>	0.030
Goal 16 Score	0.870	-0.152	8.314	1.168	<b>0.757</b>	0.023
<i>Values in bold correspond for each variable to the factor for which the squared cosine is the largest</i>						

In the second stage of the PCA, the links between the no-poverty goal (SDG 1) and the sub-indicators of the other targets were analyzed. The sub-indicators were classified under 5 principles of the SDGs. In this context, 4 PCAs for; people-centered, prosperity (economy), planet (climate) and partnerships and peace goals were performed.

*People-centered goals and no-poverty goal:* Zero hunger (SDG 2), quality of education (SDG 4), gender equality (SDG 5) comprise of 14 sub-indicators for Türkiye and only 10 of them were included to the analysis. Their overall interactions with the SDG 1 (no-poverty goal) were considered in this case.

As can be seen from the Pearson correlation matrix results (Table A.4 in Appendix) the sub-indicators of these three targets may have affected the no-poverty goal (SDG 1) in different directions. Within the SDG 2 (zero hunger) target, there is a negative correlation between “the prevalence of obesity (sdg2\_obesity)”, trophics ( sdg2\_trophic)” and “the prevalence of wasting in children under 5 years of age ( sdg2\_wasting)” indicators and the no-poverty goal. Primary school enrollment rate (sdg4\_primary) and other education indicators have different effects on overall interactions. The Primary school enrollment rate and the no-poverty goal have trade-offs that need to be considered.

The PCA for this sample, reveals that eigenvalues greater than one (F1) explains 87% of the variations. Table 9 demonstrates the primary component results and the overall in-

interactions of the people-centered goals. “Wasting in children (sdg\_2 wasting)” and “obesity (sdg2\_obesity)” indicators reveal weakness of the overall interactions. The dietary habits of Türkiye’s children and people in general show that trade-offs are important in the pursuit of poverty eradication goals. Education-related goals also have important effects. Furthermore, the literacy score is rather strong in explaining the variations among the people-centered goals. Gender-related goals have positive interactions with overall variations and are also positively correlated with the no-poverty goal.

**Table 9.** PCA dimensions for people-centered goals and SDG 1

	Factor loadings		Contribution of the variables(%)		Squared cosines of the variables
	F1	F2	F2	F1	F2
Goal 1 Score	0.961	-0.005	0.005	<b>0.923</b>	0.000
n_sdg2_stunting	0.922	0.211	10.026	<b>0.850</b>	0.045
n_sdg2_wasting	-0.854	0.043	0.411	<b>0.729</b>	0.002
n_sdg2_obesity	-0.960	-0.215	10.351	<b>0.922</b>	0.046
n_sdg2_trophic	-0.927	-0.116	3.020	<b>0.859</b>	0.013
n_sdg4_primary	-0.813	0.534	64.210	<b>0.660</b>	0.286
n_sdg4_literacy	0.979	0.050	0.560	<b>0.958</b>	0.002
n_sdg5_edat	0.971	-0.094	2.002	<b>0.942</b>	0.009
n_sdg5_lfpr	0.940	-0.141	4.481	<b>0.883</b>	0.020
n_sdg5_parl	0.963	0.148	4.935	<b>0.927</b>	0.022

*Values in bold correspond for each observation to the factor for which the squared cosine is the largest*

Prosperity (economy) centered goals and the no-poverty goal: For the PCA, together with the no-poverty goal (SDG 1), 8 of 13 sub- indicators related to three SDGs (7, 8, 9) were included in the sample. The SDG 10 (reduced inequalities) indicators were omitted. In this PCA, eigenvalues (F1 and F2) greater than one explain 87 % of the cumulative variations.

**Table 10.** PCA dimensions for prosperity-centered goals and SDG 1

	Factor loadings		Contribution of the variables %		Squared cosines	
	F1	F2	F1	F2	F1	F2
Goal 1 Score	0.898	0.006	11.994	0.003	<b>0.806</b>	0.000
n_sdg7_cleanfuel	0.898	-0.406	11.998	14.832	<b>0.807</b>	0.165
n_sdg7_co2twh	0.884	-0.423	11.620	16.165	<b>0.781</b>	0.179
n_sdg8_accounts	0.727	0.597	7.871	32.165	<b>0.529</b>	0.357
n_sdg8_unemp	-0.619	-0.227	5.708	4.652	0.384	0.052
n_sdg8_rights	-0.819	-0.463	9.973	19.365	<b>0.671</b>	0.215
n_sdg9_intuse	0.984	-0.093	14.396	0.785	<b>0.968</b>	0.009
n_sdg9_mobuse	0.947	0.179	13.340	2.878	<b>0.897</b>	0.032
n_sdg9_articles	0.939	-0.319	13.101	9.153	<b>0.881</b>	0.102

*Values in bold correspond for each variable to the factor for which the squared cosine is the largest*

Considering the results of the PCA on the economy-based goals, two main results are evident. There are strong interactions between the performance of the quality of growth in SDG 9 (industry, innovation and infrastructure), especially infrastructure-related indicators, and the no-poverty goal. However, the indicators on “protection of fundamental labor rights (worst 0–1 best) (sdg8\_rights)” and “unemployment (sdg8\_unemployment)” have negative interactions with the sample. There are positive synergies that come from the SDG 7 (clean economy) indicators. Adults with accounts (sdg8\_accounts)<sup>11</sup> interactions are positive, but its impact is weaker compared to other indicators.

Planet (climate-environmental) goals and no-poverty goal: For the PCA, only 11 of the 17 sub-indicators under 5 environmental targets were used in this category. eigenvalues that are greater than one for this PCA, explain 84% of the variations. As can be seen in Table 11, in its broadest terms, unlike the relationship between the other sub-indicators and the no-poverty goal, the overall result is negative. This indicates a low level of environmental performance and a negative synergy with the no-poverty target. The “air pollution indicator (sdg11\_pm25)” has a negative correlation with the no-poverty goal, but its overall interaction is positive in explaining the variations of the sample. SDG 14 (life below water) and SDG 15 (life on land) and their sub-indicators own negative spillovers. In particular, “sdg13\_co2import (CO<sub>2</sub> emissions embodied in imports)”, “sdg15\_cpta (mean area that is protected for biodiversity%)”, “sdg14\_cleanwater (ocean health index)” and “sdg14\_trawl (fish caught by trawling or dredging (%))” and “sdg11\_transport (satisfaction with public transport (%))” have negative interactions.

**Table 11.** PCA dimensions for planet-centered goals and SDG 1

	Factor loadings		Contribution of the variables %		Squared cosines	
	F1	F2	F1	F2	F1	F2
Goal 1 Score	-0.966	0.030	11.22890481	0.049916394	<b>0.934</b>	0.001
n_sdg11_pm25	0.733	0.457	6.452829795	11.72060254	<b>0.537</b>	0.209
n_sdg11_transport	-0.073	0.838	0.063738267	39.45995374	0.005	<b>0.703</b>
n_sdg12_ewaste	0.789	0.452	7.495570178	11.47764217	<b>0.623</b>	0.204
n_sdg12_nprod	0.982	0.041	11.59703459	0.096232806	<b>0.964</b>	0.002
n_sdg12_nimport	0.934	-0.120	10.48840107	0.814404921	<b>0.872</b>	0.015
n_sdg13_co2import	-0.804	-0.418	7.769413232	9.823063573	<b>0.646</b>	0.175
n_sdg14_cleanwat	-0.932	-0.086	10.44574701	0.416921124	<b>0.869</b>	0.007
n_sdg14_fishstocks	0.871	-0.355	9.124692706	7.064635555	<b>0.759</b>	0.126
n_sdg14_trawl	-0.808	0.183	7.842502856	1.879971535	<b>0.652</b>	0.033
n_sdg15_cpta	-0.727	0.545	6.364561838	16.66777626	<b>0.529</b>	0.297
n_sdg15_cpfa	-0.962	0.097	11.12660365	0.528879378	<b>0.925</b>	0.009

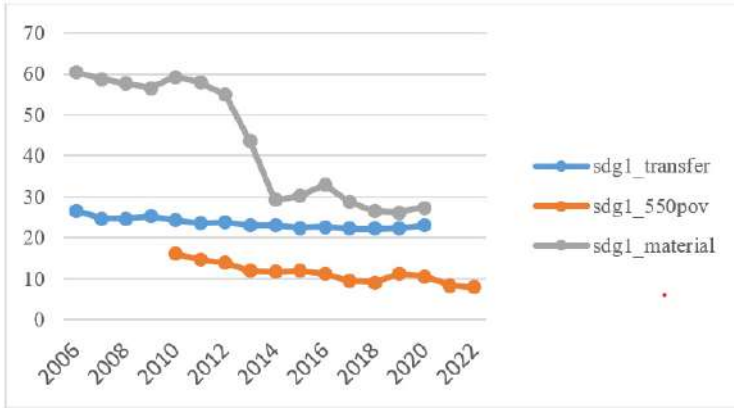
*Values in bold correspond for each observation to the factor for which the squared cosine is the largest*

11 Adults with an account at a bank or other financial institution or with a mobile-money-service provider (% of population aged 15 or over)

*Partnerships -Peace and no-poverty goal:* All the relevant sub-indicators, 9 of them for SDG 16 (peace) and SDG 17 (Partnerships) were used in this PCA. In this PCA, eigen-values (F1 and F2) greater than one explain 80% of the cumulative variations. The overall interaction of these sub-indicators together with the no-poverty goal is positive. The highest positive interactions come from the “sdg16\_homicides”. “sdg16\_justice (access to affordable justice)”, “sdg16\_detain16 (unsentenced detainees)”, and “sdg16\_safe (population who feel safe walking alone at night in the city or area where they live (%))” also have positive impacts. However, some of the sub-indicators of SDG 16 have negative interactions. Especially “sdg16\_cpi (corruption perception index)” and “sdg16\_rsf (press freedom)” have a high negative impact on overall interactions. SDG 16 which is decisive for inclusive society targets led us to question the dimensions of the corruption and freedoms in Türkiye. In this regard, “sdg17\_govrev (government revenues for health and education (GDP%))” is also decisive. Moreover, “sdg\_17statperf (statistical performance index)” is found to have a positive impact. Under SDG 17, “sdg17\_govrev” also has a negative impact on the overall interactions.

<b>Table 12. PCA dimensions for peace and partnership goals and SDG 1</b>						
	<b>Factor Loadings</b>		<b>Contribution of the variables %</b>		<b>Squared cosines</b>	
	<b>F1</b>	<b>F2</b>	<b>F1</b>	<b>F2</b>	<b>F1</b>	<b>F2</b>
Goal 1 Score	0.891	-0.322	11.91054157	7.707	<b>0.795</b>	0.103
n_sdg16_homicides	0.953	0.043	13.61377711	0.137	<b>0.908</b>	0.002
n_sdg16_detain	0.728	-0.146	7.943760689	1.589	<b>0.530</b>	0.021
n_sdg16_safe	0.691	-0.458	7.149465988	15.614	<b>0.477</b>	0.210
n_sdg16_cpi	-0.950	0.051	13.53332109	0.196	<b>0.903</b>	0.003
n_sdg16_rsf	-0.881	0.024	11.62692091	0.044	<b>0.776</b>	0.001
n_sdg16_justice	0.864	0.439	11.18503041	14.344	<b>0.746</b>	0.192
n_sdg17_govex	0.618	0.727	5.717888316	39.352	0.381	<b>0.528</b>
n_sdg17_govrev	-0.594	0.483	5.28449013	17.397	<b>0.353</b>	0.233
n_sdg17_statperf	0.896	0.220	12.03480379	3.620	<b>0.803</b>	0.049
<i>Values in bold correspond for each observation to the factor for which the squared cosine is the argest</i>						

The third sample for PCA is based on sub-components linked to the LNOB score for the period 2010-2021. Within the scope of this data, “sdg1\_transfer1 (people at risk of income poverty after social transfers (%))”, “sdg1\_550pov (poverty headcount ratio at \$5.50/day (%))”, “sdg1\_material (severely materially deprived people (%))” is included in the analysis that is different from the other two samples. These metrics represent different tendencies from the extreme poverty figures. Although there is a declining trend, these metrics indicate that the no-poverty goal performance needs to be analyzed considering multidimensional poverty conditions rather than extreme poverty. Here, the static trend of post-transfer data is noteworthy. This, in fact, is considered as an indicator of the persistence of poverty adjusted for transfer revenues.



**Figure 5.** Poverty indicators used for LNOB  
**Source:** Sachs et al. (2022)

In this analysis, the PCA tracks the interactions among extreme poverty and material deprivation, gender inequality, access to and quality of services and income inequality indicators (Table A.2 in Appendix).

**Table 13.** Pearson correlation matrix for LNOB indicators

Variables	LNOB	g1_transfer	g1_550pov	g1_material	g3_happ	g3_suicide	g3_happ	g3_incepp	g3_inceov	g4_child	g5_caring	g5_wparl	g5_wmange	g5_shower	g7_warm	g8_rights	g8_eyneet	g8_inwork	g9_bband	g11_crowding
LNOB	1	-0.666	-0.790	-0.825	-0.664	0.886	-0.743	-0.803	0.694	0.881	0.405	0.847	0.729	-0.832	-0.722	-0.577	-0.438	-0.803	0.814	-0.926
g1_transfer	-0.666	1	0.920	0.884	0.801	-0.690	0.521	0.847	-0.875	-0.727	-0.831	-0.734	-0.532	0.893	0.818	0.870	0.885	0.922	-0.786	0.650
g1_550pov	-0.790	0.920	1	0.904	0.871	-0.805	0.620	0.893	-0.857	-0.755	-0.723	-0.734	-0.563	0.905	0.782	0.822	0.824	0.943	-0.826	0.737
g1_material	-0.825	0.884	0.904	1	0.894	-0.743	0.658	0.877	-0.787	-0.783	-0.778	-0.690	-0.592	0.859	0.955	0.818	0.773	0.911	-0.886	0.784
g3_happ	-0.664	0.801	0.871	0.894	1	-0.662	0.555	0.845	-0.816	-0.647	-0.690	-0.514	-0.481	0.768	0.802	0.823	0.762	0.873	-0.810	0.665
g3_suicide	0.886	-0.690	-0.805	-0.743	-0.662	1	-0.831	-0.826	0.643	0.946	0.364	0.737	0.867	-0.772	-0.566	-0.747	-0.390	-0.764	0.868	-0.963
g3_happ	-0.743	0.521	0.620	0.658	0.555	-0.831	1	0.839	-0.467	-0.815	-0.175	-0.611	-0.923	0.685	0.483	0.681	0.197	0.688	-0.892	0.913
g3_incepp	-0.803	0.847	0.893	0.877	0.845	-0.826	0.839	1	-0.831	-0.841	-0.541	-0.786	-0.790	0.930	0.729	0.868	0.633	0.962	-0.954	0.894
g3_inceov	0.694	-0.875	-0.857	-0.787	-0.816	0.643	-0.467	-0.831	1	0.648	0.626	0.783	0.476	-0.925	-0.686	-0.703	-0.782	-0.929	0.689	-0.668
g4_child	0.881	-0.727	-0.755	-0.783	-0.647	0.946	-0.815	-0.841	0.648	1	0.441	0.785	0.915	-0.786	-0.663	-0.799	-0.388	-0.774	0.913	-0.913
g5_caring	0.405	-0.831	-0.723	-0.778	-0.690	0.364	-0.175	-0.541	0.626	0.441	1	0.439	0.191	-0.666	-0.427	-0.721	-0.140	-0.638	0.873	-0.289
g5_wparl	0.847	-0.734	-0.734	-0.690	-0.514	0.737	-0.611	-0.786	0.783	0.785	0.439	1	0.670	-0.914	-0.573	-0.540	-0.531	-0.829	0.697	-0.816
g5_wmange	0.729	-0.532	-0.563	-0.592	-0.481	0.867	-0.923	-0.790	0.476	0.915	0.191	0.670	1	-0.666	-0.427	-0.721	-0.140	-0.638	0.873	-0.887
g5_shower	-0.832	0.893	0.905	0.859	0.768	-0.772	0.685	0.930	-0.925	-0.786	-0.621	-0.914	-0.666	1	0.731	0.744	0.737	0.976	-0.829	0.831
g7_warm	-0.722	0.818	0.782	0.955	0.802	-0.566	0.483	0.729	-0.686	-0.663	-0.808	-0.573	-0.427	0.731	1	0.716	0.745	0.793	-0.764	0.636
g8_rights	-0.577	0.870	0.822	0.818	0.823	-0.747	0.681	0.868	-0.703	-0.799	-0.691	-0.540	-0.721	0.744	0.716	1	0.664	0.821	-0.899	0.680
g8_eyneet	-0.438	0.885	0.824	0.773	0.762	-0.390	0.197	0.633	-0.782	-0.388	-0.915	-0.531	-0.140	0.737	0.745	0.664	1	0.786	-0.520	0.344
g8_inwork	-0.803	0.922	0.943	0.911	0.873	-0.764	0.688	0.962	-0.929	-0.774	-0.665	-0.829	-0.638	0.976	0.793	0.821	0.786	1	-0.871	0.820
g9_bband	0.814	-0.786	-0.826	-0.886	-0.810	-0.892	-0.954	0.689	0.913	0.536	0.697	0.873	-0.829	-0.764	-0.899	-0.520	-0.871	1	-0.910	
g11_crowding	-0.926	0.650	0.737	0.784	0.665	-0.903	0.913	0.894	-0.668	-0.913	-0.289	-0.816	-0.887	0.831	0.636	0.680	0.344	0.820	-0.910	1

Values in bold are different from 0 with a significance level  $\alpha=0.05$

The Pearson correlations in Table 13 illustrate that the sub-indicators of poverty with the LNOB score have negative and strong correlations. Especially the “poverty headcount ratio at \$5.50/day (%)”, “sdg1\_material (severely materially deprived people (3%))”, and “sdg1\_post-transfer poverty” data have negative effects. Again, “sdg11\_overcrowding (overcrowding rate among people living with below 60% of median equivalent income (%))” data that relates to sustainable cities are among the indicators that determine the LNOB value in a negative direction. Health-related indicators are another determinant that affects LNOB positively/negatively according to its sub-components. Following that the PCA is interpreted for only two sub-categories due to the constraints of the data.



*Access to and quality of services under LNOB:* For this PCA only 7 sub-indicators out of 12 could be used with the LNOB score. The eigenvalues (F1 and F2) greater than one explain 90% the cumulative variations. In this sample, as can be seen from Table 15, health-related indicators apart from the “suicide rates”, have a negative impact. These indicators; specific health indicators address the “gap in life expectancy (sdg3\_incgap)” and “self-reported health (sdg3\_hgap)”, and access to “medical care indicates the existence of inequalities in health services (sdg3\_legap)” indicates negative interactions.

More specifically, improvements in “early childhood education (sdg4\_child)” have contributed positively to the LNOB and have a big positive impact. During this period the internet access indicators “(sdg9\_bband)” seem to have positively correlated with the LNOB. The “suicide rate (sdg3\_suicide)” has created positive synergies with the LNOB.

<b>Table 15.</b> PCA dimensions for access to and quality of services						
	<b>Factor loadings</b>		<b>Contribution of the variables(%)</b>		<b>Squared cosines of the variables</b>	
	<b>F1</b>	<b>F2</b>	<b>F1</b>	<b>F2</b>	<b>F1</b>	<b>F2</b>
LNOB	0.898	0.136	13.020	1.717	<b>0.806</b>	0.019
sdg3_legap	-0.836	0.443	11.295	18.095	<b>0.699</b>	0.196
sdg3_suicide	0.927	0.227	13.901	4.750	<b>0.860</b>	0.051
sdg3_hgap	-0.858	-0.388	11.904	13.899	<b>0.737</b>	0.151
sdg3_incgap	-0.963	0.101	14.984	0.934	<b>0.927</b>	0.010
sdg4_child	0.932	0.228	14.033	4.796	<b>0.868</b>	0.052
sdg9_bband	0.974	0.045	15.319	0.183	<b>0.948</b>	0.002
sdg8_euyneet	-0.586	0.776	5.544	55.626	0.343	<b>0.602</b>
<i>Values in bold correspond for each variable to the factor for which the squared cosine is the largest</i>						

In addition to the indicators connected with decent work (SDG 8); poverty risk for those at work (sdg8\_inwork) is found to have a negative impact. Furthermore, “sdg8\_euyneet (youth not in employment, education or training (NEET))” have weak but negative effects.

Results assessed under limited data constraints show that the greatest trade-offs come from material poverty and deprivations and access and the quality of public service indicators. It could be noticed that gender inequality indicators outline positive interactions that are not included in the PCA. The number of seats held by women in parliament (sdg5wparl) indicator and the number of senior women managers (sdg5wmanage) indicate achievement. The income inequality data own weak interactions and their impact on inclusiveness is limited. The case of Türkiye’s inclusiveness outlines weakness in poverty- decent work nexus and inequalities in access to basic services. Additionally, the LNOB indicators underlie the importance of



health, education, and gender-sensitive policies. Education policies, policies for vulnerable groups, and a definition of rights are vital for the case of Türkiye. Moreover, the lack of access to basic services and the dynamics of urbanization that excludes poor households need to be investigated in detail.

## **5. Conclusion**

Under the constraints of data continuity, the main findings of the PCA indicate the persistence of inequality & poverty-based vulnerabilities in Türkiye and historically affect the interactions between the SDGs. Although there has been progress in certain human-centered indicators, overall poverty and material deprivation continue to be determinants. This fact is a good example of the challenges of sustainability itself necessitating different transformations for Türkiye as an upper middle-income country. On the other hand, weaknesses in people-led indicators and the creation of policies compatible with the “growth environment and social” sphere, reveal certain contradictions. The quality of economic growth and, more importantly, the bases on which growth is based can have negative implications for the links between the economy and people-centered goals. Dimensions of discrimination and working conditions need to be considered. The target of becoming an inclusive society has bottlenecks on the basis of fundamental rights and freedoms.

One of the most fundamental contradictions is related to the weakness of the poverty, decent work and income equality nexus. Regardless of data quality, the links perform poorly. The other main evidence is related to the urbanization dynamics and living conditions of the citizens, especially the “poor”. Another main theme is related to the design of education and health policies especially focusing on vulnerable groups and defining “equality” in access to these services in the public sphere.

Beyond improving the conditions of Türkiye’s “vulnerable” groups, important policy choices may include providing guarantees for access to certain services and focusing the allocation of resources specifically on these issues. Given the changes in the scope of social transfer policies in Türkiye mentioned in this chapter, it can be argued that these transfers have in fact produced limited results in addressing material deprivation and discrimination. The findings are considered to highlight the need for access to basic services and rights-based policies to strengthen the conditions of citizens of Türkiye in general. Specifically, women and children, and people facing informality both in economic and social spheres have problems in reaching specific services. All these facts bring with them the need to improve the conditions of those living in informal areas (in rural and urban) of Türkiye, beyond supporting them with

protection mechanisms. It can have an important function in determining policy preferences and priorities and develop more comprehensive dimensions for the no-poverty goal.

How to establish the links between these goals may mean going beyond the propositions of the SDG targets. This fact also reminds us that the SDGs pillars don't include strong links with growth strategies and macroeconomic governance. Structural characteristics of countries and the international environment defining competitive conditions are ignored in some aspects. Furthermore, understanding the dynamics of economic growth and approaches to the roots of the inequalities matters for analyzing "sustainability". It could be suggested that ignoring "unequal development" dynamics cause missing links in setting up the SDGs targets that need to be discussed in detail. The reasons of the "being left behind" also need to be investigated even the methodology of defining LNOB could be questioned.

To sum up, Türkiye's increasing efforts toward SDG targets and identifying vulnerabilities for these purposes is evident. However, a more collective effort needs to be made to determine what kind of policies will be implemented and what the priorities will be in this context. Furthermore, the orientation of the resources based on the "project" led strategies, which is another pillar of the SDGs, reminds us of the importance of planning the efforts for both the short and long term. PCA methodology could be used as one of the methods for the identification of pre-conditions. Apart from growth dynamics, public policies, defining universal access to services and their design for these purposes will be an important challenge for achievements in these fields.

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## Appendix



**Figure A1. 5 Principles of the SDGs**  
Source: UN (2015)

**Table A2. LNOB Indicators**

sdg1_transfer	1	yes	People at risk of income poverty after social transfers (%)	Extreme poverty and material deprivation
sdg1_550pov	1	yes	Poverty headcount ratio at \$5.50/day (%)	Extreme poverty and material deprivation
sdg1_material	1	yes	Severely materially deprived people (%)	Extreme poverty and material deprivation
sdg3_hgap	3	yes	Gap in life expectancy at birth among regions (years)	Access to and quality of services
sdg3_suicide	3	yes	Suicide rate (per 100,000 population)	Access to and quality of services
sdg3_hgap	3	yes	Gap in self-reported health, by income (p.p.)	Access to and quality of services
sdg3_incgap	3	yes	Gap in self-reported unmet need for medical examination and care, by income (p.p.)	Access to and quality of services
sdg3_insucov	3	yes	People covered by health insurance for a core set of services (%)	Extreme poverty and material deprivation
sdg4_child	4	yes	Participation in early childhood education (% of children between age of 3 and starting age of compulsory primary)	Access to and quality of services
sdg4_undench	4	yes	Underachievers in science (% of population aged 15)	Access to and quality of services
sdg4_socioec	4	yes	Variation in science performance explained by students' socio-economic status (%)	Access to and quality of services
sdg5_empgap	5	yes	Gender employment gap (p.p.)	Gender inequality
sdg5_paygap	5	yes	Unadjusted gender pay gap (% of gross male earnings)	Gender inequality
sdg5_caring	5	yes	Population inactive due to caring responsibilities (% of population aged 20 to 64)	Gender inequality
sdg5_wparl	5	yes	Seats held by women in national parliaments (%)	Gender inequality
sdg5_wmanage	5	yes	Positions held by women in senior management positions (%)	Gender inequality
sdg5_ictwomen	5	yes	Proportion of ICT specialists that are women (%)	Gender inequality
sdg7_warm	7	yes	Population unable to keep home adequately warm (%)	Extreme poverty and material deprivation
sdg8_euynect	8	yes	Youth not in employment, education or training (NEET) (% of population aged 15 to 29)	Access to and quality of services
sdg8_inwork	8	yes	In work at-risk-of-poverty rate (%)	Extreme poverty and material deprivation
sdg9_bbandgap	9	yes	Gap in internet access, urban vs rural areas (p.p.)	Access to and quality of services
sdg9_digital	9	yes	Population with at least basic digital skills (%)	Access to and quality of services
sdg10_gini	10	yes	Gini Coefficient	Income inequality
sdg10_palm	10	yes	Palma ratio	Income inequality
sdg11_crowding	11	yes	Overcrowding rate among people living with below 60% of median equivalized income (%)	Extreme poverty and material deprivation
sdg11_urbgreen	11	yes	Urban population without access to green urban areas in their neighbourhood (%)	Access to and quality of services
sdg11_hburden	11	yes	Housing cost overburden rate (%)	Extreme poverty and material deprivation
sdg11_dwelling	11	yes	Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floors	Extreme poverty and material deprivation

Source: Lafortune et al., (2022)



Table A3. Bartlett's Sphericity Tests and KMO Results							
		Sub-indicators of the SDGs				LNOB	
	SDGs	People	Prosperity	Planet	Peace and Partnership	Material Deprivation	Acess to services
Bartlett's sphericity test							
Chi-square (Observed value)	408.13977	375.530	323.902	409.54746	240.481	134.3035267	98.42041374
Chi-square (Critical value)	99.616927	61.656	50.998	85.964907	61.656	50.99846017	41.33713815
DF	78	45	36	66	45	36	28
p-value (Two-tailed)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
alpha	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Overall KMO	0.7312631	0.8671531	0.690	0.7449395	0.730779333	0.565846586	0.575

Table A4. Pearson Correlation Matrix for SDG 1 and Sub-Indicators of the SDGs	
Variables	Goal 1 Score
Goal 1 Score	1
n_sdg2_stunting	0.880
n_sdg2_wasting	-0.880
n_sdg2_obesity	-0.902
n_sdg2_trophic	-0.853
n_sdg2_crlyld	0.845
n_sdg2_snmi	0.824
n_sdg3_matmort	0.833
n_sdg3_neonat	0.841
n_sdg3_u5mort	0.833
n_sdg3_tb	0.940
n_sdg3_ncds	0.829
n_sdg3_lifec	0.905
n_sdg3_fertility	0.888
n_sdg3_births	0.818
n_sdg3_vac	0.515
n_sdg3_uhc	0.864
n_sdg4_earlyedu	0.893
n_sdg4_primary	-0.744
n_sdg4_second	-0.010
n_sdg4_literacy	0.904

**Table A4.** Continued

n_sdg5_familypl	<b>0.910</b>
n_sdg5_edat	<b>0.942</b>
n_sdg5_lfpr	<b>0.919</b>
n_sdg5_parl	<b>0.898</b>
n_sdg6_water	<b>0.893</b>
n_sdg6_sanita	<b>0.894</b>
n_sdg6_freshwat	<b>-0.954</b>
n_sdg7_cleanfuel	<b>0.769</b>
n_sdg7_co2twh	<b>0.755</b>
n_sdg7_ren	0.371
n_sdg8_accounts	<b>0.642</b>
n_sdg8_unemp	-0.416
n_sdg8_rights	<b>-0.775</b>
n_sdg8_impacc	0.135
n_sdg9_intuse	<b>0.890</b>
n_sdg9_mobuse	<b>0.960</b>
n_sdg9_lpi	<b>0.689</b>
n_sdg9_uni	<b>-0.610</b>
n_sdg9_articles	<b>0.833</b>
n_sdg9_rdex	<b>0.863</b>
n_sdg10_gini	<b>-0.449</b>
n_sdg10_palma	0.254
n_sdg11_slums	<b>0.801</b>
n_sdg11_pm25	<b>-0.662</b>
n_sdg11_pipedwat	<b>0.902</b>
n_sdg11_transport	0.049
n_sdg12_ewaste	<b>-0.702</b>
n_sdg12_nprod	<b>-0.950</b>
n_sdg12_nimport	<b>-0.961</b>
n_sdg13_co2gcp	<b>-0.803</b>
n_sdg13_co2import	<b>0.732</b>
n_sdg14_cpma	<b>0.504</b>
n_sdg14_cleanwat	<b>0.905</b>
n_sdg14_fishstocks	<b>-0.871</b>
n_sdg14_trawl	<b>0.765</b>
n_sdg14_discard	<b>-0.552</b>
n_sdg15_cpta	<b>0.679</b>
n_sdg15_cpfa	<b>0.930</b>

Table A4. Continued	
n_sdg15_redlist	<b>-0.898</b>
n_sdg16_homicides	<b>0.805</b>
n_sdg16_detain	<b>0.764</b>
n_sdg16_safe	<b>0.764</b>
n_sdg16_cpi	<b>-0.861</b>
n_sdg16_rsf	<b>-0.751</b>
n_sdg16_justice	<b>0.616</b>
n_sdg17_govex	0.348
n_sdg17_govrev	<b>-0.611</b>
n_sdg17_statperf	<b>0.687</b>
Values in bold are different from 0 with a significance level alpha=0,05	

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 3

### FOOD AND ENVIRONMENTAL SECURITY IN TÜRKİYE: TO END HUNGER AND PROMOTE SUSTAINABLE AGRICULTURE

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#### **Abstract**

The 2030 Agenda for Sustainable Development by the UN addresses global challenges. The global prevalence of hunger and poverty is increasing daily. The concept of food security is gaining importance. A large amount of the food supply comes from agricultural land, which also provides essential ecosystem services. Agriculture is vital for food security and achieving Sustainable Development Goal 2. Food security challenges are predicted to worsen due to demographic growth, urbanization, unsustainable resource exploitation, climate change, and changing consumption patterns. By 2050, the global population will reach 10 billion, necessitating sustainable farming for food security. Urbanization challenges food distribution, requiring reliable access to nutritious food in cities. Increased use of non-renewable resources in agriculture threatens the ecosystem, requiring a transition to sustainable techniques. Extreme weather from climate change threatens food security. Increased consumption of resource-intensive foods strains agriculture. Addressing these difficulties needs collaboration among stakeholders. Sustainable farming, like organic practices, minimizes environmental harm. Investing in research and technology can boost crop yields and resilience. Food waste can be reduced by efficient transport and storage. Resilient farming and consumer education are crucial to address climate-related food poverty. Meanwhile, environmental contamination threatens biodiversity, water, and public health. Major contributors are deforestation, industrial waste, and air pollution. Global collaboration is crucial for reducing emissions and protecting the environment sustainably. According to the Global Food Security Index, Türkiye ranks 49<sup>th</sup> out of 113 countries in food security. Water and food security are important topics of discussion in the context of climate change. One problem in sustainable development is environmental security. Food security, a crucial aspect of environmental security, has gained relevance in recent years due to the COVID-19 epidemic affecting supply chains and causing a food crisis. Countries must create strategies to ensure food security in anticipation of the global food crisis. The purpose of this study is to analyze current food and environmental security policies and initiatives in Türkiye. This section will emphasize the measures needed to maintain policy consistency in this area. The challenge of sustainable food security and agriculture is exacerbated by the growing global and Turkish populations. The subject concerns political and economic policies applied by governments, corporations, institutions, and organizations. SDG3 focuses on fostering excellent health and well-being, while efforts to improve food security and achieve SDG2 may hinder its achievement. Food system sustainability depends on ensuring future generations' food security.

**Keywords:** Food Security, Environmental Security, Sustainable Development, Sustainable Agriculture, SDG2, Türkiye

## 1. Introduction

A series of multiple crises threaten the globalizing world, like wars, terror, poverty, increasing inequality, and unemployment, besides the scarcity of resources such as food, water, and land affected by climate change, leading to environmental problems such as water and food security. The sectors more vulnerable to climate change are those highly dependent on environmental conditions, such as agriculture. Water and food security is affected by climate change because it reduces agricultural productivity. Population growth causes food and water demand to increase. In the context of the growing population in the world and Türkiye, sustaining food security is a significant challenge. According to the FAO (2023), 9.8% of the world population was undernourished in 2022.

Food security is described as a condition in which all people have physical, social, and economic access to sufficient, safe, and nutritious food that fits their dietary needs and food preferences for an active and healthy life at all times (Peng & Berry, 2019). Sustainability and food security are linked to each other via the notion of sustainable diets. Sustainable diets are defined as “protective, respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable, nutritionally adequate, safe and healthy; while optimizing natural and human resources” (FAO, 2012).

The Sustainable Development Goals (SDGs) adopted by the Member States of the United Nations (UN) in 2015 consist of seventeen main topics, some of which are ending global hunger and poverty, combating climate change, and promoting responsible production and consumption in order to eliminate social, cultural, and ecological problems by 2030. Since the beginning of 2018, the UN Sustainable Development Goals have become priority areas to pull out action both internationally and nationally. Among the 17 goals, goal number 2 reads, “End hunger, achieve food security, improve nutrition, and promote sustainable agriculture.” FAO (n.d.) defines hunger as an uncomfortable or painful physical sensation caused by insufficient consumption of dietary energy. Hunger may also be referred to as undernourishment.

Türkiye is classified as a developing nation, boasting a population of 85.3 million individuals and exhibiting an average population growth rate of 0.7% in the year 2022, as reported by Turkstat (2022). The Mediterranean Basin has been classified as a highly susceptible region, as stated by the Intergovernmental Panel on Climate Change (IPCC, 2022). Türkiye’s agricultural sector will be strongly affected by drought, precipitation changes, heat waves, floods, and wildfires. Projected increases in population and decreasing agricultural areas create food insecurity. To sustain a country’s food security, it is crucial to ensure water security because

the agricultural sector is a large consumer of water. In The High-Level Political Forum on Sustainable Development in 2016, Türkiye was a volunteer country presenting its national reviews; the 10th Development Plan was implemented with the objective of addressing the issue of climate change and its impact on water resources, as well as promoting sustainable agriculture and ensuring food security. Furthermore, the integration of the country's goals into National Development Plans was initiated through the 2030 Agenda. What is more notable is to transform the SDGs into action to tackle water and food insecurity.

This chapter aims to discuss food security and environmental security in Türkiye regarding SDG2-Zero Hunger by putting forward the facts related to sustainable agriculture, water security, and climate change. Consistency of SDGs and Development Plans, Voluntary National Review of SDG and Türkiye and 2030 Agenda for Sustainable Development will be used to put forward Türkiye's Current Situation in terms of SDG2 and give details concerning further steps to be taken. This chapter is organized as follows: The second section puts forward sustainable food security policies in Türkiye. The third section states the consistencies of SDG2 with official documents, and finally, section four clarifies the current situation of food systems in Türkiye.

## **2. Sustainable Food Security Policies in Türkiye**

A sustainable food system can be defined as a system that ensures the provision of food security and nutrition to all individuals while simultaneously preserving the economic, social, and environmental foundations necessary for the continued generation of food security and nutrition for future generations (FAO, 2018). It has a positive or neutral impact on the natural environment (environmental sustainability). Using natural resources like water, energy, and food with their supply and fair distribution is germane to environmental security. This term has gained importance on the world agenda with the COVID-19 pandemic and will be present at least until 2030. Producing policies to ensure sustainable food security for the coming food crisis will be notable. Within this realm, we have five important subjects to be looked upon deeply: agricultural productivity, agricultural support, stock/waste management, climate change, and water security.

### **2.1. Agricultural Productivity**

Agriculture is vital for food security as it provides the largest share of food supplies and supports the SDGs, especially SDG 2- zero hunger. Since the 1996 World Food Summit (WFS), massive efforts have been made to increase agriculture, food production, and security (Ericksen, 2009). In 2015, the United Nations (UN) set the 17 Sustainable Development



Goals (SDGs), where an essential goal is Zero Hunger (SDG2). FAO (2023) reveals that about 29.6 percent of the global population – 2.4 billion people – were moderately or severely food insecure in 2022. On the other hand, sustainable agriculture is essential to improve other SDGs like SDG1 (No poverty) and SDG3 (Good health and well-being). Urban areas become more livable places with the green spaces increasing with the contribution of agricultural applications like urban gardens and green roofs, thus reducing the impact of natural events and pollution and ensuring food security (Viana et al., 2022). The current agri-food systems (agricultural practices, food preferences, and consumption shifts), unfortunately, are increasing greenhouse gas emissions and causing ecosystem degradation like soil degradation, loss of biodiversity, and water scarcity (Goucher et al., 2017; Pereira et al., 2018; Sanchez & Wyckhuys, 2019; Zuo et al., 2018). The trade-offs associated with agriculture may cause a global crisis in food security or environmental degradation at an unprecedented scale (Michel-Villarreal et al., 2019; Yang et al., 2020). Investing in sustainable practices like crop diversification, use of organic fertilizers, increased rotation periods, and cover cropping is necessary to increase crop resilience to pests (Feng et al., 2018; Murrell, 2017). In addition, by using sustainable agricultural practices, food quality can be improved. Local, diverse, and sustainable agriculture respectful of the environment can only adapt to the climate crisis and reduce crop vulnerability to pests and disease risks (The Royal Society, 2009). One recognized strategy to maintain and amplify food supply and reduce hunger is boosting agricultural production and productivity of agricultural land (The Royal Society, 2009; Wu et al., 2014). The progress being made in this area will contribute both to SDG2 (Zero hunger) and SDG1 (No poverty). Crop yields decreased drastically due to increased pests and pathogens (Oerke, 2006; Popp et al., 2013). This may slow down the progress of SDG2.

One of the factors that can limit total agricultural productivity is the low soil carbon content in Türkiye. In addition to this, there are decreases in precipitation and extreme weather events. Türkiye's usable agricultural area is falling off because of climate change, urbanization, and massive usage of pesticides and mineral fertilizers. Total agricultural land decreased from 40.9 MHA in 2001 to 38.5 MHA in 2015 (Ağaçayak & Keyman, 2018). Agricultural productivity is related to the concepts of competitiveness, human capital, renewable energy, and low cost. The efficiency of agricultural enterprises and agricultural employment is vital for agricultural productivity. In the 9<sup>th</sup> Development Plan, the scale efficiency of agricultural enterprises has been included. From 2007 to 2012, agricultural employment increased by 1.1 million people, although rural poverty remained a primary problem. This was due to enterprises having scale efficiency and marketing problems (Republic of Türkiye Ministry of

Development, 2013). In this context, land acquisition was discussed to grow small and family businesses (Republic of Türkiye Presidency of Strategy and Budget, 2019).

## 2.2. Agricultural Support

Agricultural support is defined as the annual monetary value of gross transfers to agriculture from consumers and taxpayers arising from government policies that support agriculture, regardless of their objectives and economic impacts. This indicator includes the total support estimate (TSE), measured as a percentage of GDP; the producer support estimate (PSE), measured as a percentage of gross farm receipts; the consumer support estimate (CSE), measured as a percentage of agricultural consumption, and the general services support estimate (GSSE), measured as a percentage of total support. Agricultural support is also expressed in monetary terms, in millions of USD and EUR. TSE transfers represent the total support granted to the agricultural sector and consist of producer support (PSE), consumer support (CSE), and general services support (GSSE) (OECD, 2023). Among these supports are those provided for employment and nutrition price supports given for agricultural products or income supports for producers, contributing to food security. Agricultural support to farmers is given to continue sustainable production to fight against poverty and provide balanced nutrition. Since 2001, direct income support has been provided to farmers on behalf of the price support system. From 2009 onwards, an area and product-based payments system started to be enforced. In this support system, the factors taken into consideration are environment, plant, animal, and human health. Agricultural support policies have to be well planned, monitored, and applied in order not to harm public finances. Within this respect, certified production methods and agricultural insurance were decided to be expanded (Republic of Türkiye Ministry of Development, 2013).

## 2.3. Stock and Waste Management

Reducing food loss and waste along the supply chain, from production to consumption, is essential to improve food security while reducing pressure on natural resources, as stated in the Sustainable Development Goals envisaged by the 2030 Agenda for Sustainable Development (FAO, 2011). Reducing food losses and waste contributes to ensuring food security. Türkiye launched the “Save Your Food Campaign” in collaboration with FAO and the Ministry of Agriculture and Forestry of Türkiye (MoAF hereafter) in 2021 for this purpose. In the next decade, Türkiye will make a contribution to the sustainability of global consumption and production via the agri-food system by preventing, reducing, and managing food loss and waste (Republic of Türkiye, MoAF, 2021). Waste management is an area that has many deficiencies

in buying and selling prices, and making regulations is not easy due to high investment costs. Stock management is done within the scope of risk management to protect the producers. In the 10<sup>th</sup> Development Plan, the importance of the implementation of effective stock management for the persistence of farmer incomes has been aforementioned (Yiğenoğlu, 2022). Lastly, in the 11<sup>th</sup> Development Plan (2019-2023), the objectives of solid waste management are to minimize the negative effects of waste on both human health and the environment.

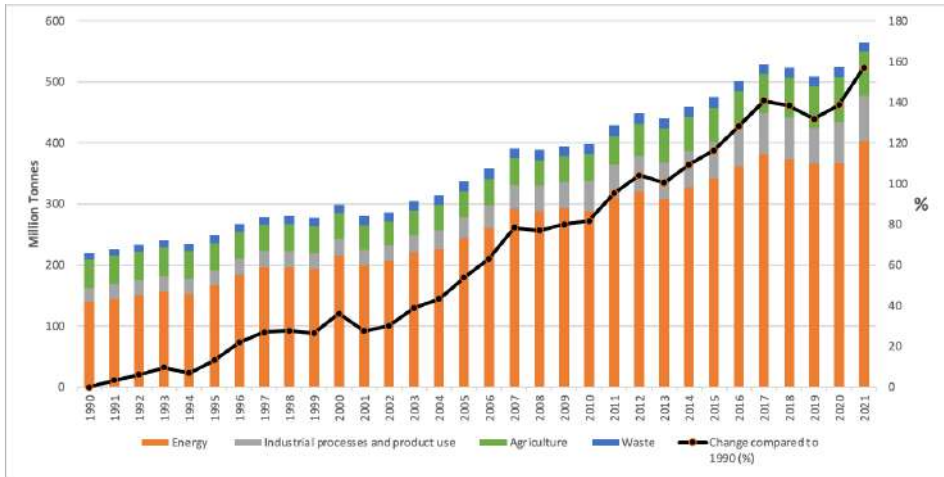
## **2.4. Climate Change**

The use of natural resources like water, energy, and food, their supply, and fair distribution are related to environmental security. Among the factors affecting food safety and security, the leading one is climate change. It has been internationally agreed that climate change is a threat to the sustainability of food security. However, the activities involved in food systems account for some 20% to 30% of all human-associated greenhouse gas (GHG) emissions and, as such, contribute to climate change (Garnett et al., 2016). The adaptation practices of farmers to climate change are positively correlated with education, the male head of household, land size, access to credit, and wealth (Ali & Erenstein, 2017). Younger farmers and those having higher education levels are more willing to use these practices.

As part of the 9<sup>th</sup> Development Plan, which ran from 2007 to 2013, environmental laws and standards were made better in terms of sustainable development. Institutional and technical infrastructure was also improved, and projects were put in place to make environmental management stronger. Basic plan documents like the Climate Change Strategic Document, the Biodiversity Plan, and the Action Plan for managing environmental policy have been made. As a result, great progress was made in cleaning up the environment, managing natural resources in a way that does not harm them, lowering emissions, protecting wildlife, and expanding protected areas.

Based on the 10<sup>th</sup> Development Plan (2014-2018), the cumulative volume of water resources in Türkiye is estimated to be 112 billion cubic meters. Presently, 39% of this amount is being utilized, with 73% allocated for irrigation purposes, 16% designated for domestic consumption, and 11% allocated for industrial applications. It is projected that by the year 2030, the per capita availability of water is anticipated to decline to 1100 m<sup>3</sup>, potentially leading to water scarcity in Türkiye. Furthermore, in order to address the issue of climate change, it is imperative to take into account the sustainable usage of biological variety. This should be done in accordance with established environmental standards in both production and consumption. To achieve this, a competitiveness and green growth approach should be adopted.

Climate change has increased the frequency of natural disasters; comprehensive disaster hazard and risk maps must be prepared and incorporated into land use and zone planning processes. Water and food security in a changing climate have become unprecedented challenges confronting Türkiye and its future (Ağaçayak & Keyman, 2018). Türkiye is experiencing a period of drought, and it will reach the level of water poverty by the second half of the century when climate projections are being observed. There are certain precautions for dealing with water and food security. Some of them can be seen as increasing investments in research and development, taking measures for deforestation, and applying drip and sprinkler irrigation to reduce water consumption, especially in agriculture. For climate change effects in terms of agriculture, crops should be adapted to climate change, and crop yield should be monitored. Many agricultural products might lose their yields due to climate change. One example in this realm is Antalya, a critical region of Türkiye in terms of vegetable production. Antalya is badly affected by vegetable production due to temperature increases and precipitation decreases (Şen, n.d.).



**Figure 1.** Greenhouse Gas Emissions by Sector (CO<sub>2</sub> equivalent) (1990-2021)  
**Source:** TurkStat (2023a)

The Ministry of Environment and Urbanization supervised the development of the National Climate Change Action Plan (NCCAP) in 2011 to enable the implementation of the Climate Change Strategy. Figure 1 shows the change in greenhouse gas emissions from 1990 to 2021. Greenhouse gas emissions increased by 157% between those years. The most significant change occurred in the energy sector, with an increase of 188%. Major agricultural elements causing emissions are methane gas emissions. Overpopulation in water-scarce regions, growing rural depopulation, food security, agricultural and industrial pollution, and

changing rainfall patterns cause droughts, lack of inefficient use of water, soil salinity, and pollution. The second goal of the SDGs aims to “end hunger, achieve food security, improve nutrition and promote sustainable agriculture” by 2030. One target of the goal is to “ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production that help maintain ecosystems which will strengthen capacity for adaptation to climate change, extreme weather conditions as drought, flooding and other disasters that progressively improve land and soil quality.” Therefore, achieving SDG2 of combatting climate change is fatal, and collaboration with SDG 13 Goal of climate action can be helpful.

## **2.5. Water Security**

Climate change poses threats to water resources, drought, and land cover change, while population increase also poses a threat to water and food security. To ensure water and food security in Türkiye, investments in research and development, as well as efforts to manage water and food resources, are crucial. Protecting forests and implementing integrated water management are essential for efficient conservation. The agriculture sector, the largest water consumer, can be improved by using drip and sprinkler irrigation and smart irrigation systems. Protecting agricultural lands, reducing excessive use of mineral fertilizers, reducing pesticide consumption, and increasing soil organic content through compost and digestate applications can also contribute to food security and improved nutrition. By adopting these measures, Türkiye can contribute to the UN’s Sustainable Development Goals of “clean water and sanitation” and “end hunger, achieve food security and improved nutrition and promote sustainable agriculture” by 2030.

## **3. Consistency of SDG2 and Official Documents**

Depending on the development plans, Türkiye has been determined to update its policies related to food security in accordance with sustainable development goals. From the analysis made concerning the development plans of Türkiye, some of the areas that need to be supported in a world under high inflationary pressures are reducing the financial difficulties faced by small agricultural enterprises, implementing rural employment policies for a possible food crisis to achieve adequate levels of biodiversity, deepening of public and private sector cooperation, ensuring the appropriate infrastructure and technology to monitor the agricultural database and statistics, providing more resources for agricultural research and development activities, implementing domestic and national projects to ensure food security and implementation of policy measures for the agricultural markets to function effectively. There are further

steps to be taken in accordance with the sustainable development objectives in the realm of food security, and policy consistency should be ensured.

### **3.1. Consistency of SDGs and the 10<sup>th</sup> National Development Plan**

The 10<sup>th</sup> Development Plan is important in particular regard for aiming to combat climate change and its effects on water resources and support sustainable agriculture and food security. The plan is for the period between 2014 and 2018. Due to the drought, the agricultural sector shrank significantly at the beginning of the period. The share of agriculture in GDP was 8.3% and decreased to 7.9 at the end of the period. Among 105 countries in 2013, Türkiye ranked 36<sup>th</sup> in the Global Food and Security Index, 44<sup>th</sup> in economic accessibility, 26<sup>th</sup> in physical accessibility, and 35<sup>th</sup> in quality and food safety.

Gene banks have been formed to support agricultural R&D activities such as generating new product types, biotechnology and nanotechnology, the construction of agricultural techno-parks, and the use of renewable energy in agriculture. During the planning period, forest areas increased slightly from 21.2 million hectares to 21.5 million hectares. Ecosystem-based functional management plans are being developed, and the capacity to combat forest fires has been improved. Rural poverty persisted between 2007 and 2012, owing to the majority of agricultural work being in subsistence farming enterprises with high levels of underemployment. A multinational body, the Rural Development and Rural Policy Management, was formed to monitor the Plan's implementation, and local institutions were heavily delegated. The Agriculture and Rural Development Support Agency, development agencies, special provincial administrations, and village service unions are the primary institutions in this capacity formation.

There are miscellaneous objectives and targets put forward to be accomplished for the development plan period to be fulfilled. Here are some of them related to agriculture:

- The effectiveness of agricultural businesses is to be increased on the basis of the business side in accordance with the production type and social structure of the sector.
- To prevent land fragmentation and well-functioning agricultural land market legislative and institutional arrangements.
- Agricultural support arrangements are based on social and production purposes in terms of agricultural basins and parcels.
- Certified production methods will be assigned and checked for compliance among crop patterns and water potential.

- Environment, plant, animal, and human health-related support policies and effectiveness supplied through monitoring.
- For achieving food security and effective stock management, to diminish the losses along the production, marketing, and consumption chain.
- New agriculture and food techno-parks and sectoral technology platforms will be ensured, environmental sustainability will be taken into consideration in the aquaculture activities, and competitiveness in international markets will be reached through product diversification and branding.

Furthermore, in order to combat climate change, the sustainable usage of biological variety must be considered, and environmental standards in production and consumption must be defined using a competitiveness and green growth strategy. Green growth entails promoting economic growth and development while ensuring that natural assets continue to offer the resources and environmental services that we rely on for our well-being. Climate change has increased the frequency of natural catastrophes; complete disaster hazard and risk maps must be developed and used in land use and zone planning processes (OECD, 2011). Environmental knowledge and sensitivity are critical for future generations to benefit from increasingly scarce resources. Profiting from environmentally friendly practices, new job possibilities, revenue sources, and product and technology development in industries such as energy, industry, agriculture, transportation, construction, services, and urbanization all contribute to green growth. The plan assesses the current situation in Türkiye in terms of overall water resources, irrigation, tapping water, and industrial water.

Available water per capita is anticipated to fall to 1100 m<sup>3</sup> by 2030, and Türkiye may face water scarcity. Modern irrigation systems have been implemented in the context of land consolidation, reclamation, irrigation infrastructure expansion, and water conservation, and the water management structure has been improved through watershed-based approaches.

### **3.2. Consistency of SDGs with Voluntary National Review**

Türkiye has prioritized contributing to a sustainable world since the adoption of Agenda 2030. Türkiye was one of the first 22 countries to submit a Voluntary National Review (VNR) during the 2016 High-Level Political Forum (HLPF). This report details Türkiye's progress on policies, legislation, implementation, and projects, as well as the steps that must be made to achieve sustainable development goals. The second VNR Report of 2019 evaluates progress toward the SDGs by incorporating SDGs into National Development Plans (NDPs) and sectoral initiatives. The progress evaluation spans the years 2010 to 2018. The Turkish Statistical

Institute issued the SDG Indicators Set comprising 83 indicators in February 2019. SDG 2 has three main objectives: (i) Meeting nutritional demands and ensuring adequate food access; (ii) increasing agricultural productivity and resilient farming practices; and (iii) preserving genetic resources and traditional knowledge. In this regard, Türkiye's biggest issue is malnutrition, nutritional quality, and overnutrition. According to VNR (2019), while total protein consumption per person is acceptable, and only a small proportion of families are undernourished in terms of energy-rich nutrients, the majority of proteins are plant-based, with low consumption of animal protein. In the subject of child nutrition, significant measures have been achieved, such as boosting breastfeeding and supplementary feeding micronutrient supplement programs (iron and vitamin D supplements, iodized salt).

Agriculture support programs that are in accordance with demographic trends, economic development goals related to rural poverty reduction, and ensuring the essential degree of dietary diversity for optimal nutrition are compatible with the EU negotiation process and WTO commitments

A number of steps were taken to improve the effectiveness of the assistance policy. "A basin-based support" strategy was used to collect accurate agricultural statistics, increase agricultural inventories, and build the infrastructure required for rural development strategies. Ongoing programs on food banks and the prevention of food waste and loss were projected to contribute positively to increased food security attainment.

Turkish farms are smaller and more divided than others. To prevent inheritance-related agricultural enterprise fragmentation, legislation was passed. Land consolidation solves this. Land consolidation reached 6.1 million hectares in 2018 (VNR, 2019). A new agricultural insurance law changed risk management and provided insurance premium support for farmers' losses. To determine food price hikes' causes, the Food and Agriculture Products Markets Monitoring and Evaluation Committee was created. One structural issue with agricultural output price volatility will be reduced by this committee. To centrally supervise vegetable and fruit commerce, the Fresh Fruit and Vegetable Wholesale Market registration system was implemented in 2012. The 2017 National Starter Culture Gene Bank protects biodiversity and ensures food security for future generations.

VNR (2019) indicates the following additional steps to be implemented in terms of SDG2 Goals: (i) Expanding enterprise sizes to increase production and productivity and hence self-sufficiency. (ii) To maintain agricultural production continuity while promoting local jobs for individuals living in rural areas. (iii) Improving the efficiency of R&D services and as-



sisting in the development of legislation to protect genetic resources and biodiversity. (iv) To address climate change, new methods for improving agricultural production are being developed. (v) Consider agricultural product costs and revenue balance. (vi) Meeting the nutritional needs of vulnerable groups. (vii) Promoting the long-term viability of the agricultural labor force through assisting youngsters and women. Finally, (viii) enhancing agricultural statistics infrastructure.

### **3.3. Consistency of SDGs with the 2030 Agenda for Sustainable Development and Türkiye**

The 2030 Agenda for Sustainable Development provides a comprehensive framework for nations to effectively address sustainable development concerns by integrating relevant policies into their domestic agendas while also addressing global difficulties. Since 1992, Türkiye has incorporated sustainable development policies into its National Development Plan (NDP) following the Rio Summit. The Turkish Government has exhibited unwavering dedication to the international pledge established by global leaders at the Millennium Summit. This commitment is evident via the alignment of the Millennium Development Goals (MDGs) with Türkiye's national development priorities.

Türkiye successfully achieved the Millennium Development Goals (MDGs) pertaining to maternal and newborn health, effectively reducing both infant mortality rates and maternal death rates by the year 2015. The primary objective of the programs implemented by the Millennium Development Goals (MDG) was the elimination of extreme poverty and hunger. The food poverty ratio, representing the proportion of individuals within a given population who lack the financial means or availability to obtain a nutritionally adequate diet, saw a drop from 1.35% in 2002 to 0.48% in 2009. Furthermore, the population living below the poverty line of \$1.25 per day was completely eradicated by 2006. The 2030 Agenda served as an initial measure for the nation to incorporate its objectives into its National Development Plans. The outcome of the Summit held in New York in September 2015, which was the approval of the 2030 Agenda for Sustainable Development, was initially mentioned by the Turkish Government in the 2016 Annual Program.

Aligned with Agenda 2030 and the Sustainable Development Goals (SDGs), the national pathways have identified specific areas of focus to enhance the national food systems. These priorities are established through a collaborative approach with the United Nations Sustainable Development Cooperation Framework (UNSDCF 2021-2025). The identified tracks include policy analysis and development, knowledge transfer, capacity development,

and advocacy. These tracks aim to strengthen the national food systems and contribute to the achievement of the SDGs.

Track 2 under the Action Tracks pertains to the transition towards a sustainable consumption pattern. Several significant efforts in this domain include (i) promoting the sustainability of the supply value chain within the agri-food sector, (ii) mitigating food loss and waste, enhancing consumer consciousness, and advocating sustainable consumption, and (iii) establishing equitable access to safe and nutritious food. This can be achieved through the implementation of school lunch initiatives and school food programs. The process of digitizing the food value chain and enhancing accessibility and transparency throughout all phases of the food value chain is of utmost importance.

An additional worry pertaining to Track 2 is the enhancement of public health, ensuring food safety, and fortifying inspection and control measures. The primary objective of the Scientific and Research Council of Türkiye is to prioritize food-feed safety, encompassing the safeguarding of animals and individuals responsible for their nourishment against potential harm or illness arising from the handling or consumption of feed products. Additionally, the council emphasizes the significance of employing contemporary food and feed production methodologies, storage and packaging techniques, as well as the valorization of food waste and traditional culinary practices to ensure optimal quality standards. The feasibility of transitioning food systems towards greater sustainability can be achieved by the implementation of a comprehensive framework of commitments and activities, with a sustained emphasis on long-term goals. The interconnection between malnutrition, health, and the environment necessitates the presence of robust policy coherence among these domains. In the context of enhancing the food traceability infrastructure through the extensive adoption of digital technology and solutions, it is crucial to prioritize several key measures. These include the monitoring of pesticide residues, the establishment of more efficient and comprehensive monitoring systems for fishing activities, the promotion of aquaculture, and the provision of training to all relevant stakeholders in the food supply chain regarding food safety and quality management (Republic of Türkiye, MoAF, 2021).

Türkiye included the 2030 Agenda for Sustainable Development into its objectives through the implementation of the 11th National Development Plan (2019-2023). The SDGs encompassed five primary pillars, namely: a robust and stable economy, enhanced productivity and competitiveness in production, a skilled and capable workforce, a resilient and cohesive society, sustainable and habitable urban areas, an environmentally sustainable ecosystem, and the promotion of the rule of law, democratization, and effective governance. The agen-

cy tasked with the generation of dependable and consistent data, as well as the monitoring of Sustainable Development Goal (SDG) indicators, is the Turkish Statistical Institute. The realization of the 2030 Agenda necessitates sustained endeavors by various actors, including governmental bodies, scholars, non-governmental organizations, and the business community (Yapar, 2019). The necessity of coherence and cooperation among institutions and sectors at both national and local levels cannot be overstated.

### **3.4. Consistency of SDGs with National Pathway of Türkiye**

In September 2021, the United Nations conducted a Food Systems Summit in New York to reinforce the 2030 Agenda and the Sustainable Development Goals. The Summit's goal was to ensure access to safe and nutritious food, increase sustainable consumption and production, and strengthen resilience to food security gaps. The Economist has developed the Global Food Security Index (GFSI) for 113 countries. The index is a dynamic quantitative and qualitative model that considers food affordability, availability, quality and safety, and sustainability and adaptation. There are 68 unique indicators for measuring food security for both developed and developing countries. Figure 2 demonstrates Türkiye's position in terms of food security indicators in 2022. Türkiye has an overall food security environment score of 66.3 and ranks 49th out of 113 countries and 8th out of 15 in the Mena region. The quality and safety pillar is strong (78.5 scores) but relatively weak on affordability (58.4 scores). Though its global Quality and Safety ranking is good (26th), it needs to make both the food prices more stable and, at the same time, affordable to achieve a more secure overall food security environment. The sustainability of the food security environment is also crucial, which makes it mandatory to preserve natural resources like oceans, lakes, and rivers and manage water stress and contamination levels.

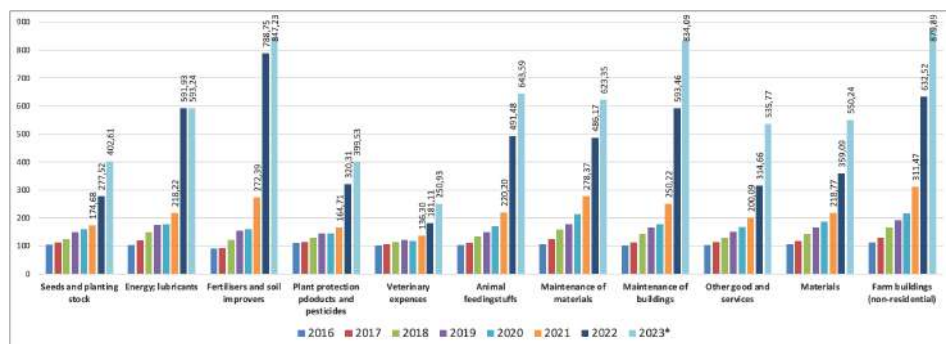


**Figure 2.** Food Security Environment in Türkiye (2022)

**Source:** Economist Impact (2022)

There exist several strengths and opportunities for potential action. While acknowledging the commendable food quality and safety measures in place, it is imperative to address the issue of rising food prices. To mitigate this concern, it is recommended to implement food safety-net initiatives that aim to enhance the accessibility and affordability of food for the general population. Türkiye has achieved a cumulative score of 28.6 in the domain of food safety-net initiatives. The sufficiency of the country's food supply has exhibited a consistent upward trend since 2016, culminating in a score of 100. Over the course of an 11-year period, there has been a notable improvement of 61 positions in nutritional standards. This improvement is reflected in a score of 100, indicating the presence of robust dietary guidelines, a comprehensive national nutritional plan, enhanced labeling practices, and regular monitoring of nutritional aspects. The measure of average food cost change poses challenges in countries with a zero score. The cost of food is subject to fluctuations in global prices and events that lead to food inflation. However, it is imperative for Türkiye to prioritize ensuring cheap access to food by placing greater emphasis on this domain. Political and social impediments to access are an additional determinant influencing food security. Türkiye is positioned at the 87th rank, with a score of 43 on this particular indicator. The low score might be attributed to the country's susceptibility to political instability and persistent levels of corruption since 2012. The agricultural trade indicator score is 26.6 points lower than the global average, placing it at the 109th rank. The primary factor contributing to the inadequacy of this score can be attributed to the implementation of elevated taxes on agricultural imports in 2012.

The National Pathway of Türkiye also highlights the inequitable distribution of resources among smaller farmers, who face challenges in obtaining a fair share, as well as the issue of unaffordable input prices. This observation indicates that the diminution in farm size in Türkiye is contributing to the increasing difficulty of sustaining a livelihood. According to the Ministry of Agriculture and Forestry (MoAF, 2021), smallholders in Türkiye face several key obstacles. These challenges include limited access to financial resources, a lack of cooperation among smallholders, risk aversion, a dearth of effective leadership, difficulties in accessing markets, and the burdensome administrative procedures associated with grant programs. Figure 3 displays the agricultural input price index 1, as provided by the Turkish Statistical Institute. As depicted in the image, a significant fluctuation in agricultural prices is observed throughout the years 2022 and 2023. The non-residential farm structures experienced the most substantial increase, reaching a growth rate of 779.89% compared to the year 2005. Conversely, veterinary expenses exhibited the lowest increase, amounting to a growth rate of 150.93%. There was a significant increase of 747% in the cost of fertilizers and soil improvers.



**Figure 3.** Agricultural Price Index in Türkiye (2015=100)

(\*) as of May 2023

Source: TurkStat (2023)

Enhancing the efficiency of the food chain has the potential to augment food supply through the mitigation of losses incurred during primary production to retail stages, encompassing both harvest and post-harvest phases. Losses primarily arise as a consequence of insufficient infrastructure, encompassing deficiencies in water and electricity provisions, subpar transit networks, and a dearth of storage capacities. The establishment of a digital infrastructure has the potential to enhance the overall efficiency of the entire food chain. Investments in transportation systems and infrastructure, as well as the implementation of effective monitoring systems utilizing artificial intelligence, have the potential to mitigate food insecurity.

In accordance with the National Rural Development Strategy of Türkiye for the period of 2021 to 2023, several measures can be undertaken in relation to agriculture. These include the promotion of small-scale enterprises, enhancement of agricultural productivity, improvement of quality of life in rural regions, and the facilitation of rural workforce participation, particularly among women and young individuals residing in rural areas. The emphasis on rural development policies underscores the need to empower the youth in rural areas. This aligns with the United Nations' sustainable development goals for young farmers, which are expected to be achieved by 2030, as well as the European Union's targets for the Common Agricultural Policy after 2022 (Republic of Türkiye, Ministry of Agriculture and Forestry, 2021).

The application of digital technologies such as artificial intelligence (AI), blockchain, and big data solutions has the potential to facilitate the digital transformation of food systems, specifically in the realm of agriculture. This can serve as a means to modernize the agri-food system as outlined by the World Bank in 2021. The process of digital transformation encounters several challenges, including insufficient financial investment, issues pertaining to data security and protection, and limited levels of digital literacy.

Türkiye will persistently endeavor to attain the Sustainable Development Goals by 2030 through the reinforcement of national, regional, and international collaboration in accordance with the National Pathway. Regions and cities may demonstrate a willingness to build policies for regional food systems through alignment with development agencies and local authorities. In order to achieve these objectives, it is imperative to enhance the resilience of the food supply chain by implementing innovative technology and digitalization, with a specific focus on agricultural services, as facilitated by the Ministry of Agriculture and Fisheries (MoAF). One potential approach involves enhancing the productivity of small-scale farmers, who are often considered the most vulnerable component within the food supply chain.

The implementation of the Agricultural Land Conservation Program for Environmental Purposes has been in effect in Türkiye since 2006. In 2019, the Agricultural Land Conservation Program for Environmental Purposes extended its coverage to encompass a total of 58 provinces. The National Water Plan placed significant emphasis on safeguarding both the quality and quantity of groundwater resources. Over the course of the past ten years, a considerable portion of the land has been made available for the purpose of irrigation. Table 1 presents the agri-environmental indicators in Türkiye. Based on the data presented in the table, there was an observed rise in the proportion of irrigated land within agricultural regions, which grew from 8% to 10.8% throughout the period spanning from 2000 to 2020. The 11<sup>th</sup> National Development plan also aims to achieve an expansion of irrigated land by 2 million hectares during the period from 2018 to 2023.

Table 1. Agri-environmental Indicators in Türkiye		
	2000	2020
Nitrogen balance (kg/ha)	27.8	32.2
Phosphorus balance (kg/ha)	8.0	8.7
Agriculture share of total energy use (%)	5.0	4.3
Agriculture share of GHG emissions (%)	14.2	13.4
Share of irrigated land in agricultural area (%)	8.0	10.8
Share of agriculture in water abstractions (%)	75.4	84.7
Water stress indicator	18.6	26.1
Source: OECD (2022)		

Figure 4 points out that pesticide use reached a peak in 2018, and after that, there was relatively lower use of pesticides. Total pesticide use in 2018 was 60.020 tonnes and decreased to 55.374 tonnes in 2022, with a percentage of 7.7%. One of the aims of extending sustainable agricultural practices is to lessen the excessive use of pesticides in agricultural production.

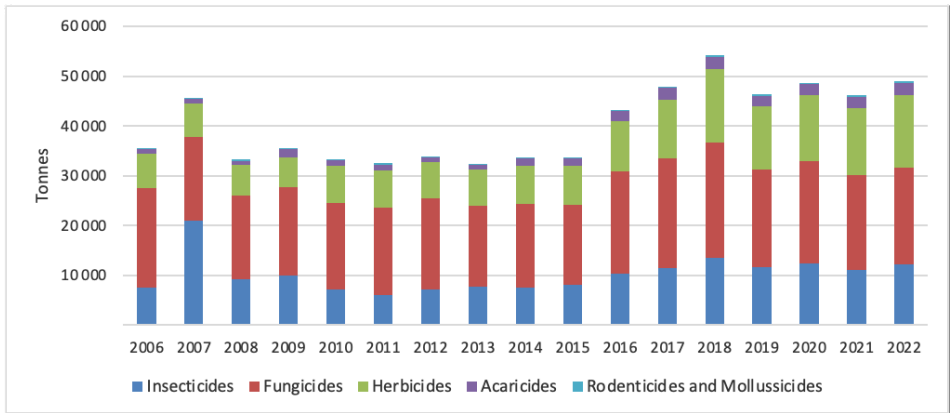


Figure 4. Pesticides Use in Türkiye (2006-2022)  
Source: TurkStat (2023b)

The National Climate Change Strategy for the period of 2010 to 2023 delineates a set of objectives spanning short-, medium-, and long-term timeframes, serving as the foundation for implementing measures aimed at addressing the challenges posed by climate change. In 2011, the preparation of the National Climate Change Action Plan (NCCAP) was overseen by the Ministry of Environment and Urbanization, with the aim of facilitating the execution of the Climate Change Strategy. As depicted in Figure 1, the data reveals a notable surge of 157% in greenhouse gas emissions throughout the period spanning from 1990 to 2021. The energy sector had a significant transformation, characterized by a substantial growth of 264%.

Within the context of food systems transformation, there are novel mechanisms pertaining to the mitigation of climate change and the sustainable utilization of natural resources, specifically focusing on the effective management of groundwater, pesticides, and fertilizers within the agricultural sector. These advancements are expected to be incorporated into the educational curriculum of agricultural programs. In relation to regional food systems, there will be a promotion of urban agriculture methods within cities to enhance the accessibility of nutritionally rich food.

### **3.5. Current Situation of Food Systems in Türkiye**

According to the Food and Agriculture Organization (FAO), it is projected that there would be a need to augment food production by a minimum of 50% in order to adequately satisfy the escalating demands of the expanding global population, particularly in relation to the heightened consumption of meat. Numerous variables contribute to the endangerment of food systems, including but not limited to the expanding population, food loss and waste, climate change, shifting consumer preferences, and evolving socioeconomic circumstances of consumers.

The rising expense of nutritious diets is closely correlated with the enduring prevalence of poverty and income disparity. According to the projections provided by the United Nations Development Programme (UNDP) for the year 2030, it is anticipated that over 840 million individuals will experience the detrimental effects of hunger.

Türkiye possesses a comprehensive land area encompassing 769,630 square kilometers. The aggregate land area allocated for agricultural purposes, encompassing both permanent meadows and pastures, amounts to 37,762,000 hectares. Approximately 41.4% of the total area in question is comprised of grain and crop products. The rate of fruit area has experienced a significant increase of 36.4% during the period spanning from 2001 to 2020. According to the Ministry of Agriculture and Forestry of the Republic of Türkiye (2021), agricultural employment accounted for 16% of the overall workforce in the year 2020.

According to the World Bank, it is projected that by the year 2050, the proportion of the global population residing in urban areas will surpass 82%, a significant increase from the 75% recorded in 2018. The majority of agricultural farms exceeding 80% in number are classified as small-scale. It is observed that there exists an inverse relationship between the size of agricultural holdings and the income earned by farmers. The Turkish Agricultural Policies encompass various objectives, including enhancing productivity, promoting crop diversification, enhancing the nutritional quality of food, and fostering women's participation



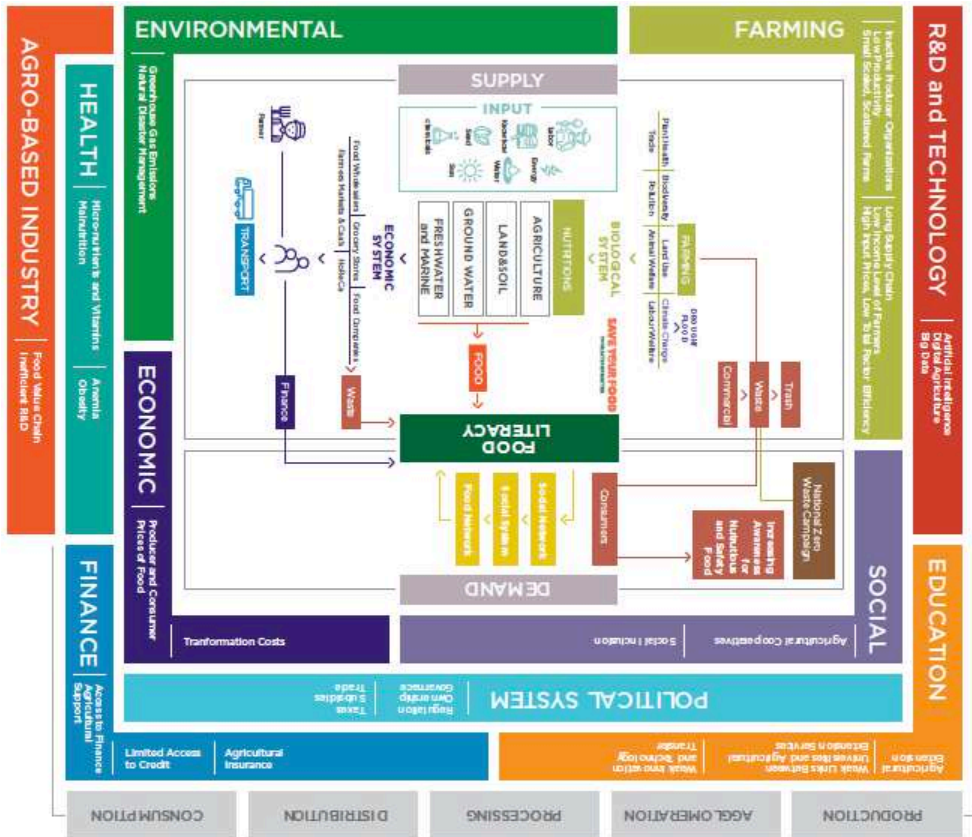
in agricultural production. In order to enhance the sustainability of agricultural systems, it is imperative to bolster the technical and institutional capabilities of agricultural cooperatives, as they function as both producer and irrigation unions.

Türkiye is a nation that possesses favorable conditions for the rearing of sheep and goats, and it also demonstrates competitiveness in the broiler and egg poultry sectors. Based on the 2019 FAO statistics, Türkiye has the second position in honey production, following China. The nation exhibits notable biological diversity, as seen by the significant rise in afforested land from 2002 to 2019, with a growth rate of 8.7 percent. Furthermore, there are plans in place to further expand afforested land to reach a projected area of 23.4 million hectares by the year 2023.

The primary issues faced by the Turkish agriculture sector pertain to harvest and post-harvest losses, which are exacerbated by the looming threats of desertification and drought, as well as the sector's susceptibility to erosion. The demand for food has seen a greater increase compared to the supply of agricultural products in Türkiye, primarily due to population growth. This demographic shift has consequently led to changes in consumption habits, particularly a preference for poultry and fish. Irrigated land is widely recognized as a crucial determinant in the enhancement of agricultural yield. According to the Ministry of Agriculture and Forestry of the Republic of Türkiye (2021), as of the year 2021, approximately 6.7 million hectares out of a total of 8.5 million hectares of land have been made accessible for irrigation purposes. As the remaining agricultural lands become irrigated, it is expected that other products will also contribute to achieving self-sufficiency. The Ministry of Agriculture and Fisheries (MoAF) undertakes significant initiatives that involve the implementation of technology in several agricultural domains, including agricultural apps, agricultural information systems, registration systems, and database systems.

Figure 5 illustrates the existing food systems and the primary obstacles encountered in the process of transitioning food systems in Türkiye. On the production front, farmers encounter significant challenges, primarily stemming from elevated input costs, including fertilizers, oil, and pesticides, as well as issues related to low productivity and marketing. Small-scale farmers are compelled to sell their products through intermediaries at prices that are lower than prevailing market rates. This implies the absence of ideal market circumstances and the lack of structured agricultural cooperatives. It is imperative for colleges to enhance their involvement in extension services for farmers, in addition to the Ministry of Agriculture and Fisheries (MoAF). There exists a deficiency in the coordination among academia, state institutions, and the commercial sector. There is an increasing interest among start-up companies in the

agri-food industry, presenting a favorable opportunity for the agriculture and food industries. Türkiye is among the nations that have experienced adverse impacts from climate change. Consequently, it is imperative to expand the distribution of drought-resistant plant varieties throughout the entire country. One further issue prevalent in conventional farming methods is the overutilization of pesticides and groundwater resources.



**Figure 5.** Food Systems in Türkiye  
**Source:** Republic of Türkiye, MoAF (2021)

A rich diet is crucial for a healthy population, and there are vulnerable groups who do not have the chance to get the recommended daily intake of minerals and vitamins. The vitamins lower than recommended levels are vitamin D, B1, B2, and B6. The deficient minerals are orderly iron, copper, calcium, and zinc. Against the healthy diet concept, Türkiye's salt consumption is almost double the recommended level, being one of the factors causing obesity besides low physical activity in individuals aged 15 and over.

## 4. Conclusion

This chapter examines the current state of policies and the steps that must be taken to attain the goal of a hunger-free world by 2030. With the Agenda for Sustainable Development, governments, citizens, non-governmental organizations, and the private sector must collaborate to invest, innovate and create lasting solutions. Sustainable Development Goal number 2 reads, “End hunger, achieve food security, improve nutrition, and promote sustainable agriculture. The goal is to ensure that everyone, everywhere, has enough nutritious food to live a healthy life. Achieving this Goal will necessitate improved food access and widespread advocacy of sustainable agriculture. This comprises increasing small-scale farmers’ productivity and earnings through fostering equal access to land, technology, and markets, as well as sustainable food production systems and resilient agricultural practices. It also necessitates larger investments through international cooperation to boost agricultural productivity in emerging countries. “Agriculture is critical in providing food and ecological services and ensuring the necessary macro and micronutrients to meet SDG2 to solve global concerns such as hunger and poverty. Food security is threatened by demographic expansion, urbanization, non-sustainable consumption of non-renewable resources, and climate change, thus shifting food consumption patterns. According to the Global Food Security Index, Türkiye ranks 49<sup>th</sup> out of 11 countries, making food security a critical concern in the realm of climate change. The actions to be taken are orderly: planning, implementing, monitoring, and supervising environmental and natural resources management, and there is a need for authority overlapping and strengthening cooperation among institutions.

Depending on the development plans and official documents, Türkiye has been determined to update its policies related to food security in accordance with the sustainable development goals. The political understanding takes into account the health of the environment and other living things by using applications and technology. Türkiye’s rural poverty reduction program worked to make the necessary corrections for the rural sector’s income distribution and achieved successful results in increasing agricultural efficiency. On the other hand, there are problematic indicators to be taken into account for Türkiye in terms of food security. The Covid 19 pandemic has disrupted supply lines and raised food costs, precipitating a food crisis. Countries must develop strategies to secure long-term food security in the face of global issues. Some of these strategies are: Diversification techniques are critical for ensuring long-term food security in the face of global concerns. Among the possible strategies is food source diversification. Countries can diversify their imports and improve domestic agricultural capabilities to lessen their reliance on a single source of food. This can lessen

the impact of supply line outages and reduce exposure to price swings. Promoting organic farming, precision agriculture, and agroecology can boost productivity, conserve resources, and reduce environmental damage. By providing nutritious food and protecting ecosystems, these strategies ensure long-term food security. Agriculture research and development investment: Governments and institutions can contribute funding to advance agricultural research and development. This includes establishing climate-resilient agricultural practices, improving crop types, improving irrigation systems, adopting novel technology, and developing climate-resilient farming strategies. These investments have the potential to boost production and adaptability to changing situations. Food security can be improved through encouraging local food production, supporting small-scale farmers, and developing resilient local supply systems. Emphasizing community-based agriculture and encouraging farmers markets can help lessen reliance on distant sources while also ensuring the availability of fresh, nutritious food. To solve global food security issues, international cooperation must improve. Countries may share expertise, encourage fair commerce, and coordinate emergency action. Food emergencies can be prevented and managed by working together.

Average food costs affected by the global price changes are increasing, and Türkiye has a zero score with remarkable food inflation. Türkiye has to enable affordable access to food by laying more stress on agriculture, climate change, water, and waste management. The second issue negatively affecting food security is political and social barriers to access. The country ranks 87<sup>th</sup> because of the potential high political instability risk since 2012.

To ensure the maintenance of water and food security in Türkiye, it is imperative to augment investments in research and development. Additionally, greater emphasis and dedication should be placed on the effective management of water and food resources. The protection of forests is crucial in ensuring water security. The enhancement of food security is closely tied to the assurance of water security. Consequently, it is advisable to consider employing comparable strategies, such as drip and sprinkler irrigation methods, as well as intelligent irrigation systems, to effectively enhance food security. Enhancing the preservation of agricultural lands, optimizing the utilization of mineral fertilizers, reducing their overconsumption, minimizing the reliance on pesticides, and augmenting the organic matter in soil via compost and digestate treatments have the potential to enhance productivity and crop production. The pursuit of these global objectives is the prevailing approach to achieving a sustainable global community, encompassing the eradication of all manifestations of poverty, the mitigation of inequities, and the addressing of climate change on a universal scale.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







## CHAPTER 4

### NUDGING IN BEHAVIORAL DEVELOPMENT ECONOMICS: AN EVALUATION OF PREVENTIVE HEALTH SERVICES IN TÜRKİYE

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#### **Abstract**

The well-being effects of human health on the economy are undeniable. While health affects people's productivity and income in the short and long term, preventive health policies prevent an increase in health expenditures. However, some individuals experience limited access to health services due to living and economic conditions and may not have enough information about preventive health services. Even if they have information, they may procrastinate using these services for various economic, social, or psychological reasons. Behavioral economic development experiments related to the health of individuals living in rural areas of developing countries and developed countries are done. In these scientific studies, individuals are nudged to get vaccinated, screened, use preventive drugs, etc., through incentives or persuasive tools. After these methods were applied, it was revealed that most individuals paid more attention to their health than they had before. The aim of this study was to 1) emphasize the need to inform individuals about preventive health services associated with cancer in Türkiye, 2) make suggestions on how to reach people who could benefit from professional health services, and 3) provide guidance to health professionals. The aim to improve preventive health policies in Türkiye, which is one of the sustainable development goals of the United Nations, was considered, and the nudge and incentive studies carried out around the world were used as the basis for the research. With the implementation of these recommendations by policymakers, it is predicted that life expectancy would be extended, the quality of life would be better and health expenditures would decrease. In this study, the evaluations and suggestions are presented in this context.

**Keywords:** Behavioral development economics, behavioral economics, preventive health services, nudging, health behavior

## 1. Introduction

In the last two decades, there was a tremendous increase in interest in behavioral economics. Its criticism of orthodox economics drew notice. The Nobel Prize in Economics awarded to Kahneman in 2002 for his work on behavioral economics was a major element in the expanding popularity of the field. Studies that analyzed people's emotional behavior and cognitive errors and used them advantageously boosted interest. Behavioral economics is not confined to economics; it has found applications in domains ranging from finance to health, and from law to fiscal system. Through applications such as nudging, behavioral economics added to both economic progress and a better understanding of economic events. Mainstream economics, which excluded human beings from theory and method, started to develop in recent years to include these criticisms of behavioral economics. Thaler received the Nobel Prize in Economics in 2017 for his work on nudge policies in behavioral economics. Behavioral economics is not restricted to the micro discipline of economics; it also found a home in studies of economic development aimed at modifying human behavior for their benefit. Banerjee, Duflo, and Kremer conducted experiments in rural areas of countries such as Kenya and India to improve the health of poor children under a certain age, giving free vaccinations and chewable tablets for intestinal worms. For these experiments in behavioral development economics, the researchers were awarded the Nobel Prize in Economics in 2019. These studies pioneered the field of behavioral development economics and contributed to the development of the field.

Health-related developments in behavioral economics are broadly in line with the United Nations Sustainable Development Goals. It calls for ensuring healthy lives and promoting well-being for all ages. It aims to ensure safe, effective, and quality health coverage for all, as well as sustainable access to quality primary health care services (The United Nations Website, 2023, Sustainable Development Goals). As a result of these health development goals, efforts are being made in Türkiye to increase people's welfare and quality of life and extend life expectancy through preventive health services. Nudging methods were applied to make the scope of these studies targeted to a specific population based on the United Nations goals related to health and to ensure participation in the healthcare system.

Most people in Türkiye are aware of the importance of early detection and diagnosis of cancer, but there is no system to encourage them using nudging methods. Therefore, the most susceptible group could be targeted for cancer screening using nudging methods and practices in the field of health. As a result, with early detection and diagnosis the quality and duration

of life could be improved. In addition, the cost of health expenditures for other diseases that occur due to cancer could be reduced or prevented through early diagnosis. The word Cancer often creates negative thoughts and feelings in people. It is common for people to avoid taking action in getting a cancer screening because they associate it with negative emotions such as fear, embarrassment or negative thoughts such as death. However, having information about your health, whether positive or negative, can affect a person's productivity, income, and even life expectancy in the short and long term. Thus, preventive health policies could prevent an increase in health expenditures. There are many people in Türkiye with inadequate living and economic conditions who do not have full access to health services and do not have sufficient knowledge about preventive health services. Therefore, encouraging them with nudge policies by the country's health policymakers and behavioral economists/behavioral scientists is important for both economics and health. In order to achieve this, the system must be changed, and new preventive health policies must be implemented.

First, I explained cognitive biases and shortcuts in behavioral economics as they relate to preventive and preventive health services. Understanding cognitive shortcuts and biases in health-related issues is the first step toward behavioral change. In the third part of our study, nudge studies in behavioral economics and behavioral development economics are discussed. Nudging studies in the field of health are explained with examples. In the fourth part, the Ministry of Health's cancer early detection and screening studies in Türkiye are mentioned. Behavioral interventions or nudges are designed to change human behavior to provide better and healthier outcomes for them. In the fifth section, health nudging techniques are explained, their relationship with screening methods is mentioned and nudge suggestions are made for early detection and diagnosis of cancer. In the sixth section, nudges that could be used by the Ministry of Health for its website are mentioned.

## **2. Heuristics and Biases in Decision-Making in Behavioral Economics**

Tversky and Kahneman (1974) criticized the definition of a rational person in mainstream economics. One of these criticisms was that with uncertainty, people do not act rationally, but emotionally. Tversky and Kahneman (1974) conducted many experiments to trace the cognitive processes underlying people's decisions and to prove that they were not completely rational. They stated that people resort to heuristics when making decisions in uncertain situations. For example, people make decisions based on the first information they access in their minds (availability heuristic), representativeness or anchoring (see. Table 1 first and second columns) (Kahneman & Tversky, 1979). People who make decisions this way do not think and research deeply and therefore do not act logically; they act according to these

mental shortcuts. Sometimes they act on basic emotional reactions (affect), such as liking or disliking something, finding it good or bad (see Table 1 first column) (Slovic, Finucane, Peters, & MacGregor, 2002).

In the field of behavioral economics, the many biases that people have were explained, and nudging policies started to be formulated accordingly (Thaler & Sunstein, 2008). These biases are observations or realities that are inconsistent with theory and difficult to rationalize. People often make decisions based on these biases. Since acting on these biases or prejudices does not often benefit a person, it would be beneficial for the government to implement nudging efforts on important issues such as health and the economy. The anomalies and biases within the scope of our study consisted of overconfidence, unrealistic optimism, framing effect, loss aversion, present bias, stereotyping bias, status quo bias, ostrich bias, opt-in and opt-out, omission bias, projection bias, peak, and end rule, learned helplessness belief, social identity bias, social/cultural norm, and procrastination (For explanation of biases about our topic, see. Table 2 second column).

### **3. The Nudge in Behavioral Economics**

Thaler and Sunstein (2009) in “Nudge: Improving Decisions about Health, Wealth and Happiness” argued that in uncertain situations, individuals could not control themselves and could not make the right choices. It was therefore necessary to guide or, as Thaler called it, nudge people in decisions they need to make to save money, improve finances, and improve health. Adjustments to the choice architecture can change people’s lives for the better. Nudge-based policy interventions are designed to help people decide what is best for them, thereby reducing human error.

Nudging is when individuals are directed towards something that is positive for them without taking away their right to choose (Thaler & Sunstein, 2009). Because people’s cognitive abilities are limited and they do not have access to all information at all times, they may not always choose what is the most beneficial. These claims of behavioral economists were the starting point of nudge policies (Thaler & Sunstein, 2009; Camerer et al., 2003). According to mainstream economics, decision-makers who act in line with their true rational preferences are non-existent *econs* or *homoeconomicus*. Since people do not have full information, unlimited cognitive ability, and complete self-control, nudging practices are designed by governments or private institutions.

Nudge-based policy practices do not interfere with a decision-makers’ choice or take away their freedom. Nudge policies are determined based on the perspective of the decision-maker.

The success of nudge policies in improving people's decisions is related to the extent in which options are aligned with people's desires (Sunstein, 2018). What matters is the self-interest of individuals. For Thaler and Sunstein (2008), whether the nudging technique adopted by a country was based on an explicit choice or a default choice was an important issue. Those who designed the choice architecture set the conditions under which choices were made. In preparing options, choice architects can control the way they are presented, as well as the extent of information provided to decision-makers. One of the most important options for nudging techniques is the default option. If the target audience does not take action, a default option is presented to them in their favor, taking into account their cognitive shortcuts and prejudices. Choice architects have a significant impact on people's decisions in many areas of their lives, from choosing between using stairs or escalators, being examined now or on a specific date, deciding how much to save for one's retirement by including it in the pension system (Thaler & Sunstein, 2009; Sunstein, 2016). Therefore, by providing people with default options, they directly involve them in the system.

Since incentive policies are related to behavioral economics, studies on individuals' saving behavior are conducted frequently. The most prominent argument was that individuals generally found it more attractive to save in the future than to save now (Thaler & Benartzi, 2004). Based on these studies, when individuals wanted to do things that were beneficial and healthy for themselves, they did not take any action and postponed it (O'Donoghue & Rabin, 2015).

It is important that individuals are presented with a default option when making decisions, because individuals tend to procrastinate or have a status quo bias. In addition, individuals make preferences based on a certain reference point, i.e. preferences close to the default option, and may exhibit loss aversion behavior based on this option (Kahneman et al., 1991; Camerer et al., 2003; Johnson & Goldstein 2003; McKenzie et al., 2006). In addition, a policy of forced choice in health-related situations was proposed. This forced choice required people to actively decide and make choices on substantive issues throughout their lives, rather than assuming the default choice. Thinking and deciding what should happen to our organs after we die is considered a policy of forced choice (Beraldo & Karpus, 2021). However, since such choices cause negative emotions such as stress, these negative emotions are eliminated by default options created by policymakers.

Chater and Loewenstein (2022) referred to individual frame (i-frame) interventions, which focused on individuals' thoughts and behaviors, as classical nudge policies. They stated that the most important way in which behavioral scientists could contribute to public policy was to make and implement changes in the system. According to Chater and Loewenstein (2022),

many behavioral scientists proposed policy interventions that fixed problems with individual behavior (an “i-frame”) rather than addressing the system within which individuals operate (an “s-frame”). Chater and Loewenstein (2022) emphasized the importance of systemic frame (s-frame) in nudge policies. For example, preventing obesity required high sugar taxes and subsidization of healthy food (s-frame), in addition to changes in portion size (i-frame). It is important that nudge interventions are supported by the s-framework to address the problem and produce solutions (see Table 1 and Table 2).

### **3.1. The Nudge in Behavioral Development Economics**

Behavioral development economics uses the theories and applications of behavioral economics, a combination of economics and psychology, to examine questions in development economics. A detailed study of behavioral development economics addressed preventive health as well as many development issues (Kremer, Rao & Schilbach, 2019). New literature emerged arguing that diversity in social preferences is an important driver of development and that providing incentives through policies that benefit people’s health and well-being influence their behavior (Kremer, Rao & Schilbach, 2019).

In behavioral development economics, a variety of experimental studies were designed and implemented (see Morris, Flores, Olinto, & Medina, 2004; Banerjee, Duflo, Glennerster, & Kothari, 2010; Banerjee & Duflo, 2011), especially in light of the fact that the negative effects of poverty causally affect people’s cognitive functions, decision-making, and productivity. As a result of these studies, people’s quality of life, health-related well-being, and incomes are improved, and nudging is practiced ensuring their sustainability.

### **3.2. Health-related Nudges in Behavioral Development Economics**

With nudges, one of the application areas of behavioral economics, solutions were found to reduce biases that prevented people from engaging in behaviors that improved long-term health outcomes (Mehta & Asch, 2014). These biases were often predictable and used to promote healthy activities (Loewenstein, Brennan & Volpp, 2007). One belief is that it is unethical to offer health-related choices and nudge people into the system. However, default options in healthcare are often unavoidable. For example, oncologists, emergency medical physicians, and cardiologists have a policy on how to care for patients who require emergency intervention. They offer medical and surgical treatment options to these patients (Halpern, Ubel & Asch, 2007; Frank, 2016 [2007]). Determining which of the nudging methods is the most reasonable is more important in early detection, screening, protection, and preventive policymaking.

Giving people choices, changing behavior positively, and improving the well-being of patients or society are things that governments should care about. In general, nudges that improve the well-being of individuals or society are considered ethical. Nudge policies make a behavior a social norm. For example, in one state in America, according to the organ donation registration system, family consent is not required if the organ, of the person who agreed and registered to be an organ donor, is to be removed at the appropriate time. This is important because, in another nudge, signing the back of a driver's license is not considered legal acceptance for organ donation. Family members can revoke the donor's acceptance if they wish. To prevent revocation, a signed donor card or a document signed by two witnesses is given to authorities. This can be done easily via the Internet. Donation pages on the Internet demonstrate social norms through the power of social influences: "87% of adults think that registering as an organ donor is the right way to go", "60% of adults have registered to donate", etc. (Thaler & Sunstein, 2009). This is because people easily accept and approve of doing what the majority approves and thinks is right. In this example, those who apply the nudge policy direct the existing norms toward life-saving options and do so without forcing anyone.

Many people prefer to avoid making an active decision about donation, often accepting the default option. Making choices is stressful in some situations, such as organ donation. For example, in the Netherlands, mailing people at home to ask them to become organ donors did not change the rate of active consent, but in some European countries offering organ donation as the default option on a document such as a driver's license has increased participation. Making it costly to change the default (filling out a form to exit the system, making a phone call, sending mail, etc.) affects retention (Johnson & Goldstein, 2003).

A study on nudging and incentives was conducted in collaboration with the government in India. The potential and potential challenges of adopting such interventions as large-scale policies were assessed. Small incentives were given to parents and an impact evaluation was conducted. It was found that parents were engaged because of the incentives they received (Banerjee et al., 2010; Banerjee & Duflo, 2011). In vaccination studies conducted to reduce infant and child mortality rates, experiments using various nudging methods such as food assistance to families, transportation to homes with mobile vaccine trucks, reducing drug prices, and educating families about immunity were found to increase vaccination rates and affected children's success in education as they became healthier. Trusted camps with incentives achieved significantly higher rates of full immunization for children aged 1-3 years compared to control sites with no camps and compared to trusted camps without incentives (Banerjee et al., 2010).



Several previous studies showed that the adoption of preventive and protective health behaviors was sensitive to small incentives or small costs. This suggests that incentives play an important role in improving health.

#### **4. Early Diagnosis and Screening of Cancer in Türkiye**

People instinctively avoid situations where there is uncertainty. This is why many people skip or postpone regular annual health check-ups to avoid the detection of a particular disease. Cancer screening is one of the most important tools to reduce cancer deaths by facilitating early detection and prevention. There has been a significant increase in cancer-related deaths in Türkiye over the last two decades (The Ministry of Health of Türkiye Website, 2023, Health Statistics Yearbook 2021). In fact, funding (see Table 3) and participation in cancer screening is inadequate (See Table 4). Nevertheless, the target for early detection of cancer is partially achieved. People who are screened are directed to advanced diagnostic centers, but it is up to them to decide whether they follow-up or not. In this context, it is important to increase people's health literacy.

In Türkiye, cancer registry centers have collected cancer data in every province since 2013. The statistics obtained for this study data were made from the data of 14 provinces, so the representation of the country was ensured. In Table 3, the difference between the requested and allocated funds for cancer control activities was quite high (The Ministry of Health of the Republic of Türkiye Website, 2023, Annual Report for 2022.). The allocation needs to be increased. The determinants of health demand were the GDP per capita, total health expenditures which means health investments, the total number of hospital beds and physicians per capita, life expectancy at birth, and the proportion of the elderly population (Sey & Demiröz, 2023). There is no publicly available record of cancer expenditures in Türkiye. Therefore, it was not possible to compare expenditures by year. To ensure sustainability in the healthcare system, cancer-related expenditure data should be shared transparently. In this way, the cost of early diagnosis screening activities can be compared. In addition to the awareness-raising efforts to combat cancer, there is a need to increase the number of specialized physicians, technicians, and cancer screening devices.

In Türkiye, Cancer Early Diagnosis, Screening and Education Centers (CEDSTC) were established in 2004 to provide training to raise awareness of cancer among citizens and to provide free breast, cervical, and colorectal cancer screenings to the target population. CEDSTC, which had 11 centers when it was first established, had a total of 364 centers by the end of 2022, 90 of which were independent, 230 of which were within Healthy Life Centers, and

44 of which were mobile. Until 2014, data on cancer screenings were handled as CEDSTC data. Since 2014, Family Physicians, Community Health Centers, and Healthy Life Centers played an active role in cancer screening. Therefore, the data are now considered as primary care screening data. Preventive health family medicine services also include cancer. The family physicians provide preventive, curative, and rehabilitative health services for the people registered with them. The physicians provide guidance and health protective services to registered patients. Within six months, they make a home visit or contact them to make an initial assessment and then conduct a follow-up and screening for age, gender, and disease groups (The Ministry of Health of the Republic of Türkiye Website, 2023, Annual Report for 2022).

In Türkiye, cervical cancer screening, which has used PAP smears for about 20 years, started including HPV DNA tests in addition to PAP smears. HPV DNA screening is performed free of charge every five years for all women aged 30-65 at Family Health Centers, Community Health Centers, Healthy Life Centers, and CEDSTCs in every province. Samples are sent to the National HPV Laboratories in Ankara and Istanbul, where HPV genotyping and cytology are done for individuals who tested positive. The results are viewed by patients via web-based software within 10 days after the sample arrives at the laboratory. Diagnostic centers in each provincial center offer advanced treatment and follow-up services to women with positive HPV tests (The Ministry of Health of the Republic of Türkiye Website, 2023, Annual Report for 2022).

The following are among the activities of the Ministry of Health of the Republic of Türkiye in the fight against cancer in 2022: (The Ministry of Health of the Republic of Türkiye Website, 2023, Annual Report for 2022).

- i) Prevent cancer through nutrition, physical activity, tobacco, and combating carcinogens,
- ii) Raising awareness by providing training about cancer,
- iii) In line with the recommendations of the World Health Organization, breast, cervix, and colorectal (large intestine) cancer screenings are carried out, which are common cancers in the world and Türkiye,
- iv) In 81 provinces, registration centers keep a record of cancer patients,
- v) Breast cancer screening according to national cancer screening standards (including free clinical breast examinations once a year for women aged 40-69 years and mammography every 2 years),
- vi) Conducting cervical cancer screening according to national cancer screening standards (including free HPV-DNA and PAP Smear testing every 5 years for women aged 30-65 years),

- vii) Screening for colon cancer according to national cancer screening standards (includes free fecal occult blood test every 2 years for men and women aged 50-70 years. Colonoscopy is recommended every 10 years for women and men aged 50-70 years).

The activities of the Ministry of Health of the Republic of Türkiye for cancer screening in 2022 are as follows: (The Ministry of Health of the Republic of Türkiye Website, 2023, Annual Report for 2022)

- i) Community Health Centers and district health directorates provided 1,508,026 cancer consultations.
- ii) Mobile Health Services were introduced to ensure that preventive health services are utilized in settlements such as towns, villages, etc. where access to health services is difficult. In this way, it is aimed to ensure the sustainability of access. It has been operating in 81 provinces since mid-2017. During visits to villages, 1,198,002 people were referred for cancer screenings.
- iii) On February 4, World Cancer Day, shopping bags and masks prepared by the Ministry of Health were distributed to employees of the Ministry and the Ministry of National Education. Posters and brochures were given to citizens by provincial health directorates at events in provinces. Billboards, 1 short video, and 1 pop-up video were prepared.
- iv) Instant content, graphic designs, and videos were prepared to emphasize the importance of early diagnosis of cancer. These were shared on social media accounts with the hashtag #ErkenTeşhishisHayatKurtarır. Early diagnosis was mentioned in the scripts of three TV series. The importance of early diagnosis of cancer was covered in the daytime programs on national TV channels.
- v) Awareness-raising activities were carried out with 81 provincial health directorates during the April 1-7 cancer week. Content on early diagnosis was broadcast in daytime programs on TV channels. Early diagnosis was mentioned in TV series scripts. A radio spot on early diagnosis was broadcast on national radio channels.
- vi) During the cervical cancer awareness month, awareness-raising activities were carried out on the theme of regular screening tests for early diagnosis. A short video titled “Early Diagnosis Saves Lives” was published on social media accounts with the hashtag #CervicalCancerAwarenessMonth.
- vii) Nationwide, 2,727,777 breast cancer screenings, 2,707,222 cervical cancer screenings, and 1,886,789 colorectal cancer screenings were conducted.

When the activities and studies of the Ministry of Health on early detection and diagnosis are examined awareness and incentives are provided, but there is no system that follows up and personally involves people to continue screening and personally reaches everyone in the target group. Applications in the international healthcare system were implemented. A text in English is sent to immigrant women in Europe by the health screening organization, urging them to get screened/tested. At a time when the numbers of immigrants and refugees are increasing in Türkiye, it is important to update this site according to the languages of the relevant groups.

## **5. Analyzing the Web Page of the Turkish Ministry of Health on Cancer Screenings**

People like and trust those who are like them. People return favors. Health workers or physicians providing the nudge offer alternatives to the default option when adjusting targeted people's preferences. By keeping them in the system and giving them choices, such as giving them other appointment dates, they appear to be doing targeted people a favor or making them feel privileged Targeted people should be encouraged to follow the nuder's instructions. Providing personalized health care increases the engagement of the target group expected to be screened. If the target person understands this, they are more likely to follow the recommendations of the mediating healthcare professional/family physician (CAH Health, 2020; CAH Health, 2022).

The study by Solbjør and Willis (2021) was one of the studies in which cancer-related websites of certain countries were analyzed and nudge policies were recommended. In their study, they examined the content and explanatory videos of mammography screening websites in Australia and Scandinavian countries and made recommendations to increase the screening rate. They examined the websites in terms of normalizing cancer, mediating risk, and taking responsibility.

As part of normalization, the webpages stated that participation in mammography screening was easy, fast, free, and part of the daily routine of health-conscious women. On a few pages, duration information was provided and it stated that it usually took less than 30 minutes. There were messages for women to value their health. At the same time, the presence of videos on the websites on how mammography examinations were performed was also part of normalization. It even ensured that famous people were among them. Another video showed the process of the mammography examination, including how the woman was greeted by the radiographer and how she was taken care of during the examination. In this video, the radiographer spoke in a soft voice. This made the target audience feel safe about the examinations.

It also showed that the examination could be uncomfortable. Although some of the videos showed ethnic diversity, the women in the video were white, younger than the target audience, taller, and thin with a healthy appearance. For example, in the Australian video, the woman's name was mentioned and it stated that the screening was routine, while in the Danish video, the woman's face was not shown and there was no conversation. In the Austrian video, the woman put her health first and challenged the sexist attitude that women were obliged to take care of others first, not themselves (Solbjør & Willis, 2021).

In terms of risk, all websites stated that the target group of mammography screening programs was all women. Generalizations were made that they were all at risk. Sweden's web page detailed the symptoms and target group. Since it is known that early detection reduces mortality from breast cancer, all pages had slogans such as "Mammography saves lives". There was no scientific evidence on the website but rather links to reports or other sources (Solbjør & Willis, 2021).

In terms of taking responsibility, some websites positioned women as autonomous. They stated that health-related explanations and options were provided to help them make decisions about their health. It was emphasized that the final decision was theirs. However, it stated that the invitation to screening was a voluntary offer. These statements on the website were therefore authoritative. For example, the Swedish page and some pages in Denmark referred to the recommendations of health authorities, while the Norwegian page included detailed text on the fact that mammography reduced deaths from breast cancer. However, even if women opted out of mammography, they were not completely excluded from the system, and their right to participate continued. There was information on all pages about the possibility of re-joining if they wanted to opt-out. If they did not want to be in constant communication, there were places where they could report this (Solbjør & Willis, 2021).

In the subheadings of this section of our study, Solbjør and Willis (2021) proposed nudge policies to encourage cancer screening in Türkiye. First, I analyzed the website of the Ministry of Health, General Directorate of Public Health, Department of Cancer, and CEDSTC's pages separately.

### **5.1. Examination of the Website of the Ministry of Health, General Directorate of Public Health, Department of Cancer**

The site language for the website is Turkish. Although there is an English language option, there was no content there. (The Ministry of Health of the Republic of Türkiye General Directorate of Public Health Official Website, 2023) "Cancer, which ranks second after cardiovas-

cular diseases in the list of known causes of death, causes heavy losses in the workforce and the national economy due to its lethality, disabilities, and high costs in its treatment.” This statement says that cancer is the second leading cause of death and that it causes disability as well as death. It emphasized that this disease has a serious impact on the Turkish economy due to the high cost of treatment and its impact on the workforce.

Social awareness and the importance of an early detection screening in the fight against cancer are explained. Information on the three types of cancer as recommended by the World Health Organization and the types of cancer screening are also provided. The types of cancer screened in Türkiye are as follows:

- i) A breast cancer screening program for women; counseling for breast self-examination once a month, a clinical breast examination once a year, and a mammography every 2 years for women aged 40-69.
- ii) A cervical cancer screening program for women; a PAP smear and HPV-DNA testing every 5 years for women between the ages of 30-65.
- iii) A colorectal cancer screening which includes fecal occult blood tests every 2 years in men and women between the ages of 50-70 and colonoscopies every 10 years for those between the ages of 50-70.

The use of colorful ribbons such as pink, green, and blue in the fight against cancer create a sense of vitality among the target audience. The photograph in the cancer screening section on the same page shows four women. All of them are fair-skinned, blonde, middle-aged, and young. Their appearance does not represent the diversity of women living in Türkiye (The Ministry of Health of the Republic of Türkiye General Directorate of Public Health Official Website, <https://hsgmdestek.saglik.gov.tr/tr/kanser-anasayfa>). There are studies on photo images that would better represent the Turkish people and inspire greater confidence (Saribay, Biten, Meral, Aldan, Třebický & Kleisner, 2018; Kamilçelebi, 2021). Based on these studies, the visuals on the website should definitely be redesigned.

## **5.2. Examination of the Website of the Republic of Türkiye Ministry of Health Cancer Early Diagnosis, Screening and Education Center**

The Ministry of Health’s Healthy Life Centers website includes information on the CED-STC. On the CEDSTC website page, it stated that cancer screening, counseling, and training activities are employed and that group and one-to-one public education activities are done for targeted individuals, prioritizing prevention, and early diagnosis. Proactive efforts are made

to ensure the active participation of the target population in screenings, except for individuals referred by family physicians. Turkish citizens are directed to the service through direct communication tools and media and counseling services are provided collectively or on an individual basis. The links shared on the website include organizational charts on screening processes (Cancer Early Diagnosis, Screening and Education Centers Website, 2023).

The Healthy Life Center can be accessed by clicking on the relevant image (The Ministry of Health of the Republic of Türkiye Healthy Life Center Website, 2023, Image) In the photo on the page, there was a picture of a woman who had undergone chemotherapy and whose hair may have fallen out as a result of the therapy but it was growing out again. The woman is smiling, holding a bunch of pink flowers and hugging the little girl next to her. If a visitor to the site is currently receiving chemotherapy, this vivid impression seems to relay the idea that we should live for others. The fact that her hair is short allows for normalization, but it could have a negative effect on an undiagnosed person visiting the site. Since this image could create negative emotions such as guilt, inadequacy, etc., it would be more appropriate to replace it with an image that would make all women (diagnosed and undiagnosed) feel valued. If women who do not have children go to the website to get an appointment for a cervical cancer screening, again this image could have a negative impact and nudge them away from an appointment. The images on this website should also include men. As it is set up now, it gives the impression that only women are screened. If the content such as visuals, videos, etc. about the processes on the site are increased, the questions in people's minds could decrease. It is important that these websites include images that better represent the diversity of the Turkish community. In addition, people should be given options in terms of autonomously assuming risk and taking responsibility.

## **6. Nudge for the Prevalence of Cancer Screening**

Cancer cases are on the rise today. To lower this risk and ensure early detection, people should be encouraged to get screened. To achieve the health policies included in the third article of the United Nations Sustainable Development Goals, it is important to continue the work in this field in Türkiye. If nudging activities are carried out within the scope of preventive cancer screening, both health expenditures will decrease, and people's life expectancy and quality will increase. The study by Purnell, Thompson, Kreuter & McBride (2015) explained the relationship that people have with healthcare using behavioral economic concepts. This study is one of the most comprehensive studies that suggested nudge techniques for cancer screening methods. In Table 1, nudge suggestions are made to encourage people living in Türkiye to participate in cancer screening by considering the mental shortcuts people use

as mentioned in the behavioral economics literature. First, the mental shortcuts they use to protect their health are defined. Then, a nudge suggestion is made by associating it with the nudge technique. In Table 2, within the framework of anomalies and biases in behavioral economics, nudge suggestions are made to encourage people to participate in cancer screening.

## 7. Conclusion

A sustainable program that incorporates behavioral economics ideas applied to health care services could lead to changes through intelligently designed nudge policies. With this idea in mind, the early detection and screening studies on cancer in Türkiye were analyzed. Then, suggestions are made about nudge policies in behavioral development economics. People have negative feelings and thoughts about cancer and tend to avoid cancer screening for economic, social, and psychological reasons. Nudge policies designed based on descriptions of how people think and behave are in Tables 1 and 2. It is important to reach the target group directly and individually through messages, letters, and mobile transportation methods. The tools must be created to ensure that screening invitations are sent via message and mail and that a rejection form is received for those who do not want to be screened. The Ministry of Health stated that mobile transportation services are implemented in certain regions. This should be expanded throughout the country. Efforts should be made to ensure that individuals who are on leave from their workplace on the day of the screening should have letters sent to their homes to encourage participation in the screening on certain dates. In other words, screening should be the default option. If people want to opt out of the system, they should be asked to apply. In Türkiye, the opposite is the case, where people wait for months to apply for screening and to get an appointment at hospitals. In cases where appointments cannot be made, the screening is done by charging private examination fees at public hospitals. This situation should be reversed through nudging efforts. When the entire target population is included for cancer screenings in Türkiye, the shortage of specialized physicians and technicians becomes obvious. In addition, there is also a lack of technical equipment for tests and screening. Therefore, it is essential to invest in this area to improve preventive and protective healthcare services. The necessary infrastructure should be prepared for the implementation of the nudge policies I propose in the field of health. For this reason, it is unlikely that they can be implemented immediately across the country, but efforts should be made quickly to implement them in regions with sufficient physicians, technicians, and equipment.

When the website of the Ministry of Health was analyzed based on the studies in the literature, I think that the design of the website should be supported by professionals. It is among our recommendations that new images of people representing and reassuring people living in



Türkiye and screening videos should be added to the website. Explanations could be added to the website allowing individuals to normalize the situation and assume the risk and responsibility autonomously. Considering that not all individuals have access to the internet, television, etc., participation in cancer screening should be done with personalized nudging tools. To better understand which incentives and nudging practices have a positive effect on the target audience, and information about their emotional state could be obtained through a short survey on e-pulse, and personalized nudge messages and letters could then be sent. Although this is thought to be costly, the cost will decrease as people participate in the system. There is a need for more studies and implementation of policies on nudging in the field of health. It is important to include specialized physicians, radiologists, and other health professionals among the policymakers as architects in the design of the nudging system for cancer screening.

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Table 1. Nudge Examples and Recommendations for Preventive Cancer Screening for Cognitive Shortcuts in Behavioral Economics			
Heuristics	Description	Nudge Description	Nudge Recommendation (i-frame and s-frame)*
<b>Anchoring</b>	In many cases, individuals set a starting point, i.e. an anchor, in their minds before estimating a quantity and adjust their estimation around this anchor (1).	The reasons for starting screening at an early age should be normalized and emphasized to the targeted audience. If the mammogram result is good, they may perceive this as an anchor and may not come again, so they should be reminded why it is necessary for the future (2).	It can be remembered that cancer can be diagnosed not only at an advanced age but also at a young age or even as a baby, so the importance of early diagnosis can be normalized and emphasized (2).
<b>Affect</b>	Individuals evaluate options according to basic emotional reactions such as good/bad, like/dislike, and approach/avoidance (3).	Strong positive feelings about screening can be evoked. Expectations of negative affect such as shame and fear can be countered (4).	Positive emotional aspects such as the relief they will feel after the screening, having information about their health, and taking action for this can be emphasized. Reasonable counterarguments or ways of coping with negative emotions such as fear, shame, and pain can be provided (4).
<b>Availability</b>	Individuals sometimes evaluate the frequency or likelihood of an event according to the frequency or ease of recalling similar past experiences and examples related to that event (1).	The frequency of positive messages encouraging screening will ensure that they stick and come to mind immediately. Easy-to-understand personal stories, powerful and vivid images that appeal to emotions, and memorable stimuli can be used (4).	When communicating about cancer screening, strong emotions can be evoked by using positive and vivid language and memorable personal stories (4).
<b>Representativeness</b>	Individuals sometimes evaluate the probability or frequency of an event based on how similar it is to similar experiences and assumptions they have had in the past (1).	Emphasizing the similarities between the characteristics of screeners such as gender, ethnic identity, etc. and the people to be screened may create behavioral change (4).	Screening can be presented to the targeted audience for cancer screening in an identifiable way and representative of them. Indicate whether women or men are doing the screening, address them accordingly if they have a different ethnic identity and, if possible, have people from the same ethnic group do the screening (4).  Providing immigrants and refugees with the option of a healthcare professional or physician who speaks their language (2). (s-frame)

\*s-frame recommendations are in parentheses; all others are i-frame.

Source: (1) (Tversky & Kahneman, 1974); (2) created by the author; (3) (Slovic, Finucane, Peters, & MacGregor, 2002); (4) (Purnell et al., 2015)

Table 2. Examples and Suggestions of Nudges for Preventive Cancer Screening for Some Cognitive Biases and Anomalies in Behavioral Economics			
Biases and Anomalies	Description	Nudge Description	Nudge Recommendation (i-frame and s-frame)*
Overconfidence	People's subjective confidence in their abilities is higher than their objective performance (1).	Previous positive experiences of the target group may lead to overconfidence in their thoughts about the possibility of being ill (2).	They should be given repeated information about the diagnosis and prognosis because they are not aware of their lack of knowledge. They should be reminded of the screening date because they may be overconfident that they will not forget the date (2).
Unrealistic Optimism	It is the tendency to believe that individuals are less likely to experience negative events and more likely to experience positive events than other people (3).	The target group may be optimistic that they will not get cancer, but screening may show otherwise (4).	Individual risk estimates such as family history, lifestyle, and living environment can be provided and an appropriate explanation can be made (4).
Framing Effect	The way choices are presented determines which option the target audience will prefer (5).	Messages could be sent emphasizing that routine screening detects cancer early prevents death and shortens the duration of the disease. Another way of framing could be to design the framing question from behavioral economics for screening and send it as a message: "Would you rather be 90% sure that you do not have cancer or not be absolutely sure?" "Would you be willing to lose 30 years of your life to avoid spending half a day with little or no discomfort?" (4).	Frame the benefits of screening results through messages to promote screening (4).
Loss Aversion	Individuals feel the pain of losses almost twice as much as the pleasure of the same number of gains. Therefore, they prefer to avoid losses rather than potential gains, even if the value and probability of both choices are the same (6).	It is necessary to draw attention to losses such as well-spent life activities if screening is not performed and gains such as peace of mind if screening is performed (4).	<p>Explain the benefits of screening. Emphasize the loss of healthy life expectancy if they are not screened (2).</p> <p>In cases where a screening appointment cannot be made, a paid examination/screening option is available. However, this practice should be done away with, and the system should be designed to always provide free examination for early diagnosis (2). (s-frame)</p>

Table 2. Continued				
Biases and Anomalies		Description	Nudge Description	Nudge Recommendation (i-frame and s-frame)*
Present bias		It is the tendency to be content with a small reward in the present rather than looking forward to a larger reward in the future (7).	People may not understand the harm of not getting screened. Providing clear instructions can help. Despite this, sometimes people may react by doing the opposite of what they are advised. In this case, reminding them that they have a say in their behavior and that they can make a choice can increase their commitment to the health system and reduce their reactions (2).	It is appropriate to explain to the target group the positive contribution of the decision to be screened to their health in the present (2).
	Stereotyping Bias	It occurs when individuals use social categories (e.g. race/ethnicity and gender) to acquire, mentally process, and remember information about others (8).	Physicians may have preconceptions of being less willing to interact with minority groups. People from different ethnic groups/race or gender may have been previously evaluated differently by physicians (9).	<p>It is recommended to create inclusive and understandable messages for people of different ethnic groups/races or genders (2).</p> <p>Appropriate representations and explanations that immigrants, refugees, and people of different ethnic groups/races or genders can understand can be added to the images on the website (2). (s-frame)</p>
Status quo bias		Individuals continue to maintain their current situation or do not take any action to change their current situation (10).	Some people ignore or tolerate some symptoms of illness until they become serious and painful, so it may be necessary to provide them with incentives to care for themselves (2).	<p>Go to the locations of the target group with mobile screening vehicles or invite them to the relevant location and provide information and reminders via letter, email, or text about how long the screening vehicles will be there. Offer automatic enrollment in the screening system, i.e. as a default option. If they want to opt out of screening, they can fill in a form. They can be asked for their preferred screening date through applications (2).</p> <p>Investment should be made to develop drugs or vaccines to cure cancer. Scientists and surgeons should be trained in this field. To prevent cancer, incentives should be provided to produce healthy food (foods with additives should always be inspected). Environmental factors that cause cancer should be banned (2). (s-frame)</p>

Table 2. Continued			
Biases and Anomalies	Description	Nudge Description	Nudge Recommendation (i-frame and s-frame)*
<b>Ostrich bias</b>	It is a cognitive bias that states that people avoid or reject negative information when monitoring their current situation (11).	Sometimes people close their minds to possible medical problems to avoid emotional pain. Even when individuals show signs of cancer, they may ignore it. This is why many serious but preventable conditions, such as breast cancer, are often diagnosed at a much later and more severe stage because people do not prioritize examinations and screening for their health. Being aware of ostrich effects can lead to earlier disease detection and can even prevent a condition from getting worse. People avoid monitoring, making it difficult to take action and find the most appropriate way to do so (2).	Emphasize the irrelevance of statements such as “ignorance is bliss”. Emphasize people’s desire for self-protection and self-improvement. Ensure that they continue all positive and negative follow-ups related to screening. Explain the positive aspects of having full information about their health (2).
<b>Opt-in and opt-out</b>	Opt-in requires a person to actively agree to participate, whereas opt-out assumes that a person participates unless they refuse (12).	Setting default options has been shown to increase engagement in cancer diagnostic imaging (12). Default options are offered (13). Automatic inclusion in the screening system, waiting for an application to opt out of the system.	Offer it as the default option, i.e. auto enrolled in the screening system. Screening is offered “on demand”, with a refusal form if they wish to opt out of screening (2).
<b>Omission bias</b>	It is the tendency to choose the bad consequences of inaction rather than choosing action (14).	Default options are offered (13). Automatic inclusion in the screening system, waiting for an application to opt-out (2).	
<b>Projection bias</b>	It refers to the tendency of individuals to erroneously assume that their preferences will remain the same in the future (15).	Consent can be obtained by informing individuals. The default option should be designed to ensure that individuals are fully aware of the potential consequences of their health-related decisions (15).	Individuals can be presented with a narrative that includes the short- and long-term emotions of people with similar experiences in the past. A default option can be presented that provides information about the decisions of these anonymous people with experience (15).



<b>Table 2. Continued</b>			
<b>Biases and Anomalies</b>	<b>Description</b>	<b>Nudge Description</b>	<b>Nudge Recommendation (i-frame and s-frame)*</b>
<b>Peak and End Rule</b>	People tend to remember their experiences largely according to how they felt at the peak and at the end, rather than according to the sum or average of each moment of the experience (16).	If they have cancer, they may remember the peak moments of the event; if not, they may remember that the mammogram was a bit painful (2).	Although screening may cause short-term pain, it can be emphasized that it is necessary for a healthy life in the future (2).
<b>Learned helplessness belief</b>	The belief that one has little control over a situation and that no action can improve or change the outcome (17).	In this case, the perception that the progression of a disease is beyond one's control may lead to a lack of compliance with appropriate monitoring or treatment (2).	Individuals can be given letters emphasizing that diseases are controllable and that they should take control of their lives. Expert support can be provided, and screening can be made the default option (2).
<b>Social identity bias</b>	People act based on group identities. It is the tendency to see themselves in a group among others with similar characteristics (18).	This sense of belonging or not belonging to a group may influence patients' decisions to seek or accept medical care (19).	Explanatory letters and messages can be sent to mobilize different ethnic/social groups living in the country, migrants, etc. in a way that they will understand (2).
<b>Social/cultural norm</b>	People will observe what most of those in their peer group are doing and imitate their behavior (20).	Low-income adults will be less likely to be screened if they do not know about cancer if they know that others in similar income groups do not screen for cancer, or if they do not know anyone who has been screened (2).	When people they trust, such as health workers and physicians, instruct them to take action, they usually listen. Provide evidence about social norms or stories from similar people screened (2).

**Table 2.** Continued

Biases and Anomalies	Description	Nudge Description	Nudge Recommendation (i-frame and s-frame)*	
<b>Procrastination</b>	Individuals often postpone their decisions due to inertia, self-control problems, or the complexity of the issue to be decided. This behavior is associated with present bias (21).	Many preventive health behaviors involve a cost, such as time and money spent in the present in exchange for future benefits. For reasons such as cost, people may avoid utilizing preventive health services, or they may delay learning about an unhealthy condition in their minds because they will learn about their disease if they go for screening. However, this situation is not rational because it may cause the disease to progress and decrease the likelihood of responding to treatment (22).	Provide incentives for cancer screening. Give a clear date for screening and if they want to cancel, offer another date very close by as a default choice instead (2). The limited time frame here makes people perceive the thing as more valuable (23). Selection architects can therefore help by providing a limited time when setting a date for screening (24).	Employees should be given one day of screening leave in addition to their annual leave (2). (s-frame)
<p>*s-frame recommendations are in parentheses; all others are i-frame.</p> <p><b>Source:</b> (1) (Pallier et al., 2002); (2) created by author; (3) (Shepperd, Carroll, Grace, &amp; Terry, 2002); (4) (Purnell et al., 2015); (5) (Tversky &amp; Kahneman, 1989); (6) (Kahneman &amp; Tversky, 1979); (7) (O'Donoghue &amp; Rabin, 1999); (8) (Dovidio, 1999); (9) (Balsa &amp; McGuire, 2003); (10) (Samuelson &amp; Zeckhauser, 1988); (11) (Webb, Chang, &amp; Benn, 2013); (12) (Mehta, Khan, Guerra, Reitz, McAuliffe, Volpp, Asch, &amp; Doubeni, 2018); (13) (Halpern, Ubel, &amp; Asch, 2007); (14) (Ritov &amp; Baron, 1990); (15) (Loewenstein, 2005); (16) (Redelmeier &amp; Kahneman, 1996); (17) (Hiroto &amp; Seligman, 1975); (18) (Tajfel &amp; Turner, 1986); (19) (Harwood &amp; Sparks, 2003); (20) (Gigerenzer, 2008); (21) (Johnson, Shu, Dellaert, Fox, Goldstein, Häubl, Larrick, Payne, Peters, Schkade, Wansink, &amp; Weber, 2012); (22) (Kremer, Rao, &amp; Schilbach, 2019); (23) (Cialdini, 2008); (24) (Johnson et al., 2012).</p>				

**Table 3.** The requested and allocated funds for cancer control activities (2022)

Budget Expenses by Activity (1.000 TRY)	
Initial Funding for Cancer-Fighting Activities	1.371.652
Total allowance	2.060
Spending	106
3/2 ratio	% 5,2

**Source:** The Ministry of Health of the Republic of Türkiye, 2023, Annual Report for 2022.

**Table 4.** Performance Indicators Related to Early Diagnosis of Cancer (2023)

Performance Indicators	Effect on Target (%)	2016	2019	2020	2021	2022	2023
Colorectal Cancer Early Diagnosis Rate (Stage 0-1) (%)	6	35,4	35,5	35,8	36	36,5	37
Breast Cancer Early Diagnosis Rate (Stage 0-1) (%)	6	50	50,3	50,5	51	51,5	52
Cervical Cancer Early Diagnosis Rate (Stage 0) (%)	6	57,8	58	58,5	59	59,3	59,5
Note: Data for 2017 and 2018 could not be found on the website. <b>Source:</b> The Ministry of Health of the Republic of Türkiye, 2023, 2019-2023 Strategic Plan							

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 5

### WOMEN EMPOWERMENT THROUGH COMPULSORY SCHOOLING REFORM: THE CASE OF TÜRKİYE

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#### **Abstract**

This study investigates the causal impacts of the 1997 compulsory schooling reform on women's empowerment in Türkiye. The reform extended the compulsory education duration from 5 years to 8 years. The policy had an impact on individuals born in 1987 onwards, whereas those born in earlier years were unaffected. This allows us to employ a regression discontinuity design (RDD) and reveal the causal impact of the reform on women's educational outcomes, their status in the family, and their perceptions and attitudes towards gender roles in relation to the Fifth Sustainable Development Goal. We examined the 2008, 2013, and 2018 waves of the Turkish Demographic and Health Survey (TDHS), which is a nationally representative micro dataset. Results show that this large-scale reform has led to significant improvements in women's educational outcomes. The policy has led to increases in the years of education, and completion of grade 8 and grade 11 for women, as well as a decrease in educational disparities between spouses. However, when we check other empowerment-related outcomes within the family, results show that the extent of empowerment is quite limited. Only one outcome in each set of variables (perception of gender roles, perception of physical violence, financial independence) shows empowerment. This suggests that higher educational attainment and improved educational status compared to the husband are not reflected in daily lives and the perceptions of women. All in all, stronger educational outcomes for women resulting from the policy have minor empowering effects.

**Keywords:** Compulsory schooling, women empowerment, policy evaluation, regression discontinuity design

## 1. Introduction

Gender-based violence, unpaid domestic and care work, unequal pay and work opportunities, and underrepresentation in politics and leadership positions are a few examples of the problems women face in society. Gender inequalities are context-dependent, and they are shaped by long-standing social norms and practices. While some countries are doing well in this regard, some have very severe inequalities. According to the United Nations (2022a):

“Inequalities faced by girls can begin right at birth and follow them all their lives. In some countries, girls are deprived of access to health care or proper nutrition, leading to a higher mortality rate.”

Türkiye is an upper-middle-income country that has made remarkable development progress during the last century, but the positive results of development have not been equally reflected in men’s and women’s outcomes. Türkiye’s Human Development Index (HDI) value was 0.583 in 1990 and increased to 0.820 in 2019 (UNDP, 2020b). According to UNDP (2022a), while Türkiye has recently risen to a greater level of human development, inequality remains a major concern, particularly due to persistent gender discrepancies. The HDI value for males and females in 2019 was 0.848 and 0.785, respectively, which indicates the magnitude and persistence of gender inequality. This implies that the positive benefits of development have not equally affected men and women, and recognizing the barriers to women’s empowerment is critical.

In this study, we aim to investigate the effects of a major education policy in Türkiye through a gender lens. 1997 compulsory schooling reform increased the duration of compulsory education from 5 years to 8 years and students who finished grade 4 in the summer of 1997 were affected by the new policy. The reform involved substantial investment in education infrastructure and resulted in equalizing educational outcomes of rural/urban area residents and boys/girls (Kırdar, Dayıoğlu, & Koç, 2016). Through this policy, girls who would not continue beyond the compulsory schooling received three more years of education and this is likely to affect their gender role perceptions, marriage, birth and labor market outcomes. Therefore, the policy has great potential to empower affected individuals. We intend to assess the impacts of the 1997 compulsory schooling policy on women’s outcomes to determine the level of empowerment through education and the barriers to achieving gender equality in the Turkish setting.

By assessing the empowerment effects of the reform, we will contribute to the women’s empowerment and policy evaluation literature. We will analyze the causal impacts of compulsory schooling on women’s empowerment by using three waves of nationally representative

data, therefore the results of this study will inform the extent of and barriers to women's empowerment in Türkiye. As the positive benefits of economic development are not shared equally by genders, insights coming from this study will be quite important. In the rest of the paper, the next section gives the conceptual framework by discussing gender inequality and its dimensions and women's empowerment, section three discusses a general overview of women's empowerment in Türkiye, women's current status and the institutional framework of compulsory schooling, in section four data and methodology will be explained, in section five results will be documented and section six discusses the results and concludes.

## **2. Conceptual Framework**

### **2.1. Gender Inequality and Its Dimensions**

Gender inequality impacts the lives of women all around the world; these inequalities put women at a disadvantage in many aspects of public and private life. Women usually face barriers to having a say in household decisions, obtaining a quality education, participating in the labor market and representing themselves in politics. However, women make up half of the population and their inability to benefit from the same resources and opportunities as men harms society and its long-term development. For this reason, ensuring gender equality has been one of the key policy areas on the global agenda in the past three decades. The most recent example of global policy action is the fifth Sustainable Development Goal<sup>1</sup>, which aims to achieve gender equality and empower all women and girls by 2030. It specifically targets the following results:

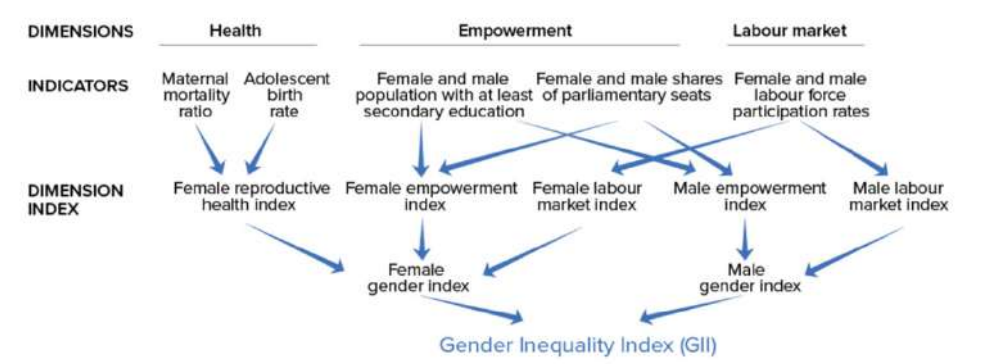
- 5.1. Ending discrimination against women and girls;
- 5.2. Ending all violence against and exploitation of women and girls;
- 5.3 Eliminating forced marriage and genital mutilation;
- 5.4 Valuing unpaid care and promoting shared domestic responsibilities;
- 5.5 Ensuring full participation in leadership and decision-making
- 5.6 Universal access to reproductive health and rights;
- 5.7 Equal rights to economic resources property ownership and financial services;
- 5.8 Promoting the empowerment of women through technology; and
- 5.9 Adopting and strengthening policies and enforceable legislation for gender equality.

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1 For further information, see <https://www.globalgoals.org/goals/5-gender-equality/>

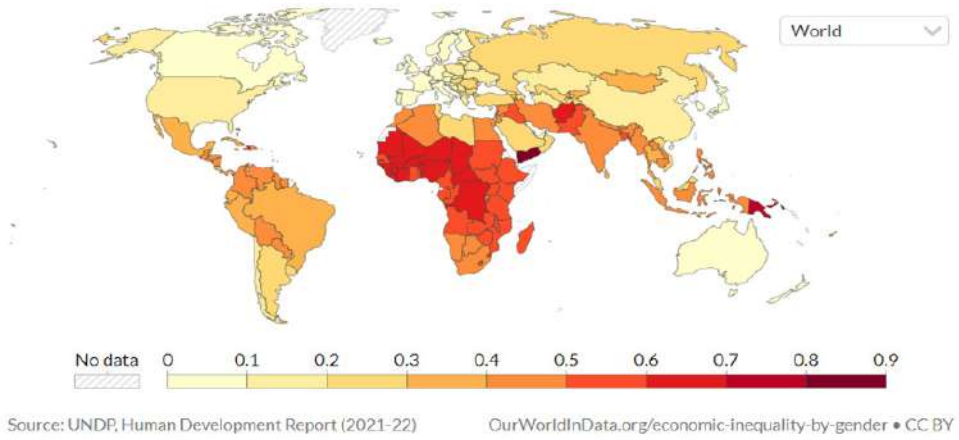


Gender inequality is a multifaceted phenomenon that varies in context. The targets mentioned above reflect the dimensions of gender inequality and the areas of empowerment most in need. Furthermore, to address this complex issue, academics and policymakers attempt to assess inequality using composite indices that allow them to see its cross-country distribution and change over time. The Gender Inequality Index (GII) developed by United Nations Development Program focuses on three dimensions: reproductive health, empowerment, and the labor market. Figure 1 shows the details of all indicators of this index. The index demonstrates the loss in potential human development brought on by the disparity between female and male achievements in these dimensions. The scale goes from 0, when men and women perform equally, to 1 where one gender performs as poorly as possible in all measured dimensions.



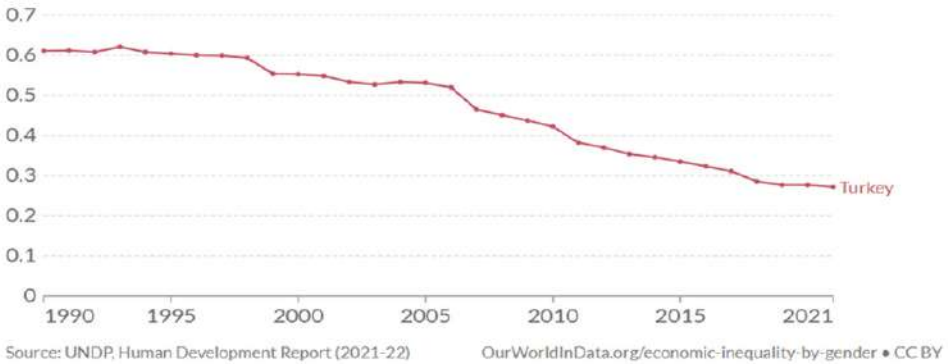
**Figure 1.** Dimensions and indicators of gender inequality index  
**Source:** <https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index#/indicies/GII>

When we look at the global distribution of the GII in Figure 2, we see that the southern part of the globe suffers from higher gender inequality that coincides with a low level of economic development. Duflo (2012) argues that there is a bidirectional relationship between economic development and women’s ability to access education, health, labor market opportunities, rights and political participation. She argues that development alone can play an important role in driving down inequality between men and women, that continuing gender inequality can hinder development, and women empowerment accelerates development. Therefore, policies focusing on gender inequality go hand in hand with the economic development process of societies.



**Figure 2.** Gender inequality index score across countries in 2021  
**Source:** UNDP (2022b) Development Report

According to the GII, Türkiye reduced its inequality score from 0.611 in 1990 to 0.272 in 2021. This indicates that Türkiye has achieved significant progress in eliminating inequality throughout the years and the progress is visible in Figure 3. However, because of the substantial gender gap in labor force participation and parliamentary representation, Türkiye has a higher score and hence more inequality than the average of industrialized countries (see Figure 2). This index addresses the need for policies that would increase women's labor market and political participation to fight against gender inequality in Türkiye.



**Figure 3.** Gender inequality index score of Türkiye through years  
**Source:** UNDP (2022b) Human Development Report (2021-22)

To understand the nature of gender inequalities in depth, one can focus on the public and private spheres in Türkiye. Kağıtçıbaşı (1986) argues that after the establishment of the Republic, legal and institutional reforms established the framework for ending sex segregation and discrim-

inatory legal treatment of women. Although there was a legal institutional setting to reduce gender inequality, many women's daily living conditions remained unchanged following the reforms. She remarks that the structures in the private sphere arise from many factors ranging from economic conditions to sex roles, from religious beliefs to family and household structures. Therefore, it is unrealistic to expect legal and institutional reforms to result in total cultural change.

İlkkaracan (2012) argues that like Middle East and North African countries, Türkiye's macroeconomic performance also contributed to the weak feminization of the labor force and helped the institutionalization of the patriarchal contract: the gendered division of labor. She argues that the male-breadwinner/female-housewife household is represented in the Turkish legal system as well.<sup>2</sup> Until the 2003 revision, according to the Turkish Civil Code, men are the family's head and breadwinner, while women are homemakers; it also made married women's involvement in the labor force dependent on their husbands' permission. Therefore, we understand that one factor that contributes to the extent of gender inequality in Türkiye is the traditional division of labor and women's internalization of related gender norms.

Although there is an egalitarian legal institutional setting in Türkiye, we see the need for women's empowerment both in public (educational attainment, labor force participation, political engagement) and private (household) spheres.<sup>3</sup> Gender inequalities at micro and macro levels reinforce each other and help the vicious cycle of bad practices. To support women in the public sphere, policies with regard to the private sphere such as increasing women's bargaining power and autonomy in the household might be helpful. For example, cash transfers to mothers might increase their decision-making power in the family and subsequently the school enrollment rate of their daughters. However, a nationwide compulsory schooling reform allowing girls to continue school longer might change the household dynamics and women's status in the household through various mechanisms (age at marriage, labor market participation, change in husband characteristics, etc.). Since compulsory schooling reforms are big in scale and affect the enrolment choices of certain groups throughout the country, a careful analysis is needed to uncover their all effects on gender equality and to understand the channels and challenges of women empowerment in society. Because of this, we will evaluate the results of the 1997 compulsory schooling reform in Türkiye through a gender lens.

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2 İlkkaracan (2012) also remarks that there is an egalitarian legal institutional setting in Türkiye, but some laws reflect the male bias.

3 The evaluation of gender equality performance of Türkiye between 2000-2019 suggests a gap between Türkiye's human development and gender development performance. As such Türkiye ranks in the Global Gender Inequality Index 68th despite ranking 54th in the Human Development Index (UNDP Türkiye, 2022a).

## 2.2. Women's Empowerment

As we mentioned previously, women's empowerment has been on the development agenda for a long time. First of all, women's empowerment is a valuable goal on its own. Kabeer (2005) argues that empowerment is an inherent rather than an instrumental objective, openly regarded as an end in itself rather than as a means to an end.

Kabeer (1999) asserts that empowerment is a fuzzy term that has not been properly defined. She defines the phrase by discussing all the essential facets, including agency, resources, and accomplishments. For her, empowerment entails reclaiming the ability to make choices after having been previously deprived or denied the power to do so. Transformation occurs as a result of empowerment, and most crucially, women experience an improvement in their ability to reach critical life decisions. When assessing empowerment in various circumstances, agency, resources, and accomplishments are crucial factors to take into account, according to Kabeer (1999). Decision-making requires resources, agency is the mechanism for making decisions, and achievement is the result of the process. Because of empowerment, having agency means doing more than just making decisions and it also calls power dynamics into question. Therefore, in this study we will regard empowerment as women's ability to make choices, have the necessary resources while doing choices and control their own lives.

Education plays a critical role in empowering women. It provides women with the knowledge and skills they need to participate in the workforce and contribute to their families and communities. It also helps them gain confidence and independence, leading to greater autonomy and decision-making power. Access to education enables girls and women to develop critical thinking skills and to become informed citizens who can participate in their communities and contribute to decision-making processes. It can also help to break down gender stereotypes and promote gender equality.

Studies have shown that educated women are more likely to have better health outcomes, marry later, and have fewer children (Brunello, Fort, Schneeweis, & Winter-Ebmer, 2015; Monstad, Propper, & Salvanes, 2008; Cygan-Rehm & Maeder, 2013). They are also more likely to earn higher wages and to be in positions of leadership and influence. In addition, educated women are better able to advocate for their own rights and to access resources and services, such as healthcare and financial services. Therefore, education is essential to the empowerment of women, as it provides them with the tools and knowledge they need to take control of their lives and contribute to their families, communities, and societies.

### **3. General Overview**

#### **3.1. Women Empowerment from a Historical Perspective in Türkiye**

Women's empowerment in Türkiye is an ongoing struggle with roots dating back to the Ottoman Empire (Yenilmez, 2017). Türkiye has a long history of patriarchy, where women have been confined to the domestic sphere and have had limited access to education and employment opportunities. Peculiarly, the established social norms and beliefs have shaped the status of women and placed them in a lower position than men (UNDP, 2005). Women have long been expected to fulfill specific roles within the family and community, with their values largely judged based on their ability to meet these expectations. While there have been some changes in attitudes toward gender roles in Türkiye over the years, traditional beliefs continue to influence the status of women and their duties. For instance, according to recent statistics, childcare responsibility falls on women in 94.4% of households. Similarly, women do most of the house chores like tidying the house, cleaning, and cooking in 85.6%, 80.9%, and 84.8% of the households, respectively (TURKSTAT, 2022). Therefore, these norms constitute various challenges that limit women's opportunities and prevent them from reaching their full potential. Nevertheless, there have been tremendous efforts to promote gender equality and empower women in all aspects of life since the proclamation of the Republic. The Republic era, which began in 1923, brought about significant changes in women's rights. Most remarkably, Turkish women gained major rights - the rights of child custody, divorce, and inheritance, the right to vote both in local and general elections as well as run for political office - much earlier than their Western counterparts (Cinar & Ugur-Cinar, 2018). Hence, within the secularization process of Türkiye, traditional gender roles have been challenged, and the government has introduced various policies and initiatives aimed at promoting women's education, employment, and empowerment.

One important initiative to promote girls' educational outcomes is the 1997 education reform, which extended compulsory education from 5 years to 8 years. Although the policy aims to increase compulsory education for both girls and boys, the effect of the policy on girls' education is more significant. While before the policy change, the net schooling ratio of girls in secondary school was lower (44.62%) than that of boys (60.6%), and the policy decreased the gap substantially in terms of educational attainment between males and females (Kırdar et al., 2016). However, despite the mandatory education reform, some parents, especially those living in rural areas, did not comply strictly with the policy. Hence, another initiative was implemented in 2003, the "Girls' Education Campaign," which aims to increase enrollment and reduce dropout rates among girls in primary and secondary schools. Additionally, high school

education became compulsory in 2012, and the expansion of higher education/universities has taken place since 2016, which improves access to education by women.

In addition to opportunities provided in education, Türkiye has taken steps to increase women's participation in the workforce in recent years. The first action plan "More and Better Jobs for Women: Women's Empowerment through Decent Work in Türkiye" was enforced to enhance women's employment in 2016. The government has also introduced policies such as flexible working hours, childcare facilities, and extended maternity leave to help women balance work and family responsibilities. Furthermore, there are policies in place to combat inequality in the workplace and promote equal pay for equal work like "The Strategy Paper and Action Plan on Women's Empowerment 2018-2023". Additionally, the "Women's Entrepreneurship Program," which provides training, mentoring, and financial support to women desiring to start their businesses, has been implemented to empower women.

However, gender-based violence, such as domestic abuse and honor killings, remains prevalent in Turkish society. The government has established women's shelters and helplines to support women who are victims of violence or abuse. Moreover, it has taken steps to address these issues, specifically, the 6284 Law to Protect Family and Prevent Violence Against Women, enforced in 2012, criminalizes domestic violence and establishes protective measures for victims. After this law, the "National Action Plan on Combating Violence Against Women" began to be prepared by the Ministry of Family, Labour and Social Services for every 3 or 4-year period.

### **3.2. Current Status of Women in Numbers**

Women's status in Türkiye has undergone significant changes over the past few decades as the country has experienced rapid modernization and development. However, despite some progress in recent years, there are still significant challenges facing women, particularly in terms of gender inequality.

One of the key indicators of gender inequality is the low female labor force participation in Türkiye. Solely 32.8% of women participated in the labor force in 2021, well below the OECD average of 64.8% (TURKSTAT, 2021a; OECD, 2021). Accordingly, the female employment to population ratio remains at a low level of 28%. The pay gap between women and men is also a pressing issue which women earn 15.6% less than their male peers (ILO, 2020). Additionally, working women are more likely to be employed in informal, low-paying jobs without benefits or job security.

Another significant challenge facing women is intimate partner violence. According to the gender statistics report (TURKSTAT, 2021b), the percentage of women who had suffered from either physical violence, or sexual violence, or both at least once during their lifetime is 35.5%, 12%, and 37.5%, respectively. The government has taken steps to address this issue. A recent development in this regard is the enforcement of the “Protocol on the Empowerment of Women and Institutional Capacity Building and Increasing Cooperation and Coordination for Combating Violence against Women” in 2019.

Although the statistics have revealed an underwhelming situation, there have been some positive developments for women in Türkiye. For example, the representative percentage of female ambassadors has increased steadily over the past two decades, from 6.9% in 2002 to 27.2% in 2022 (TURKSTAT, 2022). A similar pattern exists for the female representatives in the Assembly, in which the proportion of women has almost quadrupled and reached 17.3% in the same period. Additionally, the number of female academics is very close to that of males in higher education. Moreover, the proportion of women aged 25 and over who have completed at least one level of education was 87.3% in 2021. Of those, 18.5% hold high school degree, and 20.9% have completed higher education (including master’s and doctorate’s degrees), a figure which has doubled in the last decade.

### **3.3. Institutional Framework**

The education policy implemented in August 1997 increased compulsory schooling from 5 to 8 years. Within the reform, the 5+3+3 education system combined the first two tiers, primary and lower secondary school, and merged them under the scope of compulsory primary education. The 3-year upper secondary school education remains optional. Students lower than grade 5 at the end of the 1996/1997 academic year were bound to the policy. Hence, individuals who completed grade 4 in this academic year and were born in 1987 comprise the first cohort influenced by the policy.

According to the National Education Statistics announced by the Ministry of National Education (MoNE), the net schooling ratio was 89.4% in primary schools (grades 1-5) and 52.8% in lower secondary schools (grades 6-8) in the 1996/1997 academic year, whereas the net schooling rate in primary education (grade 1-8) reached 95.3% in the 2000/2001 academic year. New investments had been made to increase the supply side of education and accommodate newly coming students before the enforcement of the policy. Before the policy change, the budget allocated to the MoNE was 15%, while after that, it increased to 37.34% (Kırdar et al., 2016). In this context, MoNE followed several strategies, like constructing schools and



classrooms, assigning new teachers, busing children residing in rural areas to schools, and providing free school uniforms and textbooks to children from socioeconomically disadvantaged backgrounds.

In the literature, researchers highlight two underlying motivations for implementing education reform. The first is political reasons, which Gulesci and Meyersson (2013) reviewed. After the Welfare Party (an Islamist party) held the parliament's largest share in the 1995 National Elections, the conflict between the Islamist movement and secular circles began to increase, and Türkiye experienced the 1997 military memorandum, known as the postmodern coup. Following National Security Council suggestions, the 1997 compulsory schooling expansion was implemented, which led to a drop in the enrollment of students in the religious schools which were highly popular before. The other motivation was to ease the accession process of Türkiye to the European Union (Dursun, Cesur, & Mocan, 2018; Dinçer, Kaushal, & Grossman, 2014). The lower educational attainment and regional disparities were some of the obstacles in the way. So, increasing compulsory education would lower the disparities in Türkiye.

This study investigates the causal effects of the 1997 education reform on women's empowerment. Similarly, a bunch of studies examine the effects of education in Türkiye, using this policy change as a quasi-experimental design, on several outcomes of individuals, like teenage marriage and fertility (Kırdar, Dayıoğlu, & Koç, 2018), gender inequality (Kırdar et al., 2016), labor market outcomes (Aydemir & Kırdar, 2017), voting behavior (Cesur & Mocan, 2018), happiness (Dursun & Cesur, 2016), physical and domestic violence (Erten & Keskin, 2018; Gulesci, Meyersson, & Trommlerová, 2020), and health (Tansel & Karaoglan, 2016). In addition to these, the effect of this policy on the outcomes of second generations, especially related to health issues, has been recently examined (Usta, 2020; Özer, Fidrmuc, & Eryurt, 2018; Güneş, 2015). Moreover, Dinçer et al. (2014) use this reform to reveal the effect of education on women's fertility and empowerment. As a proxy for women's empowerment, they investigate the attitudes towards gender roles, modern contraception methods, antenatal visits, and knowledge of the ovulation cycle. They provide evidence that the proportion of women who make antenatal visits, use contraception methods, and have knowledge of the ovulation cycle increased along with education. At the same time, there has been no effect on attitudes towards gender roles. Similar to this research, we explore women's empowerment through education by using recent statistics, which broadens the time period, and by employing a different identification strategy, which will be discussed in detail in the next section.



## 4. Data and Methodology

### 4.1. Data

The data used in this study come from the Turkish Demographic and Health Survey (TDHS) waves of 2008, 2013, and 2018. The TDHS provides a nationally representative dataset. The Hacettepe Institute of Population Studies surveys Turkish families, and 15-49-year-old ever-married women are selected for the key modules to collect information on health-related outcomes of both mothers and their children and women’s status in the family. The data also includes detailed information about the socio-demographic characteristics and household dynamics of the respondents.

The TDHS dataset is excellent for our study because it allows us to investigate the impacts of schooling reform on women’s empowerment in a regression discontinuity design. Individuals’ schooling levels can be discovered in a variety of characteristics, including educational accomplishments, highest grade completed, and years of schooling. Moreover, a variety of variables in the data can be viewed as markers of women’s empowerment, for instance, women’s opinions toward gender roles and physical violence, as well as the frequency of controlling behavior by their husband/partner.

There are 20,108 ever-married women in the pooled dataset. Women range in age from 15 to 49, with a mean age of 34.7. In the study, we restrict our sample to birth cohorts near the cutoff date, and descriptive statistics are presented for women born between 1981 and 1992.<sup>4</sup> Table 1 shows the educational attainment of ever-married women. The sample’s average years of schooling is 7.2. The completion rates for grades 8 and 11 are roughly 49 percent and 30 percent, respectively. On average husbands are 1.4 years more educated than wives and in almost 21 percent of households the wife is more educated than the husband.

Table 1. Descriptive statistics: Schooling			
	Mean	SD	Obs
Years of Schooling	7.213	4.315	6979
Educational Attainment			
Grade 8	0.487	0.499	6979
Grade 11	0.296	0.456	6979
Difference between husband and wife schooling	1,404	0.679	6494
Wife is more educated	0.209	0.407	6495
Note: Data comes from 2008 2013 and 2018 TDHS. Summary statistics are displayed for women of cohorts 1981-1992.			

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4 The reason of the sample restriction will be explained in detail in Section 3.2 Identification Strategy.

Table 2 displays the sociodemographic characteristics of the sample to better comprehend the condition of women. The women in the sample, on average, are 27.8 years old and have 1.8 children. 73.7% of them live in urban areas and 54.7% of those have held a job previously. The average wealth index score is 2.8 out of 5. The average age of their spouse is 32.5 and they have roughly 9.8 years of education.

<b>Table 2.</b> Descriptive statistics: Sociodemographic characteristics			
	<b>Mean</b>	<b>SD</b>	<b>Obs</b>
Age	27.794	4.607	6980
Urban residence	0.737	0.440	6980
Number of children	1.824	1.317	6980
Ever-worked	0.547	0.497	6980
Wealth level	2.824	1.372	6980
Partner's age	32.479	6.176	6739
Partner's years of education	9.814	10.851	6580
<b>Note:</b> Data comes from 2008 2013 and 2018 TDHS. Summary statistics are displayed for women of cohorts 1981-1992.			

Table 3 summarizes women's attitudes toward gender roles. These statements demonstrate the extent to which women accept unfair gender norms. Observing the impact of policy on these variables would provide insight into the change in women's bargaining power and understanding of gender equality. 14% of women in the sample believe that crucial choices should be made by men, nearly 50% agree that women with children should not work, and 75% agree that women should be virgins when they marry.

<b>Table 3.</b> Descriptive statistics: Attitudes toward gender roles			
	<b>Mean</b>	<b>SD</b>	<b>Obs</b>
Important decisions should be made by men	0.140	0.347	6948
Husband should help with household chores	0.650	0.476	6938
Educating a son is better than a daughter	0.862	0.280	6956
Women with children should not work	0.497	0.500	5007
Women should be more involved in politics	0.761	0.426	6242
Women should be virgin on the wedding night	0.750	0.432	6708
<b>Note:</b> Data comes from 2008 2013 and 2018 TDHS. Summary statistics are displayed for women of cohorts 1981-1992.			

Table 4 depicts women's attitudes regarding physical violence. Wife beating is accepted in a variety of conditions, with 10% of respondents supporting it in the case of neglecting children. Nevertheless, the percentage of women who agree with other assertions is low, 14 % believe violence is justified in at least one of these instances. Approval of physical violence in marriage implies significant women's disempowerment, since they are not untroubled by a practice that is destructive to their health and well-being.

<b>Table 4.</b> Descriptive statistics: The attitudes toward physical violence			
	<b>Mean</b>	<b>SD</b>	<b>Obs</b>
Beating is justified if the wife ...			
neglects the children	0.100	0.300	6943
argues with the husband	0.075	0.264	6919
refuses to have intercourse	0.027	0.162	6932
burns the food	0.013	0.117	6963
Agrees with at least one reason	0.14	0.347	6980
<b>Note:</b> Data comes from 2008 2013 and 2018 TDHS. Summary statistics are displayed for women of cohorts 1981-1992.			

Table 5 contains summary statistics on ever-worked status and controlling behaviors that ever-married women face. The survey asks how frequently certain activities occur, and we consider that there is a controlling action if the answer is frequently or occasionally. The most common controlling behavior faced by women is that their husband demands to know where they are with 38%. The share of other controlling behaviors, such as the husband preventing her from meeting friends is roughly 11%, and the husband limiting contact with her relatives is 7.5%. Finally, 45% of women report being subjected to at least one of these controlling behaviors. If we check the summaries of economic independence variables we see that 54% of women report that they worked at least once in their life and almost 24 % say that they have money to spend.

<b>Table 5.</b> Descriptive statistics: Controlling actions and ever-work			
	<b>Mean</b>	<b>SD</b>	<b>Obs</b>
Husband...			
limits contact with her family	0.075	0.263	6971
insists on knowing where she is	0.387	0.487	6966
prevents her from seeing friends	0.109	0.312	6971
accuses her of being unfaithful	0.042	0.200	6968
distrusts with money	0.059	0.236	6968
Facing at least one controlling action	0.448	0.497	6980
Woman has her own money to spend	0.238	0.426	5094
Woman ever-worked	0.547	0.497	6980
<b>Note:</b> Data comes from 2008 2013 and 2018 TDHS. Summary statistics are displayed for women of cohorts 1981-1992.			

## 4.2. Identification Strategy

The 1997 compulsory schooling policy brought an exogenous variation in the education outcomes of individuals according to their birth cohorts. While the reform affected students who were in at most 4th grade in the 1996/1997 educational year, i.e., individuals born in

1987 and after, the older cohorts were not influenced by the policy change. Hence, this setting enables us to employ regression discontinuity design (RDD) and to reveal the causal relationship between the policy and women's empowerment in Türkiye.

RDD is a quasi-experimental design and through this setting, we mimic a natural experiment by comparing outcomes of treated (affected by the policy) and non-treated (not affected by the policy) cohorts. This strategy allows obtaining the treatment effect at the cutoff point (where the treatment status changes) with the assumption that cohorts born one year apart from each other (i.e. 1986 and 1987) show no systematic difference except their treatment status.

The core of RDD is based on 3 points: (i) explaining the running variable which determines whether an individual is treated or not, (ii) focusing on the cutoff, and (iii) comparing the observations on either side of the cutoff. In our study, the 1997 education policy creates a cutoff that some students were affected by the reform (treated) and some were not (non-treated). The running variable determines the treatment status and it is the year of birth, in our case since school starting is mainly settled according to age in Türkiye. Therefore, in our setting individuals who were born before 1987 were not affected by the reform, while those who were born in 1987 and after were affected, as we mentioned the year 1987 is the cutoff point where the treatment status changes.

The key assumptions of RDD are the continuity, the local randomization of treatment assignment, and the absence of manipulation around the cutoff. The continuity assumption requires that the relationship between the running variable and the potential outcomes is continuous around the cutoff point. This means that there are no sudden jumps or discontinuities in the outcomes solely due to the running variable. The local randomization assumption states that treatment assignment is as good as random around the cutoff point, and there are no systematic differences between individuals born just before and after the cutoff date, except for the treatment effect of the education reform. Finally, the absence of manipulation assumption implies that individuals cannot manipulate their year of birth to be assigned to a particular group. As we know the year of birth is a predetermined variable, manipulating this information is very hard and education reform is an exogenous random event, independent from the year of birth. Therefore, all these assumptions hold in our study, so that the regression discontinuity design can provide a valid estimate of the causal effect of the education reform on women's empowerment and enables us to find the average treatment effect (ATE) of the policy for the subsample that we focus on. The only possible issue is that parents did not strictly comply with the starting age of school and did not send their children to school when

they were at the age of 7. Yet, this is not a problem in terms of violation of the assumptions; it only creates a fuzziness at the cutoff.

The assignment to the treatment is a deterministic function of birth year, as illustrated below;

$$D_i = \begin{cases} 0, & x < 1987 \\ 1, & x \geq 1987 \end{cases}$$

where  $D_i$  is a treatment assignment, taking 1 if an individual was treated (affected by the policy), and 0 if an individual was not treated.

Following the basic regression model proposed by Hunnington-Klein (2022);

$$Y_i = \beta_0 + \beta_1 f(x_i) + \beta_2 D_i + \varepsilon_i$$

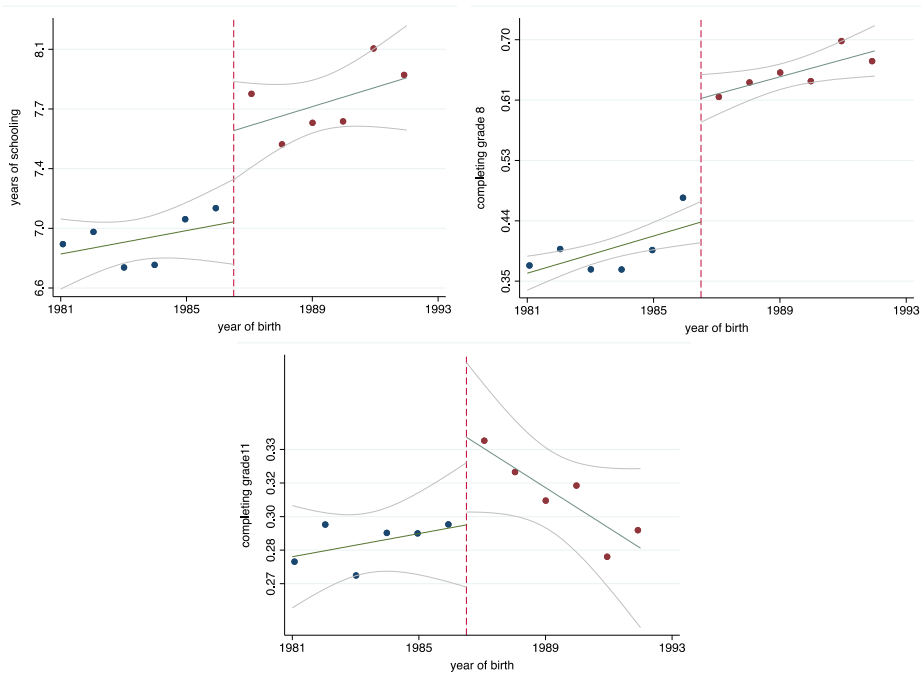
where the dependent variable,  $Y_i$ , is the outcome of interest, which could be a measure of women's agency, employment, or decision-making power.  $f(x_i)$  is a function of the running variable (i.e., year of birth) centered around the cutoff. We will follow a parametric estimation strategy and use both linear and quadratic functions of the running variable  $f(x_i)$  for the estimation.  $D_i$  shows the treatment status which is explained above.  $\beta_2$  is our parameter of interest and shows the average treatment effect of the education policy. Finally, standard errors,  $\varepsilon_i$ , are clustered according to the year of birth to take into account potential heteroscedasticity.

In a regression discontinuity design, the choice of bandwidth is crucial for the validity and precision of the estimated treatment effect. The bandwidth determines the range of values around the cutoff point that are included in the treatment and control groups. It should be wide enough to capture the true effect of the policy change but narrow enough to avoid contamination from individuals who are too dissimilar. One approach to selecting the bandwidth is to use a data-driven method proposed by Imbens and Kalyanaraman (2012). Alternatively, researchers can use a priori knowledge or theoretical considerations to determine the appropriate bandwidth. In this study, following the literature (Kırdar et al., 2016; Kırdar et al., 2018), we include 4-year and 6-year bandwidths around the cutoff. Using multiple bandwidths helps examine the robustness of the estimated treatment effect.

## 5. Estimated Findings

In this section, we document the estimated results depicting the effect of the compulsory education policy on the educational attainment of women, the educational gap between women (wife) and men (husband), the perceptions about gender roles, attitudes towards physical

violence, controlling actions, and employment outcomes of women. In all regressions, our sample consists of ever-married women born between 1981 and 1992 (1983 and 1990 for narrower bandwidth) from 2008, 2013, and 2018 TDHS datasets. In order to check the robustness of our results we carry out the analysis for two different time intervals, 6-year and 4-year intervals on both sides of the cutoff. Additionally, we adopt a parametric estimation approach and use linear time trends, which can be validated from Figure 4 which is the graphical illustration of the education variables and shows the jumps at the cutoff.



**Figure 4.** Educational outcomes of married women

In Table 6, we can see the impact of policy on the educational outcomes of ever-married women. The increase in years of schooling, and the probability of completing grade 8 and grade 11 are statistically significant for both bandwidths. In particular, the policy increased, on average, the schooling among women by 0.6 years, and the completion rate of grades 8 and 11 by 15-17 and 3-4 percentage points, respectively. When we compare these numbers with mean values, we see that women's completion rate of grade 8 increased by approximately 30% while the increase is 10% for completing grade 11 within the policy. Hence, it is obvious that the education reform has provided an opportunity for women to attain basic education and increased their enrollment rates. The results also reveal that interspousal education differences have decreased thanks to the

policy.<sup>5</sup> More specifically, the difference between the husband's and wife's schooling decreased by 0.4 years. Moreover, the households where the wife is more educated than the husband increased by 7-8 percentage points. So, we can deduce that the reform effectively decreases the educational gap between women and men and contributes to women's empowerment in this regard.

<b>Table 6.</b> The impact of policy on educational outcomes of ever-married women				
	<b>6-Year Intervals</b>	<b>Obs.</b>	<b>4-Year Intervals</b>	<b>Obs.</b>
Years of schooling	0.573** (0.186)	6979	0.555*** (0.133)	4744
Completing grade 8	0.179*** (0.030)	6979	0.151*** (0.023)	4744
Completing grade 11	0.039*** (0.004)	6979	0.031*** (0.005)	4744
Difference btw husband & wife schooling	-0.427** (0.144)	6823	-0.461** (0.170)	4644
Wife is more educated	0.085*** (0.026)	6824	0.073** (0.028)	4645
<b>Note:</b> Data comes from 2008, 2013, and 2018 TDHS married women sample. The year of birth is used as assignment variable. 6-year and 4-year intervals include 1981-1992 and 1983-1990 birth cohorts, respectively. Standard errors are clustered in year of birth level.				

Table 7 displays the impact of the policy on the perception of women regarding gender roles. Figure A2 in the appendix shows the graphical representation of these variables. Most of the findings are statistically insignificant except for the perception of women politicians. The policy led to a 3 to 6 percentage points increase in the share of women who think that women should be more involved in politics. Additionally, the share of women who perceive that education is better for a son than a daughter decreased by 2 percentage points in the narrower bandwidth. Finally, the proportion of women who state that husbands should help with domestic chores decreased with the policy but the result is not robust when we look at a narrower bandwidth. Overall, these findings do not provide strong evidence for women's empowerment in terms of their bargaining power and awareness of gender inequality, yet we see that the policy leads women to feel the need for higher political participation and engagement.

<b>Table 7.</b> The impact of policy on perceptions of gender roles				
	<b>6-Year Intervals</b>	<b>Obs.</b>	<b>4-Year Intervals</b>	<b>Obs.</b>
Important decisions should be made by men	0.005 (0.014)	6948	0.004 (0.014)	4720
Husband should help with household chores	-0.050** (0.020)	6939	-0.017 (0.032)	4710
Educating a son is better than a daughter	-0.015 (0.010)	6956	-0.019* (0.009)	4727
Women with children should not work	0.013 (0.017)	5007	-0.018 (0.010)	3383
Women should be more involved in politics	0.031** (0.014)	6242	0.058*** (0.013)	4255
Women should be a virgin on the wedding night	0.008 (0.035)	6708	0.006 (0.037)	4556
<b>Note:</b> Data comes from 2008, 2013, and 2018 TDHS married women sample. But, the data for the variable asking whether women with children work comes from 2013 and 2018 TDHS married women sample. The year of birth is used as assignment variable. 6-year and 4-year intervals include 1981-1992 and 1983-1990 birth cohorts, respectively. Standard errors are clustered in year of birth level.				

5 Figure A1 in the appendix shows the graphical representation of the variables for interspousal educational differences.

In Table 8, estimated findings for women's attitudes towards physical violence are stated. Figure A3 in the appendix shows the graphical representation of these variables. The results are generally insignificant so there was little change in women's opinion on physical violence despite the education policy. The only decrease in this issue comes from the statement that beating can be justified if women refuse to have intercourse. The proportion of women who agree with the statement decreased by 1 percentage point thanks to the policy. Although this is an indication of empowerment, the effect of policy on the physical violence attitudes is quite limited.

<b>Table 8.</b> The impact of policy on the attitudes toward physical violence				
	<b>6-Year Intervals</b>	<b>Obs.</b>	<b>4-Year Intervals</b>	<b>Obs.</b>
Beating is justified if the wife ...				
neglects the children	0.013 (0.017)	6943	0.000 (0.019)	4716
argues with husband	-0.014 (0.020)	6919	-0.032 (0.018)	4703
refuses to have intercourse	-0.011*** (0.003)	6932	-0.012** (0.004)	4707
burns the food	-0.005 (0.005)	6963	-0.008 (0.005)	4730
Agrees with at least one reason	-0.006 (0.020)	6980	-0.028 (0.019)	4745
<b>Note:</b> Data comes from 2008, 2013, and 2018 TDHS married women sample. The year of birth is used as assignment variable. 6-year and 4-year intervals include 1981-1992 and 1983-1990 birth cohorts, respectively. Standard errors are clustered in year of birth level.				

Table 9 reveals the effect of policy on the husband's controlling actions and women's economic independence. Figure A4 in the appendix shows the graphical representation of these variables. We do not find any significant impact of the education on employment of women. This shows that although education is one of the most important channels to integrate women into the labor market, it is not valid in our ever-married women sample, mainly because the obstacles are bigger for married women to participate in the labor market. However, we find a positive impact on the proportion of women who have money to spend, which is an indicator of economic independence and higher bargaining power of women. The percentage of women having money to spend increased by 3 to 5 percentage points with the policy. For controlling actions, in line with the literature (Erten & Keskin 2018) the findings suggest that as education increases, husbands tend to impose greater restrictions on women. However, the results are not robust in both bandwidths, so we argue that there is suggestive evidence in this regard. We solely find a robust and significant impact on the experience of women who reported that their husbands insist on knowing where they are. More specifically, the proportion of women stating this increased by 2 percentage points at the cutoff.



<b>Table 9.</b> The impact of policy on controlling actions and ever-work				
	<b>6-Year Intervals</b>	<b>Obs.</b>	<b>4-Year Intervals</b>	<b>Obs.</b>
Husband ...				
limits contact with her family	-0.002 (0.017)	6971	0.024* (0.011)	4738
insists on knowing where she is	0.017** (0.008)	6966	0.017*** (0.004)	4734
prevents her from seeing friends	0.004 (0.024)	6971	0.010 (0.025)	4738
accuses her of being unfaithful	0.007 (0.005)	6968	0.011** (0.005)	4736
distrusts her with money	-0.013* (0.006)	6968	-0.002 (0.004)	4736
Facing at least one controlling action	0.013 (0.011)	6980	0.024* (0.010)	4745
Woman has her own money to spend	0.032** (0.011)	5094	0.045*** (0.007)	3440
Woman is ever-worked	0.018 (0.016)	6980	0.016 (0.014)	4745
<b>Note:</b> Data comes from 2008, 2013, and 2018 TDHS married women sample. But, the data for the variable asking whether women have money spending by herself comes from 2013 and 2018 TDHS married women sample. The year of birth is used as assignment variable. 6-year and 4-year intervals include 1981-1992 and 1983-1990 birth cohorts, respectively. Standard errors are clustered in year of birth level.				

## 6. Conclusion and Discussion

In this study, we examined the causal relationship between the 1997 compulsory schooling reform and women's empowerment in Türkiye. To evaluate the results of the policy, we compared the outcomes of treated and untreated women by employing a regression discontinuity design and we used 3 waves of nationally representative Turkish Demographic and Health Survey data from the years 2008, 2013, and 2018.

The 1997 education reform plays a fundamental role in women's empowerment since it equips them with knowledge, skills, and confidence to participate fully in society. The estimated findings reveal that the reform increased women's years of schooling, and their probability to complete secondary school (grade 8) and high school (grade 11). Moreover, the educational difference between spouses decreased in the family with the reform. Because the policy is quite effective in improving women's educational outcomes and lowering the spousal educational gap, it is expected to improve women's status and bargaining power in the family as well.

When we check the empowerment-related outcomes of women within the family, results suggest that the extent of women's empowerment is quite limited, suggesting that higher educational attainment and improved educational status compared to husbands are not reflected in daily lives and the perceptions of women. We only see a small increase in the share of women

who agree with the statement that there should be more women politicians (the estimate is 5% over the mean), and there is a considerably bigger increase in the share of women who disagree with the statement that beating can be justified if a wife refuses to have intercourse with the husband (estimate is 40% over the mean). We also see suggestive evidence that the higher educational attainment of women might lead to conflict and more controlling actions faced by women. This result is in parallel with the findings of Erten and Keskin (2018) in the Turkish setting. In our case the effect is minor, the share of women who report that their husbands insist on knowing where they are increases by 1.7 percentage points which is 4 percent over the mean of the outcome. Then, we do not show any effect of the policy on the probability of ever working, we see the share of women who report that they have money to spend increases by 4 percentage points which is 24 percent over the mean of the outcome. This situation is an indication of the higher bargaining power of women in the household, yet the level of education and bargaining power are not enough to participate in the labor market for women. All in all, stronger educational outcomes for women coming with the policy have quite minor empowering effects.

In light of these findings, we can argue that there are considerable challenges that hinder women's empowerment in Türkiye. The traditional gender roles and societal norms deeply rooted in Turkish culture continue to limit women's opportunities and reinforce gender inequalities. Women face barriers in accessing decision-making positions, experiencing violence, and achieving equal pay and work opportunities. The low female labor force participation rate and the persistent gender pay gap clearly indicate the existing disparities.

To address these challenges and achieve true gender equality, a comprehensive approach is needed. It is crucial to continue promoting policies and initiatives that focus on increasing women's education, improving their access to economic opportunities, and combating violence. Additionally, efforts should be made to challenge and transform the traditional gender norms that perpetuate inequality in both the public and private spheres. This requires not only legal and institutional reforms but also changes in societal attitudes and behaviors toward gender roles and women's rights.

In conclusion, while Türkiye has made significant strides toward gender equality and women's empowerment, there is still work to be done. Continued efforts from policymakers, civil society organizations, and individuals are crucial in challenging and transforming the existing norms and creating an inclusive and equitable society where women can fully participate and thrive. Achieving gender equality is not only a matter of justice and human rights but also a prerequisite for sustainable development and a prosperous future for Türkiye.

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Appendix

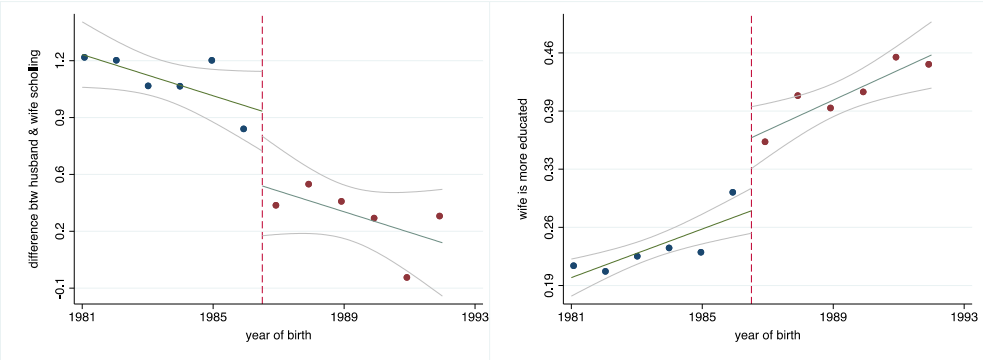


Figure A1. Intersperse educational differences

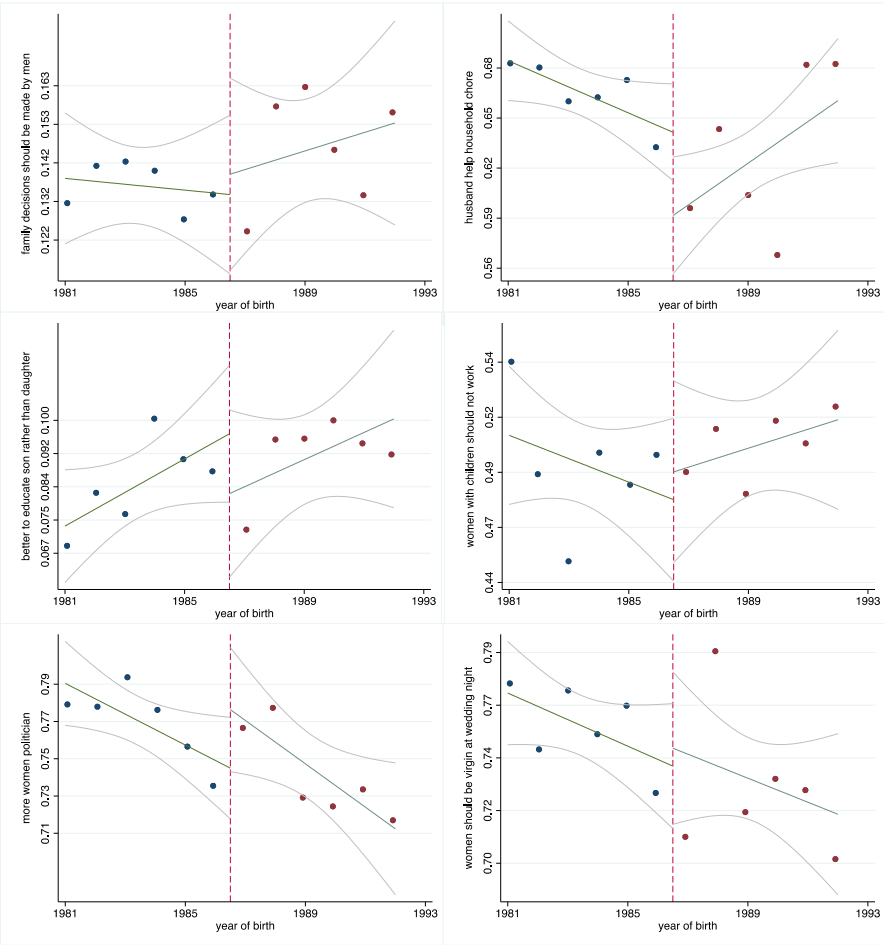
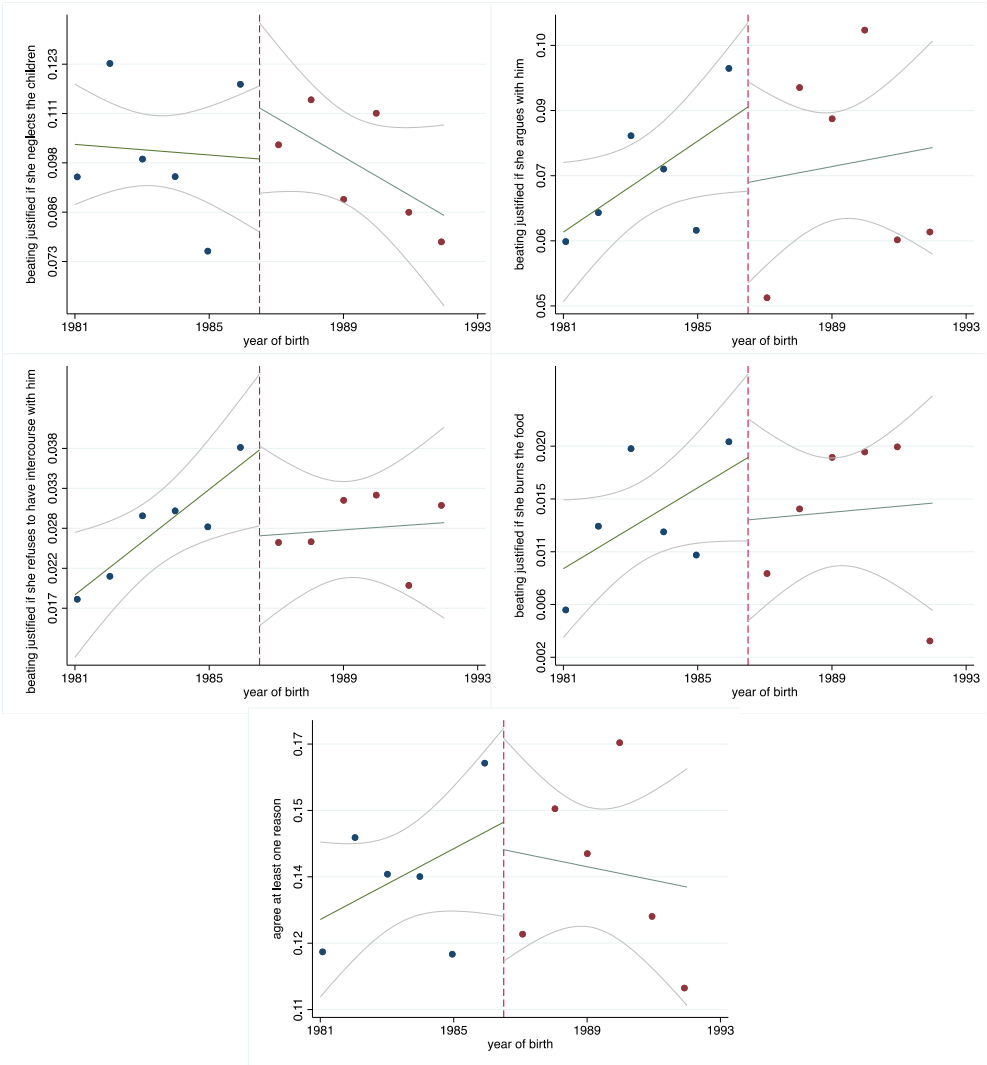


Figure A2. Perceptions about gender roles



**Figure A3.** Attitudes towards physical violence

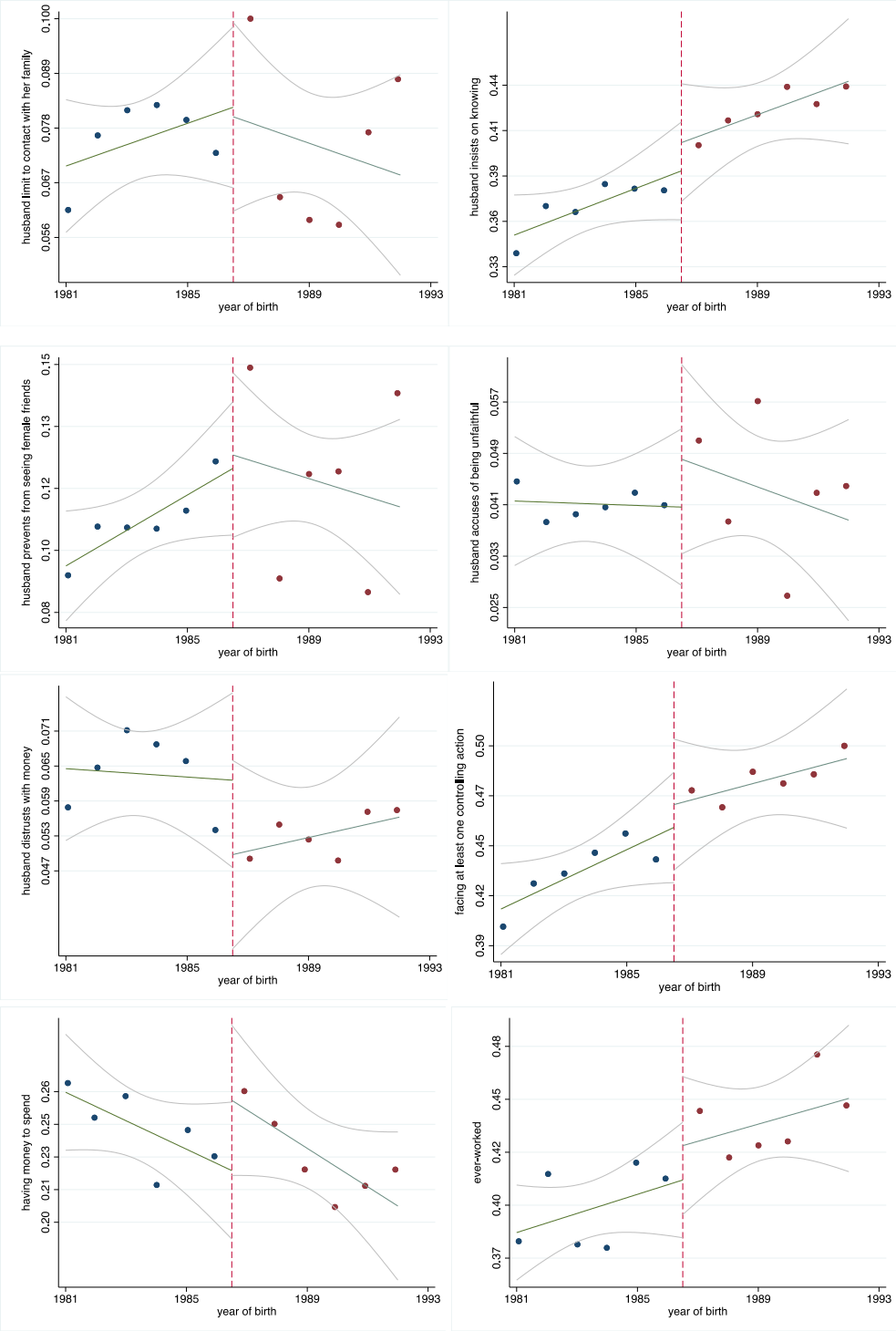


Figure A4. Controlling actions and ever-worked status

## CHAPTER 6

### REGULATIONS IN THE COMPULSORY EDUCATION SYSTEM IN THE TÜRKİYE AND GOVERNMENT SUPPORT

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#### Abstract

Education is the most important requirement for the development of a country. In addition to its economic contributions at the individual and national level, education services provide high social benefits to society as a whole due to their effects such as reducing poverty and gender inequality, creating a healthy society, reducing crime rates, and ensuring peace and stability. Therefore, access to education services in a country is of vital importance. Türkiye is one of the few countries that has managed to improve student achievement while increasing access to education. Over the past decade, significant investment and reform to Türkiye's education system have enabled a major expansion in participation. The country is aware that its core challenge now is to raise the quality of schooling in order to improve student learning outcomes and reduce the large disparities in performance between regions and across different types of schools. In this context, we'll examine the inequalities of education in Türkiye and its influence on international competition capabilities.

**Keywords:** Education, Government's Role in Education, Compulsory Education System



## 1. Introduction

States consist of public institutions organized to meet the collective needs of people living in society. The goods and services produced by public institutions to meet collective needs are called public goods and services. The concept of public goods was first defined in the literature as “collective consumption goods” by Samuelson and then as “social needs / social goods” by Musgrave. Over time, the concept has become established in the literature as “public goods” (Kayıran, 2013: 152).

The state and other public legal entities that engage in economic and social activities by producing public goods and services in the economy constitute the public sector. The main purpose of the activities carried out in the public sector is to provide public benefit or to maximize social welfare. Political and administrative units decide how and for whom products or services will be produced and who will bear the costs. In other words, the political decision mechanism operates in the public sector’s production of goods and services. These decisions are embodied in the public budget and finalized with the approval of the parliament, thus determining the distribution of scarce resources within the public sector (Susam 2020: 7-8).

In a capitalist economic system, markets, in which there are many goods that we will define as private goods, are the best means by which goods and services are distributed to members of society. Although market conditions ensure efficiency in the production of private goods, the state can play some role in this area as well. When there are spillover benefits and costs in private goods, the state intervenes in the economy by encouraging the consumption of some goods and prohibiting the consumption of others in order to increase social welfare. Such private goods are referred to as merit goods, non-merit goods and semi-public goods in the literature. The provision of some goods and services that create external benefits and can be considered as merit goods is directly undertaken by the state. These are private goods that are publicly provided. In public finance books, these goods are usually referred to as semi-public goods, but the main feature of these goods is that they have externalities. These goods are marketable, their benefits are divisible and excludable, and in addition to the private benefits they provide to individuals, they are goods that spread significant external benefits to society. Due to this feature, these goods can be produced by both the public and private sectors. However, since external benefits cause deviations from the optimum resource allocation in the market, these goods are mostly provided by the state. In addition to the benefits provided to individuals in these goods, there are also benefits provided to society. In other words, the total benefit of these goods consists of private benefits and social benefits. Since

semi-public goods are investments in the human factor, they are called social current or development current in development economics. When the production of these goods with high social benefits is left to the private sector, the resulting underproduction will cause welfare losses in society. Therefore, the provision of these goods is undertaken by the state. However, in the financing of these goods and services, private benefits are financed by the individuals using the good, while social benefits are financed by the state (Susam, 2020: 82-83). Education and health are the most typical examples of this type of good.

While education is considered a consumption good because of the knowledge and skills it provides, it is also considered an investment good because it increases the productivity and income of individuals in the future. Especially in human capital studies, education is considered a profit-making investment similar to capital investments. The reason for this is that institutions providing education services do not reduce existing resources, but rather create added value. According to the aforementioned assumption, the increase in the knowledge and skills of individuals contributes to the competitiveness of the national economy. As can be understood, education is an important service that not only benefits individuals separately but also enables individuals to be beneficial to society. For these reasons, determining the price of education, which combines the characteristics of personal and social investment, is shaped differently from the price concept in the market (Mutluer, et al., 2013: 98-100).

In order to understand why education is a state service, the issue of externalities should be emphasized. Gruber explains the reasons for the state's involvement in education services under the following headings, regarding externalities (Gruber, 2011: 292-294):

- *Potential production externality; the fact that an individual with a higher level of education is more productive shows that society also benefits from the education received by this person due to the increase in production.*
- *Citizenship awareness; education increases citizens' level of knowledge and enables them to actively participate in political life through voting.*
- *Credit market failure; in a world where education is not provided by the state, parents need to have sufficient financial means to meet the educational needs of their children. In this world, it is very difficult for a family with a low income to provide education for their children.*
- *Redistribution: In a world where education is a normal good, the demand for education increases in direct proportion to income. Therefore, when financed privately,*

*children from high-income families have a chance to have a higher level of education than children from low-income families. Since a higher level of education increases future income, it will restrict income mobility in the future. Children with low-income parents will be condemned to remain in the same social class in the future.*

When we consider education as a basic need for the development and welfare of the country, distortions in income distribution will also create inequality in the provision of education services. When we relate the issue of income inequality to education, we can see that it has two implications in different directions. One of them is how income inequalities differentiate individuals in society from each other, and in this context, the disadvantages brought about by socioeconomic infrastructure, the inability of disadvantaged groups to benefit from equal opportunities, and the resulting inequality in education (Dinçer and Kolaşın, 2009: 3). The second is to create an educated labor force to eliminate this disadvantageous situation and thus eliminate inequalities in income distribution. These considerations, which are linked to the necessity of equality in education, have created an almost universal consensus that the state should play a role in the provision of education services. At this point, the most important task that the state should undertake is to ensure equal access to public education, to redistribute social status through education, and to prevent the transfer of social inequalities to future generations (Candaş, 2010: 108). Within this framework, the state should ensure that every child has access to educational institutions equipped with equal facilities when they reach the age of education. Each child should be able to easily reach the institution that will provide education in his/her residential area, and the physical conditions between schools should be equal. In the second stage, everyone should be able to acquire the basic skills and competencies they will need at higher levels of education and in the labor market, i.e., the quality of education should be improved. It should be noted that inequalities among students are not limited to equality of opportunity, but are also based on socio-economic conditions, living environment and social factors such as gender differences, ethnicity and mother tongue.

Education is the most important factor in the development of countries and preventing inequalities. That's why shaping education policies according to the needs of the current era is a necessity at individual, national and international levels. In order to achieve these goals, it is necessary to understand the current state of the education system. However, it is very difficult to fit such an important issue into an article. For this reason, the study is limited to the compulsory education system in Türkiye and the general data outlook on education. In this context, a general picture of the Turkish education system is given in the introduction part. In the continuation of the study, changes in the scope of compulsory education in Türkiye will be discussed and Türkiye's development capabilities will be evaluated in an international and local context.

## 2. Compulsory Education System and Current Regulations in Türkiye

Countries organize and implement their education policies in accordance with their unique social, cultural, political and economic characteristics. Therefore, the education system of each country differs according to its historical background and educational philosophy (Kılıç, et al., 2015: 1). In Türkiye, the compulsory education system is governed based on the Constitution and the Basic Law of National Education. The general aim of the education system is to raise individuals who adopt and develop national, moral, humanitarian and cultural values, who have a balanced and healthy character, who have the power of free and scientific thinking, who have a broad world view; to ensure that individuals have a profession that will make them happy and contribute to the happiness of the society (National Education Basic Law No. 1739, Article 2).

In order to achieve these goals, the Ministry of National Education (MoNE) has started to develop five-year strategic plans since 2010. These plans set out the medium-term goals in line with the education policies of the Ministry of Education and draw the roadmap of the relevant ministry in the realization of these goals. While the priority in the Turkish education system has been to expand access to education, the main focus of education policies is to improve the quality of output with the implementation of strategic plans (Kitchen, et al, 2019: 49).

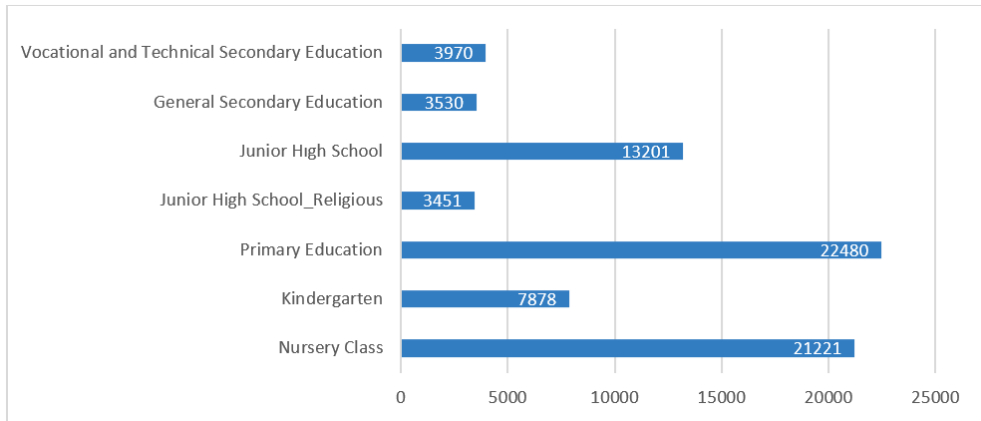
In Türkiye, the compulsory education system is centrally managed by the Ministry of National Education. General directorates and their affiliated units carry out practices that support the education policy (Zapata, et al, 2013: 15). The determination of all policies within the scope of compulsory education and the supervision of implementation are carried out by the Ministry of National Education. In this context, the MoNE is centrally responsible for the development of the curriculum, approval of textbooks, determination of student achievement assessments, distribution of human and financial resources, and school inspections. In this context, when compared with OECD countries, Türkiye ranks in the top places in determining and implementing education policies centrally. Among European countries, only Greece and Luxembourg have a similar degree of central government decision-making power, and their school systems are significantly smaller than Türkiye's. Türkiye has by far the largest school system in Europe, with nearly 54,000 public and private schools, 1 million teachers and over 16 million students, spread over an area twice the size of Germany (Kitchen, et al, 2019: 49). The fact that the central government is the dominant decision-maker in compulsory education is also reflected in decisions on budgeting made in this field. While 99% of the public

financing for compulsory education in Türkiye is provided by the central government, the average of OECD countries is 68% in this context (OECD, 2021a: 279). An important part of these expenditures is personnel expenditures, which include the salaries of teachers and school principals (OECD, 2021b: 6).

Compulsory education in Türkiye has undergone various reforms over the years. The compulsory education period, which was implemented as 8 years until 2012, was amended on February 20, 2012, with the “Draft Law on the Amendment of the Primary Education and Education Law and Some Laws”. With this law, a 12-year compulsory education system was introduced and this period was divided into three stages. The first level is organized as a 4-year primary school, the second level is a 4-year lower secondary school, and the third level is a 4-year secondary education (Kayıp & Kartal, 2021: 4778).

When we look at the types of schools in the Turkish education system, it is seen that preschool education is divided into two: kindergarten and nursery classes. While nursery class consists of the 3-6 age groups, kindergarten covers only the 6 age group. Pre-primary education is followed by primary school (6-10 years old), lower secondary school (10-14 years old), secondary education (14-18 years old) and higher education level. While the stages from primary school to higher education are within the scope of compulsory education and are affiliated with the MoNE, universities within the scope of higher education are affiliated with the Council of Higher Education (YÖK).

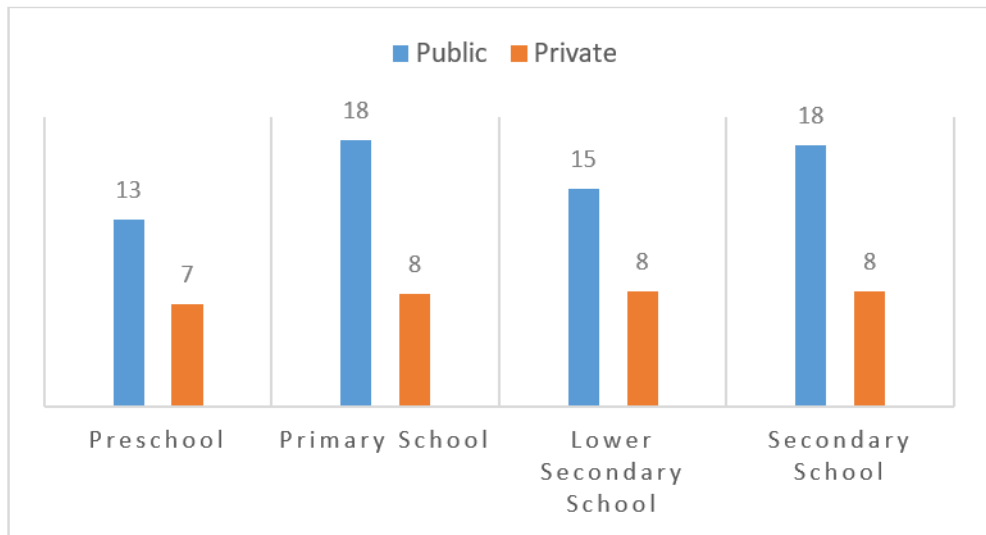
Considering the number of public schools by education type in the 2021-2022 academic year, there are 29,099 preschool education institutions, 22,480 primary schools, 3,451 religious lower secondary schools, 13,201 lower secondary schools, 3,530 general secondary education institutions and 3,970 vocational and technical secondary education institutions in Türkiye (Figure 1).



**Figure 1.** Number of Schools by Types of Education, 2021-2022

**Source:** MoNE Statistics, <https://istatistik.meb.gov.tr/KurumSayisi/OkulTuruneGore>, 08.07.2023

When we look at the distribution of teachers according to education types in public institutions, it is seen that most teachers are at the lower secondary school level, followed by secondary education and primary school, respectively. The order of the number of students in public institutions continues as lower secondary education, primary school and secondary education. When the number of students per teacher is compared among the education types, it is seen that this rate is in favor of private schools. According to this, while there are 7 students per teacher in private schools in the pre-school period, 13 students in public institutions, 8 in private primary schools, 18 in public schools, 8 in private lower secondary schools, 15 in public schools, and 8 in private secondary education, while it is 18 in public schools (Figure 2). Since the classes with fewer students make one-to-one communication with students more possible, this significant difference in the number of students per teacher is an indication that those who do not have access to private schools may be far from achieving equality of opportunity in their education life.



**Figure 2.** Number of Students Per Teacher, 2021-2022

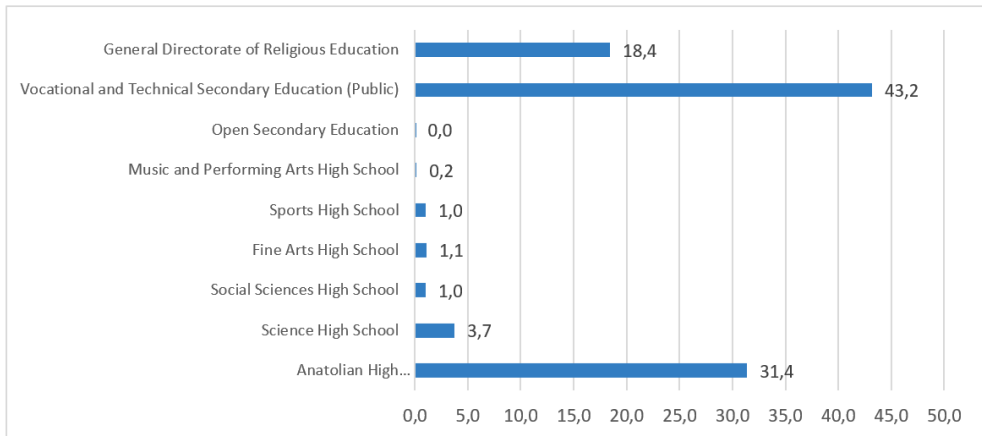
**Source:** MoNE Statistics, <https://istatistik.meb.gov.tr/KurumSayisi/OkulTuruneGore>, 10.07.2023

There have been many reforms in the Turkish education system in terms of both entrance to exams (Table 1) and the teaching process within the scope of secondary education. The common purpose of the changes in the exams for transition to secondary education is stated as *“reducing the use of out-of-school resources, preventing the exam from being the only and main goal for students, preventing the trivialization of higher level skills and basic life skills, preparing students for real life, ensuring equality of opportunity, reducing test anxiety in students, increasing participation in social, cultural, artistic and sportive activities and reducing school absenteeism”* (MoNE, 2013). However, the large number of changes made in exams in the last 20 years indicates that the search for effective systems to achieve qualitative goals continues.

<b>Table 1.</b> Change in Secondary Education Transition Exams in the Turkish Education System	
<b>Implementation Years</b>	<b>Arrangements Made</b>
1997-2004	Separate exams for private schools and police colleges were abolished and gathered under one roof under the name of High School Entrance Examination.
2005-2008	Secondary Education Institutions Selection and Placement Examination started to be implemented.
2008-2011	Multiple Level Determination Exam (SBS) and Secondary Education Transition System (OGES) were implemented.
2011-2013	The Transition System to Secondary Education with Single SBS was implemented.
2013-2017	Transition from Elementary Schools to Secondary Schools Exam (TEOG) was implemented.
2018-....	High School Entrance Exam started to be implemented
<b>Source:</b> (ERG, 2017: 6-7). <a href="https://www.egitimreformugirisimi.org/wp-content/uploads/2017/03/TEOG_BilgiNotu.07.12.17.web_.pdf">https://www.egitimreformugirisimi.org/wp-content/uploads/2017/03/TEOG_BilgiNotu.07.12.17.web_.pdf</a> , 09.07.2023.	

In order for the students to compete with the students of the European Union (EU) countries, secondary education started to be implemented as 4 years in the 2005-2006 academic year (MoNE Report on the Year 2008 Budget, 2007: 15). Also, in this period, it was decided to gradually transform general high schools into Anatolian high schools and it was implemented in 2010. The purpose of this transformation was explained as increasing the quality in secondary education and directing more students to vocational and technical secondary education. With the process completed in 2013, 1,477 general high schools were transformed into *Anatolian High Schools, Vocational and Technical High Schools and Religious High Schools*. As a result of this process, together with the newly opened high schools, the number of Vocational and Technical High Schools increased by 23%, the number of Anatolian High Schools by 57%, and the number of Religious and Anatolian Religious High Schools increased by 73% (ERG, 2014: 24).

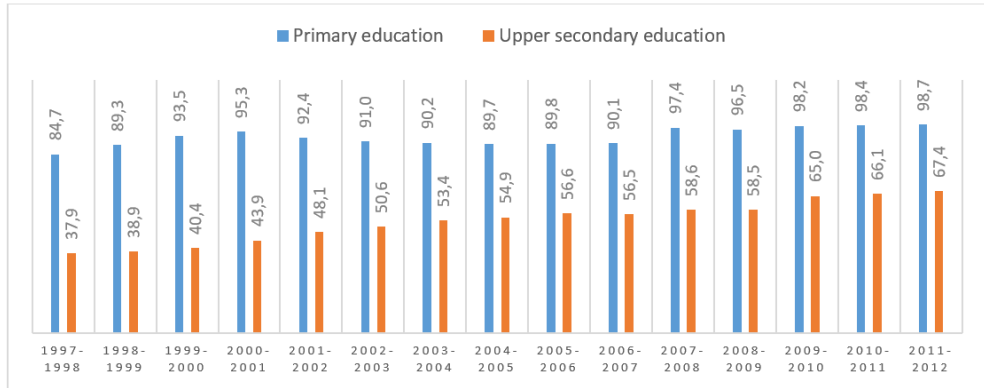
In the 2021-2022 education period, secondary education institutions providing the most vocational and technical education take first place with a ratio of 43.2%, followed by Anatolian high schools with 31.4% and secondary education institutions providing religious education with 18.4% (Figure 3).



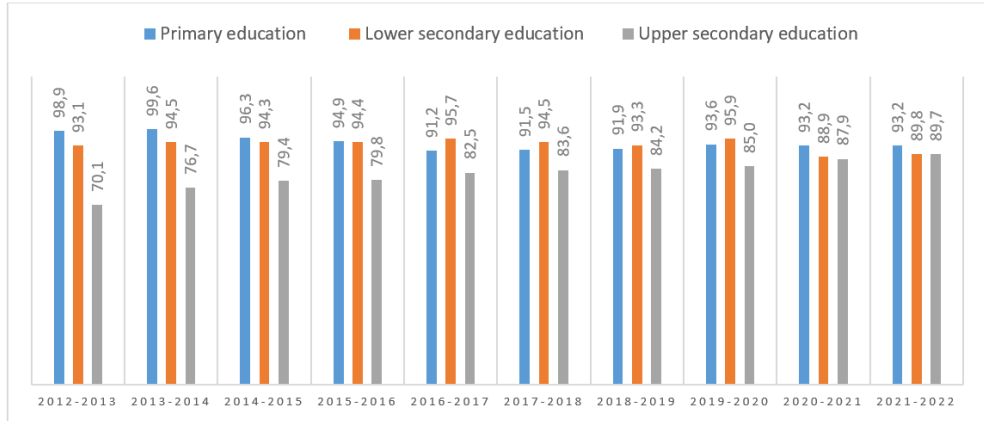
**Figure 3.** Ratios of Public Schools in Secondary Education by Type, 2021-2022  
**Source:** MoNe, <https://sgb.meb.gov.tr/www/resmi-istatistikler/icerik/64> , 08.07.2023

The positive effects of the changes made in the compulsory education period are seen in the schooling rates. While the secondary school enrollment rate in the 8-year compulsory education implemented increased every year, it was around 60% in 2012 (Figure 4). In addition to factors such as changes in social structure and urbanization, this rate has increased to 90% with the transition to 12-year compulsory education (Figure 5).



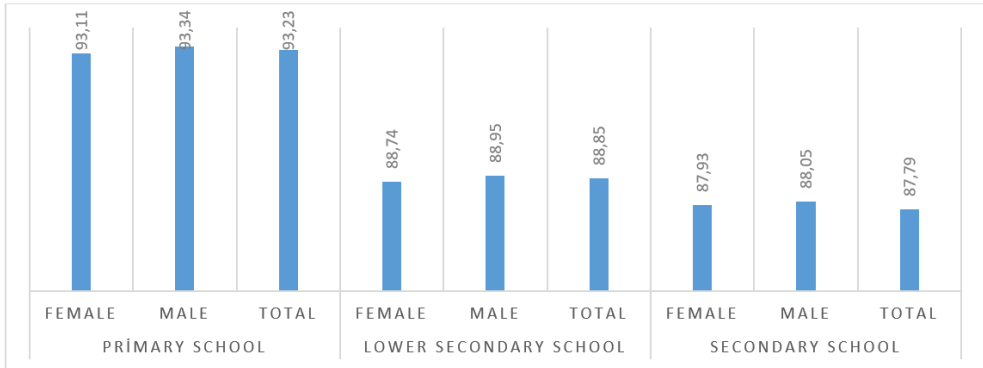


**Figure 4.** Enrollment Rate by Educational Year and Level of Education (8-Year Compulsory Education)  
**Source:** Türkstat Education Statistics, <https://data.tuik.gov.tr/Kategori/GetKategori?p=egitim-kultur-spor-ve-turizm-105&dil=1> , 09.07.2023



**Figure 5.** Enrollment Rate by Educational Year and Level of Education (12-Year Compulsory Education)  
**Source:** Türkstat Education Statistics, <https://data.tuik.gov.tr/Kategori/GetKategori?p=egitim-kultur-spor-ve-turizm-105&dil=1> , 09.07.2023

As of the 2020-2021 academic year, enrollment rates are given in Figure 6 for each of the primary, secondary and secondary education levels. The schooling rate in primary school is 93%, in secondary school it is 89%, and in secondary education it is 87.8%. Although it is seen that the schooling rates are high in all three stages of compulsory education, it is also striking that there is a decrease as the education process progresses. In all three stages of compulsory education, the difference in enrollment rates between female and male students is quite low, but the ratio of male students is slightly higher.



**Figure 6.** Enrollment Rate, 2020-2021

**Source:** MoNE Statistics, <https://istatistik.meb.gov.tr/OkullasmaOrani/Index> , 08.07.2023

### 3. Financial Support of the State to the Turkish Education System

The effectiveness of education and thus the level of human capital may increase as a result of the budget allocated to education. When the budget of the MoNE is examined within the scope of the appropriations allocated for education, it is seen that there has been an increase over the years. On the other hand, when these figures are compared with the budget share and national income, it is seen that the proportional share of the increased appropriations does not change in general (Table 2).

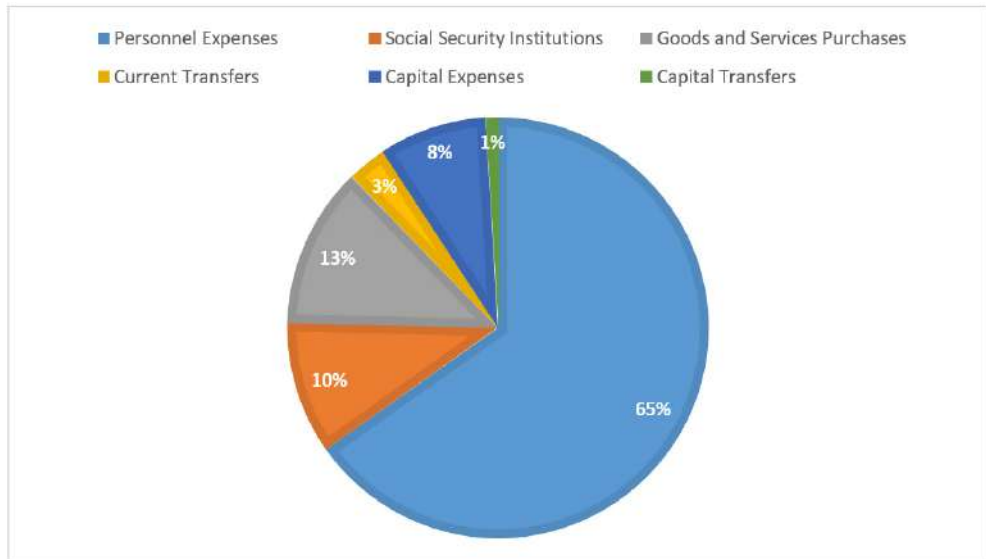
**Table 2.** MoNE Budget Share and Ratio to GDP

Years	Ratio to GDP	Budget Share
2008	2.41	10.3
2009	2.88	10.47
2010	2.57	9.84
2011	2.63	10.91
2012	2.76	11.16
2013	3.03	11.76
2014	3.19	12.81
2015	2.65	13.11
2016	2.93	13.38
2017	2.8	13.18
2018	2.69	12.13
2019	2.56	11.84
2020	2.48	11.45
2021	2.21	10.91
2022	2.4	10.79

**Source:** (MoNE, 2023: 58).

[https://sgb.meb.gov.tr/meb\\_iys\\_dosyalar/2023\\_05/28173625\\_MEB\\_2022\\_Faaliyet\\_Raporu-son.pdf](https://sgb.meb.gov.tr/meb_iys_dosyalar/2023_05/28173625_MEB_2022_Faaliyet_Raporu-son.pdf), 09.07.2023

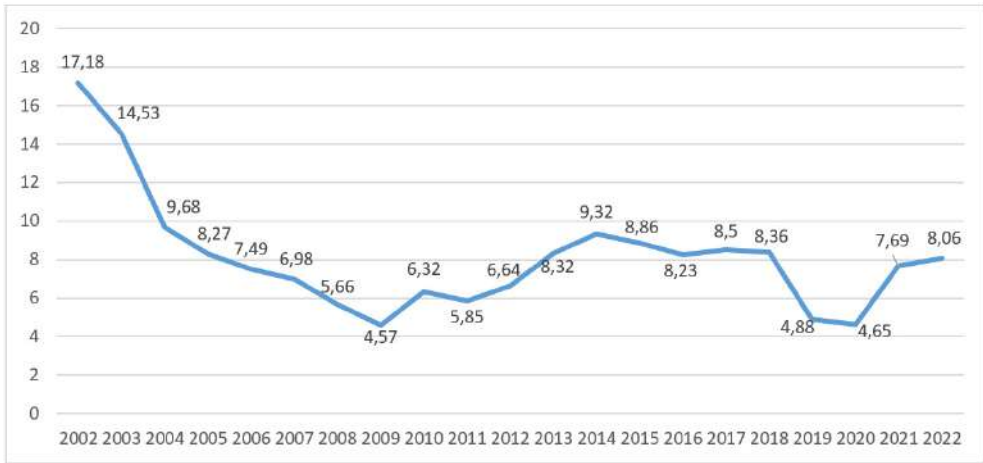
Looking at the budget distribution of the Ministry of National Education as of 2022, the highest share is made for personnel expenditures at 65%, followed by goods and services purchases (13%) and social security expenditures (10%). It is observed that capital expenditures are at the level of 8% (Figure 7).



**Figure 7.** MoNE Budget Allocation Distribution, 2022

**Source:** (MoNE, 2023: 49). [https://sgb.meb.gov.tr/meb\\_iys\\_dosyalar/2023\\_05/28173625\\_MEB\\_2022\\_Faaliyet\\_Raporu-son.pdf](https://sgb.meb.gov.tr/meb_iys_dosyalar/2023_05/28173625_MEB_2022_Faaliyet_Raporu-son.pdf), 09.07.2023

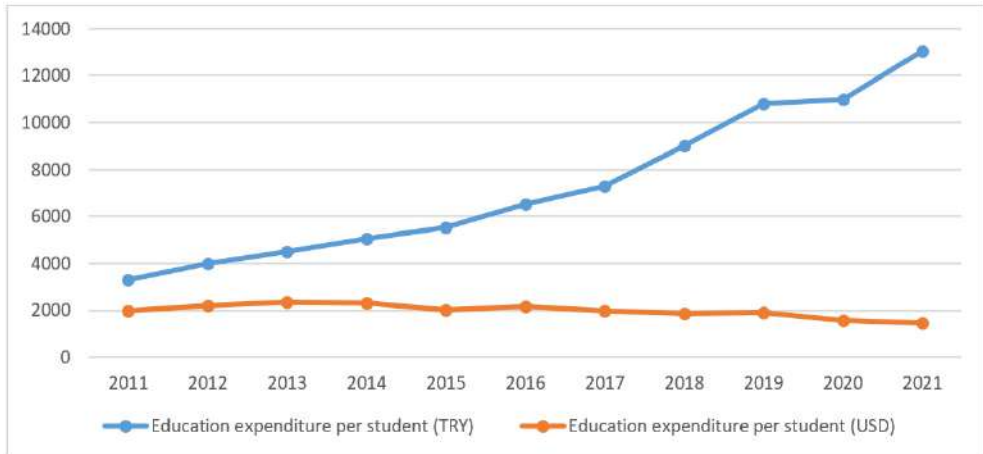
When we look at the distribution of physical investments in education over the years, a general decrease is observed. Capital expenditures, which were 17% in 2002, decreased to 4% around 2009. The increase seen from 2009 to 2014 can be interpreted as a requirement of the reforms made in the compulsory education system in these years. Physical investments in education decreased to approximately 5% in 2020 and hovered around 8% by 2022 (Figure 8).



**Figure 8.** The Share Allocated to Capital Investments from the MoNE Budget

**Source:** MoNE Activity Reports, <http://sgb.meb.gov.tr/www/dokumanlar/icerik/30>, 08.07.2023

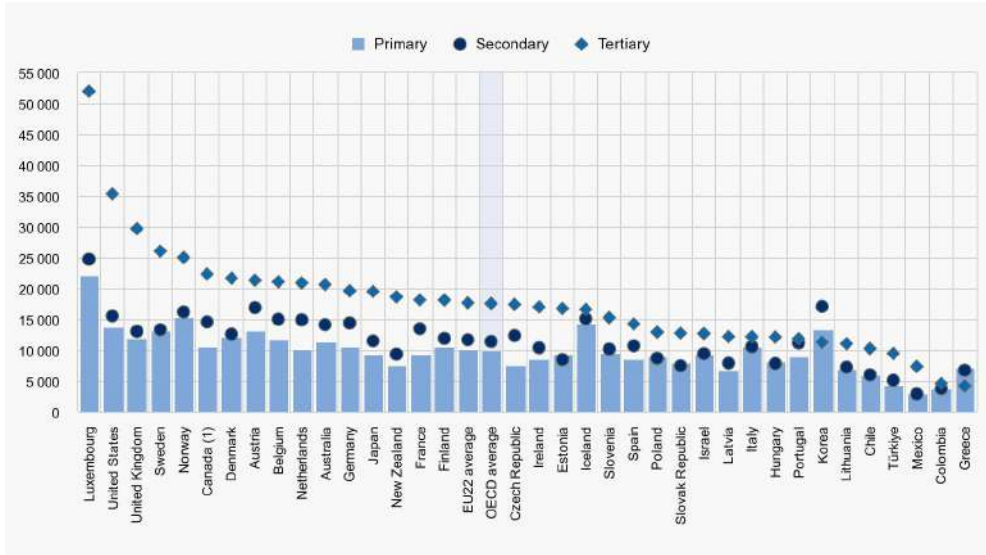
When we look at the expenditures per student within the scope of compulsory education (not including higher education) in the ten-year period between 2011 and 2021, there is a significant increase in Turkish Lira, but when the same data is reviewed in US dollars, it is seen that there is a decrease in contrast to the increase. Accordingly, although the expenditures in Turkish Lira increased from approximately 3,000₺ to 13,000₺, this figure decreased from approximately \$2,000 to \$1,489 in dollar terms (Figure 9).



**Figure 9.** Total Education Expenditure per Student

**Source:** TurkStat, Education Statistics, <https://data.tuik.gov.tr/Kategori/GetKategori?p=egitim-kultur-spor-ve-turizm-105&dil=1> 08.07.2023

Looking at all OECD countries in 2019, it is seen that the average annual expenditure per student at primary, secondary and tertiary levels is around \$12,000. When the expenditures are analyzed on the basis of countries, it is seen that while it is around \$3,600 in Mexico, it varies between about \$17,500 in Austria and Norway, \$19,500 in the United States and \$25,400 in Luxembourg (Figure 10).



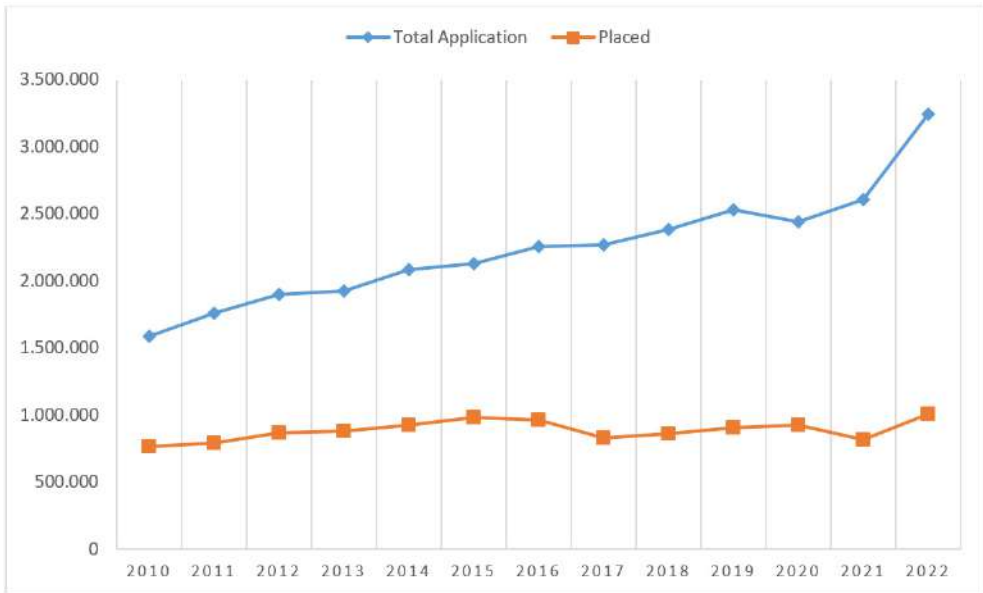
**Figure 10.** Education Expenditures per Student in OECD, 2019

Source: OECD, (2022). Education at a Glance 2022.

#### 4. Reflections of Success in Secondary Education on Higher Education in Türkiye

The importance of higher education in employment participation is undeniable. In this context, the current situation of secondary school students in transition to university will be examined in the following parts of the study.

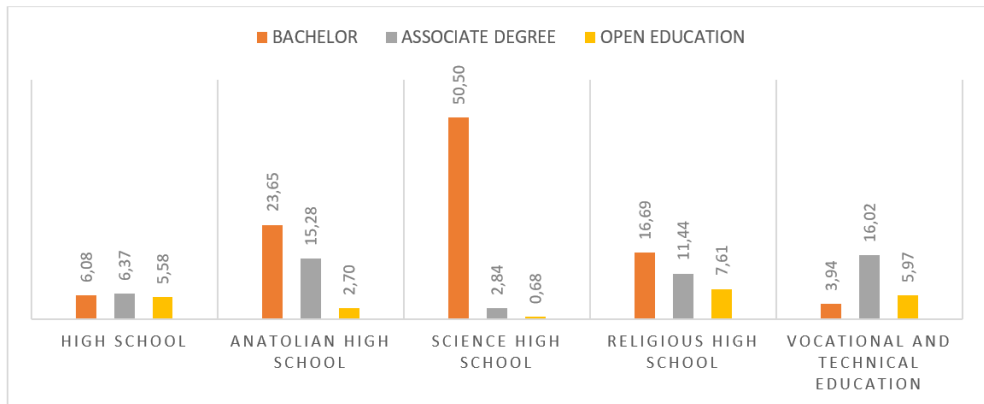
When we look at the years between 2010 and 2022, it is seen that there is a substantial increase in the number of people applying to university as a reflection of the increase in the population. While the number of these people was 1.6 million in 2010, this figure doubled to 3.2 million by 2022. Looking at the number of people enrolled in universities, it is seen that while 700,000 people enrolled in 2010, 1,000,000 people enrolled in 2022 (Figure 11).



**Figure 11.** Universities by Year - Number of Applicable and Placed Candidates

**Source:** YÖK Statistics, <https://istatistik.yok.gov.tr/> 08.07.2023

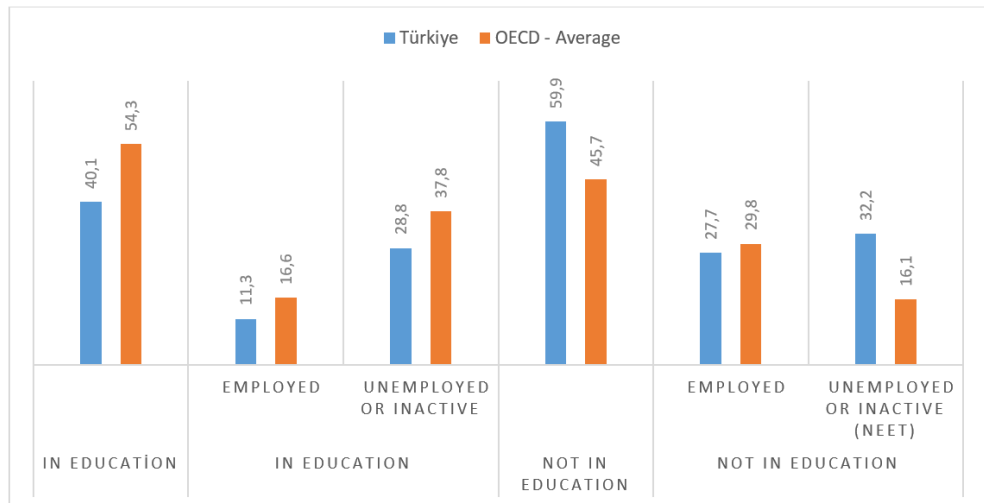
In Figure 12, the distribution of the graduates of the secondary education institutions with-in themselves to the universities in 2022 is examined. According to this, the rate of placement of general high school graduates in a university at the undergraduate level is 6%. It can be said that the reason why this rate is quite low is due to the fact that such schools have not had graduates for a while due to the changes made in general high schools. The undergraduate placement rate of Anatolian high school graduates is 23%, the undergraduate placement rate of science high school graduates is 50%, religious schools are 17%, and vocational and technical secondary education institutions are approximately 4%.



**Figure 12.** Ratio of Applicants and Placed in Higher Education Programs  
According to School Type and Educational Status, 2022

**Source:** YÖK Statistics, <https://istatistik.yok.gov.tr/> 08.07.2023

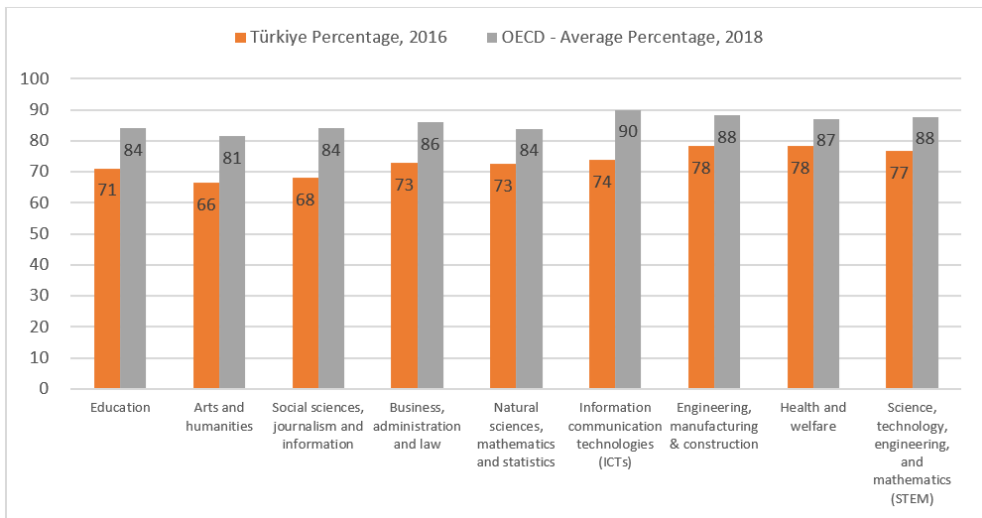
In Figure 13, the transition rates from school to work life for the 18-24 age group as of 2021 are examined. It is seen that 40% of the said age range in Türkiye receives education and 60% is out of education. In this age range, it is seen that the rate of those who take part in both education and employment is 11%. In this age range, the ratio of those who are neither in education nor employed is approximately 32%. Considering the OECD average, it is seen that 54% of the said age range is in education and 46% is out of education. In this age range, the rate of those who are both in education and employment is 17%, and 16% of this age range are neither in education nor employed.



**Figure 13.** Transition from School to Work 18 to 24 Years, 2021

**Source:** OECDStat, [https://stats.oecd.org/?\\_ga=2.33210622.158927000.1688803149-1974770237.1688803149\\_08.02.2023](https://stats.oecd.org/?_ga=2.33210622.158927000.1688803149-1974770237.1688803149_08.02.2023)

In Figure 14, the employment status of people aged 25-64 with a higher education diploma in Türkiye (2016) and OECD average (2018) is given, according to their education fields. Although there is a year difference in terms of data, in general, the employment rate of people in the relevant higher education field in Türkiye is lower than the OECD average in all fields of education. This difference is more prominent in the groups of information and communication technologies, communication, social and human sciences, education and natural sciences, and mathematics and statistics. The negative difference between Türkiye and the OECD average may be due to lower general employment rates or being employed in a sector different from the area of expertise. Both cases show that investments made in education do not create effective outputs in terms of employment.



**Figure 14. Employment Rates by Field of Study**

**Source:** OECDStat, [https://stats.oecd.org/?\\_ga=2.33210622.158927000.1688803149-1974770237.1688803149#](https://stats.oecd.org/?_ga=2.33210622.158927000.1688803149-1974770237.1688803149#), 10.02.2023

Qualified human power, when used effectively and efficiently, is the guarantee of prosperity and economic freedom at both individual and societal levels. Therefore, the proportion of university graduates between the ages of 25-64 who are not employed is ranked within the scope of the ten countries with the highest score in the Human Development Index (HDI) in 2021. As seen in Table 3, countries with high human development scores have very low rates of university graduates who are not employed. Accordingly, while Switzerland, which has the highest HDI score, has an unemployment rate of 3% at the relevant education level, this rate is approximately 10% in Türkiye, which ranks 48th. In dollar terms, Türkiye is also the country with the lowest GDP (USD/capita) ranking among the relevant countries.



**Table 3.** Development Indexes by OECD Countries, 2021

Countries	Human Development Index <sup>1</sup>	Unemployment Rates by Education Level <sup>2</sup> (Tertiary, % of 25-64 year-olds)	GDP US dollars/capita <sup>3</sup>
Switzerland	0.962	3.489084	75969.79
Norway	0.961	2.471835	81871.64
Iceland	0.959	-	58198.49
Hong Kong, China (SAR)	0.952	-	65892.58
Australia	0.951	3.017769	62095.4
Denmark	0.948	3.892657	66117.73
Sweden	0.947	4.24895	60396.72
Ireland	0.945	-	106879.2
Germany	0.942	2.349271	58799.01
Netherlands	0.941	2.635519	63369.16
Türkiye	0.838	9.986354	30679.51

Source: <sup>1</sup>UNDP, Human Development Reports, <https://hdr.undp.org/data-center/human-development-index#/indicies/HDI>, 17.07.2023; <sup>2</sup>OECD Data (a), <https://data.oecd.org/unemp/unemployment-rates-by-education-level.htm#indicator-chart>, 17.07.2023; <sup>3</sup>OECD Data (b), <https://data.oecd.org/gdp/gross-domestic-product-gdp.htm>, 17.07.2023

Table 4 compares primary and secondary education enrollment levels at NUTS 1 level with human development index and per capita income (\$) in Türkiye in 2021. While there is no significant difference in schooling rates between regions at the primary education level, there is a difference at the secondary education. The table shows that the most striking regions in terms of secondary education are located in Eastern Anatolia. North East, Central East and South East Anatolia regions, which have the lowest enrollment levels in secondary education, also have the lowest human development level and per capita income.

**Table 4.** Development Indexes in Türkiye by Region, 2021

Regions (NUTS 1)	Primary Education Enrollment Rate <sup>1</sup>	Secondary Education Enrollment Rate <sup>1</sup>	Human Development Index <sup>2</sup>	GDP per Capita <sup>3</sup> , \$
İstanbul-TR1	94.31	92.01	0.867	15 666
West Marmara-TR2	95.12	91.36	0.838	10 535
Meditertanean-TR3	94.46	91.63	0.815	9 300
East Marmara-TR4	94.44	93.52	0.846	11 918
West Anatolia-TR5	94.35	93.53	0.854	10 206
Aegean-TR6	94.46	90.43	0.836	7 522
Central Anatolia-TR7	93.58	92	0.816	6 923
West Black Sea-TR8	93.56	94.33	0.809	6 701

**Table 4.** Continued

<b>East Black Sea-TR9</b>	92.77	94.48	0.821	5 836
<b>North East Anatolia-TRA</b>	94.62	82.15	0.797	5 095
<b>Central East Anatolia-TRB</b>	94.3	83.61	0.773	4 653
<b>South East Anatolia-TRC</b>	94.62	80.66	0.762	5 054

**Source:** <sup>1</sup>Türkstat, Education Statistics, <https://data.tuik.gov.tr/Kategori/GetKategori?p=egitim-kultur-spor-ve-turizm-105&dil=1>, 17.07.2023. <sup>2</sup>GlobalDataLaB, HDI – Subnational <https://globaldatalab.org/shdi/table/shdi/TUR/?levels=1+4&years=2021&interpolation=0&extrapolation=0>, 17.07.2023. <sup>3</sup>Türkstat, National Accounts Statistics, <https://data.tuik.gov.tr/Kategori/GetKategori?p=Ulusal-Hesaplar-113>, 17.07.2023.

As mentioned at the beginning of the study, education not only contributes individually, but also benefits the society as a whole. The role of education, especially compulsory education, in ensuring development and reducing inequalities is undeniable. Therefore, ensuring that people living in every region of the country have access to education services not only contributes to both regional and national development but it also makes international competition possible.

## 5. Conclusion

Important reforms have been carried out in the Turkish education system during the hundred-year period from the establishment of the Turkish Republic in 1923 to the present day. Particularly, the remarkable increase in the literacy and schooling rate for a country with a young population density can be considered as a success of these reform efforts.

In a globalizing world, it is inevitable for Türkiye to continue its reform efforts and develop education systems suitable for its socio-economic structure in order to improve its economic, political and social competitiveness. It is necessary not only to carry out reform efforts but also to implement them and monitor the performance outputs by managing the processes well.

Despite the importance and support given to education in Türkiye, it is below the desired level of success in world education rankings. An important criterion for achieving this success is ensuring good talent management, starting with the early education system and throughout the compulsory education process. This is possible by determining the abilities of all students in the presence of consultant trainers and directing them to fields according to their abilities. Thus, specialization will be achieved in a shorter period of time, paving the way for employment opportunities for young people in their own fields.

In Türkiye, the traditional incentivization of students for higher-scoring fields and the increased demand for certain high schools and certain fields in higher education both limit the

students' abilities and demotivate them. Directing students to a field they do not want according to their exam success is also a major obstacle to education-business interaction. Although reform efforts in Türkiye are based on talent in secondary education, since the situation is determined by exams rather than talent, young people who are talented but do not perform well in the exam do not have the opportunity to specialize in the fields they want. The heavy burden placed on students by Türkiye's examination system also prevents the definition of appropriate quotas and emphasizes only success or failure. However, young people should be directed to fields in which a country needs specialized manpower and according to their abilities during secondary education. This will also prevent the discrediting of some professions by preventing crowding into popular fields.

In conclusion, the implementation and the outcome of the reform processes in the Turkish education system are as important as the reform processes themselves. In this education system, which does not offer equal opportunities, all children are evaluated with the same exams. Creating a competitive environment where equal opportunities are not provided forces many students to study in fields they do not want or are not interested in. For this reason, instead of educated manpower suitable for the socioeconomic structure of the country, the society is faced with individuals who have completed compulsory education without any specialization or who have completed higher education and cannot find a job in the field they want to work in. In this context, reforms in the Turkish education system should be carried out in harmony with socioeconomic developments. In addition, planning should be made for fields in which specialized manpower is needed in Türkiye's existing resources from the early education period and the education system should be adapted to this situation.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 7

### PROGRESS ON SUSTAINABLE DEVELOPMENT GOAL 5 IN TÜRKİYE: PREVENTION OF VIOLENCE AGAINST WOMEN AND GIRLS AND PROMOTION OF GENDER EQUALITY

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#### Abstract

According to the 2022 Sustainable Development Goals Report, Türkiye's lowest average performance is in Gender Equality (SDG 5). Türkiye's gender equality trend is stagnant, and significant challenges need to be addressed. In this regard, this chapter provides an assessment of violence against women and children, early, and forced marriage in Türkiye, with a particular focus on Targets 5.2 and 5.3. It utilizes national, international, and independent data sources. The chapter consists of three sections. The first section discusses the global outlook on Targets 5.2 and 5.3. The second section evaluates violence against women in Türkiye through the lens of legal regulations/civil society activism and Türkiye's progress on Target 5.2. The third and final part addresses children, early, and forced marriage in Türkiye through legal framework and progress on Target 5.3. The chapter highlights the relationship between gender equality and global indicators and discusses their effectiveness. Regarding Türkiye's progress within the Sustainable Development Goals framework, particular emphasis is placed on providing regular and publicly available data on violence against women and child, early, and forced marriage, such as problems regarding the "gender data gap." In this context, the conclusion section offers an assessment of the effectiveness of indicators and the need to review Türkiye's data policy.

**Keywords:** Child, early and forced marriage (CEFM), SDG 5, sustainable development goals, Türkiye, violence against women (VAW)



## 1. Introduction

Violence against women and girls (VAWG) constitutes a violation of their rights, hinders their complete engagement in all aspects of life, and serves as both a cause and an outcome of gender inequality. It draws strength from gender bias and enforces gender norms. Ending violence is a precondition to achieving gender equality and positive peace. From a broad perspective, VAWG is a significant factor related to the dimensions of sustainable development - social, ecological, and economic - and hinders sustainable development by diminishing the well-being of all individuals (Bigler, 2022, p. 9).

In the present day, there is widespread recognition that VAWG is a global issue. International and transnational efforts, along with advocacy and regulations, have played a crucial role in raising awareness about VAWG and promoting the adoption of policies to address and prevent such violence. There are four basic feminist understandings of the scope and framing of VAW. These can be listed as follows: VAW is a violation of human rights, a manifestation of gender inequality, it includes many forms and locations and has no boundaries, and it is a universal and global issue (Montoya, 2013, pp. 15-19). The global nature of violence has caused the combating violence not to stay within the borders of nations but to gain an international dimension. “Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)” (1979) imposed a responsibility on the state parties to ensure equality between women and men and to end discrimination. In the following years, this agenda was further advanced with Recommendations of the CEDAW Committee. For instance, Recommendation No. 12 of the CEDAW Convention, dated 1989, stated that states were obliged “to protect women against the incidence of all kinds of violence in everyday life” (CEDAW Committee, 1989). Moreover, the Committee’s Recommendation No. 19 of 1992 defined gender-based violence (GBV) as “a form of discrimination that seriously inhibits women’s ability to enjoy rights and freedoms on a basis of equality with men” (CEDAW Committee, 1992).

The collective efforts of transnational activism have resulted in recognizing (VAW) as a violation of human rights, a form of discrimination, and a significant public health concern. Preventing VAWG has gained prominence on the agenda of governments and international organizations, particularly the United Nations (UN). The “Declaration on the Elimination of Violence against Women” by the UN (1993) explicitly addressed and defined as “any act of gender-based violence that results in or is likely to result in physical, sexual, or psychological harm or suffering to women, including threats of such acts, coercion, or arbitrary deprivation of liberty” (United Nations, 1993). The “Beijing Declaration and Platform for Action” adopted

in 1995 identified VAW as one of the 12 critical areas and emphasized that it is a universal issue with a significant impact on victims, their families, and communities (Beijing Declaration, 1995). Five years later, in 2000 (Beijing+5), parties gathered to “review the progress of the Beijing Platform for Action” (United Nations, 2000a). The same year the “Millennium Development Goals (MDGs) Conference” was held in 2000, and the “Millennium Declaration” was adopted. The declaration aimed “to promote gender equality and empowerment of women” as one of the eight MDGs. It resolved “to combat all forms of violence against women” and to implement the CEDAW Convention (United Nations, 2000b). However, MDG 3, “Promote Gender Equality and Empower Women,” remained silent on various issues such as reproductive rights, VAW, unjust laws, etc. (Kabeer, 2005, p. 22). Therefore, the MDGs did not mention VAW. Beijing +10 emphasized the importance of effectively implementing the “Beijing Platform of Action” by all states, including eliminating VAW in 2005 (United Nations, 2005). A year later, the UN Secretary-General publicized the “In-Depth Study on All Forms of Violence against Women,” the UN’s most comprehensive report on VAW. This report (2006) aimed to “identify ways and means to ensure more sustained and effective implementation of State obligations to address all forms of violence against women, and to increase State accountability.”

In May 2011, “the Council of Europe Convention on Preventing and Combating Violence against Women and Domestic Violence (Istanbul Convention),” which aims to combat VAW in Europe, was opened to signature in Istanbul. The Istanbul Convention, established under the guidance of CEDAW measures and influenced by the jurisprudence developed by the CEDAW Committee, stands as the inaugural legally binding instrument in Europe dedicated to combating VAW. While both are human rights conventions with a gender-based approach, CEDAW aims “to prevent all forms of discrimination against women” (Article 1), and the Istanbul Convention seeks to achieve a Europe without VAW and domestic violence within specific objectives (Article 1).

A significant indicator of the robust standards provided by CEDAW on equality and non-discrimination and the comprehensive framework outlined by the Committee is evident in Article 12 of the Istanbul Convention. This article states: “Parties shall take the necessary measures to promote changes in the social and cultural patterns of behavior of women and men with a view to eradicating... all other practices which are based...on stereotyped roles for women and men.” The foundation of this provision that compels states to promote “transformative equality” lies in the conceptual framework developed by the CEDAW Com-

mittee.<sup>1</sup> Although CEDAW does not explicitly define the concept of equality, the Convention encompasses different types of equality: formal, substantive, and transformative. These types of equality have been clarified by the Committee (Cusack & Pusey, 2013, p. 10). The Committee's approach to transformative equality focuses on two distinct but interconnected categories of obligations. The first category deals with the transformation of institutions, systems, and structures that perpetuate discrimination and inequality. The second category involves changing or transforming harmful norms, prejudices, and stereotypes (Cusack & Pusey, 2013, pp. 11-12). In this context, transformative equality offers an opportunity to address the underlying causes of VAWG by scrutinizing societal and institutional structures and aiming to eliminate entrenched forms of discrimination. This opens up a space for working on and combatting the root causes of violence (Biholar, 2014).

CEDAW does not contain specific provisions on VAW and/or domestic violence. On the other hand, the Istanbul Convention covers all forms of VAWG (Article 2.1) (Council of Europe, 2011). Istanbul Convention defines VAW as “all acts of gender-based violence that result in or are likely to result in physical, sexual, psychological, or economic harm or suffering to women, including threats of such acts, coercion, or arbitrary deprivation of liberty, whether occurring in public or private life” (Article 3a). It recognizes a range of manifestations of VAW, encompassing “psychological violence (Article 33), stalking (Article 34), physical violence (Article 35), sexual violence including rape (Article 36), forced marriage (Article 37), female genital mutilation (Article 38), coercion to abortion and sterilization (Article 39), and sexual harassment (Article 40)” (Council of Europe, 2011). The Istanbul Convention can also be used as an indicator to assess progress in implementing Agenda 2030 since the Convention's objectives align with objectives 2 and 3 of SDG 5.

As a result of these advancements, there has been a notable increase in the pace of implementing legal regulations, policies, and financial investments to address VAW, particularly within the context of the UN's Sustainable Development Goals (SDGs) adopted by Member States in 2015. Gender equality (Goal 5) is one of the 17 SDGs, including explicit targets for combating VAW. These targets include “eliminating all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation” (Target 5.2) and “eliminating all harmful practices, such as child, early, and forced marriage and female genital mutilation” (Target 5.3) (United Nations, 2015).

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1 The CEDAW Committee embraced the concept of transformative equality through Recommendation No. 25 in 2004. This significant recommendation recognized the necessity of implementing measures aimed at achieving “a real transformation of opportunities, institutions and systems so that they are no longer grounded in historically determined male paradigms of power and life patterns” (CEDAW Committee, 2004).

The sole focus of SDG 5 is to attain gender equality and empower women and girls. Drawing upon the foundation laid by MDG 3, this SDG seeks to eradicate harmful practices and VAWG. It sets specific targets to address this issue. Additionally, SDG 16, which aims “to promote peaceful and inclusive societies for sustainable development,” aims “to end abuse, exploitation, trafficking, and all other forms of violence and torture against children” (Table 1). Along with this aim, endeavors are undertaken to diminish violence and associated fatalities among women, encompassing domestic violence and dowry, which are pervasive in numerous developing nations.

<b>Table 1. VAWG in the SDGs-Descriptions and Indicators</b>		
<b>SDG/Target</b>	<b>Description</b>	<b>Indicator</b>
<b>SDG 5</b>	<b>“Achieve gender equality and empower all women and girls”</b>	
<b>Target 5.2.2</b>	“Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation”	“5.2.1 Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age”
		“5.2.2 Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence”
<b>Target 5.3.</b>	“Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation”	“5.3.1 Proportion of women aged 20–24 years who were married or in a union before age 15 and before age 18”
		“5.3.2 Proportion of girls and women aged 15–49 years who have undergone female genital mutilation, by age”

- 2 The definitions of forms of violence covered under Target 5.2 are as follows: “Physical violence consists of acts aimed at physically hurting the victim and include, but are not limited to, acts like pushing, grabbing... threatening or attacking with some sort of weapon, gun or knife...Sexual violence is defined as any sort of harmful or unwanted sexual behavior that is imposed on someone, whether by use of physical force, intimidation or coercion...Psychological violence consists of any act that induces fear or emotional distress. It includes a range of behaviors that encompass acts of emotional abuse...” (UNSTATS, 2023). Therefore, Target 5.2 does not encompass multiple forms of violence, such as economic violence, as seen in the Istanbul Convention. However, Target 5.4 does aim to recognize and value unpaid care and domestic work but does not explicitly establish a link between women’s labor and economic violence within SDG 5.

Table 1. Continued		
SDG 16	“Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels”	
Target 16.1	“Significantly reduce all forms of violence and related death rates everywhere”	“16.1.1 Number of victims of intentional homicide per 100,000 population, by sex and age”
		“16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause”
		“16.1.3 Proportion of population subjected to (a) physical violence, (b) psychological violence and (c) sexual violence in the previous 12 months”
		“16.1.4 Proportion of population that feel safe walking alone around the area they live after dark”
Target 16.2.	“End abuse, exploitation, trafficking, and all forms of violence against and torture of children”	“16.2.1 Proportion of children aged 1–17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month”
		“16.2.2 Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation”
		“16.2.3 Proportion of young women and men aged 18–29 years who experienced sexual violence by age 18”
Source: United Nations (2017)		

SDGs 5.2, 5.3, 16.1, and 16.2 specifically focus on addressing VAWG. Additionally, within the remaining SDGs, there are several targets that either directly or indirectly aim to prevent and decrease VAWG (1.4, 1b, 2.3, 3.7, 4.1., 4.2., 4.3, 4.5, 11.2, 11.7) (Babu & Kusuma, 2017). Indeed, Equality Institute reveals that VAWG is associated with “poverty, hunger, poor health and well-being, maternal death, poor education, climate change adaptation, energy and environmental burdens, economic hardship, and societal insecurity” (Equality Institute, 2021). One-third of the total 230 indicators of the SDGs are related to gender equality. The achievement of SDG 5 contributes to progress across all SDGs, while the failure to achieve it would hinder the attainment of 14 out of the 17 SDGs (SDGs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 16, 17).

Looking at the global landscape of gender equality, it can be observed that in recent years, there have been various crises, especially the COVID-19 pandemic and climate change, affecting it. The COVID-19 pandemic has proven its impact on the increase of VAWG. Previous studies on HIV/AIDS, Ebola, and Zika outbreaks have shown that infectious diseases and pandemics have gendered effects, particularly affecting women and men both directly and

indirectly (Anderson, 2012; Davies & Bennett: 2016; Smith, 2019). Despite women being visibly impacted by pandemics, they often remain invisible in global health governance. This invisibility can be attributed to the lack of gender-sensitive strategies in pandemic response, slow progress in collecting gender-disaggregated data, and limited discussion of the gendered consequences of outbreaks (Harman, 2016, p. 535).

In addition to the direct effects on women, emergencies can exacerbate socio-economic vulnerabilities, leading to an increased risk of VAW during economic uncertainty and civil unrest. Previous studies on natural disasters like earthquakes, storms, and floods have also demonstrated a rise in VAW (Aolain, 2011, p. 1045; Peterman et al., 2020, p. 3; Parkinson & Zara, 2013, p. 28). With the emergence of COVID-19 and considering past experiences and research, numerous institutions and organizations have drawn attention to the potential impact of the pandemic on VAW. The World Health Organization (WHO), in a report released on March 26, 2020, highlighted the ways in which the COVID-19 pandemic increased the risk of VAW. Factors such as direct and indirect pandemic-related stress, disruptions to social and protective networks, and reduced access to services contribute to this heightened risk. Measures requiring people to stay at home have led to a particularly concerning rise in intimate partner violence. Access to essential sexual and reproductive health services, including those for women experiencing violence, has been limited. Other services like helplines, crisis centers, shelters, legal aid, and protection services may also face disruptions during crisis periods, negatively impacting the combatting of VAW (WHO, 2020). Additionally, as healthcare services focus on COVID-19 response, there is a risk that support and care for women who have escaped violence may be cut off. Social distancing measures may also reduce the number of witnesses to violence, making it harder for victims to seek help (Nightingale et al., 2020).

During the initial stages of the pandemic, reports highlighting the increased risk of VAW were followed by national and international reports showing an actual increase in violence. The 2020 Sustainable Development Goals Report noted that the COVID-19 pandemic had increased VAW and girls and created conditions that could lead to child marriage and female genital mutilation. It also recognized that the crisis posed a significant obstacle to achieving the 2030 goals overall (UN Women, 2020). The 2021 Report emphasizes that the COVID-19 pandemic has had a disproportionate impact on women and girls, leading to various socioeconomic challenges. They have faced job losses, financial instability, disruptions in education, and increased burdens of unpaid caregiving. Furthermore, women's access to essential health services, particularly those related to sexual and reproductive health, has been severely affected. Therefore, the progress towards achieving the targets of SDG 5 has significantly fallen behind. Thus, the COVID-19 pandemic once again demonstrated the link between crises and the increase in VAWG.

Alongside VAWG, climate change is one of the most urgent global issues and barriers to sustainable development. However, the visibility of the intersections between VAWG and climate change has only recently begun to be emphasized. A report prepared by UN Women (2022), acknowledging the limited data, highlights the existing evidence of the impact of climate change, environmental degradation, and slow-onset climate events such as severe rainfall and prolonged droughts on VAWG. Taking all these aspects into consideration, the inclusivity of SDG 5 regarding different forms of violence and the factors influencing violence is being questioned, and it can be argued that SDG 5 draws a limited framework, particularly concerning violence against women.

## **2. Global Outlook in Targets 5.2 and 5.3**

In 2022, VAWG continued to impact women of all age groups and remains a global concern. According to the UN SDGs Report (2022), while there has been a global increase in awareness regarding VAWG, it is reported that 26 percent of women aged 15 and older who have ever been in a partnership, totaling 641 million women, have experienced “physical and/or sexual violence by a husband or intimate partner at least once in their lifetime.” When looking at regions, the first indicator of Target 5.2, “5.2.1 - women and girls subjected to intimate partner violence”, shows a moderate distance from the target on a global average. Excluding Australia and New Zealand, Oceania has not yet reached its target. Sub-Saharan Africa is also far from achieving the target.

On the other hand, Australia, New Zealand, Latin America, and the Caribbean have successfully met the target. More data is needed to assess the progress in Northern Africa, Western Africa, Central and Southern Asia, Eastern, and South-Eastern Asia, Europe, and Northern Africa. For indicator 5.2.2 - sexual VAWG, no region has sufficient data. This brings us to the issue of VAW and data collection. This issue can be addressed from two perspectives. First, it indicates problems with countries’ data collection processes on violence. Regular data on violence is not collected, and therefore, accurate assessments of the prevalence of violence cannot be made. The World Bank’s “2021 World Development Report: Data for Better Lives” evaluated countries’ performance in SDG indicators and pointed out significant data gaps. According to the report, no government provides data on more than 90 percent of the SDG indicators. Data on gender equality is particularly scarce. The same report highlighted the lack of regular reporting of data and the non-implementation of census and surveys, which are among the tools for collecting violence data due to the impact of the COVID-19 pandemic (Kitzmüller, Stacy & Mahler, 2021).

Furthermore, the problems mentioned earlier related to violence and data are not correlated with countries' level of development. High-income countries have reported only 25 percent of the indicators related to gender equality. The second aspect of the issue of violence and data is whether the indicators of Target 5.2 provide sufficient information to determine the prevalence of VAWG, even if regular data reporting is ensured. In this regard, the emphasis on quantitative data in the SDG framework and the consequent neglect of the underlying causes of gender-based inequalities and violence (Bradshaw et al., 2017), as well as the overlooking of local patterns of GBV by SDG indicators that take national patterns into account (Fuentes & Cookson, 2020; McIlwaine et al., 2023), have been criticized. Considering all these factors, it can be said that the SDG framework places a high importance on gender equality compared to the MDG framework. However, its indicators only superficially address VAWG and divert global attention away from the power relations underlying violence. Even if the SDG framework is acknowledged to provide a comprehensive framework for addressing violence, the "gender data gap" remains an obstacle to a sound assessment of the prevalence of violence.

The discussions regarding data and the effectiveness of SDG indicators also apply to Target 5.3. Eliminating child, early, and forced marriages (CEFM) is also an essential goal of the SDGs to be achieved by 2030. However, despite the global prevalence of child marriages decreasing from 23 percent in 2012 to 19 percent in 2022, progressing from 2022 to 2030 must be 20 times faster to reach the SDG target. If the current pace continues, it will take another 300 years to eliminate CEFM. Ten years ago, one in four young women between the ages of 20 and 24 experienced child marriage, whereas today, this ratio has decreased to one in five young women (UNICEF, 2023). This ten-year progress highlights that CEFM remains a global issue. Looking at the global distribution, 35 percent of child brides are in India, 14 percent in Bangladesh, Indonesia, and Nigeria, 9 percent in Brazil, Pakistan, and Ethiopia, 4 percent in Mexico, Iran, and Egypt, and 3 percent in Congo, Tanzania, and Türkiye. The remaining 35 percent represents child brides worldwide (UNICEF, 2021, p. 12). Numerous studies have shown the relationship between child marriage, education level, and poverty. Individuals with lower education levels globally are at higher risk of their children experiencing child marriage. Additionally, child marriage is prevalent in low-income countries and among the poorest segments of society. The detrimental effects of high child marriage rates on a country's economic growth and poverty alleviation efforts manifest through their impact on "fertility and population growth, maternal and child health, and women's potential earnings and productivity" (UNICEF, 2021, p. 18).



### 3. Violence Against Women in Türkiye

#### 3.1. Legal Framework and Activism of Civil Society

The history of combating VAW in Türkiye has a long history. The first organizations and movements that drew attention to violence and women's rights emerged in the late 19th century. However, increased social awareness and official measures to combat VAW coincided with later periods. The transformation of the women's movement into a more autonomous feminist movement in Türkiye took place after the 1980 military coup (Sahin, 2022, p. 6). During the late 1980s and early 1990s, women's rights organizations (WROs) and activists initiated efforts to raise awareness and combat (VAW). Under the rallying cry of "Our bodies are ours, say no to sexual harassment," women defied all forms of violence and oppressive relationships imposed on their bodies and identities. It was not a mere coincidence that in the 1980s, women identified and articulated the violence they experienced, standing together in solidarity against this shared issue (Uçan-Çubukçu, 2005, p.65). The women's movement in this field, initiated by the "Women's March Against Beating" in 1987, played a significant role in shaping a perspective highlighting women's rights through campaigns and diverse activities. It opened doors to new accomplishments in the struggle against violence directed at women. "The Mor Çatı Women's Shelter Foundation," established in 1990, and "the Women's Solidarity Foundation," formed in 1993, marked the inception of women's organizations dedicated to this cause (Yüksel-Kaptanoğlu & Tarım, 2015, pp. 34-35). The establishment of "the General Directorate on the Status of Women (Kadının Statüsü Genel Müdürlüğü)"<sup>3</sup> in 1990 paved the way for WROs to actively and collaboratively engage with the government in shaping an agenda that promotes gender equality. This development also provided a platform for public discourse, fostering a more inclusive and open environment (Koyuncu & Özman, 2019). In these years, the women's movement argued that the Penal Code should be changed along with the Civil Code. After nearly 15 years of struggle, the women's movement has achieved some results in this direction. In 1998, the "Law on the Protection of the Family," which envisages the protection of VAW, was adopted. In 2001, the Civil Code was reformed (Tekeli, 2006). With this reform, Article 41 of the Constitution added the clause "and is based on equality between spouses" after the expression "family is the foundation of Turkish society" (Turkish Civil Code, 2001). In 2005, the Turkish Grand National Assembly established a parliamentary commission to examine and investigate "the causes of honor killings and violence against women and children and determine the measures to be taken" (Official

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3 The Directorate General on the Status of Women has been preparing National Action Plans for combating VAW since 2007 (2007-2010, 2012-2015, 2016-2020, 2021-2025).

Gazette, 2015). Based on the report prepared by this commission in 2006, a Prime Ministry Circular titled “Measures to Prevent Violence Against Children and Women and Crimes of Honor and Honor Killings” was issued (Official Gazette, 2006). In 2005, reforms were also made in the Penal Code, which criminalized marital rape, removed sexual crimes from crimes against society, included them under crimes against individuals, abolished most discriminatory provisions against women, and imposed heavy penalties for honor killings (Turkish Penal Code, 2005). During this process, the European Union (EU)-Türkiye accession process, which resumed in the late 1990s, played a significant role in supporting Turkish women’s rights organizations (WRO). Additionally, the support and initiatives of the UN also contributed to the strengthening of Turkish WROs (Kardam & Ertürk, 1999).

In the context of legal developments, the Istanbul Convention is among the most significant steps taken by Türkiye in the 2000s. The process of supporting forming a binding legal framework regarding VAW in Europe is based on a femicide case and the subsequent trial (Sahin, 2021, p. 10). The Nahide Opuz case was brought against Türkiye at the European Court of Human Rights (ECHR) in 2002 due to domestic VAW. Nahide Opuz, whose mother was killed in an attack by her husband, filed a complaint against Türkiye for failing to take measures despite her application. In 2009, the ECHR ruled that Türkiye was liable for compensation due to its “failure to protect the applicant from domestic violence” and violation of “Articles 2 (Right to Life), 3 (Prohibition of Torture), and 14 (Prohibition of Discrimination)” (European Court of Human Rights, 2009). This landmark case marked the Court’s first ruling recognizing GBV as discrimination. Ultimately, this ruling and the Court’s decision played a pivotal role in establishing the Istanbul Convention (Council of Europe, 2023).

Türkiye took the initiative by becoming the first Party to sign the Istanbul Convention in May 2011, followed by its ratification by the Turkish Grand National Assembly in November of the same year. The Convention officially came into effect on August 1, 2014. Prior to this, Türkiye made reforms in its national legislation under the Istanbul Convention. In March 2012, Law No. 6284 on “The Protection of Family and Prevention of Violence Against Women” was enacted. Law No. 6284 (2012) defines domestic violence as “any kind of physical, sexual, psychological, and economic violence that occurs between family or household members or those considered as family members, regardless of sharing the same household.” This law eliminated the distinction between married and unmarried women, provided detailed definitions of domestic violence, VAW, and violence, and incorporated the obligations of protection and support under the Istanbul Convention into domestic law. However, Law No. 6284 does not contain expressions as clear and comprehensive as the Istanbul Convention.

Nevertheless, paragraph 2 of Article 1 states that the Istanbul Convention will be the basis for the implementation of Law No. 6284 (Women's Human Rights New Solutions Association, 2023). However, on March 20, 2021. As per a decision published in the Official Gazette, Türkiye has officially withdrawn from the Istanbul Convention (Official Gazette, 2021). Consequently, Law No. 6284 currently serves as the primary legal framework for addressing VAW in Türkiye.

### **3.2. Türkiye's Progress in Target 5.2**

Considering the statistics and indicators included in the UN Women, UNFPA (United Nations Development Fund), and UNDP (United Nations Development Programme) Minimum Set of Gender Indicators, the CEİD (Center for Economic and Social Research), together with the Mapping and Monitoring Reports and the Indicator Expert Group, has prepared a set of indicators and an index. This index consists of 32 indicators related to five main areas: "the right to a healthy life, the right to education, the right to work, the right to a good and adequate life, the right to participate in decision-making," and an additional domain, the right to a violence-free life and its sub-dimensions (CEİD, 2022, p. 89). The sub-dimensions of the violence-free life right include deprivation and access to a safe life. The indicators within this dimension include "the percentage of women aged 15-59 who have experienced physical and/or sexual violence by an intimate partner, the percentage of women aged 20-24 who married before the age of 18, and the percentage of individuals, by gender, who feel safe walking alone at night in their local area". According to the CEİD Index, Türkiye ranks 32nd among 36 countries. It ranks 28th in terms of feeling safe walking alone at night but lags in terms of early and forced marriage and exposure to physical violence (CEİD, 2022, p. 109).

According to the 2021/2022 Human Development Report, Türkiye ranks 48th in the Human Development Index (HDI), placing it in the very high development group and 65th in the Gender Inequality Index (GII) (United Nations Development Programme, 2022). GII assesses gender-based disadvantages across three dimensions: "reproductive health, empowerment, and the labor market." It utilizes four Sustainable Development Goal (SDG) indicators, including "maternal mortality ratio" (SDG 3.1.1), "adolescent birth rate" (SDG 3.7.2), "the proportion of seats held by women in national parliaments and local governments" (SDG 5.5.1), and the indicator of SDG 4 Quality Education, along with "the labor participation rate." However, HDI and, therefore, GII does not include an indicator of VAW. One global study that includes indicators of VAW and child marriage is the Global Gender Gap Index of the World Economic Forum (WEF). In this index, Türkiye ranks 124th out of 146 countries. In the sub-dimensions of this index, Türkiye ranks 134th in economic participation and opportunity, 101st in educational attainment, 99th in health and survival, and 112th in political empowerment (World Economic Forum, 2022).

The Social Institutions and Gender Index (SIGI) developed by the OECD is among the data sources utilized to advance the progress of the SDGs. SIGI serves as an official data source within the legal framework for SDG 5.1.1 and provides data for all sub-targets of SDG 5. Within this index, countries are classified into categories of “very low discrimination (SIGI < 20%), low discrimination (20% < SIGI < 30%), medium discrimination (30% < SIGI < 40%), high discrimination (40% < SIGI < 50%), and very high discrimination (SIGI > 50%)” (OECD, 2019). Among the countries covered by the index, 33 have very low discrimination, 35 have low discrimination, 16 have medium discrimination, 17 have high discrimination, and 12 have very high discrimination. The components of SIGI are “discrimination in the family, restricted physical integrity, restricted access to productive and financial, and restricted civil liberties” (OECD, 2019). When examining these components and indicators, it is observed that they align with the targets within SDG 5 and encompass the topics of VAW and child marriage, which are the subject of this study. According to the 2023 data of this index, Türkiye’s score is 24.7, which is above the world average (29.9) and below the OECD average (16.5). A comparison of Türkiye’s scores with the world and OECD averages is presented in Table 2.

<b>Table 2. Türkiye’s score in SIGI</b>					
	<b>SIGI 2023</b>	<b>Discrimination in the family</b>	<b>Restricted physical integrity</b>	<b>Access to productive and financial assets</b>	<b>Restricted civil liberties</b>
<b>Türkiye</b>	24.7	31.2	13	30.7	22.7
<b>World</b>	29.9	37.8	27.6	28	28.4
<b>OECD</b>	16.5	14.2	19	13	18.4
<b>Source:</b> OECD (2023a)					

According to the 2023 data, Türkiye falls within the low discrimination group in SIGI with an average score of 24.7. When examining the sub-dimensions of discrimination in the family, which includes the indicator of child marriage, Türkiye is in the medium discrimination group with a score of 31.2. In restricted physical integrity, which includes the indicator of VAW, Türkiye is in the low discrimination group with a score of 27.6. Türkiye is also in the low discrimination group in the other two sub-dimensions. Nevertheless, based on the OECD’s indicator measuring “the percentage of women who have encountered physical and/or sexual violence from an intimate partner at any point in their lives,” Türkiye ranks as the second-highest country among all OECD nations in terms of VAW prevalence (OECD, 2023b).

Global and regional indices position Türkiye regarding gender equality and, specifically, the prevalence of VAW; as summarized above, it is necessary to emphasize that the data underlying these positions are based on official statistics. These official statistics are

based on domestic violence research conducted in Türkiye. The Domestic Violence Against Women Research in Türkiye was conducted twice, in 2008 and 2014, under the coordination of the “Directorate General on the Status of Women” and by “Hacettepe University Institute of Population Studies (HÜNEE).” The data presented for monitoring Target 5.2 is based on the 2014 research, as no third and updated research has been conducted. Therefore, the 2014 data are used to analyze Türkiye on Target 5.2. progress.

Both studies (2008 & 2014) have shown that the rate of experiencing physical or sexual violence at any stage of life increases with age, but violence is much more prevalent among young women (aged 15-24). Furthermore, both studies have found that increasing women’s educational level reduces “the rate of physical and/or sexual violence.” However, violence remains at approximately one-third among highly educated women (HÜNEE, 2015, p. 120). When it comes to different forms of violence, comparing the six years between the two studies, “the percentage of women who experienced physical violence at any stage of life” decreased from 39% to 36%, “the percentage of women who experienced sexual violence” decreased from 15% to 12%, and “the percentage of women who experienced physical and/or sexual violence” decreased from 42% to 38%. The rate of women “who experienced emotional violence/abuse at any stage of life” remained constant at 44%. The rate of women “who experienced economic violence/abuse” increased from 29% to 30%. Within the past 12 months, “the rate of women who experienced physical violence” decreased from 19% to 8%, “the rate of women who experienced sexual violence” decreased from 7% to 5%, and “the rate of women who experienced physical and/or sexual violence” decreased from 14% to 11%. “The rate of women who experienced emotional violence/abuse within the past 12 months” increased from 25% to 26%, and “the rate of women who experienced economic violence/abuse” increased from 13% to 15%. The reports also provide regional violence data. According to this data, in 2008, the region with the highest prevalence of physical violence at any stage of life was Northeast Anatolia, while in 2014, it was Central Anatolia.

Regarding sexual violence, the Northeast Anatolia region was the most prevalent in 2008 and 2014. Regarding urban and rural areas, both studies suggest that there is a higher prevalence of physical and/or sexual violence in rural areas. In terms of “the prevalence of physical and/or sexual violence in the past 12 months”, while there was equality between urban and rural areas in 2008, in 2014, the violence experienced in urban areas was 1% higher (11%) (HÜNEE, 2015, pp. 418-421). It should be noted that the calculations of the studies on the prevalence of VAW were conducted for at least once married women (including those who are married, widowed, divorced, or separated). However, it is essential to mention that the definition of marriage is not limited to official marriage but also includes religious marriages.

According to Türkiye's 2019 Sustainable Development Goals Evaluation Report, it is stated that data has been generated for 9 out of 14 indicators under Goal 5. When evaluating the progress of Target 5.2, references are made to the 2008 and 2014 studies, and the research results from 2014 are conveyed (Presidency of the Republic of Türkiye, Presidency of Strategy and Budget, 2019, p. 76). This indicates that Target 5.2 is not regularly monitored. However, in indicator 5.2.1, "Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual, or psychological violence by a current or former intimate partner in the previous 12 months, by the form of violence and by age", the term "intimate partner" refers to "a current or former partner within the context of marriage, cohabitation, or any other formal or informal union" (UNSTATS, 2023). Therefore, the indicator broadly defines a partner and anticipates data collection. However, Türkiye's data reflects the prevalence of violence among women who have been married at least once. As a result, the currency and alignment of the data with the indicator reveal challenges in monitoring Target 5.2.

The 8th Periodic Shadow Report of CEDAW (2022) draws attention to the lack of a standard and data insufficiency regarding data collection on VAW in Türkiye. Another point of criticism is that public institutions do not share and disclose data on VAW with the public and civil society organizations. Article 11 of the Istanbul Convention, titled "Data Collection and Research," outlines the parties' obligations, which involve collecting disaggregated statistical data periodically on all types of violence addressed in the Convention. It also includes "conducting population-based surveys regularly to assess the prevalence and trends of all forms of violence" covered by the Convention (Council of Europe, 2011). Data collection with the participation of various actors, including civil society organizations, and sharing the collected data with the public is also among the parties' responsibilities. Law No. 6284, on the other hand, includes provisions on data collection only within the scope of support services provided by violence prevention and monitoring centers, stating "to collect data and create an information bank regarding the imposition and implementation of protective and preventive measures and coercive detention, to keep records of protective measures" (Law No. 6284 on the Protection of Family and Prevention of Violence Against Women, 2012). Türkiye's withdrawal from the Convention has eliminated the responsibility for collecting data on violence.

In the context of problems regarding official statistics and while the precise magnitude and occurrence patterns of VAWG in Türkiye cannot be determined solely through official statistics, numerous academic studies, reports, and NGOs offer a comprehensive overview of VAW in Türkiye (Altınay & Arat, 2009; Sahin et al., 2010; Yüksel-Kaptanoğlu et al., 2012). For instance, data regarding VAW related to migration in Türkiye is brought to light

through various research and reports. Despite the fact that migrant and refugee women are particularly vulnerable to violence, face a high risk of violence, and have limited resources to combat these challenges, this issue does not hold a special place within SDG 5. In fact, the International Organization for Migration (IOM) (2018, p. 112) proposes that all forms of violence or exploitation against women related to migration, including gender-based or societal violence, should be included as a data subject under Goal 5.2. Legal regulations in Türkiye have not limited the combatting VAW to citizens, but in practice, it is noted that migrant and refugee women face discrimination. Among the primary issues encountered by migrant and refugee women are “discrimination in shelter admittance, lack of socio-economic and social supports, and language barriers” (Mor Çatı, 2022). The withdrawal of Türkiye from the Istanbul Convention, which has a special chapter (Chapter VII) dedicated to migration and asylum, can be considered a development that deepens the insecurity of migrant and refugee women.

Another area where problems arise with official data in Türkiye is femicides. Official institutions do not regularly share statistics on the number of women killed by their spouses or male family members with the public. In response to a parliamentary question in 2009, the Ministry of Justice made a notable official statement regarding the number of women who lost their lives to homicide between 2002 and 2009. The reported figures were as follows: 2002-66, 2003-83, 2004-164, 2005-317, 2006-663, 2007-806, 2009-953 (5Harfliler, 2013). Another parliamentary question in 2013 revealed that in cases of domestic violence, 171 women lost their lives in 2009, 177 in 2010, 163 in 2011, and 155 in 2012 (Ministry of Justice, 2013). In the absence of sufficient data sharing by official institutions, civil organizations’ data is often referenced for femicide statistics in Türkiye. According to the prominent We Will Stop Femicides Platform, between 2020 and 2022, 914 women were killed by men, and 632 women were found dead under suspicious circumstances (We Will Stop Femicides Platform, 2022). Target 16.1’s indicator, 16.1.1 “number of victims of intentional homicide per 100,000 populations, by sex and age”, incorporates femicides as part of the SDGs. According to the data from official national sources compiled by the United Nations Economic Commission for Europe (UNECE), in Türkiye, there were 412 women murdered in 2015, 441 in 2016, 424 in 2017, 399 in 2018, 450 in 2019, 381 in 2020, and 434 in 2021 (UNODC, 2023). The same source indicates that femicides in Türkiye have decreased by approximately 200% from 2003 to 2020 (Our World in Data, 2023). However, these data do not appear consistent with independent research, and similarly, femicide data within the SDG framework does not seem coherent.



## 4. Child, Early and Forced Marriage in Türkiye

### 4.1. Legal Framework

CEFM is considered an obstacle to achieving the SDG goals and one of the most visible forms of VAWG based on gender inequality. Another critical dimension of this multidimensional issue is that CEFM is recognized as a violation of child rights for both girls and boys. Both dimensions have been defined within the international framework. The “Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriages,” which came into effect in 1964, states that marriage should “not take place without the full and free consent of both parties” (Article 1) and establishes the elimination of child marriages and the engagement of young girls before adolescence as an obligation for states, including the determination of appropriate penalties (United Nations, 1962). Part IV, Article 16 of the CEDAW Convention (1979), states that “the betrothal and marriage of a child shall have no legal effect” and emphasizes the need to establish a minimum age for marriage, require the registration of marriages, and carry out all necessary procedures, including legislation. Recommendation No. 21 of the Convention, dated 1994, recommends that “the minimum age for marriage should be 18 for both women and men” (CEDAW Committee, 1994). The Convention on the Rights of the Child, which came into effect in 1990, states in Article 1 that “every person is considered a child until the age of 18”. The Istanbul Convention, in its Article 32 titled “Civil consequences of forced marriages,” specifies that Parties “shall take necessary legislative or other measures to ensure that marriages concluded under force may be voidable, annulled, or dissolved”, and in Article 37 titled “Forced marriage,” it defines the act of forced marriage as a crime (Council of Europe, 2011). As evident from these international regulations, CEFM is conceptualized in the context of the rights of the child and VAWG.

Globally, the occurrence of CEFM is influenced by factors such as “poverty and economic conditions, lack of education, gender inequality, cultural norms and traditions, GBV, and conflict and crisis situations” (UNFPA and HÜNEE, 2020, p. 15). Looking specifically at Türkiye, many studies have highlighted the relationship between CEFM and education and income levels. Orçan & Kar (2008) identified factors such as poverty, low education levels, employment issues, and the high number of children as reasons for early marriage and childbearing, emphasizing the socio-cultural and economic structure of the region and the accessibility of education. Anık and Barlin (2017) stated that poverty, gender perceptions, local values or customs, lack of education, legal inadequacies, and conflicts were the prominent factors for child marriage, particularly in rural areas and among impoverished families,

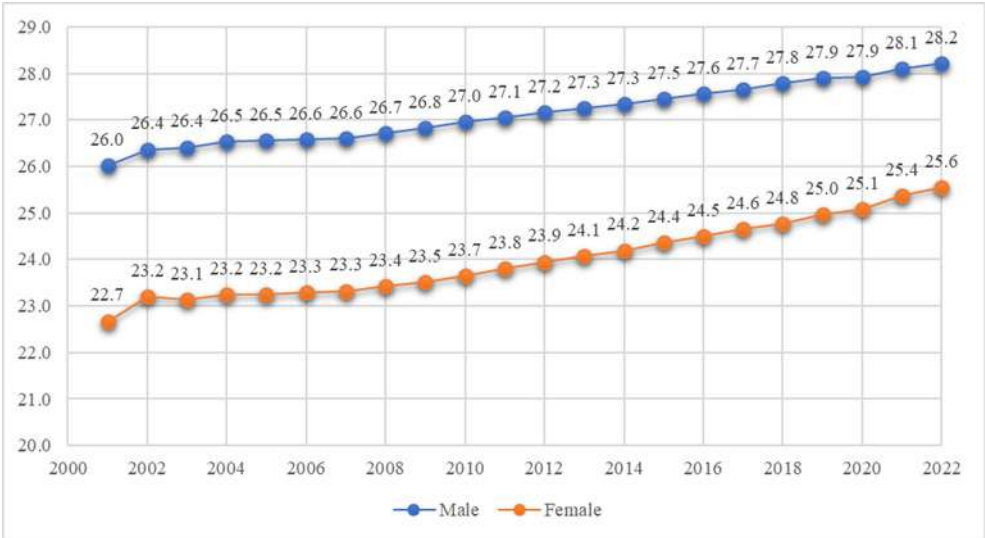


compared to urban areas. Kahraman & Ateş (2018) also drew attention to child marriage based on tradition and customs in rural areas with low education levels. The same studies revealed that individuals who married at a young age experienced various forms of violence - physical, psychological, sexual, and economic - not only from their spouses but also from other family members (Anık & Barlin, 2017; Kahraman & Şenates, 2018).

Article 124 of the Turkish Civil Code determines the minimum marriage age limit at 17. Therefore, “A person, whether male or female, cannot marry until they reach the age of seventeen.” However, the same article’s second paragraph states, “In exceptional circumstances and for significant reasons, a male or female who has reached the age of sixteen may be allowed to marry with the judge’s permission. Whenever possible, the opinions of the parents or legal guardian are heard before the decision is made.” Despite national laws and regulations and approved international treaties, early marriage remains a problem in Türkiye. Yüksel-Kaptanoğlu & Akadli Ergöçmen (2014) argue that various social and cultural factors in Türkiye legitimize early marriage through different strategies, citing religious marriages as an example. In Türkiye, girls below the legal age of marriage can be married through religious ceremonies before the official civil marriage. While *child marriage* is defined as a marriage where at least one party is a child, meaning below 18, and informal unions without legal validity are also included within the scope of child marriage; unofficial marriages are not reflected in official data.

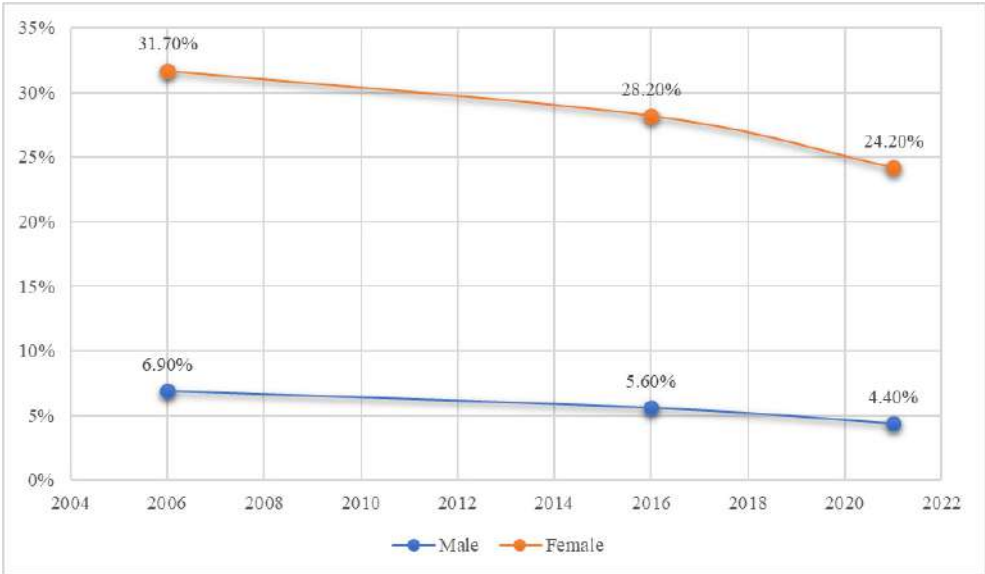
## **4.2. Türkiye’s Progress in Target 5.3**

When official statistics are examined, it can be observed that the average age of first marriage in Türkiye has slightly increased for both women and men between 2001 and 2022. The average marriage age for women was 22.7 in 2001 and increased to 25.6 in 2021. During the same period, the average marriage age for men increased from 26 to 28.2. It should be noted that official statistics only consider marriages conducted through official civil ceremonies.



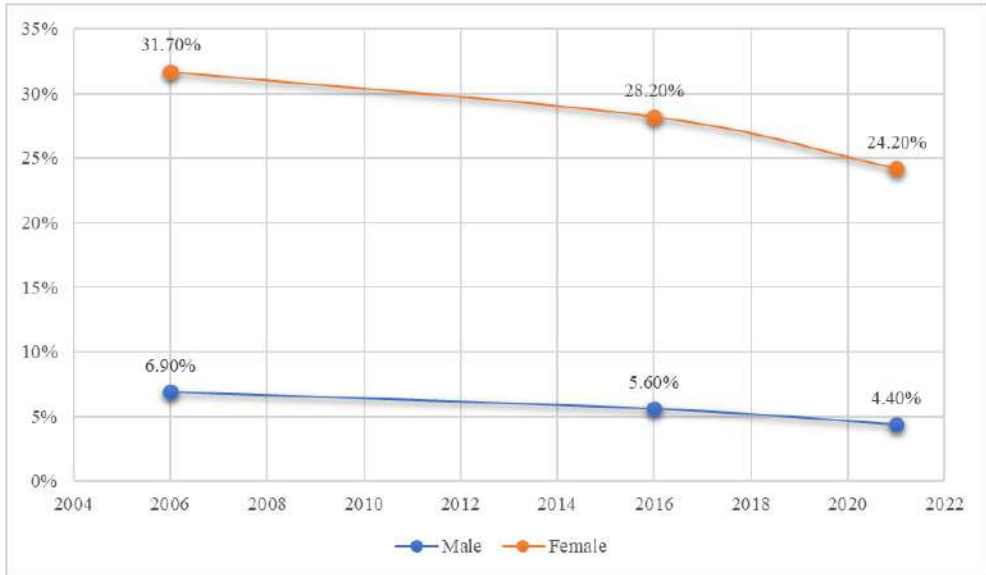
**Figure 1.** Average age at first marriage (2001-2022)  
**Source:** TURKSTAT (2023a)

Based on the data obtained from the Türkiye Family Structure Survey carried out by the Turkish Statistical Institute (TURKSTAT) in 2006, 2016, and 2021, the findings reveal that in Türkiye, the percentage of marriages occurring before the age of 18 was 6.9%, 5.6%, and 4.4% for men, and 31.7%, 28.2%, and 24.2% for women, respectively. Although the rate of marriages below the age of 18 shows a decreasing trend for both groups, there is a significant difference between men and women in these data, which are based on official civil marriages. Therefore, when examining the age of first marriage by gender, it is observed that women tend to marry earlier than men.



**Figure 2.** Age at First Marriage % (under 18) (2006, 2016, 2022)  
**Source:** TÜRKSTAT (2023b)

The study titled “Child Marriages in Türkiye: 1993-2018 Türkiye Demographic and Health Surveys Data Analysis,” prepared in partnership between UNFPA & HÜNEE, closely examines the marriages that occur before the age of 18 among young women in the 20-24 age group in Türkiye. According to this report, “the proportion of women aged 20-24 who married before the age of 18” decreased between 1993 and 2008, but this decline did not continue between 2008 and 2018. Child marriage rates have increased between 2010 and 2018 in the Western Marmara, Aegean, Mediterranean, and Southeast Anatolia regions. The same research reveals the relationship between child marriages and the educational level of both girls and boys and their families (UNFPA & HÜNEE, 2020, p. 51).



**Figure 3.** Proportion of individuals aged 20-24 years old who were married before age 18 (2010-2022)  
**Source:** TURKSTAT (2023c)

According to TURKSTAT data, “the percentage of marriages occurring before age 18” among young women in the 20-24 age group decreased from 8.2% in 2010 to 5.6% in 2018 and further declined to 3.5% in 2022. The UNFPA & HÜNEE study (2020), on the other hand, calculated data for 40 years and found that in 1978, 41% of women in the 20-24 age group were married before the age of 18, whereas in 2018, this proportion decreased to 15% (UNFPA & HÜNEE, 2020). Therefore, both data sets indicate a decrease in marriages occurring before age 18 among young women in the 20-24 age group. However, CEFM continues to be a problem in Türkiye. According to official data published by TURKSTAT, in 2002, the number of girls aged 16-17 who got married was 37,263 (accounting for 7.3% of total marriages), while the number of boys in the same age group was 2,592 (accounting for 0.5% of total marriages). In 2022, these numbers changed to 11,520 for girls (accounting for 2% of total marriages) and 688 for boys (accounting for 0.1% of total marriages). In 2002, the provinces with the highest rates of girls aged 16-17 getting married were respectively Nevşehir, Kırıkkale, Çankırı, Çorum, Yozgat, Kütahya, Niğde, Afyonkarahisar, Tokat, and Kırşehir, while in 2022, these provinces became Muş, Ağrı, Kilis, Kars, Ardahan, Bitlis, Gaziantep, Niğde, Şanlıurfa, and Siirt (TURKSTAT, 2023d). Many civil society organizations (CSOs), particularly targeting provinces with a high prevalence of CEFM, are conducting comprehensive studies. Among these organizations are Uçan Süpürge, Yaşam Kadın Çevre Kültür ve İşletme Kooperatifi (YAKA-KOOP), Muş Kadın Çatısı, KAMER Vakfı, and İzmir

Kadın Kuruluşları Birliği (UNFPA, 2020, p. 17). For instance, Muş Kadın Çatısı carried out a project between 2015-2016, with financial support from Sabancı Vakfı, to prevent CEFM and increase awareness about this issue in Muş, where CEFM is prevalent.

It is essential to specifically focus on raising awareness about CEFM because the perception of the acceptable age for marriage within society and its connection to gender norms continue to play a prominent role in combating CEFM. Another noteworthy issue is the prevalence of CEFM occurring unofficially or going unreported. UNFPA & HUNEE (2020) study highlights that in three-quarters of CEFM cases, religious ceremonies, primarily religious marriages, are conducted. To prevent this, an important legal tool, Article 230, titled “Polygamy, fraudulent marriage, and religious ceremonies” under the main heading of “Crimes against family order” in the Turkish Penal Code, which imposes a prison sentence of 2 to 6 months on imams and couples who perform religious ceremonies without an official marriage, had its fifth and sixth paragraphs annulled by a Constitutional Court decision (Turkish Penal Code, 2005). Therefore, although the data may indicate a decrease in CEFM cases since they do not include unofficial marriages, there are still challenges in eliminating the conditions that enable CEFM.

## 5. Conclusion

In this study, the progress of Türkiye in achieving SDG 5 targets is examined, with a focus on Targets 5.2 and 5.3, explicitly addressing VAW and CEFM. The global landscape of VAW and CEFM is discussed, along with international and national legislation, followed by an assessment of Türkiye’s progress based on international, national official, and independent studies. The primary finding of this assessment is that VAW and CEFM remain significant issues in Türkiye. Despite developing numerous projects and enacting legal regulations to achieve SDG over the years, according to the 2022 Sustainable Development Report, Türkiye has the lowest average performance in SDG 5. Therefore, the trend of “gender equality” in Türkiye appears stagnant, and significant challenges need to be overcome.

The second notable finding in the assessment is the general gender data gap and specific issues related to data collection and analysis for gender equality in Türkiye. Particularly concerning VAW, data-related problems hinder the monitoring and evaluation of both SDG targets and the development of policies. The official VAW data available for this study is from the HUNEE survey conducted in 2014. Regular and publicly available data publication is necessary for the public to monitor the extent to which the goals outlined in the SDGs and the National Action Plans prepared by the General Directorate on the Status of Women have

been achieved. Regarding CEFM, the “Strategy Document and Action Plan to Combat Early and Forced Marriages (2018-2023)” —developed through a participatory process involving government agencies, universities, civil society organizations, and international and regional organizations—has not yet been implemented. However, there are urgent action plans in place for various provinces. The publication of an action plan that sets goals and strategies to combat CEFM would contribute to achieving SDG Target 5.3.

Another topic emphasized within the framework of SDGs is the effectiveness of indicators for VAW and CEFM. VAW and CEFM are rooted in gender inequality and violence based on this inequality. This acceptance challenges SDG 5 itself. The explanatory power of indicators concerning the root causes is debatable. Compared to the Millennium Development Goals, SDG 5 indicators have been developed more comprehensively. The indicators of SDG 5 and similar studies are generally functional in providing policy recommendations and assessing the extent to which states fulfill their commitments. However, it is highly debated to what extent the indicators address the inequalities that form the foundation of power and gender relations and contribute to a transformation toward gender equality. In addition, especially considering the intersections of VAWG with climate change, migration, disasters, and crises, it can be argued that SDG 5 does not provide a perspective on situations where VAWG is directly or indirectly linked to these issues. The complexity of VAWG and its relationship with various social, economic, and environmental factors require a more holistic approach.

Moreover, as the indicators are calculated based on national-level data, they do not emphasize the local dynamics of VAW and CEFM. A nuanced evaluation of the effectiveness of SDGs is required. In Türkiye, this situation and the data gap increase the importance of qualitative research on VAW and CEFM. If the contribution of quantitative data to gender studies is excluded, considering that most of the other SDGs cannot be achieved without significant progress in SDG 5, steps should be reconsidered to enhance Türkiye’s performance in SDG 5, including generating regular and transparent data.

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## CHAPTER 8

### GENDER EQUALITY AS A SUSTAINABLE DEVELOPMENT GOAL: WOMEN'S PARTICIPATION IN DECISION-MAKING MECHANISMS IN TÜRKİYE

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#### Abstract

Global institutions recognize gender equality as a human right, a necessity, and an indicator of sustainable development. Türkiye accepted Sustainable Development Goal 5: Gender Equality (SDG 5) in 2015. In this context, the purpose of this study is to evaluate the significance of gender equality as a development goal in the case of Türkiye, especially by demonstrating the participation of women. This section will provide a comprehensive overview of the current state, progress, and challenges regarding gender equality and women's representation in Türkiye, analyzing the data and conducting theoretical research. The challenges and barriers that hinder women's representation in decision-making processes in Türkiye include societal norms, cultural biases, discriminatory practices, and structural barriers. This section will identify successful strategies, policies, and initiatives to promote gender equality and enhance women's representation while reviewing the literature and indicators used in international institutions (UNDP, UN Women). This study offers valuable insights into the progress of and gaps in achieving the Sustainable Development Goals for the 2030 Agenda, which require SDG 5 gender equality parameters, taking into account representation in decision-making mechanisms. The findings will contribute to a deeper understanding of the factors influencing gender equality in the country and provide a foundation for further research and policy development.

**Keywords:** Sustainable Development Goals, gender equality, women's participation, decision-making mechanisms, gender mainstreaming, Türkiye

## 1. Introduction

Achieving gender equality is crucial for creating inclusive societies, reducing poverty and inequality, and promoting economic growth and social development. It is an essential human right that must not be disregarded. The Sustainable Development Goals (SDGs) also strongly emphasize gender equality, with Sustainable Development Goal 5: Gender Equality (SDG 5) specifically focused on empowering women and girls. Achieving gender equality is crucial for creating inclusive societies, reducing poverty and inequality, and promoting economic growth and social development. It is a fundamental human right that cannot be overlooked. The SDGs also strongly emphasize gender equality, with SDG 5 specifically focused on empowering women and girls.

To advance gender equality and women's empowerment, the strategy known as "gender mainstreaming" aims to incorporate a gender perspective into all policies and programs. First, it was endorsed in the 1995 Beijing Declaration. In the UN ECOSOC plan, gender mainstreaming was referred to as a significant element of the sustainable development goals. This acknowledges the importance of gender equality in achieving sustainable development. The plan calls for the promotion of gender equality and the empowerment of women and girls in all aspects of life, such as education, health, economic opportunities, and political participation. Gender mainstreaming includes addressing discrimination and violence based on gender, promoting women's leadership and decision-making, and ensuring equal access to public services and opportunities.

Türkiye's gender representation strategies align with SDG 5, which aims to achieve gender equality and empower all women and girls. To enhance gender representation in politics in Türkiye, the following strategies and initiatives were intended to be implemented.

**Legal Reforms:** Türkiye has implemented legal reforms to enhance gender equality and representation. For instance, the Turkish Constitution guarantees equal rights for men and women, and the Law on Municipalities promotes gender equality in local governance.

**Quota System:** Despite it being a very controversial concept of the feminist movement in the Türkiye the quota system has been discussed regularly since the 1980s. The quota system in decision-making mechanisms in the politics of Türkiye has been implemented in some cases like municipalities, political parties, and social policymaking. Municipal and provincial general assembly elections in Türkiye can be cited as an example of quota implementation. In municipal and provincial general assembly elections, at least 25 percent of municipal council members in each electoral district must be women. In addition, some political parties also

apply quotas for women in their organizations such as women's branches and youth branches. Türkiye implemented a quota system in political representation for women in 2014. With this system, political parties were required to prepare lists for general and local elections in which at least 30% of the candidates were women. This system increased women's political participation and representation in decision-making processes at all levels. The government introduced the quota system which was supported by civil society organizations, including women's rights groups. The implementation of the quota system has led to an increase in the number of women in local and national assemblies. However, some critics argue that the system is not enough to address the underlying gender inequality in Türkiye (Yargıcı, 2020).

**Action Plans:** After 2014, Türkiye put gender equality action plans in place to address gender disparities in different areas. These plans aimed to increase the participation and representation of women in politics, economics, and society. However, their implementation could have been improved due to the growing popularity of the anti-gender movement on the political agenda.

**Women's Empowerment and Support Programs:** Türkiye has implemented programs to support women's empowerment and entrepreneurship. Initiatives such as the Women Entrepreneur Support Program and the Women Employment Support Program aim to enhance women's economic representation.

**Awareness and Capacity Building:** Awareness campaigns and capacity-building programs are conducted to promote gender equality and challenge gender stereotypes. These initiatives aim to change societal attitudes and empower women to participate fully in decision-making.

**Civil Society Engagement:** Civil society organizations played a crucial role in advocating for gender representation and equality in Türkiye from the 1980s until 2018. Active groups are still influential in advocacy policies. These NGOs work to raise awareness, provide support services, and advocate for policy changes.

While progress has been made, there are still obstacles to achieving gender representation in Türkiye. Gender stereotypes, cultural norms, and structural barriers impede full gender equality. Nonetheless, these strategies and initiatives demonstrate Türkiye's dedication to SDG 5's goal of increasing gender representation. The 2030 Agenda for Sustainable Development seeks to ensure the sustainable use of ecosystems and promote biodiversity conservation, while SDG 5 is devoted to achieving gender equality and empowering all women and girls. Both objectives are vital to advancing equality but focus on different facets of the norm construction and sustainability of global development.

## **2. Developmental Goals from the MDGs to the SDGs: Gender Equality**

According to UN Women, gender equality is both a human rights issue and a requirement for and indicator of sustainable development. It follows that whether a person is born or not, and regardless of their birth sex, their rights, obligations, and opportunities are indivisible, integral and comprehensive. The same is true for gender, orientation, age, race and ethnicity. Social equality entails considering the differences between the interests, needs, and priorities of an individual in all groups and giving them an equal voice in planning and decision-making processes (UN Women, 2001). The Millennium Goals and UN Sustainable Development Plans include gender equality as an inclusive and long-term development goal. Their context-specific, strategic approaches also include the legal and institutional processes adopted to achieve this goal (UN Women, 2014).

The Millennium Development Goals (MDGs) were approved by 189 member states, including 147 heads of state or government, at the UN General Assembly during the Millennium Summit. The MDGs are a set of eight goals based on the founding Millennium Declaration with the goal of eradicating extreme poverty and hunger and advancing global development by 2015. The third Millennium Development Goal is “Promoting gender equality” (UNDP, 2015). This covers issues such as the abolition of extreme poverty and hunger, universal primary education, child mortality, maternal health, combating HIV/AIDS, malaria, and other complex histories, reproductive sustainability, and global partnership. The sub-target is “eliminating gender inequality in primary and secondary education by 2005, and in all levels of education by 2015” (UNDP, 2015).

In the light of the lessons learned from the MDGs and the experience gained in the past, achieving gender equality should be considered both as a goal in itself and as an issue that touches all parts of other agendas. According to UN Women and other development partners, the goal of gender equality is a prerequisite for development and should be included in all goals. In line with the global commitments of UN Member States to gender equality, three critical areas are ensuring that women and girls are not exposed to violence, ensuring gender equality in resource allocation, and ensuring gender equality in decision-making in all areas of public and private life (UN Women, 2014).

The MDGs were primarily targeted at low- and middle-income countries. However, the SDGs cover all countries. The SDGs offer a more inclusive and sustainable approach by addressing gender equality in a broader perspective than the MDGs. It also has a broader perspective that includes areas such as gender-based violence, women's health, girls' educa-

tion and sexual and reproductive health, women's economic participation, access to leadership roles, and combating domestic violence. Sustainable Development Goal 5 is to achieve gender equality and empower all women and girls (The Global Goals). The 5th of the more detailed sub-goals includes ending all forms of discrimination against women and girls and eliminating all forms of violence, eliminating child marriage and forced early marriage, universal access to sexual and reproductive rights, eliminating unpaid care, and valuing domestic work. Another crucial sub-goal is to ensure the full and effective participation of women in political, economic, and social fields decision-making processes, as well as to provide equal opportunities for women to lead decision-making processes at all levels.

The two indicators cited in achieving this goal are “the seat rate of women in local governments and national parliaments” and “the proportion of women in managerial positions” (The Global Goals). In this context, it can be argued that ensuring the equal participation of women in decision-making mechanisms and encouraging active participation are very important and decisive in achieving sustainable development goals.

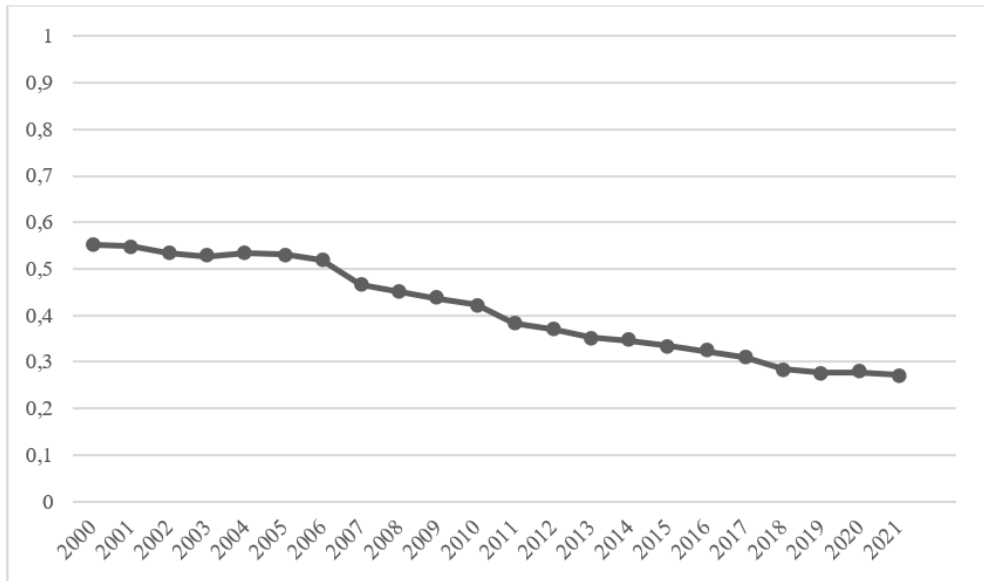
### 3. Gender Equality in Türkiye: A Brief Review through Indicators

The Human Development Index (HDI) first appeared in the Human Development Report published by the United Nations Development Programme (UNDP) in 1990. The HDI is an index used to measure the development level of countries, taking into account factors such as personal income, as well as education and health. The Human Development Report is updated annually and encompasses a broad dataset with the aim of evaluating the quality of life in countries. Türkiye's Human Development Index (HDI) values increased quite rapidly from 1990 to 2019. This measurement was started in 1990. With an HDI of 0.670 in 2000, when the MDGs were adopted, Türkiye is in the medium human development category. After the adoption of the SDGs, it was promoted to the high human development category in 2019. However, the Gender Inequality Index (GII)<sup>1</sup> shows that Türkiye's gender inequality gap increased from 2000, when the MDGs were adopted, to 2020 (See: Figure 1). Although the index value calculated for the six regions of the world in 2021 was 0.465, Türkiye's score remained below the world average.

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1 The GII is a composite index which measures development within a country and then negatively corrects for gender inequality. According to the United Nations Development Program, it is a measure that reflects inequality between women and men in terms of earnings in three dimensions: “reproductive health, empowerment and labor market participation”. Its value ranges from 0 (when women and men are paid equally) to 1 (when men or women are underpaid in all dimensions).





**Figure 1.** Gender Inequality Index (GII) Values of Türkiye (2000-2021)

**Source:** UNDP Data Center: Gender Inequality Index (GII)

The Global Gender Gap Index, developed by the World Economic Forum in 2006 for more than 100 countries, is calculated by measuring four different dimensions: “economic participation, educational attainment, health and survival, and political empowerment”. Rather than ranking countries according to their level of development or development levels, this index, which is prepared annually to measure gender-based gaps in terms of access to resources and opportunities, also reveals progress and regressions in these dimensions. The 2023 Global Gender Gap Report results reveal the following:

“For the 146 countries covered in the 2023 index, the Health and Survival gender gap has closed by 96%, the Educational Attainment gap by 95.2%, Economic Participation and Opportunity gap by 60.1%, and Political Empowerment gap by 22.1%. Based on the constant sample of 102 countries covered in all editions since 2006, there is an advancement from 95.3% to 96.1% in Educational Attainment between 2022 and 2023, moving beyond pre-pandemic levels, and an improvement from 95.7% to 95.9% for the Health and Survival dimension. The Political Empowerment score edges up from 22.4% to 22.5%, and Economic Participation and Opportunity regresses from 60.0% in 2022 to 59.8% in 2023. At the current rate of progress over the 2006-2023 span, it will take 162 years to close the Political Empowerment gender gap, 169 years for the Economic Participation and Opportunity gender gap, and 16 years for the Educational Attainment gender gap. The time to close the Health and Survival gender gap remains undefined.” (WEF, Global Gender Gap Report 2023).

Türkiye's index ranking since 2015, when the SDGs were adopted, is analyzed in the table and graph below:

<b>Table 1. The Global Gender Gap Index Rankings of Türkiye (2015-2022)<sup>2</sup></b>						
<b>Year</b>	<b>Economic Participation Decision-making</b>	<b>Educational Attainment</b>	<b>Health and Survival</b>	<b>Political Empowerment</b>	<b>Global Index</b>	<b>Total Number of Countries</b>
<b>2015</b>	131	105	1	105	130	145
<b>2016</b>	129	109	1	113	130	144
<b>2017</b>	128	101	59	118	131	144
<b>2018</b>	131	106	67	113	130	149
<b>2019</b>	136	103	64	109	130	135
<b>2020</b>	136	113	64	109	130	153
<b>2021</b>	140	101	105	114	133	156
<b>2022</b>	134	101	99	112	124	146
<b>Source:</b> World Economic Forum Global Gender Gap Reports: <a href="https://www.weforum.org/reports/">https://www.weforum.org/reports/</a>						

According to the results of sub-indices based on these four dimensions, Türkiye ranked 134th in economic participation and opportunities, 101st in educational attainment, 99th in health and survival, and 112th in political empowerment in 2022 (Global Gender Gap Report 2023). In parallel with the global results, Türkiye has not made significant progress in women's political participation.

The number of women involved in decision-making mechanisms is an important data point for measuring gender equality (Yıldırım, 2019:151). Thus, we argue that participation in decision-making mechanisms in Türkiye is an area where inequality is strikingly high and where certain policies need to be developed. In this context, this study will examine women's participation in decision-making mechanisms in Türkiye in four areas: parliament, public administrative/local government, diplomacy, and higher education.

2 In the Global Gender Gap Index, each sub-index includes specific indicators and countries are scored based on their performance on these indicators. Each score range represents a specific level of inequality. Total scores are calculated as a weighted average of the scores of these four sub-indices. Countries are ranked according to their total score. Looking at the rankings in the annual reports, for example, in 2015, 25 countries ranked 1st in the education attainment index. In 2016, 38 countries ranked 1st in the health and survival index. Having more than one country in the same ranking means that these countries perform similarly in terms of gender inequality. That is, their scores in the sub-indices and inequality levels are close.

## **4. Women's Participation in High-Level Decision-Making Mechanisms in Türkiye**

The advancements made by Türkiye in promoting gender equality and women's participation extend beyond politics and the public sector. The significance of gender equality in high-level decision-making mechanisms, such as diplomacy and other critical areas, is increasingly acknowledged.

In recent years, Türkiye has demonstrated a commitment to expanding women's representation and participation in these vital fields. There have been efforts to ensure women's participation in diplomatic negotiations, international forums, and other decision-making processes. Türkiye aims to establish a more inclusive and diverse approach to decision-making by creating opportunities for women to hold high-level positions and participate in significant discussions.

While obstacles may persist, Türkiye's efforts to increase women's participation in diplomacy and other high-level decision-making mechanisms indicate a positive trend toward gender equality and inclusiveness. These initiatives recognize the valued perspectives and contributions women bring to the table, thereby fostering a more balanced and effective decision-making process. In this context, women's participation in decision-making mechanisms will be analyzed under four headings: politics, public administration/local governments, diplomacy, and academia.

### **4.1. Women in Parliament**

Women's participation in politics in Türkiye has received increasing attention and effort over time but still faces some challenges. Women's representation in the political arena in Türkiye remains low. Although the proportion of women Members of Parliament and municipal council members in parliament and local government assemblies has increased over time, it is still not at the desired level. There are several challenges that prevent women from accessing equal opportunities in the political arena. It is sometimes more difficult for women to rise to leadership positions in political parties and to become candidates. In this context, we will examine women's representation in politics, one of the most important indicators for monitoring progress towards SDG 5.

General elections for the primary legislative body in Türkiye are held every five years. The percentage of women in parliament was 4.4% after the first general election held after the adoption of the Millennium Development Goals in 2000. The percentage increased to

9.1% after the 2007 general elections, 14.4% after the 2011 general elections, 14.7% after the 2015 general elections, and 17.3% after the 2018 general elections, finally reaching 20.6% after the 2023 elections.

Year	Total number of representatives	Number of Women members of parliament	Proportion of representation (%)
2002	550	24	4.4
2007	550	50	9.1
2011	550	79	14.4
2012	548	79	14.4
2013	548	79	14.4
2014	535	77	14.4
2015	550	81	14.7
2016	550	81	14.7
2017	539	75	13.9
2018	600	104	17.3
2019	589	102	17.3
2020	584	101	17.3
2021	582	102	17.4
2022	579	100	17.3
2023	600	121	20.16

**Source:** TÜİK Number of representatives and proportion of representation of the Assembly by sex. <https://www.mecliste.org/>

Worldwide, the percentage of women parliamentarians was 15% in 2002, 17.7% in 2007, 19.5% in 2011, 22.7% in 2015, 24.1% in 2018, and is projected to be 26.5% in 2023. As of the May 14, 2023, election, the percentage of women in parliament in Türkiye is lower than the global average of 26.8% according to the UN Women and Inter-Parliamentary Union (IPU) report titled “Women in Parliament 2022” published in 2023 (IPU, 2022).

Overall, the report shows that in 47 countries where elections were held in 2022, women won an average of 25.8% of the seats, which represents a 2.33% increase compared to the previous election. In 2022, women’s representation increased at the slowest pace in six years, reaching only 26.5% by the end of the year. According to the IPU’s findings on women’s participation in politics, every year since 2005 a significant factor in the increase in women’s representation in parliament is that of legal quotas which require a minimum number of female candidates. In countries with legal or voluntary quotas, 30.9% of women were elected to parliament. This percentage fell to 21.2% in countries without quotas (IPU, 2022).

Table 3. Global averages of women in national parliaments					
Year	Total MPs	Known gender breakdown	Men	Women	Percentage of women (%)
2002	41,746	37,803	32,130	5,673	15.0
2007	44,087	44,087	36,294	7,793	17.7
2011	46,501	45,731	36,803	8,928	19.5
2015	44,877	44,548	34,438	10,110	22.7
2018	46,125	45,732	34,712	11,020	24.1
2023	44,446	43,977	32,208	11,769	26.8
Source: IPU's open data platform (Data for December 2002-2007-2011-2015-2018: <a href="http://archive.ipu.org/wmn-e/world-arc.htm">http://archive.ipu.org/wmn-e/world-arc.htm</a> , Data for 1st April 2023: <a href="https://data.ipu.org/women-averages">https://data.ipu.org/women-averages</a> )					

4.2. Women in Public Administration/Local Government

Women’s representation in public administration and local governments in Türkiye is a subject of ongoing debate, and effort on gender equality and the role of women in politics continues to be made. The representation of women in executive positions in public administration, state institutions, and the public sector is still low in Türkiye. Although there have been occasional female ministers and senior officials in government councils, women’s representation in political leadership positions is not yet at the desired level. For our study, we obtained the number of women ministers by examining the Councils of Ministers from the 2002 General Elections, which was the first general election after 2000 when the Millennium Development Goals were adopted. As can be seen in the table, the number of female ministers in government in the examined period, with changes, is 17 in total. In each period of government established after 2000, only one or two ministerial positions were given to women. These positions are mainly limited to the Ministries of “Women and Family”, “Family and Social Policies”, and “Family, Labor and Social Policies”, the names of which have changed over time.

There is a quota for women in municipal and provincial general assembly elections. This aims to increase women’s representation in local government assemblies. The total number of metropolitan, provincial, district, and town municipalities in Türkiye is approximately 1,389. Women’s representation in high-level positions such as mayorship is still weak.

**Table 4.** Number of Women Ministers in Governments and Their Positions

Government	Number of Women Ministers	Positions
58th Turkish Government (2002-2003)	1	Minister of Tourism
59th Turkish Government (2003-2007)	2	Minister of State / Minister of State
60th Turkish Government (2007-2011)	2	Minister of State/Minister of Women and Family/Minister of National Education
61st Turkish Government (2011-2014)	2	Minister of Family and Social Services
62nd Turkish Government (2014-2015)	1	Minister of Family and Social Services
63rd Turkish Government (August-November 2015)	2	Minister of Family and Social Services / Minister for EU Affairs
64th Turkish Government (2015-2016)	2	Minister of Family and Social Services / Minister of Environment and Urbanization
65th Turkish Government (2016-2018)	2	Minister of Family and Social Services / Minister of Labor and Social Security
66th Turkish Government (2018-2023)	3	Minister of Family, Labor and Social Services / Minister of Family and Social Services / Minister of Trade
Source: TBMM: <a href="https://www.tbmm.gov.tr/">https://www.tbmm.gov.tr/</a>		

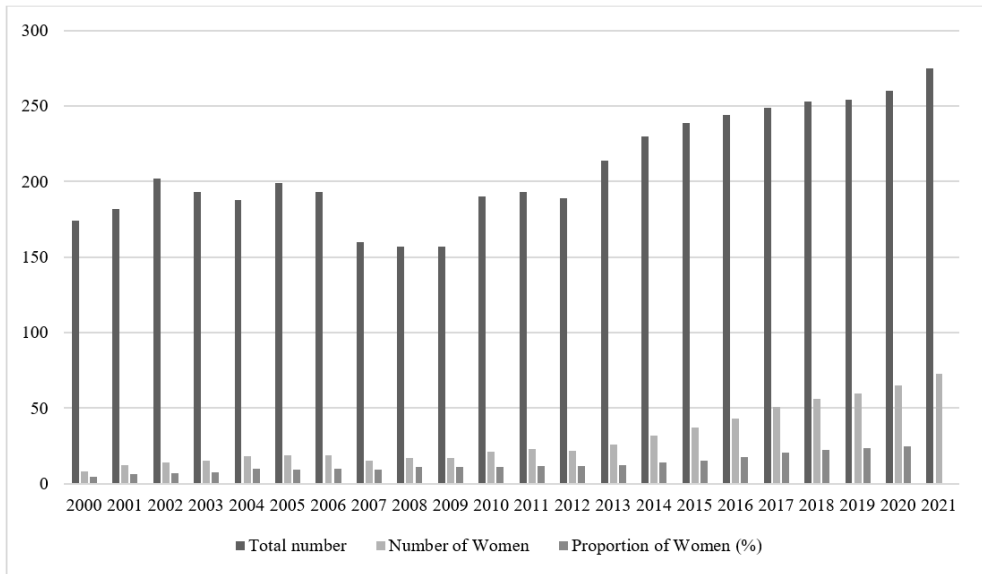
As seen in Table 4, an analysis of the 2004, 2009, 2014, and 2019 local election results shows a regular increase in the number of female mayors from the 2004 elections to the 2019 elections. According to the results of the 2004 local elections, the proportion of women among the provincial council members is 1.7%. According to the results of 2009, this is 3.3%, in 2014 it is 4.8%, and in 2019 it is 3.7%. Although the representation of women in the provincial council increased until the 2014 elections, the number of women who were members of the provincial councils decreased by 12 people in the 2019 elections compared to the 2014 elections, which corresponds to a decrease of 1.1%. It is possible to say that the ratio of women among the members of the municipal councils showed a regular increase when viewed over the total numbers in all the election years examined. However, in general, according to Sancar (2018), contrary to the trend in the world, the representation of women at local levels in Türkiye is still far behind their representation in general elections.

<b>Table 5. Number and Ratio of Women in Local Government (2004-2019)</b>			
<b>2004 Local Elections</b>	<b>Total Number</b>	<b>Number of Women</b>	<b>Proportion of Women (%)</b>
Mayor of the Municipality	3,225	18	0.56
Provincial council membership	3,208	56	1.75
Membership of the municipal council	34,477	799	2.32
<b>2009 Local Elections</b>	<b>Total Number</b>	<b>Number of Women</b>	<b>Proportion of Women (%)</b>
Mayor of the Municipality	2,948	44	0.9
Provincial council membership	3,379	110	3.25
Membership of the municipal council	31,790	1,340	4.21
<b>2014 Local Elections</b>	<b>Total Number</b>	<b>Number of Women</b>	<b>Proportion of Women (%)</b>
Mayor of the Municipality	1,398	40	2.9
Provincial council membership	1,251	60	4.8
Membership of the municipal council	20,498	2,198	10.7
<b>2019 Local Elections</b>	<b>Total Number</b>	<b>Number of Women</b>	<b>Proportion of Women (%)</b>
Mayor of the Municipality	1,389	42	3.0
Provincial council membership	1,272	48	3.77
Membership of the municipal council	19,546	2,283	11.68
<b>Source:</b> The data was compiled by analyzing YSK statistics ( <a href="https://www.ysk.gov.tr/tr/mahalli-idareler-genel-secimleri-arsivi/2650">https://www.ysk.gov.tr/tr/mahalli-idareler-genel-secimleri-arsivi/2650</a> ) and publications of KA.DER - Kadın Adayları Destekleme Derneği ( <a href="https://ka-der.org.tr/">https://ka-der.org.tr/</a> )			

### 4.3. Women in Diplomacy

Women's representation in diplomacy in Türkiye refers to the role of women diplomats and officials in international relations. The presence of women in diplomacy can vary depending on many factors related to gender equality and women's access to leadership positions. When we look at the representation of women in diplomacy in Türkiye, the rate of female ambassadors increased from 4.6% to 26.5% from 2000 to 2021, which is quite remarkable (See: Figure 2). Some women diplomats have served in senior positions in Türkiye. Women diplomats have assumed leadership roles in embassies, consulates and international organizations. Women diplomats work effectively on issues such as peace and security, human rights, humanitarian aid, environment and development. However, the number of female diplomats in Türkiye remains low compared to male diplomats, although it has increased over time.

Various efforts are also underway to increase the number of women diplomats in the Ministry of Foreign Affairs and other diplomatic missions and to promote them to more senior positions. In order to encourage greater representation of women in diplomacy, various policies and programs for diplomatic training, appointments, and career opportunities are being implemented within the ministry, in civil society, and in academia.



**Figure 2.** Number and proportion of women ambassadors (2000-2021)

**Source:** TÜİK-Number and proportion of ambassadors by sex:

<https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Kadin-2021-45635>

#### 4.4. Women in Higher Education

The position of women in Turkish universities has been changing over the years. Since the mid-20th century, the presence of women in education and academia has increased. Efforts were made to prevent gender discrimination in university admissions and the number of female students increased. However, it is also a fact that there are various difficulties which hinder women from advancing in their academic careers and reaching senior positions.

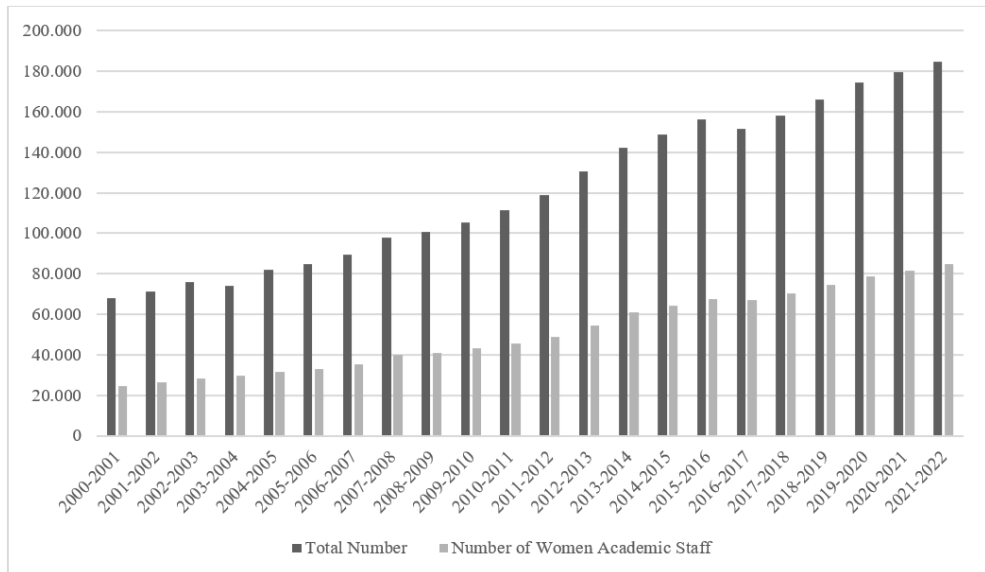
Women are generally underrepresented in fields traditionally considered male-dominated, such as STEM (science, technology, engineering and mathematics) fields. In universities, men have outnumbered women, especially in senior academic titles such as professor and associate professor. In addition, the representation of women in senior management positions at universities, such as rectors, deans and department heads, can be limited. Women may face various challenges in becoming academic administrators. These include traditional gender roles and expectations, domestic/family responsibilities, patriarchal structures and gender inequality. In many studies on women in decision-making positions in higher education institutions, it has been revealed that the barriers to women's participation in decision-making processes are issues such as the glass ceiling phenomenon (Özkaplan, 2013), stereotypes about roles in the family and gender-based division of labor in domestic responsibilities (Öztan & Doğan,



2015), the masculine culture of institutions (Göker & Polatdemir, 2019), and lack of mentoring support (Ünlü, Baybars, & Kesken, 2014).

Gender equality in Turkish universities is an important issue at both national and international level. Universities aim to provide equal opportunities for male and female students and academics by adopting and implementing policies that promote gender equality. However, the situation in this area calls for more concrete policies and more inclusive action plans.

According to the Council of Higher Education 2020 data, the percentage of female academic staff out of the total number of academic staff in Türkiye is 45.13% (YÖK Women's Studies in Academia Unit). According to World Bank data, the rate of female academic staff at higher education levels is 42% in the European Union and OECD countries (The World Bank Data). In light of these data, it is seen that the ratio of female academic staff in higher education institutions in Türkiye is above the average of EU and OECD countries. According to the data obtained from the statistics on the web page of the Council of Higher Education Women in Academia Studies Unit, despite the relatively equal gender ratio in the number of academic staff, the number of female rectors and deans in universities, for example, the number of women in managerial positions in higher education, is quite low, as can be seen in figure 3 and table 6.



**Figure 3.** Number of women academic staff in higher education (2000-2022)

**Source:** TÜİK-Number of teaching staff in higher education by sex and academic title: <https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Kadin-2021-45635>

According to data from KA.DER - Association for the Support of Women Candidates - from 2015, when the SDGs were adopted, to the present day, the rate of women rectors at universities was 7.5% in 2015, 9.66% in 2016, 9.66% in 2017, 9.09% in 2018, and 8.6% in 2019 (KA.DER). Looking at the 2020 data of YÖK Women in Academia Studies Unit, while the total number of deans in public and foundation universities is 1,797, the number of female deans is 322, corresponding to 18% (See Table 7). While the total number of rectors in universities is 201, the number of female rectors is 16, corresponding to 8%.

<b>Table 6. Number/Proportion of Women Deans and Rectors in Universities (2020)</b>				
<b>University (Public/Foundation)</b>	<b>Total Number of Deans</b>	<b>Number of Women Deans</b>	<b>Total Number of Rectors</b>	<b>Number of Women Rectors</b>
Public Universities	1,388	216	127	8
Foundation Universities	409	106	74	9
Total Number	1,797	322	201	17
Proportion (%)		18		8
<b>Source:</b> YÖK Statistics: <a href="http://www.yok.gov.tr">www.yok.gov.tr</a>				

## **5. Challenges and Opportunities for Increasing Women's Participation in Turkish Decision-Making Processes**

There are many obstacles to women gaining access to decision-making positions both in Türkiye and in the world. These obstacles include patriarchal social structure, women's unequal access to education, perceptions and prejudices based on gender roles, policies without a gender perspective, and incomplete and inadequate social/public policies in areas such as care work and equal pay. In this context, we argue that a gender mainstreaming strategy should be implemented to increase women's participation in decision-making mechanisms in Türkiye.

Gender mainstreaming is an integral approach to achieving gender equality and empowering women in various aspects of society, including decision-making processes. While Türkiye does not currently have a Women, Peace, and Security (WPS) National Action Plan, it can still adopt gender mainstreaming policies that are vehicles for the promotion of women's representation in decision-making mechanisms. Gender mainstreaming involves integrating a gender perspective into all policies and programs, ensuring that women's specific needs, experiences, and perspectives are considered. By implementing gender mainstreaming policies, Türkiye can work towards creating an inclusive and equitable society where women have equal opportunities to participate in and influence decision-making processes at all levels. It requires a comprehensive and coordinated effort involving government institutions, civil

society organizations, and other stakeholders to ensure that gender equality is a priority in all policy areas, ultimately leading to a more inclusive and representative society.

Increasing women's representation in decision-making mechanisms in Türkiye can be a complex endeavor, and there are both challenges and opportunities to address. Here are some potential opportunities and policy recommendations:

1. Promote gender-responsive laws and policies: Implementing and enforcing laws and policies that specifically address gender equality can help create a more inclusive decision-making environment. The new habitat of norms could include measures such as quotas or affirmative action policies to increase the number of women in political and leadership positions.

2. Enhance political party reform: Encourage political parties to adopt internal policies that promote gender equality, such as ensuring a certain percentage of women candidates in elections. Parties can also establish training programs and mentorship opportunities to support women's political participation and leadership development.

3. Enhance education and awareness: Invest in educational campaigns and initiatives designed to elevate awareness regarding the significance of women's involvement in decision-making processes. This recommendation involves advocating for gender equality and challenging societal stereotypes and biases that hinder progress in leadership roles.

4. Expand support networks and capacity-building programs: Establish networks and organizations that provide support, mentorship, and training to women who aspire to be decision-makers. Such programs can help build the skills, confidence, and networks necessary for success in leadership positions.

5. Foster inclusive workplace environments: Encourage public and private sector organizations to implement policies that support work-life balance, such as flexible working hours and parental leave. Caregiving obligations, which frequently adversely affect women's career advancement, may be lessened.

6. Enhance data collection and research: Improve data collection efforts to monitor women's representation in decision-making mechanisms. This data can provide evidence for policymakers and activists, enabling them to develop targeted interventions and track progress over time.

7. Engage men as allies: Involve men in initiatives promoting gender equality and women's empowerment. Encouraging men to actively support and champion women's representation in decision-making can help break down traditional gender norms and stereotypes.

8. Promote media diversity and gender-sensitive reporting. Encourage media outlets to portray women as leaders and decision-makers, highlighting their accomplishments and contributions. As a result, more women may be motivated to pursue leadership positions, challenging gender stereotypes.

9. Strengthen international collaboration: Seek opportunities for collaboration and knowledge sharing with other countries and international organizations that have successfully increased women's representation in decision-making processes. Learning from their experiences and best practices can inform policy development and implementation in Türkiye.

Addressing these challenges and pursuing these opportunities can create a more inclusive and representative decision-making environment in Türkiye, benefiting both women and society.

## 6. Conclusion

This study has aimed to demonstrate that gender equality, which is one of both the Millennium Development Goals and the Sustainable Development Goals, is a long-term global goal that UN member states are committed to achieving. The 3rd Millennium Development Goal is to promote gender equality and women's empowerment. To achieve the MDGs, monitoring concrete progress and determining the extent to which progress has been made is important. By 2015, the deadline for achieving the MDGs, gender inequality was still a persistent problem, and women were discriminated against in areas such as participation in the labor force, ownership of economic resources, and participation in decision-making processes. Therefore, developing the 2015 Agenda following the MDGs made it clear that poverty cannot be solved without addressing gender inequality.

SDG 5, which builds on the MDGs and includes more inclusive sub-goals based on the experience during this period, is to achieve gender equality and empower all women and girls. Among a series of sub-goals, such as ending discrimination and all forms of violence against women and girls, ensuring public services, infrastructure, and social protection policies for gender equality where appropriate to national circumstances, and valuing unpaid care work and domestic work, the 5th SDG is to ensure women's full and effective participation in and equal opportunities for leadership at all levels of decision-making in political, economic, and social life. The SDGs were adopted in 2015, entered into force in 2016, and are targeted to be achieved by the end of 2030, requiring national and global efforts by UN member states, including Türkiye.

Türkiye has made substantial efforts to achieve Sustainable Development Goal 5 on gender equality. In 2014, the government implemented a quota system for political representation, mandating that political parties include at least 30 percent of female candidates on their candidate lists for national and local elections. As a result, more women are now in national and local assemblies. However, there are still obstacles to achieving effective gender mainstreaming in developing and implementing policies.

To promote gender equality, municipalities in Türkiye have also implemented gender budgeting and provided gender-sensitive services. Türkiye has also created a National Action Plan on Gender Equality, which outlines goals and plans for achieving gender equality in several fields.

Additionally, gender equality has been actively promoted by Türkiye's foreign policy. In regional and international forums, the country has actively pushed for the rights and empowerment of women. Additionally, it has put policies in place to support female entrepreneurship and workforce participation.

Although these efforts are commendable, more work is needed to fully integrate gender concerns into all policies and programs. Gender mainstreaming must go beyond a standard understanding of equality and be intersectional and quota-based to include a comprehensive strategy to address structural gender inequalities.

In conclusion, Türkiye's efforts to achieve SDG 5 and promote gender equality in parliamentary, municipal, and foreign policy representation are commendable and should be continued and intensified. However, gender mainstreaming must be further integrated into all policy areas, and sustained efforts must be made to address the structural gender inequalities that persist in Turkish society. The barriers to women's participation were identified in the policy areas evaluated based on the data, and the importance of addressing structural issues was emphasized. Social mainstreaming is discussed as a strategy that political parties, various levels of local government, and university administrations can employ to increase the participation of women in these fields.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







## CHAPTER 9

### A DETAILED ANALYSIS OF SDG 6 AND TÜRKİYE

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#### Abstract

One of the most basic human needs is access to clean water and sanitation. The availability of adequate drinking water is essential for societies' health, economic development, and social welfare. However, decreasing water resources due to urbanization, pollution, climate change, and insufficient investment in this regard threaten water resources. For this reason, the water issue has been moved to the top of the world agenda and became part of the Sustainable Development Goals (SDG 6) in 2015. The EIA (2020) report highlights that the most critical environmental problem in Türkiye is water pollution. In this chapter, access to clean water and sanitation in Türkiye between 2000-2020 was evaluated with Boxplots compared to OECD countries. In the next stage, the relationship between SDG 6 and poverty, education, health, and gender inequality indicators for OECD countries was investigated. Based on these indicators, OECD countries were divided into clusters, and it was investigated whether there was a difference between these clusters in terms of SDG 6.

**Keywords:** Cluster Analysis, Kruskal Wallis Test, SGD 6, Water and Sanitation

## 1. Introduction

Although the growth rate of the world population has slowed down compared to previous decades, it continues to increase. As a result of this situation, societies face many problems, such as poverty, famine, health problems, climate crises, and decreasing biodiversity. To overcome these problems and to live in a cleaner, more equitable, more prosperous, more peaceful, and better environment, United Nations Member States agreed on 17 Sustainable Development Goals (SDGs) in 2015 as a universal call to action. SDGs, aimed to be achieved by 2030, are based on ending poverty and hunger, strengthening healthy and prosperous societies and women, ending climate change, decreasing biodiversity, and increasing environmental pollution.

At the point of realizing these goals, global solidarity is very important, as well as the efforts of citizens and governments. Policymakers and academics have adopted the 2030 Sustainable Development Goals in order to realize the concepts of “equality, efficiency, and sustainability” (Ghosh, Bhowmick & Saha, 2020). All SDGs are built on optimizing human-human and human-nature interactions and their interconnections (Ghosh, Bhowmick & Saha, 2020); access to education, employment opportunities, health services, access to food, drinking water, and sanitation are prominent parameters in the development of countries (Oswald, 1997; Sen, 2000). On the other hand, there is a positive and significant correlation between public spending and the achievement of SDG targets (Sachs et al., 2022). The correlation between government spending and the SDG Index score is relatively stronger in low-income countries (Sachs et al., 2022).

The recent Covid-19 epidemic, natural disasters, armed conflict, and wars have cost many lives. These difficulties have negatively affected almost every aspect of human life, from health to livelihoods, food security, job loss, human rights, and gender equality (ESCAP, 2021). For this reason, years of progress in ending poverty, access to food, safe water and sanitation, and access to energy have slowed down (UN, 2023). The world is behind the targets set for 2030 as these crises affect many intertwined environmental, economic, and social events (UN, 2023). The SDG index score average has fallen over the past two years as Covid 19, war, and natural disasters have delayed the recovery of poor countries (Sachs et al., 2022). Furthermore, the projections made by the researchers for the coming periods will be that the effects of climate change will be more serious than the previous forecasts (Kikstra et al., 2022), the expected way to reduce poverty will not be taken (Si et al. 2020), and the water scarcity problem will deepen (He et al., 2021).

The sixth of the 17 SDG targets, prominent for developing societies, relates to vital water and sanitation. SDG 6 is about “Ensuring the availability and sustainable management of water and sanitation for all” (Assembly, 2015). SDG 6 has an important relationship with natural, social, and physical capital (Ghosh, Bhowmick & Saha, 2020). Water resources and sanitation are closely related to other development issues such as food hygiene, health, agriculture, industrial growth, energy production, and ecosystem (UN, 2018). As a result of climate change, reasons such as increasing temperatures, increasing population, desertification, urbanization, and pollution cause water-related problems to expand. Inadequate water supply and unsafe sanitation cause serious health problems. There is a strong relationship between water, sanitation, and public health (Roy and Pramanick, 2019). For example, it is important to improve water and sanitation to solve cases such as diarrhea, ascariasis, cholera, scabies, trachoma, and amebiasis encountered in poor countries (Bartram and Cairncross, 2010). In the long run, increased access to food due to water and sanitation improvement will result in better educational performance and an improved labor market (Paunio and Acharya, 2008).

SDG 6 and other Sustainable Development Goals are related; improvement in one positively affects other sustainability goals. Access to safe water and improved sanitation affects these goals: eradicating poverty (SDG 1), ending hunger with enhanced nutrition (SDG 2), promoting wellness (SDG 3), quality education (SDG 4), gender equality (SDG 5), cities of inclusion (SDG 11), underwater life (SDG 14), and terrestrial ecosystems (SDG 15) (Bharat, Dkhar and Abraham, 2020). In this sense, realizing SDG 6 targets will also improve other SDG indicators. In this sense, it is important to actualize the SDG 6 targets, as they are both vital and pave the way for realizing other sustainability goals.

In the past 20 years, the proportion of the world population using safely managed drinking water has increased from 62% to 74%, and similarly, recovery has been observed to access safe sanitation. However, today, 2.2 billion people do not have access to safe drinking water, and 3.4 billion people do not have access to safe sanitation (UN, 2023). These numbers show that there is still a long way to go to reach the 2030 targets. Additionally, it is predicted that one out of every four people will experience water scarcity in 2050 (SUEV, 2020).

There are six SDG 6 goals planned to be achieved by 2030. These are as follows (UN, 2018):

*“Safe and affordable drinking water; end open defecation and provide access to sanitation and hygiene; improve water quality, wastewater treatment and safe reuse; increase water use efficiency and secure freshwater resources; implement integrated water resources management; protect and restore aquatic ecosystems.”*

Some of the indicators used to measure these six targets are as follows: “Proportion of population using safely managed drinking water services”, “Proportion of the population using safely managed sanitation services”, “Proportion of safely treated domestic and industrial wastewater streams”, “Water stress indicator: freshwater as a proportion of available freshwater resources gravity”, “Proportion of transboundary catchment area with an operational arrangement for water cooperation” and “Change in the extent of water-related ecosystems over time”.

The water stress indicator, one of the targets used in the measurement of SDG 6, has serious negative effects on human life and livelihoods (WRI, 2023). Water stress is “extremely high” in 17 countries that comprise a quarter of the world’s population. On the other hand, Türkiye’s water stress level is defined as the “high baseline” and ranks 32<sup>nd</sup> among 164 countries (WRI, 2023).

This chapter aims to examine in detail the issue of access to safe water and sanitation in Türkiye. For this purpose, the development of Türkiye in the last 20 years according to SDG 6 indicators, the comparison of this development process with other OECD countries, the relationship between SDG 6 and other sustainability targets, the determination of different OECD country groups in terms of SDG 6 indicators, and recommendations are included.

## **2. SDG 6 and Türkiye**

Türkiye is a country that does not have rich water resources, and it is estimated that the amount of water per capita will decrease by 32% in 2030 compared to the previous decade due to increasing population, urbanization, and drought (EIA, 2020). Ranking 72 out of 166 countries in the SDG 2023 report, it has been stated that Türkiye has a moderately improving trend in SDG 6 and still faces significant challenges.

According to the EIA 2020 report, water pollution, the prior environmental problem in 27 of the 81 provinces in Türkiye, the second priority in 30, and the third priority environmental problem in 16, stands out as an important ecological problem in 73 provinces in total. According to this report, 26% of surface water resources contain high-quality water, 18% slightly polluted water, 21% contaminated water, and 35% heavily polluted water, while 69% of groundwater resources are of good quality and 31% are of poor quality. Domestic wastes, agricultural wastes, and industrial wastes are shown as the most important causes of pollution of water resources and seas, respectively. It is stated that the most important cause of domestic wastewater-sourced pollution is the insufficient sewerage network in the provincial centers and the lack of treatment in the districts. In addition, according to the survey results of the

EIA 2020 report, the difficulties encountered in the prevention of water pollution are, in order of importance, treatment plants that could not be established due to financial impossibilities, lack of awareness, insufficient inspection, and legal deficiencies.

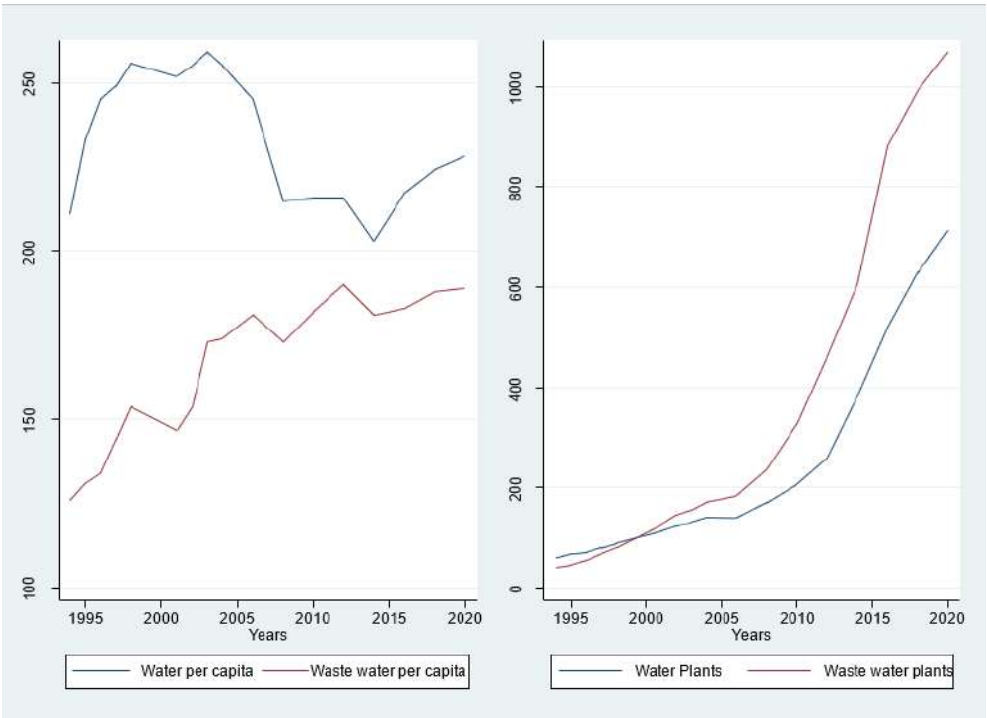
Although the amount of water used per capita in Türkiye is lower than 20 years ago, the amount of wastewater produced increased in this process. On the left side of the panel in Figure 1 is a graph of the amount of water withdrawn by the municipalities and the amount of wastewater discharged (per capita, liter). Graphs are based on TurkStat statistics for the years 1995-2020. It is observed that wastewater has an increasing trend until 2012, and after 2015, it follows a partially horizontal course. While the amount of wastewater withdrawn was 126 liters per person in 1995, it increased to 189 liters in 2020. While the amount of sewage per capita is 189 liters in Türkiye in 2020, it is 117 liters in Germany, an OECD country. When the amount of water used per capita in Türkiye is analyzed, an increasing trend is observed between 1995-2000. It followed a decreasing trend after 2005 and reached its lowest level in 2015. After 2015, it entered an increasing trend. The amount of water distributed from municipalities in 2020 is 228 liters per person. In response to this, the amount of water consumed per capita is 125 liters in Germany and 101 liters in Denmark (Statista, 2020).

The number of drinking water and wastewater treatment plants increased rapidly in Türkiye, which can be seen in the right part of Figure 1 panel. With the increase in the number of plants, an increase has been observed in the ratio of those who receive safe drinking water and sanitation services to the total population (TURKSTAT, 2020).

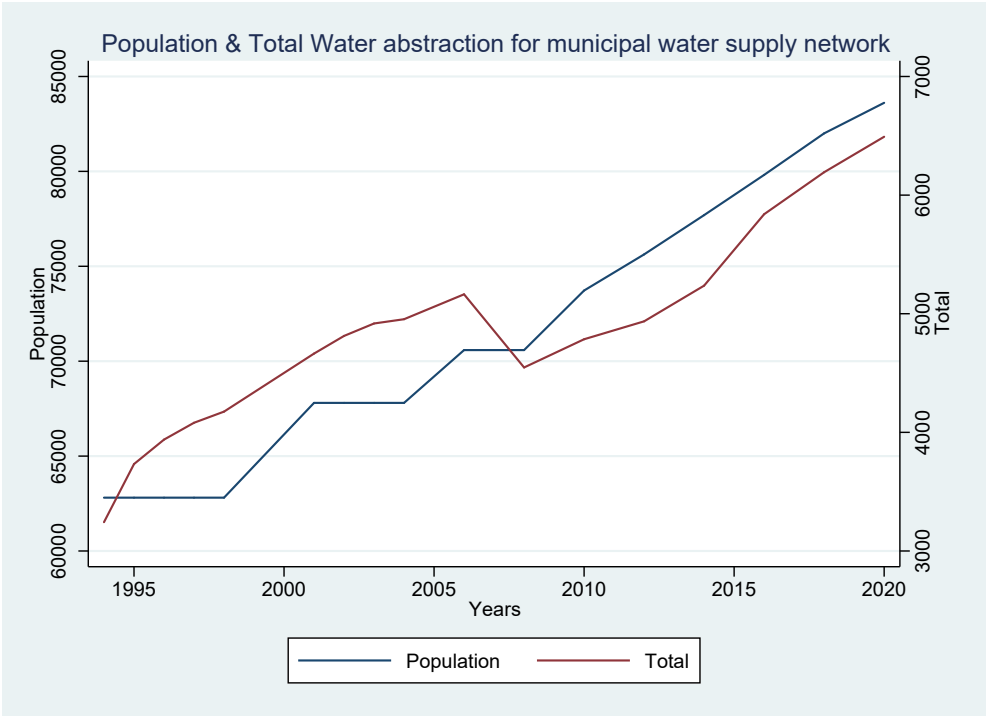
With the increasing population in Türkiye, there has been an increase in the total amount of water drawn by the municipalities from year to year. However, as seen in Figure 2, there was a break in the total amount of water withdrawn in 2005. With the decrease in the total amount of water withdrawn per capita (Figure 1), there has been a change in the slope. In 2020, municipalities drew 6.5 billion m<sup>3</sup> of water from water sources to drinking and utility water networks. 40.9% of the withdrawn water was obtained from dams, 29.3% from wells, 15.6% from springs, 10.1% from rivers, and 4% from lakes, ponds, or seas (TURKSTAT, 2020).

Similarly, the total amount of wastewater drawn by municipalities has increased in parallel with the increase in population (Figure 3). 4.4 billion m<sup>3</sup> of 5 billion m<sup>3</sup> of sewage discharged from the sewerage network by municipalities in 2020 was treated in wastewater treatment plants. Advanced treatment was applied to 50.7%, biological treatment to 27.1%, physical treatment to 21.9%, and natural treatment to 0.3% of the treated wastewater. Of the treated

wastewater, 46.4% goes to the river, 42.8% to the sea, 3% to the dam, 1.2% to the lake pond, 0.3% to the land, and 6.2% to other receivers discharged into the environment. 1.6% of this treated wastewater is used for industry, agricultural irrigation, etc. It was determined that it was reused in some areas (TURKSTAT, 2020).

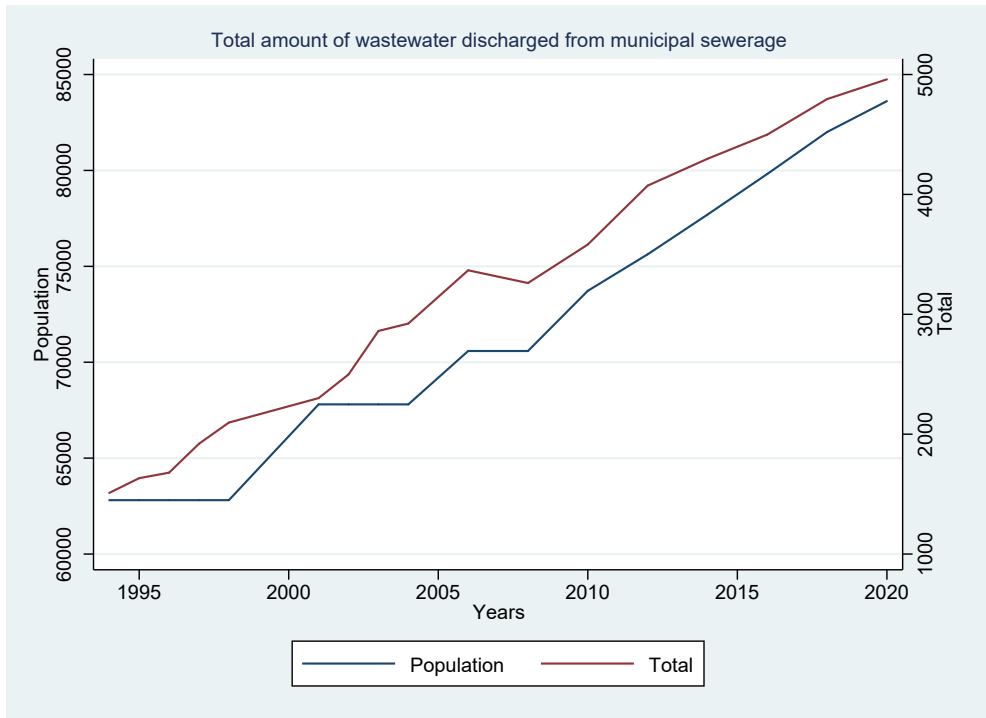


**Figure 1.** The amount of water withdrawn by the municipalities and the amount of wastewater discharged (Left side). Number of drinking water treatment plants and the number of wastewater treatment plants (Right side).



**Figure 2.** Total water abstraction for municipal water supply network





**Figure 3.** Total amount of wastewater discharged from municipal sewerage

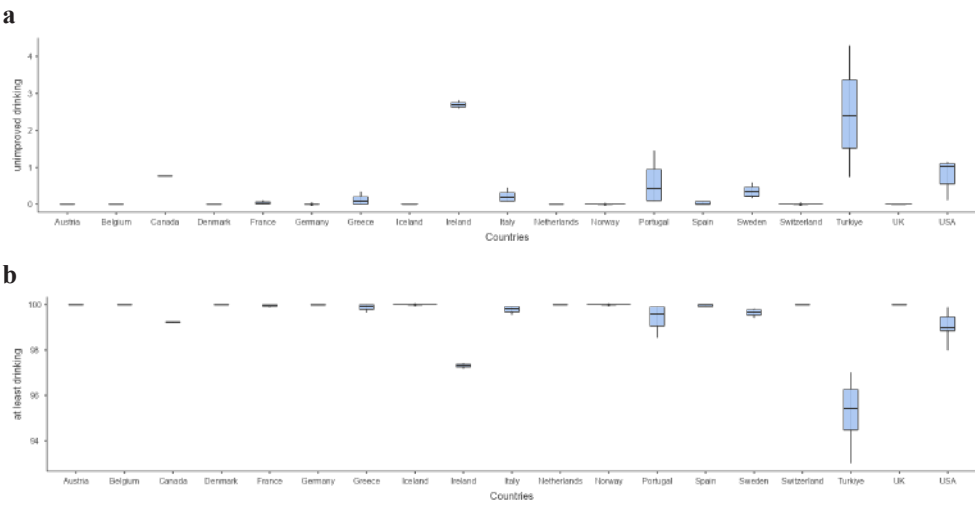
Although Türkiye’s SDG index score has been on an increasing trend in the last 20 years (66.1 in 2000, 66.8 in 2005, 69.26 in 2010, 69.53 in 2015, and 70.6 in 2020), it ranks 36th in the group of 38 OECD countries, below the OECD average.

Considering the “Proportion of the population using safely managed water services,” “Proportion of the population using safely managed sanitation services,” and “Proportion of the population using at least basic drinking water services, when the changes in OECD countries between 2000-2020 are examined, it is seen that Türkiye stands out as an outlier (Figure 4 & 5).

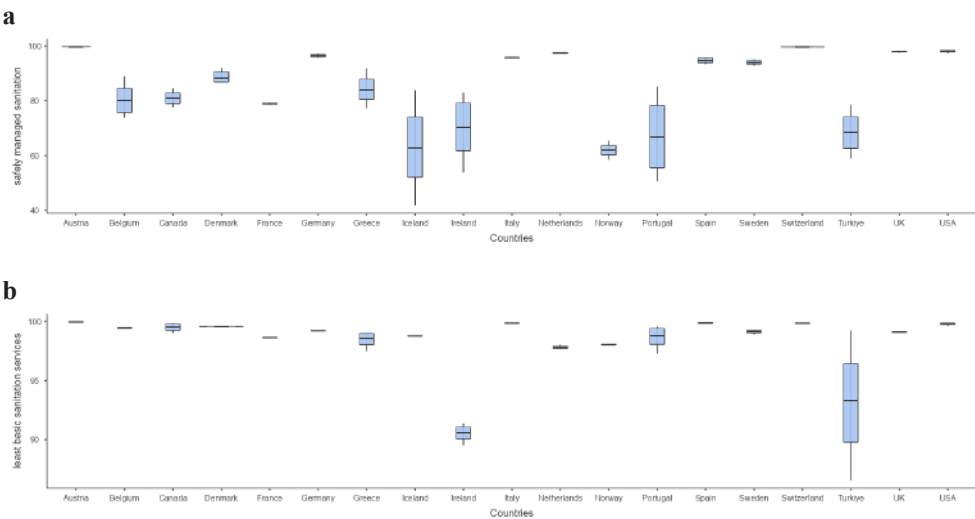
Since there is no “Proportion of the population using safely managed water services” data for Türkiye, “Proportion of the population using unimproved drinking water sources” statistics are considered. The boxplots in Figure 4 and Figure 5 provide information about the average scores and variability (development process) of the 20-year SDG6 indicators of the countries. All the average scores are based on the median, resistant to outliers. Figures 4 & 5 only cover the 19 oldest OECD countries.

When the 20-year changes of the countries belonging to the “Population using at least basic drinking water services” series are analyzed (Figure 4), it is seen that the countries with the lowest average are Türkiye (95.3%) and Ireland (97.3%). However, Türkiye’s change in 20 years (93% in 2000 and 97% in 2020) is more than Ireland’s. The averages of all remaining countries are above 99%. (Figure 4a). According to the statistics of the “Proportion of the population using unimproved drinking water sources,” the highest rate belongs to Ireland (2.69%) and Türkiye (2.45%). These two countries are followed by the USA (0.824%), Canada (0.769%), and Portugal (0.555%). The averages of the remaining OECD countries are below 0.5% (Figure 4b). Values of the “Proportion of the population using unimproved drinking water sources” were 4.28% in 2000 and 0.738% in 2020 for Türkiye.

According to the statistics of “Proportion of the population using at least basic sanitation services,” the countries with the lowest average are Ireland (90.5%) and Türkiye (93%). The change Türkiye has shown in the 20 years (86% in 2000 and 99% in 2020) is greater than that of Ireland. The averages of the remaining countries are above 99% (Figure 5a). The “Proportion of the population using safely managed sanitation services” statistics show that the countries with the lowest average in 20 years are Norway (61.9%), Iceland (63.1%), Portugal (67.1%), Türkiye (68.5%) and Ireland (70%). (Figure 5b). Values of the “Proportion of the population using safely managed sanitation services” were %59.03 in 2000 and 78.4% in 2020 for Türkiye.



**Figure 4.** Boxplots of OECD countries (water sources)  
(a) Proportion of the population using unimproved drinking water sources  
(b) Proportion of the population using at least basic water sources



**Figure 5.** Boxplots of OECD countries (sanitation)  
(a) The proportion of the population using safely managed sanitation services  
(b) The proportion of the population using at least basic sanitation services

According to the 2023 SDG report, the rating and Trend of SDG 6 sub-components are summarized as follows (UN, 2023):

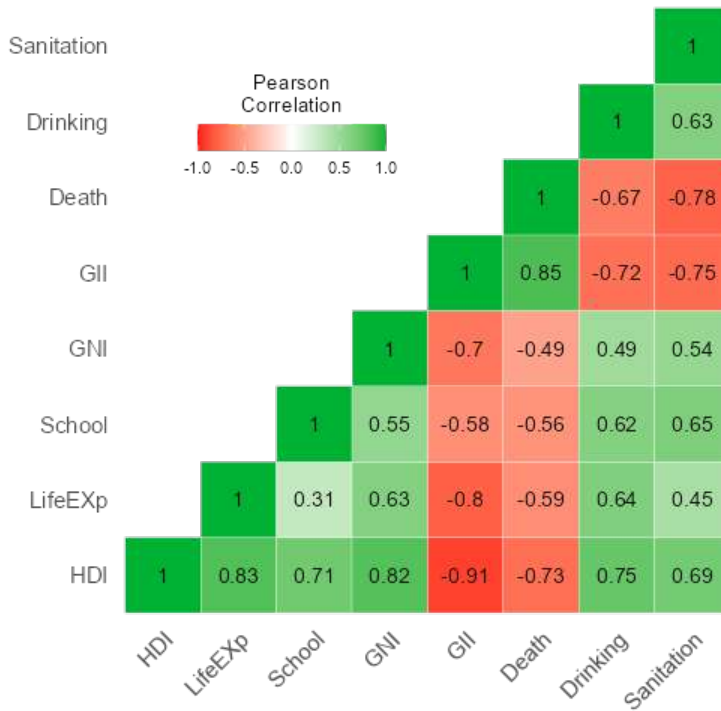
- **Population using at least basic drinking water services:** Rating: “challenges remain”, Trend: “on track”
- **Population using at least basic sanitation services:** This component is in the best position compared to other SDG 6 components. An explanation of “SDG achieved” is made for both rating and Trend.
- **Freshwater withdrawal:** The most recently evaluated Rating score belongs to 2019 and is in the status of “challenges remain”. There are not enough statistics available to assess the Trend.
- **Anthropogenic waste that receives treatment:** The rating score was defined as a “major challenge”; trend evaluation was stated to be insufficient statistics.
- **Scarce water consumption embodied in imports:** The most recently evaluated Rating score belongs to 2018 and has been defined as positive. It has been stated that there needs to be more statistics for trend evaluation.
- **Population using safely managed water services:** Türkiye shares no statistics on this issue.
- **Population using safely managed sanitation services:** The rating for this component is defined as “challenges remain,” and the Trend is defined as “moderately improving”.

These evaluation results in the UN 2023 report are in line with the points indicated in Figures 1-2-3-4-5. Although Türkiye remains below the OECD average in SDG 6 and has the problems stated in the EIA 2020 report, it has been improving in this regard for the last 20 years.

### **3. Relationship of SDG 6 with Health, Gender Inequality, and Poverty for OECD Countries**

The sustainability development goals’ interrelationship can be considered a chain reaction. For example, improvement in poverty level positively affects safe water and sanitation, and safe water and sanitation improves health conditions; with improved health conditions, girls are more likely to go to school, and educated girls affect employment, which affects gender inequality and income level, thus poverty. In this section, in the first step, the relationship be-

tween water and sanitation and gender inequality index (GII), Gross National Income (GNI), average reading time, average life expectancy, number of stillborn babies, and human development indicator (HDI) will be evaluated. HDI can be thought of as a composite index of education, life expectancy, and income. In the second step, based on these variables, 39 OECD countries will be grouped by cluster analysis, and the place of Türkiye will be investigated. In the last stage, starting from the country groups obtained in the previous step, whether the SDG 6 components are statistically different for these groups will be evaluated by the Kruskal Wallis test and pairwise comparisons.



**Figure 6.** Correlation heat map

The Pearson correlation values in Figure 6 are statistically significant ( $p < .001$ ). For OECD countries, the indicators most associated with access to safe sanitation are the number of stillborn babies ( $r = -0.78$ ) and gender inequality ( $r = -0.75$ ). There is an inverse relationship between access to safe sanitation, the number of stillborn babies, and gender inequality. A moderate and inverse relationship exists between access to safe sanitation and HDI, life expectancy, average years of education, and GNI. The highest correlations with access to safe water are between HDI ( $r = -0.75$ ), GII ( $r = -0.72$ ), and stillbirths ( $r = -0.67$ ), respectively. These

relationships are negative. A moderate and positive relationship exists between average life expectancy, average learning time, and GNI.

Considering these interrelated variables, 39 OECD countries were divided into clusters using hierarchical and k-means clustering methods through the JAMOVİ program. The HDI variable was excluded from the analysis because it highly correlated with GNI, GII, and life expectancy. According to the findings, countries were divided into three groups. Türkiye is included in Cluster 3 of these country groups seen in Figure 7 (countries in Cluster 2 are not marked because they are too dispersed). Cluster 3 includes Türkiye, Colombia, Mexico, and Costa Rica. Countries in each cluster have similar characteristics regarding the variables mentioned above. The next step will evaluate whether the difference between these 3 clusters is statistically significant only for SDG 6. For this purpose, the Kruskal Wallis test was applied, and the findings are given in Table 1.

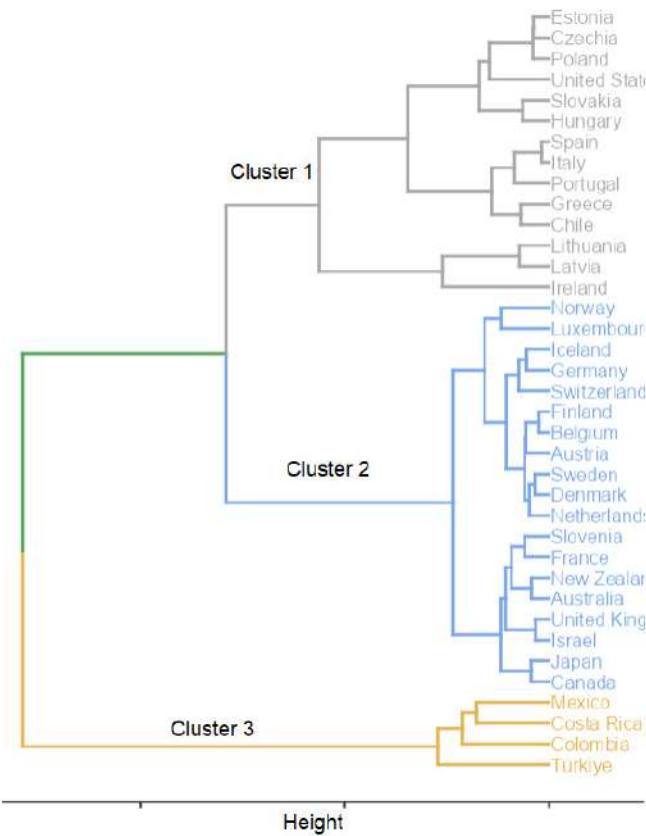


Figure 7. Classification of OECD countries

Regarding the “at least basic sanitation” variable, the difference between cluster averages is not statistically significant. 39 OECD countries can be considered very similar in “at least basic sanitation” ( $p=0.062$ ). However, the difference between the averages of the three clusters in terms of “at least basic drinking,” “safely managed sanitation,” and “safely managed drinking” is statistically significant ( $p<.005$ ). In other words, OECD countries differ in terms of SDG 6. To evaluate these differences in more detail, pairwise comparisons (Dwass-Steel-Critchlow-Fligner) were performed (Table 2).

<b>Table 1. Kruskal Wallis Test</b>			
<b>Variables</b>	$\chi^2$	<b>df</b>	<b>p</b>
Safely managed sanitation	10.04	2	0.007
At least basic sanitation	5.56	2	0.062
At least basic water services	12.54	2	0.002
Safely managed water services	16.43	2	<.001

Pairwise comparison results of statistics used in the evaluation of SDG 6 are as follows:

- Regarding “safely managed sanitation services”, Cluster 1 and Cluster 2 averages can be considered the same ( $p=.689$ ). However, the average of Cluster 3, differs from the averages of the other 2 clusters ( $p<.005$ ).
- There is no significant difference between cluster averages in terms of “At least basic sanitation services” ( $p>.005$ ); this finding supports the Kruskal Wallis test statistic result.
- The difference between Cluster 2 and Cluster 3 means in terms of “at least basic water services” is not statistically significant ( $p=.411$ ). However, the difference between ‘Cluster1-Cluster2’ and ‘Cluster 1- Cluster 3’ is significant ( $p<.05$ ).
- In terms of “Safely managed water services”, it is seen that the averages of all three country groups differ from each other ( $p<.005$ ). There needs to be statistics for the proportion of the population using safely managed water services in Türkiye. However, the Cluster 3 average, where Türkiye has similar characteristics in terms of other SDG 6 indicators, has been considered here.

**Table 2.** Pairwise Comparisons of clusters (Dwass-Steel-Critchlow-Fligner)

a. safely managed sanitation services				b. at least basic sanitation services			
Clusters		W	p	Clusters		W	p
1	2	-1.16	0.689	1	2	-1.66	0.468
1	3	-4.25	0.008	1	3	-3.28	0.053
2	3	-3.80	0.020	2	3	-1.40	0.583
c. at least basic water services				d. safely managed water services			
Clusters		W	p	Clusters		W	p
1	2	-3.71	0.024	1	2	-4.48	0.004
1	3	-3.96	0.014	1	3	-3.90	0.016
2	3	-1.80	0.411	2	3	-3.59	0.030

The relationship between SDG 6 and other sustainability goals (education, health, poverty, and gender equality) mentioned in the literature has also been confirmed for OECD countries. In particular, the strong relationship between gender inequality and SDG 6 components stands out. On the other hand, we cannot say that all OECD countries have the same standards in terms of SDG 6 components (except for “at least basic sanitation services”).

#### 4. Conclusions and Recommendations

Water and sanitation are not only essential for human survival but are also necessary to support other sustainable development goals. Reasons such as increasing population, changing climatic conditions, wrong policies, and pollution cause a decrease in water resources. SDG 6, adopted by the member states of the United Nations, aims to improve safe drinking water and sanitation by 2030 and to make them accessible to all.

Türkiye does not have rich water resources; according to the projections, the amount of water per capita in 2030 will decrease by 32% compared to the previous decade (EIA, 2020). The daily per capita water and wastewater amounts are higher in Europe than in many countries with low water stress levels. Indiscriminate and excessive use of water resources causes natural resources to face depletion. The importance of the SDG goals for national development should often be stressed.

Indicators used to evaluate SDG 6 have improved for Türkiye in the last 20 years, and progress has been made. However, these indicators are still below OECD countries. The study found significant relationships between SDG 6 indicators of OECD countries and GNI, education, health, and gender inequality indicators. This finding is consistent with the literature. The strongest relationship is between gender inequality and SDG 6 indicators. When SDG 6 and GNI, education, health, and gender inequality variables are taken into account, it is seen



that OECD countries are grouped into 3 clusters. When these country groups were evaluated in terms of SDG 6 indicators, it was seen that they had statistically different averages.

While 33% of water resources in Europe are used for irrigation purposes, this rate is 73% in Türkiye (TURKSTAT, 2020). Treated water is widely used for irrigation worldwide, and wastewater recovery activities are common. However, 1.7% of the total wastewater is reused in Türkiye. According to the EIA 2020 report, water pollution is one of the most important problems in Türkiye's provinces. Domestic wastewater is one of the most important causes of water pollution. There needs to be more treatment facilities for domestic wastewater for recovery (EIA, 2020).

In Türkiye, there is a problem with excessive use of natural resources, wastes arising from unplanned and rapid industrialization and urbanization, and water treatment plants with low capacity (ÇED, 2020). The increase in treatment facilities will help improve SDG 6 indicators for Türkiye. The consequences of water and sanitation on the quality of life associated with better health systems and poverty reduction should be measured and evaluated by policymakers and NGOs. Campaigns and information meetings should be organized to share the results of these evaluations.

Preventing pollution is important for water resources because working on contaminated resources will be more difficult. Therefore, it is important to support awareness-raising and behavior change campaigns by stakeholders such as educational institutions and the media on wise water use, the separation of household waste, the problems caused by water pollution, the importance of SDG 6 goals, and their relationship with other sustainability goals. On the other hand, farmers should be informed about efficient water use, and investments should be made in modernizing irrigation infrastructures and using treated wastewater. Legal arrangements should be made regarding the optimal use of water and wastewater recycling policies.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 10

# RENEWABLE ENERGY POTENTIAL OF TÜRKİYE AND POLICY RECOMMENDATIONS TO IMPROVE ENERGY EFFICIENCY

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### Abstract

Development does not only depend on the quantitative increase of the goods and services produced but also defines a development that should have social aspects and environmental protection bases and results, which means sustainable development. The widespread use of “sustainable development” as a technical concept started with the adoption of the “Our Common Future” Report published by the World Commission on Environmental Development in 1987 by the United Nations (UN). In the UN General Assembly convened in September 2000, it was accepted that the strengthening of the principles of human dignity, equality, and well-being at the global level is the common responsibility of the world’s societies, and the Millennium Declaration was announced in consensus on ensuring improvement in economic, environmental and social conditions in the world by 2015. Eight Millennium Development Goals (MDGs) were determined to implement these principles. At the UN’s Sustainable Development Summit convened in September 2015, the 15-year performance of the MDGs adopted in 2000 was evaluated on a global scale, and it was announced that the performance put forward in terms of achieving these goals is far from bringing the expected solutions to the economic, social and environmental problems our world is facing. At the summit, it was emphasized that in light of the experiences gained from the sustainable development process initiated with the MDGs, there is a necessity to determine inclusive sustainable development goals that would bring solutions to the current problems of our world. In this direction, the 2030 Sustainable Development Goals (SDGs 2030), which were accepted with the signatures of 193 member countries, including Türkiye, consist of 17 basic objectives and 169 related targets. This new global agenda envisages shaping the development plans and policies of countries with an understanding that emphasizes the principle of human rights for all by 2030. The concept of sustainable development entered Türkiye’s agenda with the 1992 Rio Conference and was included in the 6<sup>th</sup> Five-Year Development Plan, and this concept has continued to maintain its importance until today. In terms of Türkiye’s reserves and capacity compared to non-renewable energy sources, the potential for renewable energy sources is high. In this study, within the scope of Affordable and Clean Energy, which is the 7<sup>th</sup> Goal of the SDGs; firstly, a general analysis of Türkiye’s renewable energy resources has been made, and the current situation of renewable energy in terms of both potential and production has been revealed mostly focusing on biomass, solar and wind energy. Then, the development of affordable and clean energy with respect to time has been evaluated, and policy proposals for increasing energy efficiency have been discussed.

**Keywords:** Sustainable development goals, renewable energy, energy efficiency, sustainable development, clean energy, Türkiye

## 1. Introduction

As a result of the industrial revolution, the shift towards non-renewable energy sources has replaced the previous reliance on mechanical energy-based production methods. There is concern about the long-term sustainability of the energy-intensive lifestyle in industrialized regions in all countries. Additionally, considering available resources, there are doubts about the Earth's ability to sustain the same level of development for the majority of the human population. These concerns stem from the pressures of continued population growth and high per capita energy use on a planet with limited resources and waste capacity (Bent, Baker & Orr, 2002).

Energy has always been a political element from history to the present. Significantly, the oil crisis in the 1970s made energy and politics inseparable. The reason for this is primarily because energy is a strategic element. Countries with high energy reserves are countries with strategic superiority. In addition, shortages and cutbacks in the energy sector are experienced at the economic, social, and political levels.

The concept of sustainability first came to the fore in 1977 in Dennis Pirages' book "Sustainable Society". This was followed by Dennis Hayes' book "Repairs, Reuse, Recycling: First Steps Towards Sustainable Society" published in 1978. The definition of sustainable development, which was first officially used in 1980 in the "World Conservation Strategy" prepared for UNEP by the "International Union for Conservation of Nature" (IUCN), as "conserving natural resources for future generations", is the center of the environmental movement. It became the subject of the "Our Common Future" report (Brundtland Report) published by the UN World Commission on Environment and Development in 1987. It is defined as "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs" (WCED, 1987).

The relationship between sustainable development and energy resources is essential in addressing the challenges of our rapidly changing world. Energy resources play a vital role in boosting economies, improving living standards, and driving technological advances. The link between sustainable development and energy resources lies in the recognition that the way we produce, distribute, and consume energy has significant impacts on the environmental, social, and economic dimensions of sustainability. Understanding the relationship between sustainable development and energy resources is critical for policymakers, researchers, and stakeholders to improve effective strategies and policies that support a more sustainable and equitable future.

The role of energy in sustainable development can be summarized as follows:

1. *The importance of sustainable energy for sustainable development:* Sustainable energy is recognized as one of the pillars of sustainable development, acting as a catalyst for achieving multiple sustainable development goals (SDGs). The United Nations' Sustainable Development Goal 7 (SDG 7) specifically emphasizes the importance of ensuring access to affordable, reliable, sustainable, and modern energy for all (UN, 2021). This highlights the critical role of energy in removing poverty, improving health care, supporting education, and promoting economic growth.

2. *The role of renewable energy in sustainable development:* Renewable energy sources such as solar, wind, hydro, and biomass are essential components of sustainable energy systems. By providing a cleaner and more sustainable alternative to fossil fuels, they reduce greenhouse gas emissions, air pollution, and dependence on limited resources (REN21, 2021). The International Renewable Energy Agency (IRENA) highlights the transformative potential of renewable energy in achieving sustainable development goals while mitigating climate change (2020).

3. *Energy efficiency as a sustainability driver:* Energy efficiency plays a crucial role in the pursuit of sustainable development. Improving energy efficiency across sectors helps reduce energy consumption, reduce greenhouse gas emissions, and improve resource conservation (IEA, 2020). The International Energy Agency (IEA) recognizes the importance of energy efficiency measures in achieving multiple SDGs, including poverty reduction, health promotion, and climate action.

The interdependence between sustainable development and energy resources is clear, as energy serves as a cornerstone for achieving sustainable and equitable societies. Promoting sustainable energy, including renewable resources and energy efficiency, is vital to addressing environmental challenges, promoting social well-being, and supporting economic well-being. Understanding and using this relationship is crucial to shaping policies, investments, and practices that lead us toward a more sustainable future.

The consumption and the distribution of energy resources have a crucial role, especially in developing countries such as Türkiye, because these countries need to increase their energy consumption in order to achieve their economic and social development. The energy resources and technologies they prefer and the distribution of these resources will affect future living conditions. These preferences also have a significant effect on the climate policies of these countries (Geller et al., 2004). Although there is no direct relationship between renewable



energy resource consumption and energy efficiency, diversifying energy resources, reducing import dependence, and cutting inefficiency and energy waste are the core targets that developing countries should reach. That is the reason why Türkiye's case is worthy of studying as a developing country that should foster the consumption of renewable energy resources and ensure energy efficiency.

The study is organized as follows: after the introduction, in section 2, an analysis of Türkiye's renewable energy resources is examined. Since there are two chapters under the SDG7 section within the scope of this book, only biomass, solar, and wind energy are examined in this chapter, and the remaining renewable resources are left to the other chapter. In section 3, as a sustainable development goal, the development of "affordable and clean energy" in Türkiye from a historical perspective is investigated. The importance of energy efficiency and increasing energy efficiency in Türkiye is examined in section 4, and the 5<sup>th</sup> section includes the conclusion and recommendations.

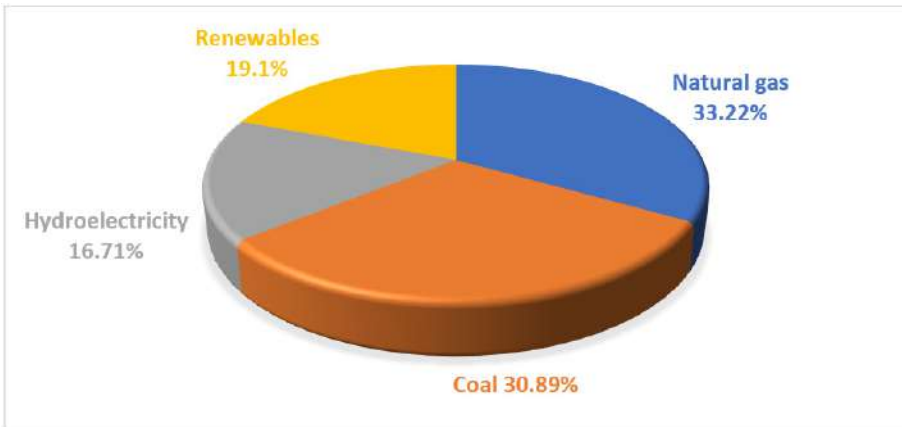
## **2. Analysis of Türkiye's Renewable Energy Resources**

Türkiye supplies 27.6% of its total energy needs from oil, 30.2% from natural gas, 25.5% from coal, 7.6% from hydro electricity and 8.9% from renewable energy sources (BP Statistical Review, 2022). As of the end of 2021, Türkiye's primary energy supply is 159.4 million TOE<sup>1</sup>, of which domestic production is 46.7 million TOE, total primary energy consumption is 123.9 million TOE, and imports are 124.2 million TOE. Of this import amount, 42% belongs to oil, 39% to natural gas and 19% to coal. The rate of locality in primary energy supply is at the level of 29% (MENR, 2021). In terms of Türkiye's reserve and capacity; it can be claimed that compared to non-renewable energy sources, it is more fortunate in terms of renewable energy sources such as hydroelectric energy, geothermal energy, bioenergy, solar energy and wind energy.

As seen in Figure 1, renewable energy resources meet 19.1% of the total electricity production in 2021.

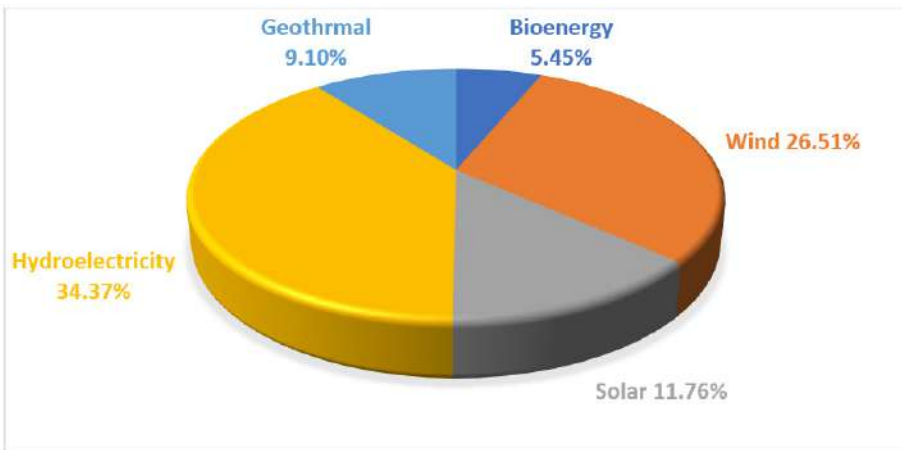
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1 Tonne of oil equivalent



**Figure 1.** Distribution of 2021 Turkish Electricity Production by Resources  
**Source:** TETC, 2021

In Figure 2, the distribution of electricity production from renewable resources in 2021 can be examined. According to the figure, bioenergy has 5.45%, wind energy has 26.51%, solar energy has 11.76 %, hydroelectric energy has 34.37%, and geothermal energy has a 9.1% share in electricity production among renewable resources.



**Figure 2.** Distribution of Electricity Production from Renewable Sources in Türkiye in 2021  
**Source:** TETC, 2021

## 2.1. Biomass Energy

The rapid increase in the use of biomass for energy production has drawn attention to the potential negative environmental, social, and economic effects of biomass chains. Although there have been potential negative effects of biomass chains, including biodiversity losses and land tenure conflicts, in recent years, the positive effects of biomass use have also attracted attention, and policies have aimed at developing bioenergy. For example, the production and use of bioenergy have various positive effects, such as the development of rural areas, the creation of different income sources, the reduction of dependence on imports by reducing the use of fossil fuels, and the prevention of climate change (PWC, 2021/a).

Biomass covers a wide range of topics, such as raw material sources, conversion methods, and energy outputs, and therefore its environmental, social, and economic benefits vary depending on many different factors. Therefore, the sustainability of each part of the biomass chain should be considered in the use of biomass. There are also disadvantages that can be caused by the use of biomass if inappropriate policies and practices are adopted.

The nature of the benefits and risks that may be caused by the use of biomass and the production of bioenergy depends on some factors, such as environmental, social, and economic characteristics of the region and its people, biomass types, raw materials, and recycling technologies, applied agriculture and forestry management approaches and practices, production scale and ownership, logistics of biomass transportation, and the business model applied throughout the supply chain (PWC, 2021a).

Bioenergy is used as biodiesel, biogas and bioethanol in Türkiye. Biodiesel is a product that is released as a result of the reaction of vegetable oils or animal oils obtained from oil-seed plants such as canola, sunflower, soybean, and safflower with methanol or ethanol in the presence of a catalyst and used as fuel. Biodiesel does not contain petroleum. However, it can be used as a fuel - pure or mixed with petroleum-based diesel. Biodiesel production in Türkiye first started in 1934, but the establishment of biodiesel plants in real terms occurred in the early 2000s. Over the years, the production facilities have gradually increased. Türkiye's biodiesel installed capacity is 1.5 million tons (Bayrakçı & Koçar, 2018).

Bioethanol is an alternative fuel, the raw material of which is obtained by fermentation of sugar, starch, or cellulose-based agricultural products such as sugar beet, corn, wheat, and wood and used by blending with gasoline in certain proportions. In terms of investment, it has not yet developed as much as biodiesel. The number of facilities is very small. On average, 162 million liters of bioethanol are produced annually of which 46.9% is used for fuel. Of the

bioethanol produced for fuel, 8% is exported, and 92% is consumed by blending with gasoline for the country's fuel needs (Canan & Ceyhan, 2017).

Biogas is a colorless - odorless, light-than-air gas mixture that is formed as a result of fermentation of organic-based waste and residues in an oxygen-free environment. In the field of biogas, there are 95 biogas plants in 32 cities with 369.22 MW capacity as of 2022 in Türkiye (Biyogazder, 2022).

According to the Biomass Energy Potential Atlas (BEPA) data, the total economic energy equivalent of our waste, which can be collected, is approximately 3.9 MTEP/year. The installed power based on biomass and waste heat energy is 2,172 MW as of the end of June 2022, and its ratio to the total installed power is 2.14%.

## 2.2. Solar Energy

Studies on utilizing solar energy intensified, especially after the oil crisis in the 1970s. Today, solar energy is used in the heating and cooling of residences and workplaces, hot water supply, agricultural technology, industry, solar cells, solar pumps, transportation and communication vehicles, signalization, automation, and industry.

Although there is a great diversity in terms of solar technology and materials, these technologies, in general, are divided into two main groups: Thermal Solar Technologies and Solar Cells. In Thermal Solar Technologies, firstly, heat is obtained from solar energy, and then this heat is used directly or in electricity production. In solar cell technology, semiconductor materials called photovoltaic batteries convert sunlight directly into electricity.

On a global scale, China is the leader in solar power plant installed power and solar plant materials. Eight of the top 10 companies that sell the most solar panels are of Chinese origin. China also maintains its leadership in cell and panel production. According to the installed power capacities of 2020, after China's 254 GW installed capacity, the USA ranks 2nd with 74 GW, Japan 3rd with 69 GW, Germany 4th with 54 GW, and India 5th with 39 GW (PWC, 2021/b).

If a part of the Eastern Black Sea region of Türkiye is excluded, it is technically and economically possible to benefit from solar energy throughout the country. The regions that receive the most solar energy in Türkiye are the South East Anatolia, Mediterranean, East Anatolia, Central Anatolia, Aegean, Marmara, and Black Sea Regions. In addition, the month in which the most solar energy can be produced in Türkiye is July, and the month with the least solar energy production is December. However, when we look at the averages, Türkiye

remains above the annual limit of 2,000 hours, which is the limit for almost all of them to benefit from solar energy economically (Akova, 2008).

The most common use of solar energy in Türkiye is hot water heating systems. Türkiye, which is the 2nd in the world in the use of solar energy for heating purposes, has shown rapid development in the field of obtaining electrical energy from the sun, especially in the last five years. Until 2014, solar energy in Türkiye was used only for hot water generation, drying, and similar processes in residences and industry.

After 2015, it has also started to be used for electricity generation. According to the data of IRENA, as of 2020, Türkiye ranks 12<sup>th</sup> in the world in total renewable energy installed power and 16<sup>th</sup> in the world in solar energy.

Türkiye Solar Energy Potential Atlas (GEPA) was prepared by the General Directorate of Renewable Energy in 2008. Thus, Türkiye has the capacity to produce 380,000 GWh of electricity annually from solar energy, taking into account areas with a slope of under three degrees, deemed suitable for solar power plant installation, with an annual sunlight duration exceeding 1,650 kWh/m<sup>2</sup> encompassing an area suitable for power plant establishment spanning 4,600 km<sup>2</sup>. According to Türkiye's Solar Energy Potential Atlas, the total annual sunshine duration is 2,737 hours (the daily total is 7.5 hours), and the annual total incoming solar energy (radiation intensity) is determined as 1,527 kWh/m<sup>2</sup> (4.2 kWh/m<sup>2</sup>/day), (MENR, 2023).

Türkiye's solar-based electricity installed power at the end of June 2022 is 8,479 MW, and its ratio to the total installed power is 8.35%. Unlicensed power plants have a large share of solar-installed power, with 6,960 MW. The total number of solar power plants is 8,482, of which 8,445 are unlicensed and only 37 are licensed (Büyükbözkırlı 2022).

In Türkiye, where the potential to generate electricity from solar energy is very high, the most effective way to reduce foreign dependency is to follow the most efficient, environmentally friendly, and sustainable energy policy by making use of every unit of high sunlight areas, especially with rooftop solar power plants.

An issue to be considered regarding solar energy is that it is very important to protect the very precious land areas of Türkiye where solar thermal power plants cannot be established as they are not suitable for solar energy. These areas can be listed as follows:

- Precious agricultural lands, plant and forest areas, or areas close to these lands,
- Areas with a land slope greater than 3 degrees,

- Residential areas and areas within 500 m of safety strips,
- Roads and railways and areas within 100 m of safety strips,
- Airports and areas within 3 km of safety strips,
- Environmental protection, national park and natural areas and areas within 500 m of safety strips,
- Lakes, rivers, dam lakes and wetlands,
- High forests, afforestation areas, private forests, nurseries, reeds, and swamps, conservation forests.

Careful attention should be paid to such areas, and all necessary precautions should be taken to protect them (Kılıç, 2015).

### **2.3. Wind Energy**

In Türkiye, it has been accepted that 5 MW/km<sup>2</sup> wind power plants can be established at 50 meters above ground level and in areas with wind speeds above 7.5 m/s. In light of these assumptions, a mid-scale digital weather Wind Energy Potential Atlas (REPA), which gives wind resource information produced by using the forecast model and micro-scale wind flow model, has been prepared. Accordingly, Türkiye's wind energy potential has been determined as 48,000 MW. The total area corresponding to this potential corresponds to 1.30% of Türkiye's surface area (Teneler, 2022).

The potential and possible applications of Offshore and Small-Scale Wind Energy, which were not previously included in the energy agenda of Türkiye and were not mentioned in relevant sector reports, have also started to be discussed today. According to a report published by the World Bank, there is an offshore wind energy potential of approximately 70,000 MW in total, with 12,000 MW in areas with a depth of less than 50 meters on the Turkish coast and 57,000 MW in regions with a depth of 50-1,000 meters (World Bank Group, 2019).

Various documents (strategy documents, action plans, development plans, etc.) containing targets, strategies, and policies regarding the development of the energy sector have been published by different ministries and institutions in Türkiye. Türkiye's wind energy installed power target was determined by the Ministry of Energy and Natural Resources in 2009 as 20,000 MW for 2023. Although significant developments and advances have been made in the past 12 years, it is obvious that this target is far behind the expectations. However, in 2019, 25,000 MW for 2030 was expressed as a long-term target proposal by the Turkish Wind Ener-

gy Association. In the Presidential Annual Program for the Year 2022 (25.10.2021), the 2021 Wind Power Plant (WPP) Installed Power Realization Estimate was 10,100 MW, the 2022 program was 10,900 MW, the 2021 WPP-based generation realization estimate was 29,137 GW, and the 2022 program was 30,643 GWh (Teneler, 2022).

Investments in wind energy in Türkiye have a very recent history, beginning in 1998. Another striking point in the wind energy sector in Türkiye is that the entire sector is in the hands of the private sector. The total installed power of wind electricity connected to the grid in Türkiye was 8,832.4 MWe as of the end of December 2020 and reached 10,607 MWe at the end of 2021.

It was realized as 24,828 GWh (8.10% of the total electricity production of the country) in 2016, and according to the provisional data in 2021, it provided 9.50% of the total electricity production with 31,478 GWh. In December 2021, 12% of the electricity produced in Türkiye was met by wind (Teneler, 2022).

According to the Turkish Wind Energy Association Statistic Report (2021), the number of operating WPPs is 245 with a total installed capacity of 9,305 MWm<sup>2</sup>, the number of WPPs under construction is 41 with a total capacity of 1,872 MWm, the number of licensed WPPs is 13 with the total capacity of 477 MWm, and the number of pre-licensed WPPs is 87 with the total capacity of 3,757 MWm.

In addition to the advantage that wind power plants can be put into operation in a short time, like one year after the completion of the preparation period, there are also disadvantages such as high turbine costs and long return on investment costs. Although various incentives have been given by the state regarding this, these incentives are not sufficient when compared to other countries considering the scarcity of turbine manufacturers.

### **3. The Development of Affordable and Clean Energy in Türkiye**

Türkiye has an important role in energy due to its geographical location. It is a transition country between regions with energy resources, such as the Middle East, the Caucasus, and the EU. Energy production is an indispensable element for activities covering all areas of life, from industry to services. It is the production-demand mismatch that makes energy a problem in the development process in Türkiye (Kepenek & Yentürk, 2005).

In the pre-Republican period, energy production and consumption in Türkiye was quite limited. In the first years of the Republic, energy was used in residences for heating rather

than industry. Kerosene was used for lighting. Starting from the speech of Mustafa Kemal Atatürk at the 1st Izmir Economics Congress in the 1923-1930 period, it was emphasized that an independent economic model should be created with all its sectors (İnan, 1972).

However, foreign capital was not completely excluded in the energy sector, and energy investments were focused on partnerships with the state-private sector. Along with the statist economic policies implemented in the 1930s, this period is important in terms of organization and first initiatives in energy. However, since sufficient private capital accumulation could not be achieved in Türkiye during this period, a “moderate statism policy” was implemented in the energy sector (TÜSİAD, 1998).

The First and Second Five-Year Development Plans were prepared for the 1933-1942 period and it was aimed to increase energy production and reduce foreign dependency. In the First Five-Year Development Plan, it was requested to investigate hydraulic and thermal energy sources. Thus, in 1935, the “Electrical Works Survey Administration” and “Mineral Research and Exploration Institute” were established (Kepenek & Yentürk, 2005).

In the post-World War II period, it is seen that energy was given a special priority. In this period, the increase in energy demand with the accelerated urbanization and industrialization efforts caused the energy sector to be given priority. In 1947, the “Türkiye Economic Development Plan” came into effect, and Etibank’s energy projects were included in this plan. With the coming to power of the Democratic Party in 1950, the “liberal economy” policy was put into practice; however, the role of the state was aimed to be reduced. However, the developments have been on the contrary, and the public sector has developed in the field of energy. State Hydraulic Works was established in 1953, and Turkish Coal Enterprises Institution and Turkish Petroleum Corporation were established in 1957. During this period, public investments were made in the field of hydraulic power generation. In addition, the share of oil in energy resources based on trading was quite high.

In the planned period in general, since the 1960s, we see that Türkiye has developed an energy policy inversely proportional to its development needs. The industry, which has shown a rapid increase in these years in Türkiye, has led to an increase in energy demand which created an increase in the demand for petroleum products. However, the development in the energy sector over the years has not been able to provide the amount and quality of energy required by the development. In addition, the existing reserves of hydraulic energy resources at that time could not be utilized sufficiently. Energy production could not meet the consumption. Besides all these, the share of petroleum products that we imported for consumption increased



gradually over the years. By the end of the 1970s, only half of the energy demand could be obtained from national resources. In addition to all this, the inability to implement the necessary saving measures in the energy sector put the sector in a deep bottleneck.

The first consideration of renewable energy sources coincides with the fourth plan period (1979-1983). However, the first attempts at this could only be realized in the early 1990s.

With the entry into force of the Electricity Market Law No. 4628 in 2001, free market practice in the electricity sector started, and a significant decrease was observed in generation facility investments. In a new market structure, the construction of electricity generation facilities by the public was actually stopped, and private investors did not show the expected interest in investing in the anticipated competitive environment. Because over 6,000 MW capacity constructed under the Build-Operate model until 2002 became operational, and the rise in electricity demand was not as high as anticipated, the existing capacity at that point satisfied the requirement for a period. However, in 2006-2007 new capacity was needed, and studies were carried out on different support mechanisms. One of them is the Capacity Mechanism application. As another way of support, studies have been carried out to support electricity generation based on renewable resources. Some initiatives have been established to include especially small-capacity but productive sites in the system where investors are not willing to invest. Within the scope of Law No. 5346, which entered into force on 10.05.2005, the first support mechanism studies for renewable resources started, but its implementation only took place in the year 2011. To re-emphasize, electricity generation from renewable sources was initiated mainly for the purpose of utilizing low-capacity but productive resources located in difficult areas. For this reason, the tariffs are kept quite high.

In the high tariffs applied, it should not be overlooked that the lobbying activities of the technology owners and some investors are effective. Over time, many hydroelectric and wind power plants have been included in the system and have benefited from the support, with features that would contradict the real purpose of the support mechanism.

Private companies that made these investments were influential in the formation and implementation processes of the decisions to support electricity generation based on renewable energy sources.

With the Law amendment made on 29.12.2010 after Law No. 5346 came into force, applications for the Renewable Energy Resources Support Mechanism (YEKDEM) were received for 2011 before the relevant regulations were published and the actual application started.

The Regulation on Certification and Support of Renewable Energy Resources entered into force on 01.10.2013. In this regulation, changes were made on 29.04.2016, 28.10.2016, 23.02.2017, 11.05.2017, 21.04.2018 and 09.10.2018.

The Regulation on Unlicensed Electricity Production in the Electricity Market entered into force on 03.12.2010, and later on, amendments were made to this regulation on 02.10.2013, 23.03.2016, 22.10.2016, 15.05.2017 and 17.01.2018 (Bayrak, 2022).

With the start of the first implementation of YEKDEM in 2011, the number and capacity of power plants participating in this mechanism increased every year. While participation was relatively low until 2015, a rapid increase occurred in participation after 2015. Although there has been a rise in the number of power plants producing electricity from all renewable sources, the highest increase was realized in hydraulic power plants. In 2015, there was a massive increase in the number of power plants that joined the system. The entry into force of the Regulation on Certification and Support of Renewable Energy Resources on 01.10.2013 is considered to be the most important factor in the increase in these applications (Bayrak, 2022).

The number of YEKDEM participating power plants exceeded 500 in 2016 and reached 1,036 in 2022. The size of the installed power is more important than the number of power plants registered to the YEKDEM system because the amount to be paid to these power plants within the scope of the mechanism are made according to the amount of generation they realize during the year which depends on their installed power. The total capacity, which was 713.1 MW in 2011, the first year of implementation, reached 25,524.0 MW in 2022.

In 2021, 138 power plants with a total installed power of 1941.9 MW were registered to the YEKDEM system. As it is known, the YEKDEM tariff support, which was in Dollars, was changed to Turkish Lira for the power plants that will be put into operation after 01.01.2021. In order to benefit from the system before the support payment unit was converted into Turkish Lira, 135 power plants with a total installed power of 1,933.6 MW were put into operation before 30.06.2021, and from 01.07.2021 until the end of the year, only three power plants with an installed power of 8.3 MW were put into operation.

YEKDEM supports, whose primary purpose is to provide support for the generation of electricity from renewable resources in small capacity but efficient fields that are more difficult to evaluate, started to be implemented in 2011. However, over time, the principle determined at the beginning was violated, and almost all electricity generation facilities connected to renewable resources built by private companies were included in the scope of this support.

Some dam hydroelectric power plants with very large installed capacities and large-capacity wind power plants are also included.

The amount of support applied in this context is normally much higher than the electricity generation cost. The cost increase was caused by the fact that 74,254 GWh, which corresponds to 22.4% of Türkiye's total electricity production, which was 331,492 GWh compared to the end of 2021, was produced within the scope of YEKDEM. It has been quite high and reached the level of 61.5 Billion TL in 2021 (Bayrak, 2022). Naturally, as this high cost is reflected in consumer electricity prices, the electricity bills of all consumers in Türkiye have increased. The cost of electrical energy used for residences in daily life has exceeded the bearable level for all consumers.

Moreover, in the industrial sector, where almost half of the country's electricity consumption is realized, high electricity prices cause very heavy economic consequences and weaken the competitiveness of the industry in production. While determining the support principles for electricity producers, protecting the rights of consumers against high electricity prices should be addressed first.

#### **4. Increasing Energy Efficiency in Türkiye**

Energy efficiency is a key element in the transformation of energy and production systems and provides improvements in sustainability by reducing the need for new energy sources. While energy efficiency increases energy production, it also reduces greenhouse gas emissions, air pollution, and energy costs. While the contributions of energy efficiency go far beyond financial dimensions, it can provide energy security, higher efficiency for businesses, and a reduction in greenhouse gas emissions. The International Energy Agency estimates that, with the right policies and investments, energy efficiency can contribute to around 40% of the reduction in greenhouse gas emissions by 2050. Different energy sources have a significant impact on the climate, and most of the greenhouse gas emissions in the world come from the energy sector alone. Energy efficiency improvements have been proven to provide a variety of benefits, including energy security, job creation, poverty reduction, improved health, and reduction of greenhouse gas emissions (PWC, 2021/a).

Although increasing investments in renewable energy sources show an encouraging momentum for adaptation to climate targets, the slow pace of the last decade in the calculated improvement in global energy efficiency, especially for 2020, distorts all calculations and is alarming. In countries that set serious targets to improve energy efficiency, this is not only considered as the dominant measure of climate policies, but also that efficiency measures can

support economic growth and increase employment, contribute to reducing the budgets they allocate to energy, especially imported energy, in the program packages designed to mitigate the economic crisis, and many secondary benefits are also taken into consideration.

The pace of global energy intensity recovery, which has already followed a stagnant trend in energy efficiency in the last five years, has slowed further in the first period of the pandemic as a result of the economic effects of the COVID-19 crisis, deepening the challenge of achieving international energy and climate targets and making the actions of governments more critical.

The studies on energy efficiency in Türkiye, which started in the 1980s, have gone through various organizational processes, and since 2019, they have been carried out under the management of the Department of Energy Efficiency and Environment (EVÇED) under the Ministry of Energy and Natural Resources General Directorate of Energy Affairs. This recent structural change has, in a way, blocked a more effective and functional structuring for energy efficiency, and energy efficiency has lost its institutional visibility to a great extent. The EVÇED carries out its studies, especially in the implementation and monitoring center of the National Energy Efficiency Action Plan to be implemented between 2018-2023.

The National Energy Efficiency Action Plan aims to reduce Türkiye's primary energy consumption by 14% in 2023 with 55 actions defined in 6 areas, including five final consumption areas in total as buildings and services, energy, transportation, industry and technology, agriculture, and horizontal issues that can be common to the sectors. In line with this target, it is foreseen to save 23.9 MTEP cumulatively until 2023 and to invest USD 10.9 billion for these savings. The cumulative savings targeted until 2033 with 2017 prices is 30.2 billion USD, and the impact of some savings is expected to continue until 2040.

According to EVÇED evaluations, a total of USD 4.78 billion was invested in energy efficiency in the 2017-2020 period, resulting in a cumulative energy savings of 3,190 kTOE, equivalent to USD 117 million in monetary terms. Considering that the total primary energy supply was 147.2 million TOE in 2020, it is seen that only 1.06 MTEP is saved on an annual cumulative average. This value can be evaluated as insufficient when compared to both the cumulative saving of 23.9 MTEP in 6 years and the total primary energy supply.

In addition, approximately 1,500 dollars was spent for 1 TEP energy saving, which suggests that it is incompatible with the much lower sample saving costs that emerged from program evaluations abroad. On the other hand, it is stated that 3,190 kTOE savings, which is a monetary equivalent of 117 million USD, was achieved, while the value of 1 TEP was calculated as 36.7 USD (Güven, 2022).

The pandemic process and its economic effects have led to the postponement of energy efficiency investment decisions on a global scale. In Türkiye, energy efficiency investments decreased in 2020, which is similar to the world trend.

As a result, energy efficiency should be accepted as a sector full of opportunities for the public and industrialists, where all benefit. For energy efficiency, an effective organizational structure should be made, and the financial support given on the production side should be given to the public and industrialists for applications on the demand side. As in other areas, digital development should be supported with domestic services and domestic materials. Effective policies should be determined with more monitoring and analysis, targets and actions such as energy, climate, industry, and transportation in various strategies and action plans should be reviewed and shared, and development of all sectors towards these goals should be ensured.

## **5. Conclusion**

There is a massive deficit in non-renewable energy resources in Türkiye. When we consider it economically, there is a very significant foreign dependency on energy. In addition, the traditional energy resources we use cause important environmental problems such as pollution and deforestation. However, Türkiye has a very rich potential in terms of clean and renewable energy resources. Unfortunately, this potential is not utilized to the required extent.

With the developments in energy production technologies, the issue of renewables and sustainability of energy resources has started to gain importance. The increasing need for energy day by day and the limit and exhaustion of fossil fuels bring the need for alternative energy sources to the fore. In meeting the energy need with alternative resources, it is of great importance to ensure sustainability without harming nature. At this point, renewable energy sources are an alternative to the rapidly increasing energy need. Increasing the use of renewable energy sources plays an important role in maintaining sustainability.

Renewable energy resources are cheap resources, apart from the initial investment cost. The development of technologies in which these resources are included over the years supports this. These resources do not create foreign dependency, are abundant, do not create pollution, are free from the effects of all kinds of crises, and can be easily obtained where needed since there is no transportation problem.

Although progress has been made in improving energy efficiency and improving access to electricity, current developments are insufficient to achieve sustainable development goals.

Although the promotion of clean energy provides an increase in the use of renewable resources in global energy production, the need for clean and renewable energy production is expected to increase as the electricity demand continues to increase.

The Sustainable Development Goals adopted under the United Nations Development Program in 2015 provide a framework for eliminating global warming and poverty, protecting our planet, and reducing inequalities. Although the “Affordable and Clean Energy” goal, one of the 17 goals of sustainable development that is aimed to be achieved by 2030, is related to most of the other development goals, it shows how important the role of energy in achieving sustainable development is. Affordable and clean energy supports all SDGs.

Among the renewable energy resources, the second most suitable resource for Türkiye is solar energy after hydroelectric energy, which is left for another chapter. Although Türkiye is at the forefront of the world in terms of using solar energy with thermal technology, it should include the production of electricity through photovoltaic cells as soon as possible, as well as using this source for heating. For wind energy, whose investment costs are quite high, incentives should be increased as soon as possible with laws enacted so that more investments can be made throughout the country.

In energy production and use in Türkiye, first of all, national and international legal regulations should be restructured, energy production areas should be brought into the economy by taking into account the environmental effects of energy production technologies and resource selection, and great importance should be given to efficiency in energy use. Therefore, instead of classical fossil fuel-based energy production systems and traditional production technologies that cause environmental pollution and climate change on a global scale, it is necessary to evaluate environmentally friendly, sustainable renewable energy sources and develop their technologies.

With regard to renewable energy sources that create economic potential in Türkiye, necessary legal measures should be taken to complete the licensed projects within the stipulated time. Production plans, should also be prepared depending on technological developments and legislative regulations.

Türkiye is well-positioned to be a leader in Europe in terms of renewable energy sources. With the new legal regulations, studies, and investments to be made, important steps should be taken in energy by realizing the local resources, technology, and technical staff with these high potentials and raising awareness.

Energy and foreign exchange savings should be made in Türkiye. The country has a very high potential of at least 25% in terms of increasing energy efficiency, and this potential needs to be utilized in the best and quickest way.

Air, water, and soil pollution should be reduced. Comprehensive technological and scientific studies should be carried out with the aim of protecting people, the environment, and all assets that are a part of it.

In addition, it is necessary to diversify energy, to increase the use of solar, wind, and biomass energy as domestic resources, to ensure security in energy, and to minimize losses in energy production, transmission, distribution, and consumption.

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## CHAPTER 11

### THE ROLE OF GEOTHERMAL AND HYDRAULIC ENERGY IN TÜRKİYE’S ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT GOAL 7: POTENTIAL, OPPORTUNITIES, AND BARRIERS

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#### **Abstract**

The United Nations General Assembly adopted the Sustainable Development Goals in September 2015 as a roadmap to be completed by 2030, aiming to eradicate poverty, protect our planet, and fight inequality and injustice. The main objective is to leave a livable and sustainable world behind for future generations. In this regard, basic goals have been established under 17 headings. SDG7, one of these goals, focuses on providing countries with access to affordable and clean energy. Renewable energy resources are considered essential for achieving this objective. Given Türkiye’s geographical structure, hydraulic and geothermal energy resources play a vital role. This study aims to analyze Türkiye’s situation concerning hydraulic and geothermal energy resources and assess their impact on achieving the targets set by SDG7. The share of hydraulic energy in the total installed capacity was approximately 32% in 2011 and 31% as of June 2022. The percentage of geothermal energy increased from 0.20% to 1.60% for the same period. Regarding SDG goals, Türkiye has successfully achieved the SDG7 goal, with 100% of the population having access to electricity and 95.1% having access to clean fuels and technologies for cooking. Additionally, 15.9% of the primary energy sources in Türkiye come from renewable energy. However, Türkiye fell short of the target regarding carbon dioxide emissions measuring 1.3% of such emissions per electricity generation. Based on this information, it can be concluded that Türkiye’s hydraulic and geothermal energy resources have been instrumental in achieving the said targets. Nevertheless, Türkiye needs to further utilize renewable energy sources to effectively reduce carbon dioxide emissions. Policy recommendations are discussed in this paper.

**Keywords:** Sustainable Development Goals, SDG7, Hydraulic Energy, Geothermal Energy, Türkiye

## 1. Introduction

The Paris Agreement, which calls for the reduction of greenhouse gas (GHG) emissions to combat climate change, and the 2030 Agenda, especially Sustainable Development Goal (SDG) 7, which aims to “ensure access to affordable, reliable and modern energy for all,” are the two main international agendas currently influencing the development of sustainable energy systems. Minimizing environmental impacts while ensuring socioeconomic development can be broadly defined as the goal of developing a sustainable energy system (Spittler et al., 2020). The energy problem arises from the increasing global demand for energy, highlighting the crucial need for sustainable energy resources. Humans rely on energy in various areas, including industrial activities, transportation, heating, and lighting. However, most available energy resources are limited and based on fossil fuels, which cause harm to the environment. The energy problem presents a significant challenge due to its adverse environmental impacts. The combustion of fossil fuels releases greenhouse gases, contributing to issues such as global climate change and air pollution. These factors have detrimental effects on natural life, ecosystems, and human health.

Moreover, economic challenges such as dwindling fossil fuel reserves and price fluctuations further complicate the energy problem. Sustainable energy sources play a vital role in addressing this issue. Renewable energy sources, such as solar, wind, hydro, biomass, and nuclear, derive from unlimited or renewable natural resources and are environmentally friendly. These energy sources can reduce dependence on fossil fuels, mitigate greenhouse gas emissions, and enhance energy security.

Although Türkiye is a country rich in energy resources, it faces challenges regarding energy supply security. Most of Türkiye's energy resources are imported, posing a serious risk to the sustainability of its energy supply. Therefore, the country is increasing its investment in energy resources and aiming to enhance the utilization of renewable energy sources. Türkiye's energy mix comprises coal, natural gas, hydro, geothermal, and wind. Coal is the largest energy source, accounting for approximately 30 percent of the total energy supply. Natural gas is the second-largest energy source, representing around 25 percent of the total energy supply. Hydro-electric energy is Türkiye's most significant renewable energy source, contributing to about 25 percent of total electricity generation. Geothermal energy is another essential renewable energy source in Türkiye primarily used for heating. Wind energy has experienced rapid development in recent years and currently provides approximately 7 percent of the total electricity generation.

Türkiye focuses on SDG7 within the Sustainable Development Goals (SDGs) framework. This goal is to “ensure accessible, secure, sustainable and modern energy sources for all.”

Hydraulic and geothermal energy resources can play an essential role in helping Türkiye achieve this goal. Türkiye is a country rich in hydraulic energy potential. Rich in water resources, Türkiye has favorable conditions for hydraulic energy production. There are many hydroelectric power plants throughout the country, and these power plants meet a great deal of the total electricity generation. In addition, Türkiye has excellent hydraulic energy potential that has not yet been fully utilized.

Regarding geothermal energy resources, Türkiye is in a critical position worldwide. Geothermal resources can be used in heating, greenhouse cultivation, industrial use, and electricity generation. Türkiye is among the top 10 countries in the world in terms of geothermal energy potential, and most of these resources are located in Western Anatolia. More than 45 geothermal power plants are currently operating in the country, with a total installed capacity of about 1.6 GW. However, Türkiye's geothermal energy potential has not yet been fully utilized, and the country's potential should be further developed to ensure energy supply security (Republic of Türkiye Ministry of Energy and Natural Resources).

Furthermore, Türkiye's hydraulic and geothermal energy resources offer a significant opportunity to achieve SDG7 targets. Hydraulic energy resources can be used as a clean and renewable energy source in electricity generation. Geothermal energy resources can also be used in heating, greenhouse cultivation, and industrial use. Fully utilizing the potential of these resources will help Türkiye ensure the security of its energy supply and achieve sustainable development goals.

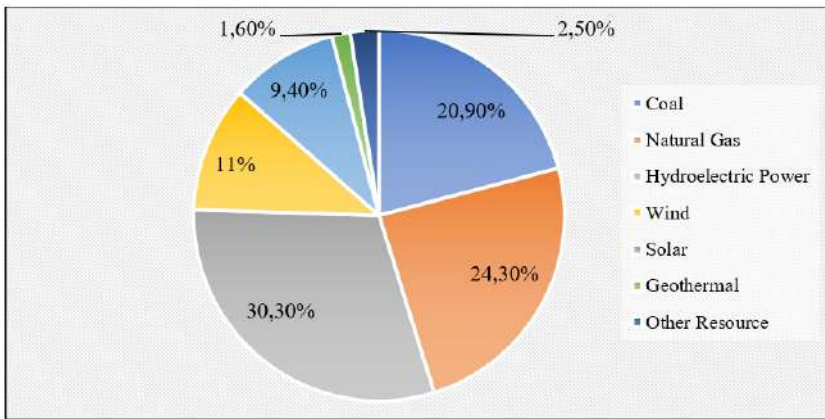
In summary, Türkiye is rich in energy resources but faces some challenges regarding energy supply security. Therefore, renewable energy sources offer an essential opportunity for Türkiye to ensure energy supply security and achieve its sustainable development goals.

The rest of the paper is organized as follows: Section 1 discusses Türkiye's energy profile, current situation, and evolution since 2000 through data. Section 2 mentions the importance of hydropower and geothermal energy in achieving the goal of clean and affordable energy. The situation of hydropower and geothermal energy in Türkiye and how it has changed over time is discussed in detail within the same section. Section 3 discusses Türkiye's performance in achieving the goal of clean and accessible energy. The final section presents the conclusion and recommendations.

## **2. Türkiye's Energy Profile**

Developing countries need energy to ensure economic growth, improve quality of life, and support social development. However, maintaining the balance between energy supply and demand is a significant challenge these countries face. As a developing country with

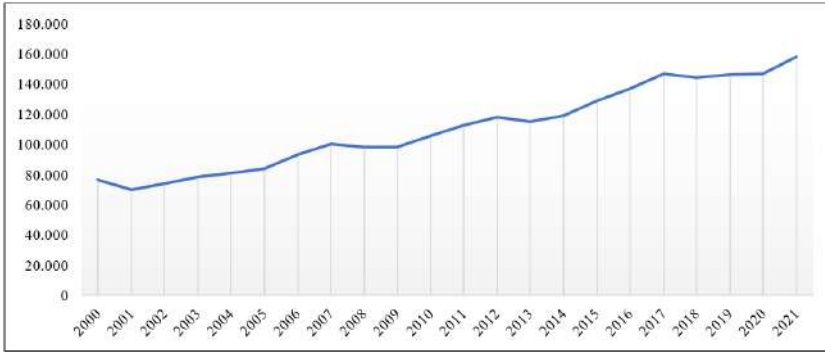
rapid economic growth rates, Türkiye needs a lot of energy. Therefore, the sustainability of energy is important for meeting this need. In 2022, 34.6% of Türkiye's electricity came from coal, 22.2% from natural gas, 20.6% from hydroelectric power, 10.8% from wind, 4.7% from solar, 3.3% from geothermal, and 3.7% from other sources. As of the end of March 2023, the installed capacity reached 104,348 MW. The distribution of installed capacity by source is as follows: 30.3% hydraulic energy, 24.3% natural gas, 20.9% coal, 11% wind, 9.4% solar, 1.6% geothermal, and 2.5% other sources. In addition, the number of power plants increased to 11,845 (including unlicensed) by the end of March 2023. Of the existing power plants, 751 are hydroelectric, 67 are coal, 361 are wind, 63 are geothermal, 346 are natural gas, 9,767 are solar, and 490 are other sources (Republic of Türkiye Ministry of Energy and Natural Resources).



**Figure 1.** Share of Energy Source in Total Installed Capacity  
**Source:** Republic of Türkiye Ministry of Energy and Natural Resources

Since Türkiye is a developing economy, its energy demand is increasing day by day. Primary energy supply represents the total amount of energy a country obtains from all energy sources. Figure 2 shows Türkiye's primary energy supply between 2000 and 2021 in tons of oil equivalent (toe). According to the data, Türkiye's primary energy supply has generally increased over the years. From 76,288 toes in 2000, the primary energy supply increased to 158,249 in 2021. The increase in primary energy supply can be realized due to various factors. For example, factors such as economic growth, increased industrial activities, population growth, changes in energy policies, and increased energy demand have contributed to the increase in primary energy supply. However, fluctuations are also observed in the data between years. For example, although the primary energy supply increased between 2000 and 2003, it followed a more stable course between 2003 and 2009. The primary energy supply

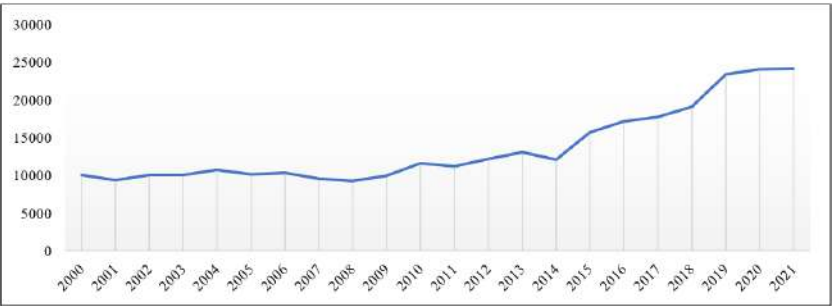
generally maintained its upward trend in the following years. These data show that Türkiye's energy demand is increasing, and the country needs to take various measures to diversify its energy supply and move towards sustainable sources. In addition, policies and strategies such as implementing energy efficiency measures and greater utilization of renewable energy sources may also be necessary.



**Figure 2.** Primary Energy Supply (Million toe)

**Source:** OECD (2023a)

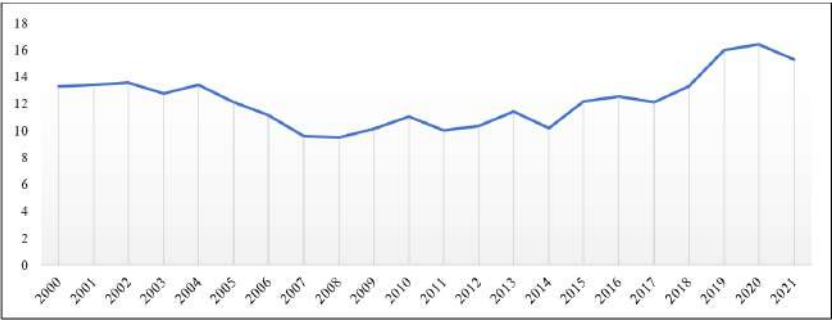
Figure 3 shows the renewable energy supply. According to the data, Türkiye's renewable energy production has increased over time. Although there are fluctuations in the beginning, a general upward trend is noticeable. Between 2000 and 2005, renewable energy generation fluctuated. During this period, there were ups and downs in production. Since 2005, Türkiye's renewable energy generation has grown more steadily. There was a significant increase in the period 2005-2015. By 2010, Türkiye's renewable energy generation had increased rapidly. After that year, there was a significant growth in generation in the period between 2010 and 2021. Between 2015 and 2021, Türkiye's renewable energy production increased rapidly. In 2019, there was a big leap forward, and production reached record levels. The data shows that Türkiye is increasing its investments in the renewable energy sector and focusing on the goal of sustainable energy production. However, the continuous growth trend in renewable energy generation shows that Türkiye's potential has not yet been fully realized. Continued investments and more efficient utilization of renewable energy resources could further increase generation capacity.



**Figure 3.** Renewable Energy (Thousand toe)  
**Source:** OECD (2023b)

Since the share of renewable energy supply is only one component of the primary energy supply, it is important to consider other energy sources. Factors such as the share of fossil fuels, nuclear energy, and other energy sources can also affect a change in the primary energy supply. The increasing share of renewable energy supply reflects Türkiye’s efforts to achieve its sustainable energy targets. Increased use of renewable energy sources can reduce dependence on fossil fuels, ensure energy security, and enhance environmental sustainability. Figure 4 contains data on the changes in the shares of renewable energy supply in Türkiye’s primary energy supply between 2000 and 2021. According to the data, the share of renewable energy supply in Türkiye’s primary energy supply varies between years. There have been increases in some years and decreases in others. Until 2007, the renewable energy supply ratio generally showed a downward trend. However, increases have started to be seen since 2007. In 2019 and 2020, there were significant increases and the renewable energy supply ratio increased substantially.

This shows that Türkiye has made significant progress in renewable energy supply. However, continued policy measures and investments are needed to further increase the share of renewable energy supply. Incentives and regulations for sustainable energy sources can support progress in this area.



**Figure 4.** Renewable Energy (% of Primary Energy Supply)  
**Source:** OECD (2023b)

### 3. Hydraulic and Geothermal Energy Sources Towards Sustainable Development Goals?

The diminishing reserves of fossil-based energy resources and their formation taking years raises concerns about sustainability and the need to switch to renewable energy sources rather than fossil-based ones due to their negative impact on the environment (Dincer, 2000). Renewable energy comes from ongoing natural processes that replenish it. It derives directly from the sun, wind, rain, ocean tides, biomass, and geothermal resources, which are heat sources produced deep within the earth (Mohtasham, 2015). According to the definition of renewable energy, it is “an energy source that can be available the same the next day within the evolution of nature itself.” The critical characteristics of renewable energy sources are that they contribute to environmental protection by lowering carbon dioxide emissions, lessen reliance on imported energy, create more jobs because they are domestic resources, and enjoy widespread and enthusiastic public support. In other words, accessible, available, and acceptable qualities describe renewable energy sources (General Directorate of Mineral Exploration and Research, 2023).

Due to their lack of toxic gas and particle discharges that pollute the atmosphere, their low operating costs compared to non-renewable energy sources, and their use in agriculture, hydropower and dams are considered essential. However, only a third of the potential of hydropower is currently used. This is equivalent to 17% of the electricity produced worldwide. Some argue that since large dams generate more environmental harm than small ones, they cannot be regarded as renewable energy sources. However, the World Bank, which had previously advocated against the construction of sizable dams, has begun to alter its stance. More power and energy are needed in nations where energy consumption is much lower than the global average (Republic of Türkiye Ministry of Foreign Affairs, 2023). Geothermal energy, on the other hand, is thermal energy generated naturally in the planet’s interior, primarily by the decay of radioactive potassium, uranium, and thorium isotopes (Younger, 2015). It is the only renewable energy source not dependent on solar radiation or the moon’s or the sun’s gravitational pull (McCay, 2014). Among the renewable energy sources, hydropower and geothermal energy hold a significant position. To lessen reliance on fossil fuels, ensure energy security, safeguard the environment, and combat climate change, these resources are crucial. We require both hydropower and geothermal energy for the following reasons:

***Reducing dependence on fossil fuels:*** Hydraulic and geothermal energy replace fossil fuels and increase the diversity of our energy sources. This increases energy supply security and reduces dependence on fossil fuels.



***Protecting the environment:*** Hydraulic and geothermal energy sources are environmentally friendly, unlike fossil fuels. The energy produced from these sources helps combat climate change by reducing greenhouse gas emissions. In addition, hydraulic energy sources do not affect natural habitats and minimize environmental impacts.

***Ensuring energy supply security:*** Hydraulic and geothermal energy resources are important in terms of energy supply security as they are produced from domestic sources. These resources reduce the dependence of countries on energy imports and prevent the interruption of energy supply.

***Providing economic benefits:*** Hydraulic and geothermal energy resources provide economic benefits as they are produced from domestic resources. With the use of these resources, employment is increased, local economies are revived, and energy costs are reduced.

### **3.1. Hydraulic Energy**

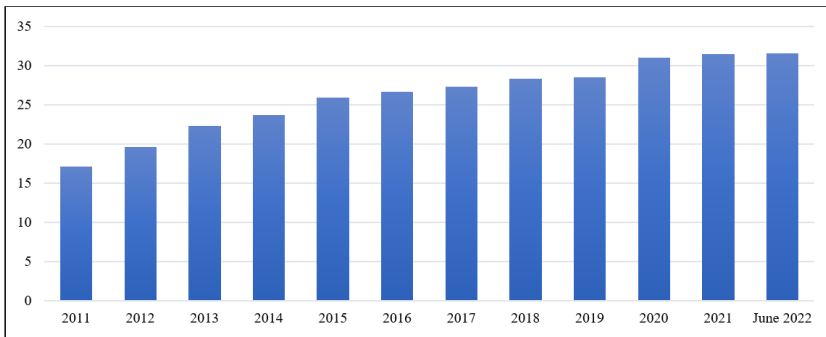
Utilizing the mechanical energy of moving water, hydropower is created by forcing the water through a penstock, which turns an electrical generator to create electricity. Wave and tidal energy are two additional forms of waterpower that are still under investigation by scientists as they work to figure out how to use the energy generated by ocean currents. Compared to most other sources of electricity production, hydropower has several advantages. High levels of dependability-tested technology, high efficiency, extremely low operating and maintenance costs, and the capacity to quickly adapt to load changes are a few of these (IHA, 2023). This makes it one of the most popular renewable energy sources both in Türkiye and around the world. In general, many hydropower plants near reservoirs benefit the community by providing water, flood control, and recreational opportunities. However, hydropower has several drawbacks, including expensive initial outlays for facilities, reliance on precipitation (no control over water availability), adjustments to stream regimes (can affect fish, plants, and wildlife by changing stream levels, flow patterns, and temperature), flooding of land and wildlife habitat (creation of reservoir), and eviction of residents from the reservoir area (Mohtasham, 2015).

In addition to the above features, the advantages of hydraulic energy can be summarized as follows (Erdogan et al. (2018), Wasti et al. (2022)):

- Long economic life
- Widespread worldwide
- Environmentally friendly
- Low operating and maintenance costs

- No fuel costs
- Short payback period
- High efficiency
- Ability to meet peak demands by providing flexibility and convenience in business
- Providing economic and social contributions to the local people
- It is a domestic resource that is not dependent on foreign sources and ensures energy production
- Potential to generate hydrogen

Figure 5 contains data on installed capacity based on hydraulic energy in Türkiye between 2011 and 2022. In 2011, Türkiye's installed capacity based on hydraulic energy was 17,137 MW. In 2012, this amount increased to 19,609 MW, showing an increase. In 2013, the installed capacity was recorded as 22,289 MW. This trend continued in 2014 and increased to 23,643 MW. In 2015, the increase gained momentum and reached 25,868 MW. In 2016 and 2017, the installed capacity based on hydraulic energy was 26,681 MW and 27,273 MW, respectively, and reached 28,291 MW in 2018. In 2019, Türkiye's installed hydraulic energy resource capacity was 28,503 MW. In 2020, there was a significant increase, reaching 30,984 MW. This upward trend continued in 2021 and reached 31,493 MW. Finally, as of June 2022, Türkiye's installed capacity based on hydraulic energy was determined as 31,558 MW. Based on these data, it can be said that Türkiye's installed capacity based on hydraulic energy has been increasing over the years and has shown a continuous growth trend from 2011 to 2022.



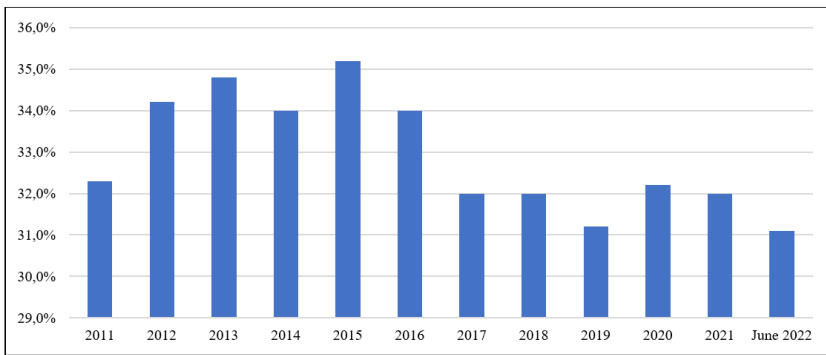
**Figure 5.** Amount of Installed Power Based on Hydraulic Energy (MW)

**Source:** Republic of Türkiye Ministry of Energy and Natural Resources

Figure 6 shows Türkiye's hydraulic energy share in total installed capacity. According to the data, in 2011, hydraulic energy accounted for 32.3 percent of Türkiye's installed capacity, while this share increased to 34.2 percent in 2012 and 34.8 percent in 2013. However, after a decline in 2014, the percentage of hydraulic energy fell to 34.0 percent. In the following years, the share of hydraulic energy in installed capacity fluctuated. While it increased to 35.2% in

2015, it decreased to 34.0% in 2016 and remained constant at 32.0% in the years 2017 and 2018. In 2019, the percentage decreased to 31.2% and then increased again in 2020 to 32.2%.

The data show that the share of hydraulic energy in installed capacity has generally followed a stable course. No significant increase or decrease is observed in this period. These data suggest that Türkiye should continue its energy-generation and utilization diversification efforts. Steps such as investing more in renewable energy sources, developing sustainable energy policies, and increasing energy efficiency can help improve the share of hydraulic energy as well as other renewable energy sources in the energy portfolio.



**Figure 6.** Share of Hydraulic Energy in Total Installed Power (%)  
**Source:** Republic of Türkiye Ministry of Energy and Natural Resources

### 3.2. Geothermal Energy

Sustainable development has become a critical issue for humanity due to the rapid growth of the world's population and increasing environmental concerns. In many regions of the world, geothermal resources have the potential to make a significant contribution to sustainable energy use. Sustainable use of geothermal energy means producing energy at a rate that can be sustained for a very long time (100-300 years). International organizations have classified geothermal energy as a renewable energy source. This classification has been in use for a very long time. Still, it is occasionally claimed that geothermal energy is not strictly a renewable energy source on human time scales because the thermal depletion of geothermal reservoirs would take a long time to recover (Ledingham, 1998). Depending on their geological setting and nature, different geothermal systems have various production capacities and respond to production differently. The sustainable use of all geothermal resources requires comprehensive management. In other words, effective management is needed to prevent overexploitation, which typically results from ignorance and lack of understanding, as well as from situations where multiple users exploit the same resource without coordinated

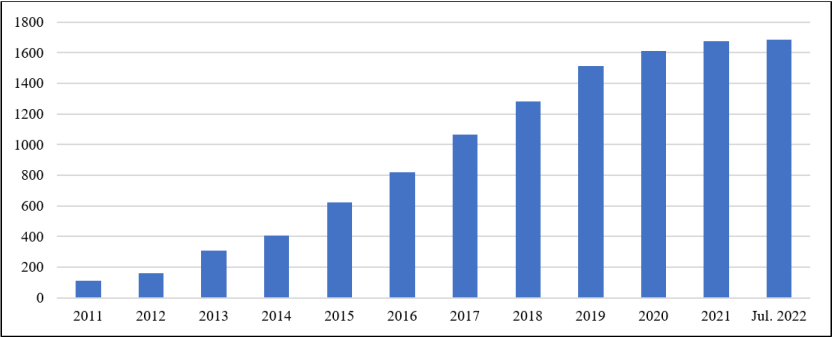
management. Sustainable development requires careful monitoring and modeling, as well as energy-efficient use. Sustainable use of closed geothermal systems, which have little recharge, also depends on injection (Hepbasli & Özgener, 2004).

The geothermal process involves storing energy below ground and releasing it as heat as it rises to the surface. This heat is captured and used to turn a steam turbine to produce electricity when it naturally has hot water or steam. Geothermal energy is very considerate of the environment as a result. It provides a consistent, effective clean energy supply with little negative environmental impact (Geothermal Engineering Ltd.). Geothermal energy can be directly used for various purposes, including industry, greenhouses, fish farming, health spas, and space heating and cooling. It mostly makes use of current technology and simple engineering. The direct use of geothermal energy has been proven to be technologically feasible, dependable, economically viable, and environmentally acceptable worldwide (Fridleifsson, 2001).

The first electricity generation in geothermal energy applications was started in 1975 with the Kızıldere Power Plant established by the General Directorate of MTA with a power of 0.5 Mwe. The geothermal potential of Türkiye is relatively high, and 78% of the potential areas are located in Western Anatolia, 9% in Central Anatolia, 7% in the Marmara Region, 5% in Eastern Anatolia, and 1% in other regions. 90% of our geothermal resources have low and medium temperatures and are suitable for direct applications (heating, thermal tourism, various industrial applications, etc.). In comparison, 10% are ideal for indirect applications (electrical energy generation). The installed capacity of geothermal energy in the world is 16.1 GWe, according to data taken at the end of 2022. The top 5 countries in electricity generation from geothermal energy are the USA, Indonesia, Philippines, Türkiye, and New Zealand. Non-electricity utilization has exceeded 107,000 MWt, and the top 5 countries in the world in direct utilization applications are the USA, China, Sweden, Türkiye, and Germany (General Directorate of Mineral Exploration and Research, 2023).

With the support of the Ministry of Energy and Natural Resources, the available heat capacity, which was 3100 MWt as of the end of 2004, increased to 5000 MWt with an additional 1900 MWt heat energy increase as of the end of December 2022. In addition, the number of discovered geothermal fields, which was 173 by MTA, has increased to 243 fields with the discovery of new fields, 16 of which are suitable for electricity generation, and a total of 658 exploration works with 447.000 meters of drilling have been carried out to date. As a result, approximately 5000 MWt of heat energy has been obtained with the wells drilled, including natural outlets (General Directorate of Mineral Exploration and Research, 2023).

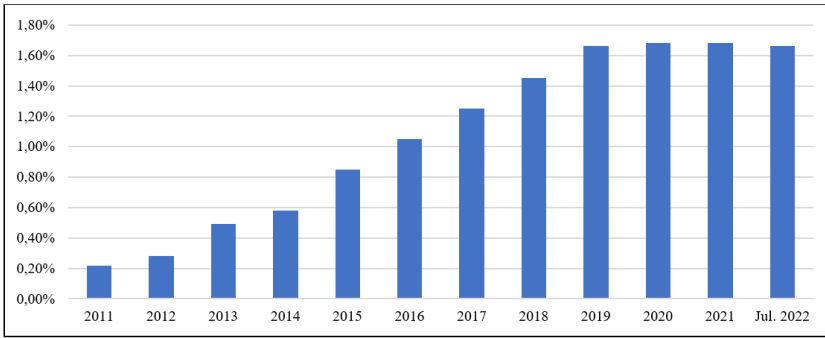
Figure 7 shows Türkiye’s geothermal energy-based installed capacity data by years, and an analysis of this indicates significant trends and developments. In 2011, the installed capacity of geothermal energy was 114 megawatts (MW), which increased rapidly to 162 MW in 2012. In 2013, this amount increased significantly and reached 311 MW. In 2014, the amount of geothermal energy-based installed capacity increased to 405 MW and continued to increase. In the following years, this increase gained momentum and was recorded as 624 MW in 2015, 821 MW in 2016, and 1064 MW in 2017. The amount of geothermal energy-based installed capacity reached 1283 MW in 2018 and displayed a continuous growth trend. In 2019, the amount of geothermal energy-based installed capacity increased to 1515 MW and continued to increase compared to the previous year. In 2020, this amount increased to 1613 MW. The data shows that it maintained its upward trend in 2021, reaching 1676 MW. In addition, data for June 2022 is also available, and the amount of installed capacity from geothermal energy is determined as 1686 MW on this date. Overall, Türkiye’s geothermal energy sector is developing rapidly with a continuous increase in the data. This rate of increase has gained momentum over time, and significant growth has been achieved in the amount of installed capacity from geothermal energy. These data show that Türkiye’s investments in renewable energy resources are increasing, and with this, the potential of the geothermal energy sector is also increasing. Geothermal energy is essential in Türkiye’s energy portfolio as a sustainable and environmentally friendly energy source.



**Figure 7. Geothermal Sourced Installed Power (MW)**  
**Source:** Republic of Türkiye Ministry of Energy and Natural Resources

Figure 8 shows the ratio of geothermal energy in Türkiye’s total installed capacity between 2011 and 2022. In 2011, the percentage of geothermal energy in Türkiye’s total installed capacity was only 0.22%. However, this ratio showed a significant increase in the following years. In 2012, the ratio improved slightly to 0.28 percent. An even more remarkable development took place in 2013. The proportion of geothermal energy increased to 0.49 percent,

showing a significant increase, and achieved a rapid growth momentum. This upward trend continued in 2014, and the ratio increased to 0.58 percent. According to the data, it increased to 0.85 percent in 2015 and continued to grow. Then, an even more significant increase was recorded in 2016, reaching 1.05 percent. The share of geothermal energy resources in total installed capacity increased steadily, reaching 1.25% in 2017. In 2018 and 2019, the ratio of geothermal energy was 1.45% and 1.66%, respectively. Investments in geothermal energy resources and the increase in installed capacity continued in these years. In 2020 and 2021, the geothermal energy ratio remained constant at 1.68%. According to the July 2022 data, the geothermal energy ratio decreased to 1.66%.



**Figure 8.** Share of Geothermal Energy in Total Installed Capacity  
**Source:** Republic of Türkiye Ministry of Energy and Natural Resources

Comparison of Geothermal Applications in Türkiye for the Years 2002-2022 (General Directorate of Mineral Exploration and Research)

- The number of sites suitable for electricity generation increased from 16 in 2002 to 25 in 2022.
- Greenhouse heating increased from 500 acres in 2002 to 4052 acres in 2022, an increase of 710%.
- Residential heating increased from 30,000 houses in 2002 to 125,820 houses equivalent in 2022, an increase of 319%.
- Installed capacity in electricity generation increased from 15 MWe in 2002 to 1691 MWe in 2022, an increase of 11,000%.
- The country's apparent heat capacity increased from 3000 MWt in 2002 to 40,000 MWt in 2019 (together with the private sector), an increase of 1230%.
- In addition, 350 thermal facilities in our country are utilized for treatment and thermal tourism purposes.

#### 4. Türkiye's Achievements in Line with SDG7 Goals

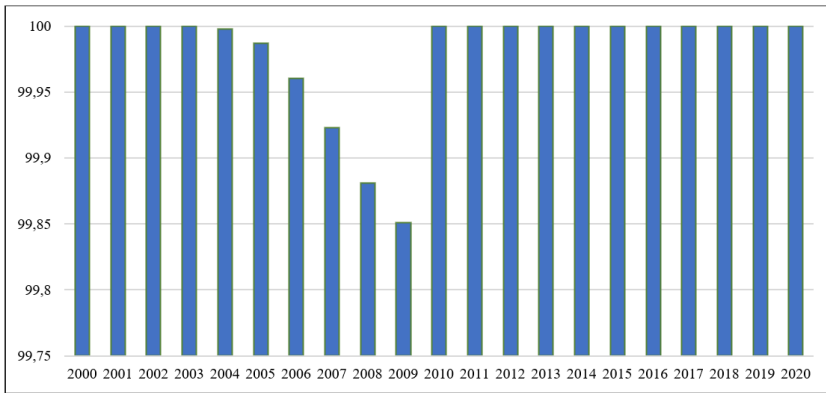
At a time when EU member states have started to concentrate on efforts to increase the share of renewable energy sources in their energy consumption, Türkiye, as a country that aspires to EU membership as a national policy, attaches increasing importance to renewable energy sources. Türkiye continues its efforts to encourage the use of renewable energy resources and to establish the necessary administrative structure for this purpose, both in terms of international commitments and European Union membership targets and national needs and interests. In this framework, in the revised “National Program of Türkiye for the Adoption of the European Union Acquis”, which entered into force on July 24, 2003, increasing the share of renewable energy resources in total energy production is stated among the short-term priorities. The National Program also states that increasing the use of renewable energy in the energy supply balance constitutes an important part of the energy policy and that the use of renewable energy should be supported in order to reduce energy import dependency and ensure the security of supply. In the Eighth Five-Year Development Plan, it is emphasized that necessary measures should be taken to support the use of renewable energy resources for the protection of the environment. Within the framework of policies to ensure greater utilization of renewable energy resources, preparations are underway to submit a “Draft Law on the Utilization of Renewable Energy Resources” to Parliament. Furthermore, with “Electricity Market Law” No. 4628, efforts are being made to take the necessary measures to encourage the use of renewable energy resources in electricity generation. In this framework, a World Bank loan amounting to 200 million dollars was made available to the private sector through the Industrial Development Bank of Türkiye and the Development Bank of Türkiye for renewable energy investments (Republic of Türkiye Ministry of Foreign Affairs, 2023).

Figure 9 provides data on the access rates of the Turkish population to electricity. Based on the data in the figure, it can be said that the access rates to electricity in Türkiye were generally high and stable between 2000 and 2020. Indeed, the access rate to electricity has been consistently above 99%, reaching 100% in 2020. These data show a positive development in line with the sub-target of access to electricity within the framework of the United Nations Sustainable Development Goals (SDG7). SDG7 aims to ensure everyone can access reliable, sustainable, and modern energy by 2030. Therefore, Türkiye's high access rate to electricity can be considered an indicator of progress toward this goal.

The rate of access to electricity, which was 99.99 percent in 2004, showed a slight downward trend in the years that followed, as can be seen by looking at the figure in more detail. However, the access rate to electricity has generally remained above 99 percent, and it should

be noted that this downward trend has only been very slight. This demonstrates how steadily and largely successfully Türkiye's electrification process has gone.

The steady increase in Türkiye's access to electricity can be attributed to infrastructure developments, investments, and policy measures in the energy sector. Electrification supports economic growth, increases access to health services, and promotes social development. Therefore, Türkiye's progress in this area indicates its efforts toward the energy sector and sustainable development. As a result, it is clear that Türkiye has achieved its target of population access to electricity under SDG7.



**Figure 9.** Türkiye's Access to Electricity (% of Population)

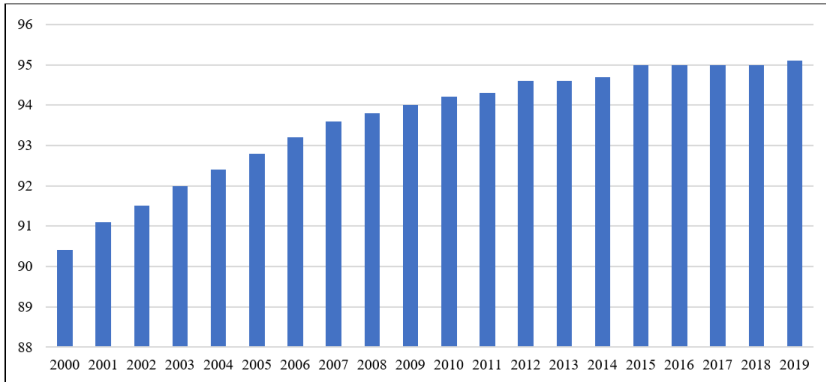
**Source:** Sustainable Development Report

Figure 10 includes data on the percentage of the population that has access to clean fuel and technology for cooking. Based on the data in the figure, we can observe that Türkiye's access rate generally increased between 2000 and 2020. These data point to a positive development when evaluated in the context of SDG7 targets. While the access rate was 90.1 percent in 2000, this rate increased to 95.2 percent in 2020. This shows an improvement in the access that Türkiye's population has to clean fuels and technology.

Access to clean fuels and technology, among the SDG7 targets, is essential for a healthy and sustainable life. Using clean fuels and technology can help reduce air pollution, improve indoor air, and prevent health problems. Increasing the access rate of Türkiye's population can be attributed to developments in the energy sector, policy measures, and awareness-raising efforts. A high rate shows Türkiye's steps toward achieving sustainable development goals in this area. However, it can also be observed that there has not been a significant increase in the data over the years. Since 2010, the access rate has ranged between 94.2 percent and 95.2 percent. This shows that progress has been slower in recent years.



In conclusion, the data shows that Türkiye's access rate to clean fuels and technology for cooking increased between 2000 and 2020. This indicates that Türkiye is making progress toward the SDG7 targets. However, it is important to take further steps to accelerate progress in this area and to continue efforts to provide access to clean fuels and technology to a broader segment of the population.

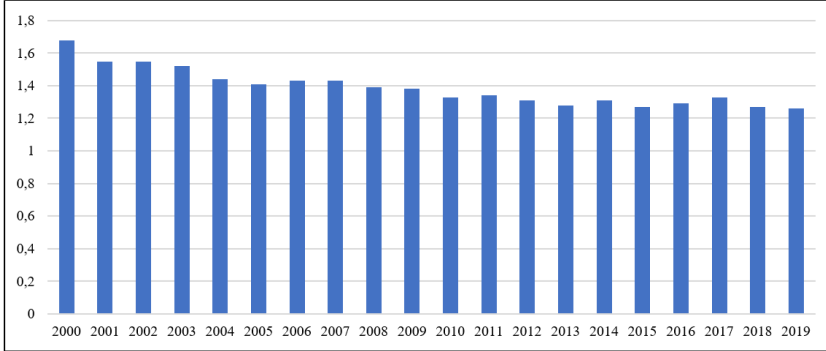


**Figure 10.** Population with Access to Clean Fuels and Technology for Cooking  
**Source:** Sustainable Development Report

Figure 11 contains the data on carbon dioxide (CO<sub>2</sub>) emissions per total electricity generation in MtCO<sub>2</sub>/TWh. Based on the data given, it is seen that Türkiye has been in a general downward trend between 2000 and 2019. While in 2000, the amount of emissions was 1.68, it decreased to 1.26 in 2019. This shows that there is a decrease in Türkiye's emission amount. Reducing carbon dioxide emissions is important in combating climate change, using clean energy, and sustainable development. Moreover, lower CO<sub>2</sub> emission amounts can help mitigate the effects of global warming by reducing the greenhouse gas concentration in the atmosphere. Therefore, reducing CO<sub>2</sub> emissions in Türkiye is a positive development in terms of environmental sustainability and combating climate change. This observed decrease in Türkiye's CO<sub>2</sub> emissions per total electricity generation can be attributed to various factors. These include increased energy efficiency, increased use of renewable energy sources, adoption of cleaner technologies, and the impact of policy measures. The combination of these factors is a tangible sign of Türkiye's steps toward reducing carbon dioxide emissions. However, despite the downward trend in the data, there was an increase in 2017 and 2018. These increases may reflect a temporary situation that requires further analysis or specific impacts in certain sectors. Therefore, monitoring such fluctuations and maintaining efforts to reduce emissions continuously is essential.

As a result, the data show that Türkiye's CO<sub>2</sub> emissions per electricity output decreased between 2000 and 2019. This indicates that Türkiye is progressing towards reducing carbon

dioxide emissions in line with the SDG7 targets. However, further efforts to reduce CO<sub>2</sub> emissions should be made, including increasing renewable energy sources, improving energy efficiency, and investing in clean technologies.



**Figure 11.** CO<sub>2</sub> Emissions from Fuel Combustion Per Total Electricity Output (MtCO<sub>2</sub>/TWh)

**Source:** Sustainable Development Report

The Sustainable Development Report 2022 summarizes Türkiye's performance against the goals. The report also provides information on where Türkiye has achieved its targets, where it has not achieved them, and the direction in which the situation is heading. Data on Türkiye's performance on SDG7 issues are given in Table 1.

Goal	Score	Situation
Population with access to electricity (%)	100.0	SDG Achieved
Population with access to clean fuels and technology for cooking (%)	95.1	SDG Achieved
CO <sub>2</sub> emissions from fuel combustion per total electricity output (MtCO <sub>2</sub> /TWh)	1.3	Stagnated
Share of renewable energy in total primary energy supply (%)	15.9	SDG Achieved
<b>Source:</b> Sustainable Development Report (2022)		

According to the report a detailed evaluation of the goals is as follows:

**Population with access to electricity:** Türkiye's electricity access rate reaching 100% in 2020 and achieving the SDG7 target can be considered a positive development. Electricity is a basic necessity of modern life, and the achievement of this target indicates the strengthening of Türkiye's energy infrastructure and the inclusiveness of its population. Indeed, it can affect the development of a country's energy sector and society's welfare. Furthermore, electricity is essential in many areas, such as lighting, heating, healthcare, education, communication, and industrial production. Therefore, the completion of access to electricity can improve the

living standards of citizens and contribute to economic development. SDG7 includes targets such as promoting access to sustainable energy, increasing energy efficiency, and expanding the use of renewable energy sources. Türkiye's 100% electricity access rate shows that these targets have been achieved, and steps are being taken toward sustainable energy. However, electricity access is not only measured by the access rate. Other factors such as energy security, energy efficiency, diversification of energy sources, and environmental sustainability are also important. Therefore, Türkiye needs to continue and advance its efforts in the energy sector in areas such as sustainability and using renewable energy. Türkiye's electricity access rate reaching 100% and meeting the SDG7 target is a positive development. This achievement shows the impact of investments and policies in the country's energy sector.

***Population with access to clean fuels and technology for cooking:*** Access to clean fuels and technology for cooking is essential for environmental sustainability and human health. Traditionally, food is cooked in low-income areas using wood, charcoal, and other polluting fuels. This can cause indoor air pollution, which has environmental impacts (air pollution, deforestation, etc.) and negative impacts on human health. This development can reduce environmental impacts and improve health by providing a cleaner and more efficient way of cooking. Türkiye's 95.1% access rate indicates that households are progressing in switching from traditional fuels to clean energy sources. However, an access rate of 95.1% still does not mean that the SDG7 target has been fully achieved. Instead, it shows that policies and projects tackling fuel poverty and promoting the transition to clean energy are succeeding, but inclusivity needs to be further increased. To summarize, it is a positive development that Türkiye's population with access to clean fuels and technology for cooking has reached 95.1%. This is an important step towards environmental sustainability and human health. However, it is essential to make further progress on access to clean energy and increase inclusiveness.

***CO<sub>2</sub> emissions from fuel combustion per total electricity output (MtCO<sub>2</sub>/TWh):*** Türkiye's CO<sub>2</sub> emissions from fuel consumption per total electricity output, a target of SDG7, was 1.3 in 2020, indicating that the situation is not at the desired level. This shows that progress has not been made in the energy sector regarding environmental sustainability, and CO<sub>2</sub> emissions are still high. SDG7 includes sustainable energy targets, including reducing CO<sub>2</sub> emissions and promoting the transition to clean energy sources. CO<sub>2</sub> emissions from fuel consumption per total electricity output is an indicator that reflects the efficiency and environmental impact of the energy sector. Lower CO<sub>2</sub> emission values indicate cleaner and more sustainable energy production. Indeed, the value of 1.3 indicates that Türkiye still has a high amount of fuel consumption in energy production and the CO<sub>2</sub> emissions associated with this

consumption. This highlights the importance of taking measures in the energy sector, such as energy efficiency, transition to renewable energy sources, and adoption of low-carbon technologies. This assessment shows that Türkiye needs to work towards further sustainability goals in the energy sector. Steps such as increasing the use of renewable energy sources, implementing energy efficiency measures, and investing in low-carbon technologies can contribute to reducing CO<sub>2</sub> emissions and improving environmental sustainability. This situation indicates challenges to environmental sustainability in the energy sector. Therefore, it is essential to take further measures to remedy this situation and increase the use of sustainable energy sources.

***Share of renewable energy in total primary energy supply:*** Türkiye's share of renewable energy in the total primary energy supply was 15.9% in 2020, indicating that it has successfully achieved a target of SDG7. This shows that Türkiye has made progress in investing in renewable energy sources and diversifying its portfolio. Increasing the share of renewable energy in the total energy supply is important for environmental sustainability. Renewable energy sources produce fewer greenhouse gas emissions than fossil fuels and play an important role in combating climate change. In addition, renewable energy sources can also offer advantages regarding energy security, as their sources are local and sustainable. In recent years, Türkiye has increased its investments in renewable energy sources such as wind, solar, hydroelectric, and biomass. This helps the country to diversify its energy portfolio, increase energy security and support environmental sustainability. However, the 15.9% share of renewable energy shows that further progress is needed. In line with the SDG7 targets, Türkiye needs to increase its use of renewable energy and reduce its dependence on fossil fuels for electricity generation. Therefore, investments in renewable energy sources must be continuously encouraged, and renewable energy potential needs to be further exploited. Overall, the 15.9% share of renewable energy in Türkiye's total primary energy supply is a positive development and shows progress towards the SDG7 targets. However, continued efforts are needed to further increase the use of renewable energy and further diversify the energy portfolio. This is important for environmental sustainability and energy security.

## **5. Conclusion and Recommendations**

Hydraulic and geothermal energy is vital among sustainable energy sources in line with Türkiye's SDG 7 targets. In addition, these energy sources contribute to Türkiye's energy transformation with their environmentally friendly features and renewable nature. Therefore, geothermal energy is becoming increasingly crucial in Türkiye's energy portfolio. Türkiye has rich geothermal resources in various fields, such as electricity generation, heating, and greenhouse heating. In addition, geothermal energy is considered a sustainable energy source

as it is derived from natural resources that are continuously renewed. Therefore, increasing the use of geothermal energy is essential to ensure Türkiye's energy security by diversifying its energy supply. Türkiye's investments in and utilization of hydraulic and geothermal energy have significantly contributed to sustainable energy production. However, various challenges are faced in exploring the potential and utilizing these energy resources more effectively. These challenges include technical and financial barriers, infrastructure deficiencies, and improving regulatory measures.

The proportion of the population with access to electricity is 100%, indicating that Türkiye has achieved the SDG target. This means that everyone in Türkiye is powered by electricity and has full access to modern energy. The proportion of the population with access to clean fuels and technology for cooking is 95.1%. This indicates that the SDG target has been achieved. Türkiye has provided clean and healthy cooking methods to the vast majority of the population. CO<sub>2</sub> emissions from fuel combustion per total electricity generation (Mt CO<sub>2</sub>/TWh) is 1.3, below the SDG target. This indicates that Türkiye needs lower carbon dioxide emissions from power generation for less environmental damage. The share of renewable energy in the total primary energy supply is 15.9%, meeting the SDG target. Therefore, Türkiye has obtained a significant percentage of its energy supply from renewable sources.

Overall, Türkiye has primarily achieved the SDG7 targets through hydro and geothermal energy. In addition, significant progress has been made in areas such as access to electricity, clean fuels, low carbon dioxide emissions, and the use of renewable energy. These achievements reflect Türkiye's commitment to transition to sustainable energy and its steps towards achieving environmental goals.

Considering Türkiye's current situation, some policy recommendations regarding sustainability and climate change issues can be listed as follows.

***Focus on Renewable Energy Targets:*** Türkiye should focus more on renewable energy targets by increasing the potential and expanding the use of geothermal and hydraulic energy resources. In addition, investments in renewable energy sources and infrastructure development should be encouraged.

***Research and Development Investments:*** Türkiye should invest more in research and development activities in geothermal and hydraulic energy. Developing new technologies and innovative solutions is essential for increasing energy efficiency and reducing carbon dioxide emissions.

**Assessment of Geothermal Potential:** Türkiye's geothermal energy potential is relatively high. Therefore, policies should be established to identify, explore, and develop geothermal areas to utilize geothermal resources more effectively. In addition, sustainability principles should be observed by considering the geographical and environmental impacts of geothermal energy utilization.

**Hydraulic Energy Management and Water Resources:** A sustainable approach to managing hydraulic energy resources should be adopted. Policies should be established for the sustainable use of water resources, evaluation of the impacts of hydroelectric potential, and protection of aquatic ecosystems. In addition, water conservation and effective water management measures should be encouraged.

**Energy Efficiency and Transformation:** Besides geothermal and hydraulic energy utilization, energy efficiency is also essential for sustainability. Therefore, Türkiye should strengthen energy efficiency policies and promote energy transition. Guidelines should be developed in areas such as energy efficiency measures in buildings, innovative technologies in industry, and the transformation of energy-intensive sectors.

**International Cooperation and Financing:** Türkiye should effectively utilize international cooperation and financing resources to increase geothermal and hydraulic energy use. Applications should be made to international funds for sustainable energy projects, and co-operation should be developed to transfer renewable energy technologies.

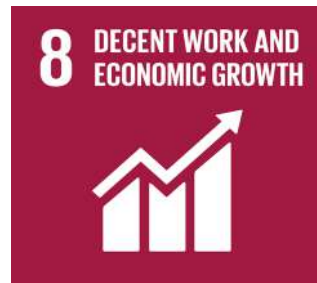
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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







## CHAPTER 12

### FROM THE PERSPECTIVE OF INCLUSIVE GROWTH, THE EXAMINATION OF TÜRKİYE'S ECONOMIC GROWTH AFTER 2002

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#### Abstract

This study aims to examine Türkiye's economic experience with GDP growth from 2002 onwards within two sub-samples (2002-2011 and 2011-2019) from the perspective of the inclusive growth approach, which was accepted by the United Nations as the eighth of the Sustainable Development Goals in 2015. The notion of inclusive growth emerged at the beginning of the 2010s, as neo-classical growth-led policies failed to stimulate sufficient convergence between different income groups in societies. The high growth rates in developing countries do not provide similar opportunities for people at all income levels. In addition, the global financial crisis led to a worsening of the income gap in many countries. Therefore, growth strategies in many countries after 2010 aim to foster inclusive and sustainable growth as opposed to the neo-classical growth-oriented approach. For this reason, this study estimates the inclusive growth for Türkiye creating an index for the last two decades based on the McKinley (2010) and Hakimian (2016) indices and then analyzes the determinants of inclusive growth for each subperiod. The results show that inclusive growth structure of Türkiye had more inclusive features in 2002-2011, and it dramatically changed after 2011.

**Keywords:** Inclusive growth, sustainable growth, Turkish economy, inclusive growth index

## 1. Introduction

According to the neoclassical growth model, the main determinant of economic growth in the early stages of development is capital accumulation. When capital accumulation exceeds labor growth, economic growth is sustained. As a result, output becomes a function of the capital-labor ratio. In other words, as the capital-labor ratio increases, so does labor productivity and output. The labor productivity determines wages according to the marginalist view (Clark, 1899: 3). This means that wages will automatically depend on economic growth. Regarding the rate of return to capital, labor productivity, and hence growth, would be high in the early stages of development and in economies where capital is scarce. As a result of growth, a rising income level proportionally raises the average income level of the lowest quantile, thus helping to reduce poverty. In this way, capital becomes an essential input and reflects the sustainable economic growth in this model (Solow, 1956; Dollar & Kraay, 2000; Dollar & Kraay, 2013).

However, the neo-classical economic model has not promised similar economic welfare to all parties who participate in economic activities in a society. Although the theory doesn't claim that the end result is fair income distribution, Kuznets proposed an income path called as inverted-U curve (Kuznets, 1955). It states that income distribution worsens during initial years of capital accumulation, but it improves as economic growth is sustained over time. However, in practice, the gap between the highest and lowest 5% income groups have widened not only in developing countries but also in developed ones. Hence, by worsening the income gap across the world, as opposed to the inverted-U curve or catch-up theory following the Solow-Swan model (Solow, 1956; Swan, 1956), many international organizations such as the United Nations (UN), the World Bank (WB), and the Organization for Economic Cooperation and Development (OECD) have raised concern over the widening income differentials.

Although economic growth is a necessary condition for reducing poverty and vulnerabilities, sustained growth is of great importance for policymakers. Hence, the conditions that ensure the sustained growth should be identified. Sustained growth is only possible if the benefits from economic growth could disperse into all sectors of the economy. As a result, employment opportunities in all sectors increase, leading to a larger part of the labor force contributing to economic activity. In return, they can reap the benefits from increased production and accelerated growth. In this regard, the urgency in reduction of poverty as well as preserving the sustainable welfare in middle class conceptualize the term of inclusive growth (IG) in the literature. Although different institutions have different perspectives on IG and without a clear definition of it, a definition can be provided as adopted in the application section of

this study: IG is a type of growth that ensures equal opportunities for all, not just for the poor. It considers opportunities in two dimensions: (i) achieving sustainable growth that creates and expands economic opportunities, and (ii) ensuring broader access to these opportunities so that members of society can participate in and benefit from them (ADB, 2010: 1). It is also a new and different concept from sustained and sustainable growth. Sustained growth is associated with a continuous increase in GDP, while sustainable growth is associated with an increase in GDP over time without damaging the environment. However, there is a multi-directional relationship between sustained, sustainable and inclusive growth.

“Decent Work and Economic Growth” is the eighth goal of the Sustainable Development Goals (SDG) that was established by the United Nations General Assembly in 2015. SDG 8 is to “promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”. Inclusive growth is therefore a part of the title of SDG 8.

Although inclusive growth is a separate goal from the other goals; it intersects with many others, such as no poverty, good health and well-being, gender equality, clean water and sanitation, etc. It is therefore necessary not to consider inclusive growth in isolation from other SDG goals, but to take into account its linkages with other goals. Moreover, while the SDG targets that include inclusive growth were set in 2015, the concept of inclusive growth dates back to the 2010s. Therefore, it should be kept in mind that there may be differences between inclusive growth under SDG 8 and other inclusive growth concepts.

The aim of this study is to measure the inclusive growth in Türkiye over the period 2002-2019. The study draws on two indexes based on McKinley (2010) and Hakimian (2016). We generate two composite indices based on these indices. We derive the time of this composite index during the years 2002-2019. In addition, we analyze the growth path of the index and examine the compatibility of the path with the industrial policy conducted in the country from 2002 to 2019.

The paper is organized in the following manner. Section 1 provides the definition and explanation of the term inclusive growth. Section 2 discusses the literature review. Section 3 describes the measurement methodologies. Section 4 presents the index and discusses the results for Türkiye. Finally, section 5 concludes the study.

## **2. Inclusive Growth**

There is a multi-directional relationship between growth, poverty and income inequality in a country. Strong and sustainable growth helps to reduce poverty and vulnerabilities. If economic growth is not sustainable, then it may weaken the efforts in reducing poverty. In a similar vein, if growth is not inclusive, then income inequality would persist in the medium

or long run. Persistence in income inequality, in turn, would harm growth, as well, because it affects the economic activities through four different channels (Ali & Son, 2007; Maggi & Tang, 2022: 29). First, it may increase the risk of political instability while decreasing incentives for both domestic and foreign investment. Second, it may prevent broad agreement on economic policies. Third, it may distort incentives by causing individuals to focus their efforts on obtaining preferential treatment or protection, resulting in resource misallocation, corruption, and nepotism. Finally, because poorer households are less likely to generate demand for new products, it can impede the development of domestic industrial sectors.

For those reasons, to combat inequality and poverty, achieving strong and sustained growth has become very important for policymakers (Ianchovichiana & Lunstrom, 2009). In this regard, we had a better look at world economic growth experience and its impact on poverty and inequality over the last two decades. Growth has been remarkable and strong enough to reduce inequalities and poverty all over the world. For example, the world per capita GDP which was around \$4,900 in 1990 increased to a level higher than \$12,500 in 2022, which is three times as high as that of 1990 (WB, 2023). As seen in Table 1, the growth rate of the world economy until the Covid-19 pandemic was realized at an average annual rate of 3%. The economic growth performance of developing countries was twice as high as that of advanced economies. In accordance with the increased income level resulting from growth, the number of people living below the extreme poverty line has decreased dramatically from 38% of the world population in 1990 to 8.5% of it before the Covid-19 pandemic, as illustrated in Figure 1, in line with the neo-classical model supposed. However, the pandemic caused extreme poverty to rise by 11% in 2021 and jeopardized the goal of decreasing poverty to 3.4% by 2030 within the framework of the Sustainable Development Agenda by the UN. Nonetheless, considering the broadly defined poverty line, as shown in Figure 2, the neo-classical model has limited success in reducing poverty. The poverty ratio could only fall from 69% in 1990 to 47% in 2020. It means that today almost half of the world population still lives below \$6.85 per day. (WB, 2022a).

Moreover, achieving growth and increasing prosperity cannot end up with a fair income distribution and reduce vulnerability automatically across the world, as well (Ali & Son, 2007; UN, 2014; 2). Kuznets' inverted U curve (Kuznets, 1955) argued that inequality deteriorates at low levels of per capita income in the early stages of development and then a more fair income distribution occurs as the economy improves and higher per capita incomes are achieved. In contrast to this, the income gap between the richest and the poorest groups, in reality, is widening every passing year. For example, the US is witnessed a long-lasting

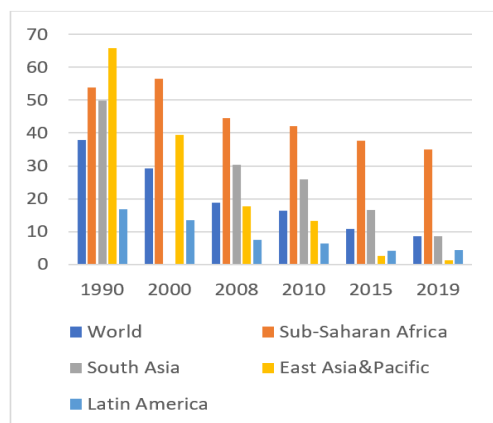
growth path since 2010. However, the Gini coefficient, which was 0.36 in 1974, reached 0.42 in 2019, reflecting the most inequitable levels since the data has been available (FRED, 2023). In terms of wealth inequality in the US, the richest 1% of American households own almost 40% of the total net wealth of the nation as of 2018, which is a historical record since 1989 (Dua *et al.*, 2018). Hence, it is clear that sustained growth in the American economy cannot guarantee fair income distribution.

Similarly, when we examine income and wealth inequality in OECD countries, both have been much more unequally distributed, especially after the Global Financial Crisis (GFC) of 2008. As regard income inequality, while the top 10% of income earners receive on average about 25% (but close to 40% in Chile and Mexico) of total income, the share of the bottom 40% of earners only consists of 20% of total income in 18 OECD countries. Considering wealth inequality, real assets account for 75% of total assets on average, whereas the bottom 40% own only 3% of the total household wealth. At the other end of the wealth-distribution scale, the richest 10 % of households hold half of the total household wealth. If we look at the wealthiest 1%, they own 18% of total household wealth. However, lower income inequality does not indicate less concentration of wealth, as in the case of Austria, Germany and the Netherlands (OECD, 2015).

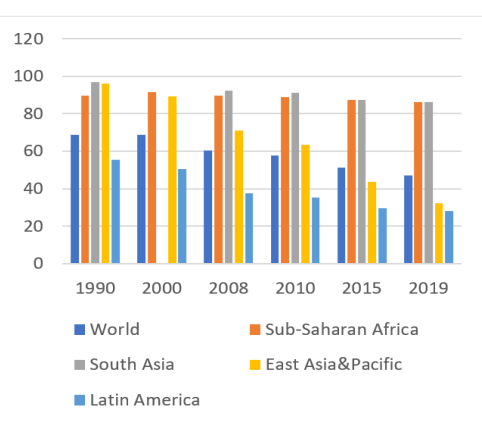
When examining emerging economies, taking Türkiye as an example, while the top quantile get almost half of the total income by 46.7%, the bottom quantile get only 6.7% of the total income in 2020. Thus the gap between the highest and lowest income group reached 7.6 times. The scene of income inequality between the top 10% income group and the bottom 10% is more disappointing, the ratio of P90/P10 is 13.7. The Gini coefficient, which was 38.4 in 2007, increased to 41.9 in 2019 (FRED, 2023). And what is worse, the Covid-19 pandemic exacerbated poverty and inequality in income distribution as well (Cerra *et al.*, 2022). Similarly, as seen in Table 1 and Figure 2, the “African Renaissance” with an annual average growth rate of 5.5% between 2000-2009 didn’t lead to a remarkable reduction in poverty and inequality within and between countries. However, Asia’s experience was successful to compete with poverty at the expense of inequality (Hakimian, 2013). All in all, hitting the growth target cannot alone improve income distribution markedly for an economy. These facts shed light on an urgent need for policies in making growth more inclusive towards poor and vulnerable people, especially in the lower and middle classes.

	1991-1990	2000-2009	2009-2019	2015-2019	2020-2023
<b>World</b>	2.9	3.3	3.0	3.0	1.9
<b>Developed economies</b>	2.3	2.2	1.9	2.1	0.9
<b>Developing economies</b>	4.9	6.4	5.0	4.4	3.2
<b>Africa</b>	2.5	5.5	3.0	3.0	1.9
<b>Latin America and the Caribbean</b>	3.3	3.4	1.6	0.4	0.5
<b>Asia</b>	4.4	5.6	5.1	4.7	3.2
<b>China</b>	11.0	10.6	7.5	6.7	4.9
<b>India</b>	5.9	7.2	6.9	7.0	3.0
<b>Oceania</b>	3.6	3.2	2.7	2.6	2.1

**Source:** UNCTAD, 2022



**Figure 1.** Extreme Poverty Ratio\* (% of Population)  
\*(less than 2.15\$ per person per day)  
**Source:** World Bank Databank, WDI



**Figure 2.** Poverty Ratio\* (% of Population)  
\*(less than 6.85\$ per person per day)  
**Source:** World Bank Databank, WDI

Based on this phenomenon, many international organizations such as the UN, WB, IMF, EU as well as national governance turn their face to income distribution and inclusive growth issues and take them in their political strategy. In 2000, the UN announced the Millenium National Goals with eight different articles from reducing extreme poverty and hunger to promoting gender equality and reducing child mortality, in order to achieve a more prosperous and equitable world. In 2016, the UN launched a new programme titled the Sustainable Development Goals, with a range of 17 different targets from no poverty and hunger to peace, justice and strong institutions. The programme aims to hit economic, social and environmental targets by 2030. Similar to this, “Equity and Development” was the topic of the World Bank’s

World Development Report in 2006, which addressed the inherent value of equity and emphasized its beneficial effects on long-term development (Ianchovichina *et al*, 2009). In 2008, the Asian Development Bank (ADB) also accepted the Asian Development Strategy 2020, which envisaged the IG as one of the strategic pillars of development. Next, in 2013 the African Development Bank (AfDB) declared inclusive growth one of the strategic priorities for 2013-2022, too (AfDB, 2013). In the same vein, many countries took the subject in their agenda individually. For example, in 2006, India, by focusing on a new strategy that aims to promote the well-being of poor and disadvantaged groups (Planning Commission of India, 2006) and China, by accepting the harmonious society concept prioritize the outcome of more balanced growth to its citizens in its 11th Five-Year-Plan. (State Council of China, 2006). Finally, the World Economic Forum started publishing periodic IG reports in 2015.

Although there is no consensus on the definition of inclusive growth (IG) in economic thinking, the term has common basic similarities. IG, according to the ADB is a kind of growth that ensures equal opportunities to all. They consider opportunities with two dimensions: creating opportunities and making opportunities accessible to all. So, IG should not only create new economic opportunities but also should ensure equal access to the opportunities created for all segments of society, particularly for the poor (Ali & Zhuang, 2007; Ali & Son 2007, McKinley, 2010). In this regard, IG should involve reducing both poverty and inequality (Munir & Ullah, 2018). The World Bank (Ianchovichina & Lundstrom, 2009) approaches the concept from a different direction. They define IG in a long-term perspective that promotes productive and decent employment to reduce inequalities rather than direct income distribution. They focus on the pace and pattern of growth. Hence, determinants of IG are relevant to the employability of the poor. The IMF defines IG as a situation in which all parties, especially the lower and middle classes, contribute equally to and benefit from economic growth (Ianchovichina & Lunstrom-Gable, 2012: 147). The AfDB envisaged IG as a growth for most, not just the poor, and is opposed to pro-poor growth (Hakimian, 2013). According to the Growth Commission (2008), growth, equity, equality of opportunity, and protection in the the market and employment are the four main pillars of inclusiveness.

In order to enhance equity and ensure fair income distribution, the term IG is not unique in the literature. Pro-poor growth, shared growth or IG are similar but not the same approaches to the issue of income distribution. First, IG refers to the extent to which all parties, especially the lower and middle classes, contribute to and benefit from economic growth (Ali & Zhuang, 2007; IMF, Ianchovichina & Lunstrom-Gable 2012: 147, Hakimian, 2013). However, there has been no consensus among researchers about the scope of IG. Some put this term



somewhere close to pro-poor growth or shared growth studies (Rauniyar & Kanbur, 2010), whereas others underline a new research ground on behalf of IG (Klasen 2010, Hakimian, 2013; Hakimian, 2016).

In this regard, the difference between pro-poor growth, shared prosperity and IG should be highlighted. First, the pro-poor growth discussions that date back to the early 2000s evaluate the growth as pro-poor if and only if growth can reduce income poverty in an absolute (Rawallion, 2004) or relative sense in a country (Kakwani, Khandker & Son, 2004; Kanbur & Rauniyar, 2010; Klasen, 2010). On the contrary, IG is a relatively new concept accepted by international organizations such as the OECD, UN and others in the late 2000s. IG focuses on inequality in society rather than just the reduction or eradication of poverty. While pro-poor growth may reduce poverty, it may also deteriorate equality in higher income groups as well. Hence, growth could be pro-poor without being inclusive, and at the same time lead to rising inequality. In addition, while pro-poor growth is concerned with poverty, IG focuses on the distribution of well-being in society (Kanbur & Rauniyar, 2010).

Second, pro-poor growth evaluates the pace and nature of the growth only in terms of income. In contrast, IG considers a growth pattern not only in terms of income or economic perspective but also non-income benefits and social (such as access to education and health services, social protection and gender), political (governance institutions), environmental, and even spatial perspectives (Hakimian, 2016).

Third, IG focuses directly on widening the scope of growth in productive employment instead of raising the income of those who are out of the labor force via the redistribution of income as the pro-poor growth policy suggests. From the perspective of IG, how income is distributed among participants is of greater importance than decreasing poverty or increasing the income level of people who are outside of the labor force. That's way IG doesn't consider people as disadvantaged and vulnerable, just as poverty studies do (Ianchovchina & Lunstom, 2009). In this regard, another issue within the IG framework is gender inequality. Employment of women, differences in wage and working conditions between men and women, low female participation in the labor force and education are among the other issues addressed by IG. Eliminating gender inequality would contribute to greater household income and lower rates of poverty. IG aims to eliminate those differences with the productive employment of women (OECD, 2015; 219).

Fourth, IG is a kind of growth for most; including poor, near-poor, middle income, and even the rich; not just the people living below the poverty line, as opposed to pro-poor growth. (Klasen, 2010; Hakimian, 2013). In this regard, inclusive growth could be non-discrimina-

tory growth that provides equal access to all and could be growth that reduces disadvantage (Klasen, 2010).

Fifth, generating and reaching opportunities for the broad part of society, in other words, opportunities available for the broad mass of society, are a crucial feature of IG. That's why it is not a distribution outcome, rather, it is a process of generating opportunities (Ali & Zhuang, 2007; Ali & Son, 2007, Hakimian, 2013).

Finally, and sixth, pro-poor growth measurement is easier compared to IG, because pro-poor growth encompasses only income benefits from growth. On the contrary, IG also covers non-income dimensions of well-being such as access to opportunities, safety net, social security, governance, gender equality and even the environment in a broad sense. Hence, bringing together the various type of indicators into a single index makes constructing and calculating the index of IG more sophisticated (Klasen, 2010).

Thus, IG is a different concept different from pro-poor growth that aims to decrease relative poverty as well as inequality in the long run (Ianchovchina & Lanstrom-Gable, 2009: 149-150). But, according to Rauniyar and Kambur (2010), growth might be simultaneously pro-poor and inclusive if the growth can succeed in improving income distribution. Otherwise, it is only called pro-poor growth. In other words, every IG includes pro-poor growth but not vice versa. So, IG policies must cover and focus on four main dimensions as follows (Bibolov *et al.*, 2022: 8):

1. The increase in income resulting from growth should be broadly shared across the population;
2. The growth should provide opportunities to access basic public services, especially health and education;
3. The growth should support women and youth to participate in economic activity; and
4. The growth should encourage citizens to participate in their country's social and political life.

In terms of shared prosperity, IG is also a different concept from shared prosperity, as well. Shared prosperity is one of the twin goals of the WB that aims to decrease extreme poverty to 3% and to increase the income level of people who are placed in the bottom 40% by 2030 (WB, 2022a). So, it focuses on the consumption and income level of the poorest 40% of the population, whereas IG considers 60% of the population (McKinley, 2010). Compared with shared prosperity, IG comprises a wide range of aspects of economic growth rather than only

household consumption and income level (WB, 2022a). Due to economic growth not being sufficient itself to hit those targets, IG focuses on the equity of opportunities (Bocutoglu, 2017). In this respect, the shared prosperity concept misses the opportunities that are one of the main pillars of IG.

Opportunities can be described in terms of a variety of services, including access to healthcare, educational opportunities and employment (Ali & Son, 2007). As mentioned above, generating and reaching opportunities are two main pillars of IG. The pattern and nature of the growth are reflected in the opportunities for all segments of society. How public services such as education, health, sanitation, and social protection may vary based on income levels is of great importance for the subject. Reduction in unequal opportunities depending on income level is one of the main targets of IG strategies. Hence, these opportunities must be included in IG in a broad sense. The WB's Commission on Growth and Development discusses inclusiveness with four dimensions: equality, equality of opportunity, protection in the market and employment (World Bank, 2008).

To sum up, IG analyzes how growth is distributed among different social classes in terms of increasing income, accelerating employment opportunities, providing decent working conditions, achieving gender equality, as well as improving health and education services. For an economy aiming to hit the IG target, achieving sustainable growth is crucial in the long run, because a sustainable growth pace is a key recipe for this target. However, although the growth pace is a necessary condition, it isn't sufficient to hit this goal (Ali & Son, 2007; UN, 2014). If growth is broad-based or, in other words, if the large part of country's labor force benefits from the growth, then it can be counted as IG. From this perspective, IG does not only focus on improving the income of lower and middle-income groups. Rather, it is interested in employment opportunities, gender equality, health and education services etc. In this sense, the scope of IG is much wider than other approaches.

### **3. Literature Review**

Ali & Son (2007) did a preliminary study in which they examined the IG path by employing the social opportunity curve methodology in terms of education and health services in the Philippines over the period between the 1998 and 2004. They showed that the upward shift in the opportunity curve suggested that the entire population benefits from, on average, higher attendance to school and having treatment in available health facilities. However, the upward sloping of the curves suggests that the growth is not distributed inclusively on behalf of the lower income groups. The growth process is called distribution neutral if the growth

incidence curve is perfectly flat in such a way that all percentiles grow at the same rate; leaving inequality unchanged (Ravallion & Chen, 1997). But the upward sloping of the curve reflects the pro-higher income growth instead of being inclusive under consideration period in the Philippines.

McKinley (2010) calculated his proposed indices for six Asian countries: Bangladesh, Cambodia, India, Indonesia, the Philippines and Uzbekistan. He found that Uzbekistan is ranked the top among the six countries with a score of 6.8, which is at the upper end of the satisfactory range. It made progress in almost all dimensions; especially for inequality, gender equity and social protection. However, the Philippines ranked at the bottom with a score of 3.80. It neither generated rapid growth nor productive employment during this period. Finally, the rest of the group ranged between 4.55 and 5.70, which stands for a satisfactory range; however it is close to the lower range of the scale.

Anand *et al.* (2013) put forward a trade-off between growth and equity in some emerging markets by employing their own methodology. For example, China and India have experienced rapid per capita income growth whereas inequity has grown. But, in countries such as Brazil, Mexico, Malaysia and Thailand, both the direction of the change in per capita growth and equity was the same. However, the growth pace is not sufficient to benefit the entire population like with China or India (Anand, Mishra and Peiris, 2013). They claim that macroeconomic stability, human capital and structural change are the main determinants of IG for emerging economies (Khan *et al.*, 2016).

Hakimian (2013) compared five North African countries (Algeria, Egypt, Libya, Morocco and Tunisia) with selected Middle East and some under-developed countries after calculating the IG Index, which includes 13 indicators for 193 countries over the periods 2000-2002 and 2008-2010. He found that while all North African countries underperformed internationally, ranking in the bottom median of all countries, Tunisia performed best followed by Egypt. After a decade, Libya and Algeria performed the best followed by Egypt, while Morocco and Tunisia witnessed modest improvement. In addition, Hakimian highlighted the employment indicators among other indicators to achieve inclusive growth in the region. He stated that generating high-quality employment will be an essential determinant and that failure to do so will pose one of the main obstacles to the prospects of achieving IG. Comparing the Middle East countries over the same period, he concluded that while Yemen, Lebanon, Türkiye and Israel obtained a strong trend of improvement by 30%, 25%, 15%, and 15% respectively, Iran and Syria showed a deteriorating trend with a decline of 13% and 19% respectively. Finally, taking into account the BRICS countries, he concluded that China, Brazil and India showed

an enhanced performance in terms of the nature and type of growth. However, Russia and South Africa showed a significant decline of 20-30% (Hakimian, 2013).

Hakimian (2016) reached different results from Hakimian (2013). In the previous study, he claimed that all North African countries showed some degree of progress towards inclusiveness of growth. However, the latter study displayed that Algeria's Inclusive Growth Index (IGI) deteriorated over years as opposed to the other countries. Egypt ranked at the top of the list followed by Morocco and Tunisia, respectively. Similarly, while he found some strong progress for Yemen in the Middle East countries in the previous study, he presented the worst performance with a decline of 30% in the IGI in his last study. Similarly, he estimated that Türkiye ranked at the upper lines in terms of inclusiveness of growth in the previous study. However, in the latter study, he found that inclusiveness in Türkiye didn't change remarkably over the years. In addition, the last paper showed that the IGI suffered more in Middle East countries, with the exception of Iraq. Finally, taking into account the BRICS countries, IGI values for India showed a strong difference between two studies. While the first study resulted in appreciable improvement in IGI for India, the last one revealed a moderate improvement (Hakimian, 2016).

Taşkın (2014) argues that growth in Türkiye has been inclusive on average over the period 2002-2011, using the social mobility curve methodology improved by Anand et al. (2013). In addition, the study highlighted regional and temporal differentiation in terms of inclusiveness. He revealed a trade-off between income growth and equity in the regional dimension, especially between 2007 and 2011 in Türkiye.

Bocutoğlu (2017) examines the inclusiveness of growth for OECD countries including Türkiye, Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria and Pakistan. Using the World Economic Forum's 2015 data, he applies the comparative analysis method for these Islamic countries. According to the results obtained; Malaysia, Türkiye, Indonesia and Iran show a better performance compared to the average of other countries with the same income level.

Gizem Can, Can and Bal (2019) present the relationship between inclusive growth and globalization in Türkiye between 1991 and 2015 by employing Engle Granger cointegration, Granger causality and the ARDL bound test. They claim that inclusiveness of growth accelerated during the period under consideration. They found that there is a long-run relationship between inclusiveness and globalization, and inclusive growth affected the globalization positively.

Avcı and Tonus (2020) measured the inclusiveness of growth in Türkiye based on five

different indices for the period 2006-2018. They compared the results from each different index and they concluded that each index reflects that inclusiveness of growth increased during the sample period.

Soyyigit and Elverdi (2021) examined the general and regional framework of inclusive growth in Türkiye for the period 2006-2019. Having analyzed the evolving inclusiveness of growth based on the social opportunity function method across NUTS Regions, they examined the existence of the convergence of inclusiveness in terms of equity index of opportunity among regions by employing the panel unit root test. They found that the inclusiveness of growth in Türkiye, as a whole, started getting worse in 2016. On the contrary, equity of opportunity in Türkiye has been increasing in all regions. Considering inclusiveness in terms of sub-region, while TR4 East Marmara Region performs the best, TR1 Istanbul reflects the worst performance. Finally, they did not detect any convergence between NUTS 1 regions and Türkiye as a whole.

Keyifli, Karakurt and Şentürk (2022) analyze the relationship between inclusive growth and government expenditure for eight emerging market economies (Argentina, China, Brazil, India, Mexico, Indonesia, Türkiye and South Africa) employing the Bootstrap Panel Rolling Window causality approach between 1985 and 2019. They found that inclusive growth caused government size to increase in India, Indonesia, Mexico and South Africa, while increasing government size caused inclusive growth in Türkiye.

#### 4. Inclusive Growth Indexes

Because the definition and scope of inclusive growth can vary by international institutions, the literature lacks a consistent measurement methodology for this concept. The WB, for example, emphasizes the fruits of growth for low-income groups. In contrast, the OECD or the AfDB do not highlight disadvantaged groups in their definition but rather emphasize a broad range of groups including low and middle-income (Hakimian, 2013). Hence, the available methodologies can differ from each other in terms of two aspects. First, some of them concentrate on growth and income distribution indicators in their index. Others, however, consider non-income benefits such as health, education, employment, financial, and environmental aspects of growth, as well as growth and income distribution (McKinley, 2010). The second difference appears in giving greater weight to the benefits obtained by lower-income groups than the other studies do (Ali & Son, 2007).

We can divide the measurement methods for IGI into two general groups. Early studies (Ali & Son 2007, Anand *et al.*, 2013) proposed a methodology based on the social opportunity functions and social mobility functions, respectively. In this methodology, studies mainly

focus on the growth rate and income distribution indicators. However, IG is not only related to the income benefits of growth but also to non-income benefits. For this reason, later studies tried to create a comprehensive index that covers much more related indicators than previous studies to gauge IGI accurately for related countries in a broad sense (McKinley, 2010; Hakimian, 2013; Hakimian, 2016).

Since we calculate IG based on the indexing methodology in this study, the details of the first methodology are beyond the scope of this study. Therefore, we will only briefly explain the general features of the first methodology and then move on to the second methodology index, as below.

First, the methodology proposed by Ali & Son (2007) arose from the ADB and is based on the social opportunity function. According to this method, IG would be based on two main indicators. i) average opportunities available to the population, and ii) how opportunities are distributed among the population. For this reason, growth should expand average opportunities for all and lead to a transfer from richer to poorer in order to be inclusive. They depict an opportunity curve that reflects the inclusiveness of growth. If and only if the opportunity curve shifts upward and the sloping is downward, which implies poor at the bottom after distribution have greater opportunity than the rich at the top, then the growth can be called inclusive.

The second methodology to generate an IGI is McKinley's (2010). This methodology also arose from the ADB. As illustrated in Table 2, McKinley created an index with four dimensions and ten different sub-dimensions with different weights. Since growth is the most essential determinant of the IG, it takes one-fourth of the overall weight. The IG aims to distribute the benefits of the growth to broad based groups, especially for poor and vulnerable people. Although poverty comes with vulnerability, vulnerable people do not only consist of the poor, but also the elderly, the ill, the unemployed, women and minorities. For this reason, a suitable IGI must include indicators for those vulnerable people (UN, 2014). Next, employment takes 15% of the total weight. While human capabilities are assigned 15% of the total weight, social protection is weighted with 10%. When calculating the index, each indicator is assigned a score between 0 and 10 based on a subjective manner according to the country's current situation or level of development. A score of 1-3 means unsatisfactory progress in IG, a score of 4-7 is satisfactory progress; and finally, a score of 8-10 means superior progress. The score of each indicator is multiplied by its subjectively assigned weight to create the index value of the indicator. The sum of the index values of the indicators gives the inclusive growth index (McKinley, 2010).

**Table 2.** Indicators Used for Computation of Inclusive Growth Index by McKinley (2010)

Dimension	Sub Dimension	Indicator(s)	Score	Weights
<b>Economic Growth, Productive Employment, and Economic Infrastructure</b>	<b>Economic Growth</b>	-Real rate of growth of gross domestic product per capita -Share of industry, services, and agriculture in total value added	0-10	0.25
	<b>Productive Employment</b>	-Share of the employed in industry -Share of employment in manufacturing -The share of workers who are part of households whose income is below the \$2.50 per day per person international PPP poverty line -Share of own-account workers and formally unpaid family workers in total employment	0-10	0.15
	<b>Access to economic infrastructure</b>	-Proportion of the population with access to electricity -Number of mobile phone subscribers per 100 people.	0-10	0.10
<b>Income Poverty and General Equity</b>	<b>Poverty measures</b>	-The proportion of the population living below nationally determined poverty lines -The proportion of the population living below the \$2.50 per day per person international poverty line in 2005 prices	0-10	0.10
	<b>Inequality measures</b>	<i>Vertical inequality:</i> -The Gini coefficient -The income share of the poorest 60% of the population <i>Horizontal inequality:</i> -The income or expenditure gap between rural and urban areas -Where feasible, the income or expenditure gap among regions or among major ethnic groupings	0-10	0.10
	<b>Gender Inequality</b>	-The ratio of literate females to literate males among those aged 15– 24 years -The ratio of girls to boys in secondary education -The percentage of births attended by skilled health personnel -The share of women in nonagricultural wage employment	0-10	0.5
<b>Human Capabilities</b>	<b>Health and Nutrition</b>	-Under-5 mortality rate -Mortality rate under age 40 -Percentage of children under age 5 years who are underweight	0-10	0.5
	<b>Education</b>	-Net primary enrollment ratio -Net secondary enrollment ratio	0-10	0.5
	<b>Water and sanitation</b>	-Proportion of the population with access to safe water -Proportion of the population with access to adequate sanitation	0-10	0.5



Table 2. Continued				
Social Protection	Social Protection Index	-The total expenditures on all social protection programs as a ratio to GDP -The number of beneficiaries of social protection programs as a ratio to the reference populations for key target groups -The number of social protection beneficiaries who are poor as a ratio to the total poor population -The average social protection expenditure for each poor person as a ratio to the poverty line	0-10	0.10
Source: McKinley (2010)				

Another methodology was proposed by Hakimian (2013) under the roof of the AfDB. Hakimian (2013) generated a new method by combining the Inequality adjusted Human Development Index (IHDI) and McKinley’s (2010) Index. His indicators are quite similar to that of McKinley (2010), except for a few components and indicators that McKinley (2010) employed. For example, Hakimian (2013) omitted the economic infrastructure component which was included in McKinley’s (2010) index. Hakimian (2013) included the corruption index under a new component named governance, which is not included in McKinley (2010). Another difference from McKinley’s (2010) study is the normalization of the index. While McKinley (2010) uses a weighted score system between 0-10 points, Hakimian (2013) employs the rank of countries in the HDI and obtains normalized series for all indicators by applying the following formula:

$$s_{ij} = 100. (\frac{m_j-r_j}{m_j-1})_i$$

Where  $r_j$  is the rank of the country for indicator  $j$  (in descending order) and  $m_j$  is the total number of countries for which data indicator  $s_j$  is available. On the basis of the normalized series, he calculates the overall inclusive growth score as the geometric mean for the country according to the formula below:

$$IG_i = \sqrt[n]{s_{1i} \cdot s_{2i} \cdot s_{3i} \dots \cdot s_{ji} \dots}$$

Where,

$i = 1, \dots, m$ : country  $i$  included in the data set

$j = 1, \dots, n$ : indicator  $j$  included in the data set

Standardized scores take a maximum value of 100 (for the highest ranking) and 0 (for the lowest ranking) for each country for each indicator. All indicators have the same weight ( $1/n$ ).

<b>Table 3.</b> Indicators Used for Computation of Inclusive Growth Index by Hakimian (2013) and Hakimian (2016)		
<b>Broad Categories*</b>	<b>Specific Indicators (S<sub>j</sub>) (Hakimian, 2013)**</b>	<b>Specific Indicators (S<sub>j</sub>) (Hakimian, 2016)***</b>
<b>Growth</b>	<b>Real GDP Growth</b> Real per capita GDP Growth	1. Real per capita GDP Growth
<b>Health and Demographics</b>	Public Health Expenditure (% GDP) Mortality Rate Under-5 (per 1,000) Life Expectancy at Birth <b>Tuberculosis (per 100,000 people)</b>	2. Life Expectancy at Birth 3. Mortality Rate Under-5 (per 1,000) 4. Public Health Expenditure (% GDP)
<b>Labor Force and Employment</b>	Wage & Salaried (% of total employment) Employment-to-Population Ratios (% of 15+)	5. Wage & Salaried (% of total employment) 6. Employment-to-Population Ratios (% of 15+) 7. <i>Employment-to-Population Ratios (% of 15- 24)</i>
<b>Gender</b>	<b>9. Female Labor Force (% of total workforce)</b>	8. <i>Gender Inequality Index (GII)</i>
<b>Education</b>	10. Ratio of Female to Male Secondary Enrolment (%)	9. Ratio of Female to Male Secondary Enrolment (%) 10. <i>Public Spending on Education (% of total)</i>
<b>Environment</b>		11. <i>Environment Performance Index (EPI)</i>
<b>Sanitation</b>	11. Population Using Improved Sanitation Facilities (%)	
<b>Inequality</b>	12. Gini Index	12. Gini Index 13. <i>Poverty Gap at \$2 a day</i>
<b>Governance</b>	13. Corruption Perception Index	14. Corruption Perception Index
* denotes equal weights for all components ( $w_i = 1/8 = 12.5\%$ )	** denotes equal weights for all indicators ( $w_i = 1/13 = 7.7\%$ )	*** denotes equal weights for all indicators ( $w_i = 1/14 = 7.15\%$ ) and then each indicator within that component depending on the number
<b>Source:</b> Hakimian (2013), Hakimian (2016)		

Afterwards, Hakimian (2016), as shown in Table 3, expanded the extent of his indices to 14 different performance indicators. Compared to the previous study, he omitted from the list some indicators typed in bold, such as sanitation, real GDP growth or tuberculosis per 100,000 people. He also takes into account the new component and indicators typed in italics in the table, such as environment or gender equality index. Taking the 5-year-average value of all indicators between 2001 and 2010 for 153 countries, he creates an IGI by calculating arithmetic means of all indicators after having normalized them. The indices can be estimated by averaging the sum of the normalized value for every single indicator  $s_j$  for country  $i$  as given below. Each component and each indicator within the component has the same weight ( $1/n$ ).

$$IG_i = \sum_{i=1}^m w_i \cdot s_{ij}$$

In addition to the indices explained above, some other alternative evaluation criteria have been proposed by the IMF, OECD, UNDP, WEF and EU. Nonetheless, due to data restrictions, there has been no study to attempt to measure IG based on the proposed framework by those organizations (Bedir, 2022: 320-326).

## 5. Empirical Analysis

In this part of the study, an empirical analysis is conducted using an IGI for Türkiye between 2002-2019. First, the reference studies, the indicators and the methodology used to construct the index are explained. Then, the results are discussed and conclusions are drawn about the development of inclusive growth in Türkiye and its determinants.

### 5.1. Data and Methodology

In this study, two different composite indices were created, taking into account the multidimensional structure of inclusive growth, which is increasingly recognized and gaining importance in the literature. The first index is based on the indicators and weights used in McKinley's (2010) study, and the second index is based on the indicators and weights used in Hakimian's (2016) study. The methodologies used to construct the indices in these two studies were not used in this study, as we used time series data. The time period for calculating these two indexes for Türkiye is from 2002 to 2019.

When creating a composite index, numerous indicators and their movements are used to generate a single index that reflects the current situation and progress. A composite index is used to measure multidimensional concepts that cannot be measured by a single indicator (OECD, 2008: 13).

In the first stage, it is necessary to select indicators that accurately reflect the concept of inclusive growth and the composite index based on it. For the first index, the dimensions, sub-dimensions, and indicators used in McKinley's (2010) IGI, which is one of the first and most referenced studies on inclusive growth index, were referenced. The inclusive growth index in that study consists of four dimensions: "Economic Growth, Productive Employment, and Economic Infrastructure", "Income Poverty and General Equity", "Human Capabilities", and "Social Protection". Each of these four dimensions is further subdivided into branches, creating 10 sub-dimensions. However, there are problems in accessing the selected indicators

based on these sub-dimensions, such as limited access to data and the lack of availability in the desired time series dimension. Therefore, McKinley (2010) proposed alternative indicators that are similar and can be used in other studies. Due to the difficulty in accessing each selected data, the alternative indicators proposed by McKinley (2010) were also utilized in this study. As seen in Table 4, a wide range of data was utilized in this study, with a total of 32 indicators selected, with their weights determined according to McKinley (2010). The number of indicators in the inclusive growth index created in this study is significantly higher compared to other studies conducted in this field. The high number of indicators and consequently lower weights reduce the impact of individual movements on the index, resulting in a more robust and highly representative composite index.

The following explanations have been presented regarding some indicators listed in this index: The inclusive growth index created in this study includes the sub-dimension of 'Economic Growth,' which consists of the indicators 'GDP per capita growth', 'Manufacturing, value added (% of GDP)', and 'Modern Services, value added (% of GDP)' indicators. "Information and communication", "Financial and insurance activities", "Professional, scientific and technical activities" and "Administrative and support service activities" were selected as the modern services sector, which refers to the high value added services sector activity with reference to the classification of Eichengreen and Gupta (2009: 16). The data on 'employment in industry' and 'employment in manufacturing' for the period 2002-2018 were obtained from the Economic Transformation Database (EDT). Since the EDT data ends in 2018, the 2019 data for 'employment in industry' was obtained from the World Bank, and the 2019 data for 'employment in manufacturing' was obtained from the International Labor Organization (ILO). The WB and ILO data are highly correlated and have very close values to the EDT data. Instead of the poverty headcount ratio according to the national poverty line to represent extreme poverty, the PPP-adjusted value (% of population) based on the \$2.15 per day poverty line has been used. To measure moderate poverty, the PPP-adjusted value (% of population) based on the daily poverty line of \$6.85 per day for upper middle-income countries was used (WB, 2022b). Additionally, since the poverty line varies over time, the most recent poverty line has been chosen instead of the specific year mentioned in McKinley's study. Due to the lack of availability of data regarding the indicator 'The percentage of births attended by skilled health personnel,' the 'Maternal mortality ratio (deaths per 100,000 live births)' was selected as a close substitute indicator. Since the "Percentage of children under age 5 who are underweight" in McKinley's index could not be found, the Physicians (per 1,000 people) indicator was used as an alternative health indicator. The school enrolment, primary (% net)

indicator was obtained from the WB for the period 2002-2012 and from UNICEF for the period 2013-2019. This is because the data for the period 2002-2019 could not be obtained consistently from both databases. As the data for the common years were found to be very close and highly correlated, a combination of both datasets was used. McKinley's indicator 'school enrolment, secondary (% net)' was obtained separately from UNICEF as upper secondary and lower secondary. Since the 'people using safely managed drinking water services (% of population)' data was not available for Türkiye, the 'people using at least basic drinking water services (% of population)' indicator was chosen. The ADB's Social Protection Index, which consists of four indicators, was used in McKinley's study. 'The Social protection expenditures (% of GDP)' data was available for Türkiye and was used in this study. However, the indicator "the number of beneficiaries of social protection programs as a ratio to the reference populations for key target groups" could not be used, so the 'Government/compulsory health insurance coverage (% of total population)' indicator, which only covers health in social protection expenditures, was used instead. The other two social protection data in Table 2 could not be used due to lack of availability. Since 'Government/compulsory health insurance coverage (% of total population)' data has been compiled by a different institution since 2004, there was a break in that year. To correct for this break, the percentage increase rate of each year was calculated and 2004 (the percentage increase rate of 2004 compared to 2003) was accepted as the missing value. This is because the actual rate of increase in that year is not known. The rate of increase in 2004 was estimated using the spline interpolation method and then the values for other years were calculated by their original percentage increase rate. In addition, the indicators "Share of workers in non-agricultural paid employment", "Youth unemployment", "The number of internet users per 100 people", "Paved roads", and "Life expectancy at birth, total (years)" have been added to the list of inclusive growth index as recommended by McKinley.

**Table 4.** First IGI based on McKinley (2010)

Dimension	Sub Dimension	Indicator(s)	Weights of Indicators	Data Source
<b>Economic Growth, Productive Employment, and Economic Infrastructure (%50)</b>	Economic growth (%25)	GDP per capita growth (annual %)	12.50%	WB
		Manufacturing, value added (% of GDP)	6.25%	TURKSTAT
		Modern Services, value added (% of GDP)	6.25%	TURKSTAT
	Productive employment (%15)	Employment in industry (% of total employment)	2.50%	Economic Transformation Database and WB
		Employment in manufacturing (% of total employment)	2.50%	Economic Transformation Database and ILO
		Working poverty rate (percentage of employed living below US\$5.5 PPP) (%)	2.50%	ILOSTAT
		Vulnerable employment, total (% of total employment)	2.50%	WB
		Share of workers in nonagricultural paid employment (%total employment)	2.50%	ILO
		Unemployment, youth total (% of total labor force ages 15-24)	2.50%	WB
	Access to economic infrastructure (%10)	Access to electricity (% of population)	2.50%	WB
		Mobile cellular subscriptions (per 100 people)	2.50%	WB
		Individuals using the Internet (% of population)	2.50%	WB
		Roads, paved (% of total roads)	2.50%	TURKSTAT
<b>Income Poverty and General Equity (%25)</b>	Poverty measures (%10)	Poverty headcount ratio at \$2.15 a day (2017 PPP) (% of population)	5.00%	WB
		Poverty headcount ratio at \$6.85 a day (2017 PPP) (% of population)	5.00%	WB
	Inequality measures (%10)	Gini Index	5.00%	WB
		Income share held by 60%	5.00%	WB
	Gender inequality (%5)	School enrollment, primary (gross), gender parity index (GPI)	1.25%	WB
		School enrollment, secondary (gross), gender parity index (GPI)	1.25%	WB
		Maternal mortality ratio (deaths per 100 000 live births)	1.25%	WB
		The share of women in nonagricultural employees	1.25%	ILOSTAT

Table 4. Continued				
Human Capabilities (%15)	Health and nutrition (%5)	Mortality rate, under-5 (per 1,000 live births)	1.25%	WB
		Mortality before Age 40, both sexes (deaths under age 40 per 1,000 live births)	1.25%	United Nations
		Life expectancy at birth, total (years)	1.25%	WB
		Physicians (per 1,000 people)	1.25%	WB
	Education (%5)	School enrollment, primary (% net)	2.50%	UNESCO and WB
		School enrollment, upper secondary (% net)	1.25%	UNESCO
		School enrollment, lower secondary (% net)	1.25%	UNESCO
	Water and sanitation (%5)	People using at least basic drinking water services (% of population)	2.50%	WB
		People using safely managed sanitation services (% of population)	2.50%	WB
Social Protection (%10)	Social Protection (%10)	Social protection expenditures (% of GDP)	5.00%	TURKSTAT
		Government/compulsory health insurance coverage (% of total population)	5.00%	OECD
Note: The values in brackets in the dimension and sub-dimension give the weights				

The second index used in this study takes as a reference the indicators and weights used by Hakimian (2016) in constructing the inclusive growth index. The indicators used are shown in Table 5. Although it has many indicators in common with McKinley (2010), it also has indicators not included in McKinley (2010), such as ‘Environment’ and ‘Governance’.

The following explanations have been presented regarding some indicators listed in this index: ‘Public Spending on Education (% of total)’, as an ‘Education’ indicator, was not available for 2002-2019. So, ‘School enrolment, primary (% net)’ was used instead. Since the Environment Performance Index was not available, the indicators CO<sub>2</sub> emissions per capita (tonnes) and Maternal Footprint per capita (tonnes) were used instead. In the calculation of the Corruption Perception Index data, there was a break in that year due to the change in methodology since 2012. To correct for this break, the percentage increase rate of each year was calculated and 2012 (the percentage increase rate of 2012 compared to 2011) was accepted as a missing value. This is because the actual rate of increase in that year is not known. The rate of increase in 2012 was estimated using the spline interpolation method and then the values for other years were calculated by their original percentage increase rate.

<b>Table 5.</b> Second IGI based on Hakimian (2016)			
<b>Components</b>	<b>Individual Indicators</b>	<b>Weights of Indicators</b>	<b>Data Source</b>
<b>Growth (%12.5)</b>	GDP per capita growth (annual %)	12.5	WB
<b>Labor Force &amp; Employment (%12.5)</b>	Wage & Salaried (% of total employment)	4.17	WB
	Employment to population ratio, 15+, total (%)	4.17	WB
	Employment to population ratio, ages 15-24, total (%)	4.17	WB
<b>Health &amp; Demographics (%12.5)</b>	Life expectancy at birth, total (years)	4.17	WB
	Mortality rate, under-5 (per 1,000 live births)	4.17	WB
	Domestic general government health expenditure (% of GDP)	4.17	WB
<b>Education (%12.5)</b>	School enrollment, secondary (gross), gender parity index (GPI)	6.25	WB
	School enrollment, primary (% net)	6.25	UNESCO and WB
<b>Gender (%12.5)</b>	Gender Inequality Index	12.5	UNDP, Human Development Report
<b>Environment %12.5)</b>	CO <sub>2</sub> emissions per capita (tonnes)	6.25	Sustainable Development Index
	Maternal Footprint per capita (tonnes)	6.25	Sustainable Development Index
<b>Inequality &amp; Poverty (%12.5)</b>	Gini index	6.25	WB
	Poverty gap at \$6.85 a day (2017 PPP) (%)	6.25	WB
<b>Governance (%12.5)</b>	Corruption Perception Index	12.5	Transparency International
<b>Note:</b> The values in brackets in the dimension and sub-dimension give the weights			

The increase in the observation values of the indicators used in this study can have a positive or negative effect on IGI. For this reason, indicators that would negatively affect the inclusive growth index were multiplied by the expression (-1), so that the increase in observation values would have a positive effect on the IGI (UNECE, 2019: 75).

After selecting the indicators, the second step is to normalize the data. Considering the multidimensional nature of inclusive growth, there are significant differences in the scale of the data. Therefore, the data should be normalized to the same scale. The two most commonly used methods for this are the min-max method and the z-score method. The indicators of both indices calculated in this study are normalized using the min-max method. The min-max



method normalizes the values of the indicators between 0 and 1. The min-max method gives very unfavorable results in the presence of outliers and in this case, the z-score was used (OECD, 2008: 28). Since there are no outliers in the indicators used in this study, the min-max method was used.

According to the equation below,  $i$  gives the normalized value of the indicator according to the min-max method.  $X_i$  is the value of the indicator.  $X_{\max}$  gives the maximum value of the indicator while  $X_{\min}$  gives the minimum value of the indicator (UNECE, 2019: 116).

$$i = \frac{X_i - X_{\min}}{X_{\max} - X_{\min}}$$

The third step is to determine the weights and scoring. This study used the weights determined by McKinley (2010), which applied a subjective scoring and weighting system, and Hakimian (2016), which applied a scoring method of ranking and a subjective weighting system. Although the weights in this study were not determined by objective and statistical methods, they were based on the reference studies regarding the inclusive growth index. While McKinley (2010) employed a subjective scoring method to represent a specific time interval with a single value ranging from 0 to 10, this method is not suitable for this study as we used time series data. Hakimian (2016), however, conducted scoring based ranking, which requires the availability of data from numerous countries. Since this study is limited to Türkiye, such a method is not appropriate. Therefore, in determining the weights, the mentioned studies were taken as a reference, and the indicators are composed of their original values as scores. This makes it possible to see how this index changes over time.

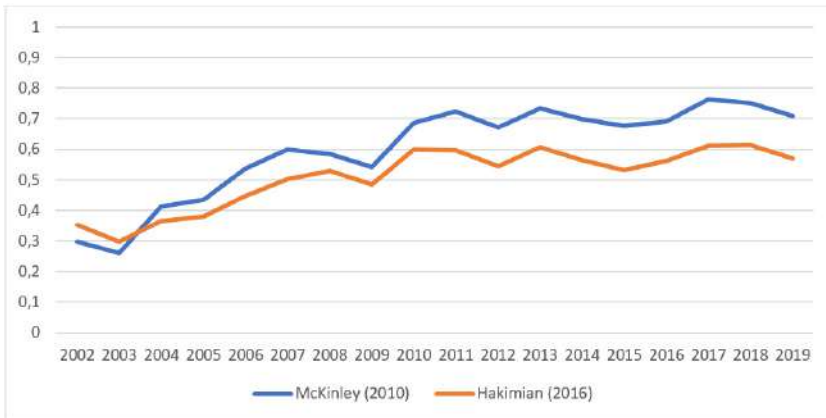
In the final step, the normalized values and weights are multiplied and these values are summed up to form an inclusive growth index. The inclusive growth index ranges between 0 and 1. As the index approaches 1, it indicates an increase in inclusive growth. As the index approaches 0, it indicates a decline in inclusive growth.

## 5.2. Results and Discussion

The results obtained according to the indexes of McKinley (2010) and Hakimian (2016) are presented in Figure 3. Since the Central Bank of the Republic of Türkiye (CBRT) dramatically changed the monetary policy in Türkiye in 2011, we prefer to analyze the whole sample within the two sub-samples. While the first sub-sample covers the years 2002-2011, the second sub-sample covers 2011 and onwards.

As illustrated in Figure 3, the results show that IGI for both referenced indices show great similarities over the period in Türkiye. In general, the main differences arise in two points.

The first difference is that the score of McKinley's (2010) index is slightly higher than the results of Hakimian's (2016), although it starts from a lower point. While the gap between the two results is small at the beginning of the first period, this gap expands towards the end of the second period. The other difference is period- related. The speed of improvement of IGI, especially for McKinley (2010), is significant (sharp) in the first sub-sample. However, the value of IGI is fairly stable in the second sub-sample. Over this period, there is almost no progress in IGI for either index.



**Figure 3.** Inclusive Growth Indexes (IGI) in Türkiye (2002-2019)

**Source:** Authors' Calculation

Looking at the indices in more detail, the first sub-sample experienced two different financial crises in Türkiye. While the first crisis, which happened in 2001, is a national crisis, the second one, which occurred in 2009, resulted from the contagion of the global financial crisis of 2007-2008. In this period, both financial crises have a significant impact on the structure of the IGI, causing a remarkable deterioration in the IGI indicators such as GDP per capita growth, unemployment rate, poverty and inequality, primary school enrolment rate etc. The financial crisis of 2001 and its lingering contractionary effects are the main determinants of this deterioration. Nevertheless, after both crises, the IGI shows a strong improvement only within one year and the index is able to reach the value of the previous year before the crisis. Moreover, the slope of the index is higher in this period than in the second period of the sample. It displays a satisfactory improvement in the inclusiveness of growth compared with the second period. As seen in Figure 3, the index referenced by McKinley (2010) increased from 0.3 to 0.7, and the index referenced by Hakimian (2016) increased from 0.3 to 0.6, almost doubling in size.

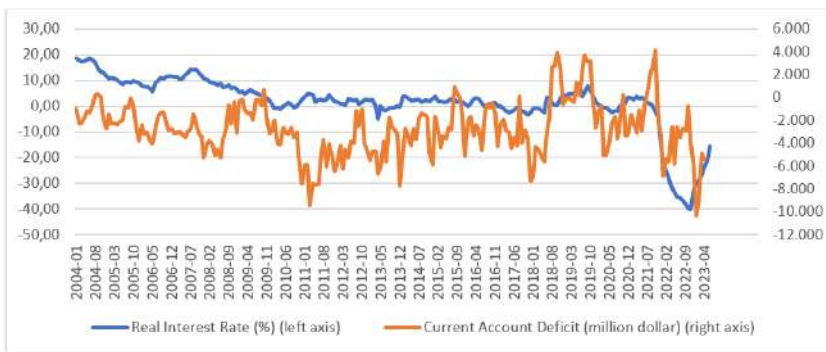
Looking at the indicators in detail, almost every single indicator in the index displays con-

siderable progress in the first sub-sample. As seen in Table A1 in the Appendix, the main selective determinants of the rising index in McKinley (2010) are rising per capita GDP, falling poverty rate, rising internet usage, improving Gini coefficient, falling infant mortality rate, and rising social protection expenditures. Considering Hakimian (2016), as seen in Table A2 in the Appendix, rising per capita GDP, increasing life expectancy at birth, increasing secondary school enrolment and a decreasing poverty gap are the main determinants of the rising index. Over this period, GDP per capita growth averages 6.40%, excluding the GFC years. For the McKinley (2010) Index, working poverty rate decreased from 30.5% to 11.5% in the first period. Similarly, the Gini coefficient improved from 41.4 to 40.2. In terms of poverty rate (\$6.85 per day, upper middle income level), it decreases from 38.5% to 15% towards the end of the period. While the mobile cellular subscription climbed to 89% from 35%, individual internet usage increased from 11% to 48%. Secondary school enrolment increased from 72% to 91%. The share of women in the non-agriculture sector increased from 22.1% to 27.9%. The mortality rate under 5-year fell from 32.7 to 15.8 per 1000 live birth. Finally, in terms of social protection, the coverage of compulsory government insurance increased from 75% to 91%, while social protection expenditures % of GDP increased from 9.26% to 12.21%. For the Hakimian Index (2016), some additional indicators reflect similar improvements in the same period such as wages and salaries of total employment reaching 61% from 49% earlier in the first period. The poverty gap improved from 13.6 to 5.7. CO<sub>2</sub> emissions increased from 3.72 to 5.12, and finally the material footprint increased from 7.64 to 13.99.

The economic policy behind this improvement in the index could be based on both global and country-specific factors. From the point of view of global effects, the global saving glut, as Bernanke called it, i.e. the increase in excess savings in the corporate sector in G7 countries, led to a decline in real long-term interest rates in the US between 2003 and 2007. These excess savings flowed to developing countries, including Türkiye, with insufficient saving rates to achieve economic growth. Moreover, towards the end of the period, the FED started the monetary policy of Quantitative Easing (QE) between 2009 and 2014, purchasing securities through open market operations in order to reduce interest rates and increase the money supply to rescue the US economy after the GFC of 2007-2008. After QE, the surge in international capital accelerated capital inflows to Türkiye.

At home, after the financial crisis of 2002, a single political party (Justice and Development Party, JDP) came to power after the long unsuccessful coalition practices in the country for two decades. During this period, the JDP pledged to improve relations with the EU and made great efforts towards full EU membership. Along with other huge capital inflows from

the EU to Türkiye, many foreign direct investments were attracted to this full membership process. Also, this period witnessed rapid privatization of state-owned companies. Also, after the financial crisis of 2002, Türkiye changed its monetary policy towards an inflation targeting regime to reduce inflation to a single-digit level. Therefore, the CBRT focused solely on price stability rather than financial stability in the first period. In this regard, Türkiye raised the real interest rate and paid a considerably high real interest rate of around 10%, in contrast to the low interest rate in the US. Constructive monetary policy helped to attract large capital flows to the country. After contracting in 2009, Türkiye witnessed a quick recovery due to solid macroeconomic fundamentals and strong domestic demand. The elevated capital inflows resulting from the historically low level of foreign interest rates in the world caused domestic credit growth. In addition, the central bank allowed the Turkish lira to appreciate as a result of excessive capital inflows. Hence, the low exchange rate pass-through helped to reduce inflation towards the target levels. However, cheap imports resulting from the appreciation of the local currency worsened the current account deficit and threatened the production structure of the economy (Kara, 2012). This was because exports remained depressed due to weak external demand and the appreciation of the Turkish lira. As seen in Figure 4, the current account deficit showed a continuous deterioration until the end of the first period, with the exception of the 2009 GFC. This deterioration and unsustainable deficit were the main reason for changing monetary policy of the CBRT in 2011, when the second sub-sample of the study begins.



**Figure 4.** Real Interest Rate (%) and Current Account Deficit (Million USD), (2004-2023)

**Source:** CBRT

Considering the second sub-sample, the value of the IGI has a slightly stable feature. During this period, there is almost no progress in the IGI. The index fluctuates around the value of 0.7 and 0.6, for McKinley (2010) and Hakimian (2016), respectively. However, it started to decline to some degree after the 2018 economic crisis. Although we don't have the current value of the indicators, it is known that the Covid-19 pandemic significantly deterio-

rated many economic and social indicators. For example, according to the estimation of the WB, the pandemic increased the global extreme poverty rate to 9.3% in 2020, up from 8.4% in 2019. In other words, over 70 million people were pushed into extreme poverty due to the pandemic (WB, 2022a). Taking into account this fact, the existing trend of the indices may continue to deteriorate for some time.

In general, the main reason for the stable index is related to the sluggish economic activity in the second sub-period compared to the first. Diminishing GDP per capita growth, a decreasing rate of employment in manufacturing and worsening income distribution were responsible for the unpleasant results of the McKinley (2010) index. The growth rate of GDP per capita fell to an average of 4% in the second period. The employment rate in the manufacturing and industry sector decreases from 19.78% and 28.14%, respectively, at the beginning of the second period to 18.35% and 25.32%, respectively, at the end of the period. The income share held by 60% of the population diminished from 31.6% in 2011 to 30.1% in 2019. Lower secondary school enrolment (net) dropped from 98.79% in 2011 to 96.51% in 2019. In addition to this, in the Hakimian (2016) index, the government health expenditure rate of total expenditures decreased from 3.42% to 3.39% in the second period. The Gini coefficient deteriorated from 40.0 to 41.9. Finally, per capita CO<sub>2</sub> emissions decreased from 5.55 to 4.64 at the end of the period.

Looking at the whole index, we can put forward an argument that growth is the main accelerator in the pace of the progress in IGI. It is clear that higher growth means more inclusiveness in Türkiye over the period considered. For this reason, we would like to shed light on the reasons for the staggered economic performance in terms of macroeconomic policies in the second sub-period.

Before the GFC of 2008, price stability was considered to be the main objective of macroeconomic stability. However, the mortgage crisis in the US demonstrated that price stability was not solely enough to obtain macroeconomic stability even in advanced countries. Subsequently, monetary policies started to be redesigned in a way that included financial stability rather than focusing solely on price stability. Thus, as mentioned above, in 2011, the CBRT initiated a departure in its monetary and exchange rate policies in order to achieve not only price stability but also financial stability in the country (CBRT, 2011). Lowering interest rates to restrict capital inflows was one of these steps. Although the CBRT started to decrease the real interest rate remarkably -to single digit- after 2008, the surge in capital flows lasted. However, when excess capital moved into the country, the bank didn't let the Turkish lira appreciate and instead started to accumulate international reserves. Or vice versa. As seen in

Figure 5, international reserves hiked between 2011-2014 in the period of QE policy by the FED. On the contrary, with the tapering by the FED that started in 2014, capital outflows occurred in many developing countries, including Türkiye. This time, however, the CBRT didn't let the Turkish lira depreciate so much, instead, made intervention to the foreign exchange market and sold international reserves to stabilize the financial sector. After 2014, international reserves decreased continuously, reflecting the tight financial cycle for Türkiye. During this period, the country faced a number of economic and political problems. For example, the country experienced a political uprising called the Gezi protests in 2013. The others were an attempted military coup in 2016, the Priest Brunson case with the US in 2018, a trade war between China and US in 2018 and finally the Covid-19 pandemic in 2020. All these cases rendered Türkiye a more risky country to invest capital. The reduction in foreign capital flows to Türkiye in early 2018 led to a depreciation of local currency by more than 50% from March 2017 to October 2018 (CBRT, 2023). Besides, the borrowing structure of the corporate sector in Türkiye has been foreign exchange dominated since the exchange rate followed a stable pattern for years. However, the depreciation of the Turkish lira burdened the corporate sector heavily by increasing the value of their borrowings and importing capital goods for investment in national currency. This led to a contraction in economic activity for the subsequent three quarters between 2018:Q4 and 2019:Q3 (CBRT, 2023).

As shown in Figure 6, the appreciation of the Turkish lira in real terms reflects a premium of around 10-20% over its fair value for most of the first period. Reflecting this appreciation, Türkiye's average growth rate exceeded its potential growth rate. Excluding the GFC period, the average growth rate was around 7.1% between 2002-2007 and 9.8% between 2010-2011. Cheap imported capital goods and inputs combined with increasing purchasing power of households provide a low cost environment for investors in the country during the expansionary cycle, resulting in a high growth rate in the first period. Contrarily, after 2011, the real exchange rate turned upside down. The depreciation of the Turkish lira made pressure on production costs and demand, resulting in a low growth rate of 5% over the period.



**Figure 5.** Real Interest Rate (%) and International Reserves (Million USD), (2004-2023)  
**Source:** CBRT



**Figure 6.** Real Effective Exchange Rate and Economic Growth (%), (2002-2019)  
**Source:** CBRT, TurkSTAT

## 6. Conclusion

Inclusive growth has been a new agenda for countries since the second half of the 2010s onwards. In growing economies, not only is income distribution unfair for the lowest income group, but the life quality of the middle groups is also deteriorating. Moreover, growth alone is not sufficient to ensure a fair distribution of income. Ensuring that most people have access to opportunities is also crucial for the fruits of growth. For this reason, it is of great importance for policymakers and international organizations to provide a fair income distribution as well as opportunities to a large part of the population.

This study aims to analyze the relationship between growth and distribution patterns in the Turkish economy by constructing a time series composite inclusive growth index between 2002 and 2019, based on McKinley (2010) and Hakimian (2016) indexes. Our results show



that Türkiye has been successful in combating absolute poverty throughout the whole period. Taking inclusiveness into account, Türkiye improved its inclusive growth sharply between 2002 and 2009. Although the IG path displayed a slightly stable pattern from 2012 to 2019, it has probably started to deteriorate due to the outbreak and ongoing effects of the Covid-19 pandemic. Achieving growth itself is behind the main determinants of progress in IGI. In years of high growth, the IGI increases as well. Similarly, when the economy staggers, the index starts to deteriorate.

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Appendix

Table A1. Selective Indicators in McKinley (2010) Index					
Indicators	2002	2005	2010	2015	2019
GDP per capita growth (annual %)	4.969062	7.533399	6.990641	4.04114	-0.02812
Employment in manufacturing (% of total employment)	20.95743	21.586	20.35624	18.61758	18.35
Individuals using the Internet (% of population)	11.38	15.46	39.82	53.74498	73.9767
Poverty headcount ratio at \$6.85 a day (2017 PPP) (% of population)	38.8	28.4	18.2	13.7	12.6
Gini Index	41.4	42.6	38.8	42.9	41.9
The share of women in nonagricultural employees	0.206194	0.21932	0.229723	0.274576	0.30716
Mortality rate, under-5 (per 1,000 live births)	32.7	26.2	18.1	13	10.1
School enrollment, primary (% net)	96.71826	97.79379	96.08606	94.73559	95.21797
People using safely managed sanitation services (% of population)	59.61047	62.66177	68.39421	74.15938	78.06227
Social protection expenditures (% of GDP)	9.261467	10.45613	12.71337	11.91328	12.57502
Source: WB, ILO, UNESCO, TURKSTAT, Economic Transformation Database					

**Table A2.** Selective Indicators in Hakimian (2016) Index

Indicators	2002	2005	2010	2015	2019
GDP per capita growth (annual %)	4.969062	7.533399	6.990641	4.04114	-0.02812
Employment to population ratio, 15+, total (%)	44.444	41.49	42.999	45.993	45.677
Life expectancy at birth, total (years)	72.579	73.534	75.069	76.646	77.832
School enrollment, secondary (gross), gender parity index (GPI)	0.72247	0.83096	0.91584	0.97397	0.96177
Gender Inequality Index	0.533	0.531	0.422	0.335	0.277
Poverty gap at \$6.85 a day (2017 PPP) (%)	13.6	10.2	5.7	3.8	3.5
Corruption Perception Index	32	35	44	36.04605	33.47134
CO <sub>2</sub> emissions pcap (tonnes)	3.72	4.48	5.12	5.58	4.64
<b>Source:</b> WB, GNDP, Sustainable Development Index					



## CHAPTER 13

### MULTIPLE DISADVANTAGES IN THE LABOR MARKET OF TÜRKİYE: A QUALITATIVE STUDY OF WOMEN WITH DISABILITIES

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#### Abstract

Promoting sustainable, inclusive and sustainable economic growth, full and productive employment and decent work for all are essential parts of achieving the Sustainable Development Goals. Disabled people, one of the target groups for reducing non-decent work, are considered as one of the particularly vulnerable groups in many societies. The multitude of discriminatory and exclusionary attitudes faced by the disabled women both in the labor market and in their social lives raises the issue of disabled women and multiple disadvantages. Many disabled women are more likely to experience “non-decent work” in the job market as a result of these various disadvantages. The issue of “non-decent work conditions” is brought up in this study as a challenge faced by women with disabilities, on the axis of discrimination and exclusion in the job market in many regions and countries. This study makes arguments on how decent working standards arise in the working lives of 17 disabled women in the labor market of Türkiye by examining their working-life and job-seeking experiences. In this study, interviews were done utilizing a phenomenologically based semi-structured interview technique. The MaxQDA was used to conduct content analysis on the interviews. The findings showed that disabled women experienced condescending language and actions from their managers and coworkers, they were rejected from jobs by their managers, they had struggles with accessibility, and experienced other issues. The disabled women who were looking for jobs, first struggled with poverty, and they were unable to locate occupations that would be appropriate for their occupational profiles and disabilities. Furthermore, they were subjected to employers’ unfavorable attitudes throughout the job search, and lacked social networks that could have assisted them in finding jobs. The aforementioned problems were both the source and the effect of social exclusion and discrimination. According to this research, there should be a variety of policies developed for “women with disabilities” in labor markets in order to provide criterias for decent work.

**Keywords:** Disabled Women, Decent Work, Quality of Employment

## 1. Introduction

Employment supports the individual's active participation in socioeconomic life and is an important tool in the fight against the poverty and exclusion that affect people with disabilities. For this reason, the promotion of participation in working life is recognized as a social support for both disabled and non-disabled people and is also an economic policy measure. However, although promoting the labor force participation of people with disabilities is a priority in many countries, in reality, these goals are sometimes not achievable. The reasons for this include many factors such as the current socio-economic structure of the country, deficiencies in the skills and competencies of the workforce, shortcomings in legal regulations and the formation of individual (employer) prejudices. One of these factors is related to the level of education and professional skills of the disabled. Although increasing the level of education of people with disabilities has a positive impact on employability and the average income of people with disabilities, the negative impact of disability on educational participation (Sevak, et. al, 2015:81) highlights an important paradox related to employability and a decent job. Therefore, in our opinion, two important challenges must be overcome for people with disabilities to obtain a decent job. These challenges are access to quality education and access to the labor market after education. After finding solutions to these two problems, the agenda will be to discuss the employability of disabled people in decent jobs. When these discussions are examined in terms of the employment situation of disabled workers in Türkiye, it is inevitable that being a "disabled woman" will be classified as an even more precarious situation. Because these people are usually employed in the labor market in low-skilled jobs with low status, low wages, non-decent working conditions and limited opportunities for advancement (Kağmıcioğlu vd., 2019:164). In this direction, this research addresses the current situation of "women with disabilities" in the labor market of Türkiye within the framework of "Goal 8: Decent Work and Economic Growth", which emphasizes the issue of "employment" within the Sustainable Development Goals. The study examines the job search experiences, past and current employment conditions of women with disabilities in accessing the labor market in Türkiye, and discusses possible implications for the stages of decent work conditions.

This study, which is divided into three parts, begins with the background of research that addresses the problems faced by disabled people, especially women, in the labor market. The relevant section focuses on understanding the current situation in the world regarding the employment of people with disabilities, and in particular the employment of women with disabilities, in line with the findings of previous research. The second part of the study examines the definition and elements of the concept of decent work, its place in the Sustainable

Development Goals, and the employment of women with disabilities. The third and final part examines the employment conditions of women with disabilities in the labor market of Türkiye in terms of decent work and discusses the findings of the qualitative field research we conducted on women with disabilities. Thus, with the aim of “supporting stable, inclusive and sustainable economic growth, full and productive employment and decent work for all”, the current situation of women with disabilities, a vulnerable group in the labor market of Türkiye, has been examined. Based on qualitative research findings showing that women with disabilities are not working on a decent work axis in the labor market of Türkiye, this study concludes by proposing some specific measures for the labor market of Türkiye to fulfil the promised commitments.

## 2. Background of the Research

Decent work and the quality of working life are important to everyone. In this process, it becomes much more important for disabled people to combat social exclusion and develop their self-efficacy awareness. Having fair and decent working conditions has become a globally accepted policy area, primarily because it is a human right. The struggle for fair and decent employment for all is undoubtedly becoming more important “due to the fragility” of the disabled. The study conducted by Brown and Ciciurkaite (2022) found that disabled people face more ‘precarious employment’ compared to non-disabled people and these people are associated with higher rates of psychological distress. Similarly, Lindsay (2011) stated that individuals’ disability is a barrier to securing and maintaining employment. It was emphasized that various socio-economic and demographic factors such as the severity, type, duration of disability and education level, gender, low income, geographical location, and the number of people living in the household affect the discrimination in employment of the disabled. Disabled people and women are called disadvantaged and vulnerable groups in the labor market due to their employment relations or perceived individual characteristics. Being a disabled woman, however, represents ‘double fragility’ and reveals a problematic area that will deepen both in economic life and social life. Indeed, according to Hirano et. al (2023), young women with disabilities tend to have worse employment outcomes after school than young men with disabilities and their peers without disabilities.

Various studies have revealed that women with disabilities are approximately four times more likely to be sexually assaulted than women without disabilities (Martin et al., 2006). It is known that there are various results such as that disabled women have higher rates of depression and stress than non-disabled women (Nosek & Hughes, 2003). Considering the problems experienced by disabled people in socio-economic life, employment becomes a



more important factor for disabled women to break the psycho-social violence cycle they experience (Smith, 2008). However, considering the problems experienced by both the disabled and women in the labor market, it is inevitable that being a ‘disabled and a woman’ indicates the existence of a situation that may cause a double disadvantage of people. Vick and Lightman (2010) defined the barriers to the employability of women in two groups as individual reasons and structural reasons for their study. Accordingly, the individual reasons for the employment of women were defined as precarious bodies (poor health and disability), emotional struggles, especially inadequacy, shame, incompetence, and poor self-worth. The structural reasons were listed as institutional misunderstanding, employer misunderstanding and the embodiment of work. Therefore, the issue of the employability of women with disabilities is an area with more challenges in the labor market. Disabled women face various difficulties not only while seeking employment opportunities, but even if they are employed. The research carried out reveals that women with disabilities are exposed to negative behaviors and inequalities at various levels of socio-economic life. The research conducted by Kim et al (2012) showed that women with disabilities are employed at lower wages than men with disabilities and are not treated equally in terms of working hours. When the existing research from the past to the present is examined, it is seen that the problem of wage discrimination is more negative for women than for men, and it shows that this difference occurs at a much more negative level for women with disabilities. (Baldwin, 1995; Landes, 1977; Longhi, 2017:44) On the other hand, the employment rates for people with psychosocial impairments appear to be rather low, and women are disproportionately affected by the structural exclusion of people with psychosocial disabilities from the workforce. (Gitonga et. al, 2021). Due to the double discrimination of gender and disability, it becomes more difficult for women with disabilities to have a more egalitarian and fairer standard of living in society. The fact that women with disabilities form a more vulnerable group in the labor market due to facing multiple disadvantages also increases the importance of their access to the quality of their working life and working at decent work standards. The argument that women with disabilities are at a double disadvantage in the labor market has been put forward by O’Hara (2004). According to this argument, women with disabilities are twice penalized due to potential discrimination based on both their gender and their disability status. In addition, being a disabled woman also describes a structure that can be called “Intersectional Discrimination”, which describes the situation where “various forms of oppression intersect with each other in multiple, complex ways” (Gedikli, 2022:85, quoting Garry 2011). The common point of these two concepts is the combination of more than one phenomenon that can characterise a person as being disadvantaged. In this direction, being a “disabled woman” constitutes a field of

study where “disability problems” intersect with “gender” problems. These problem areas result in various discriminatory attitudes toward the use of basic working-life rights, particularly wage discrimination and accessibility, which are extensively documented in the literature. The disadvantage of people with disabilities in the labor market has, however, not received as much attention as that of other minority groups. (Østerud, 2022:1). Studies that have examined the experiences of disabled women workers have produced results that demonstrate this condition from the past to the present. For example, Burke (1999) discovered that women with disabilities reported less favorable employment experiences than women without disabilities. These unfavorable conditions included higher levels of harassment, a riskier and more demanding workplace, higher job demands, and greater job instability. However, studies also show that being a woman with disabilities is not necessarily a disadvantage. For example, a study conducted by Hwa and Ang (2017) on employers’ perceptions of employing people with disabilities found that, contrary to existing research, employers were more positive about women with disabilities than men with disabilities in their hiring practices. The results of the above study also showed that employers’ perceptions in the hiring process are mainly influenced by the type of disability. These findings are also supported by Doğan and Unal’s (2023) study on the different forms of disability in Türkiye. As a result, the interviewers showed that disabled individuals with certain types of disabilities (especially orthopedic and hearing impaired) perceive themselves as more disadvantaged in the labor market compared to other disabled individuals in the hiring process. In fact, according to the results of an empirical study by Benito et al. (2016), for both men and women, the average earnings of deaf or hard-of-hearing members were lower than those who were not deaf. These analyses have shown us that discrimination against people with disabilities is not just focused on “gender” but can be a significant barrier to employment depending on the “type” of disability. While being a disabled woman is a significant disadvantage in the labor market, personal preferences such as ethnicity, skin color, religious orientation, or differences such as age, education, and place of residence can compound this disadvantage. Being a less educated, non-white woman or any combination of the above criteria may have created the conditions in which women with disabilities find it difficult to find work. (Johnson & Janes, 1984:346). These discrimination-based problems, which have continued from the past to the present, sometimes deepen the negative effects of being a disabled woman who characterizes a disadvantage. Indeed, Oberoi et al. (2015) found that African-American women with disabilities have lower employment rates when compared to white (disabled) women. Considering the impact of employment on the socio-economic inclusion of individuals, these problems constitute a risk area for social peace. Because being employed in a decent job increases the quality and stan-

dards of people's social life as well as their economic life standards. Therefore, participation in employment and the quality of working life is not only an economic goal but also an important social phenomenon. Various studies have proven that participation in employment positively affects not only the economic well-being of individuals but also many different indicators such as their self-esteem and self-confidence, their participation in social life, their psycho-social well-being and their physical health (Bond et al, 2001; Crowther & Marshall, 2002; Stuart, 2006; Brunes and Heir, 2022). Furthermore, considering the aggravating effect of lack of employment on the possibility of people having chronic diseases such as depression, anxiety, diabetes, heart disease and obesity (Goodman, 2015:8), employment gains vital importance to improve the existing health conditions of the disabled or prevent their health problems from progressing. However, at this stage, the quality of employment, which is important for everyone, becomes more vital for disabled people. It is known that non-decent jobs and harmful employment further exacerbate the existing health problems of people with disabilities and cause the emergence of permanent problems that are sometimes irreversible in the disability levels of people. The strategies for integrating people with disabilities into the labor market have evolved toward a social approach, in which the objective is the integration with stable and decent jobs (Castro Núñez., 2020:202). For example, The Serbian Labor Act (2005) has introduced a category of workers with health problems and stipulates that those workers could not be assigned to a job that could have a negative effect on the health status/condition of an individual (Stojković-Zlatanović, 2016). In line with this background information, this research has been prepared to evaluate the situation of women with disabilities in the labor market of Türkiye on the axis of 'decent work'.

### **3. Disabled Women in the Labor Market of Türkiye**

The statistics on disabled people in the labor market of Türkiye are mainly based on the results of the 2011 Population and Housing Survey, and a bulletin on disability statistics is published quarterly based on these data (Ministry of Family and Social Services, 2023). The related survey was conducted with a total of 2.2 million households and persons in institutional settings using the full survey method. In the survey study, "disability" is defined by the International Classification of Functioning (ICF), Disability and Health developed by the World Health Organization (WHO). In accordance with the results of the corresponding survey, the proportion of disabled women in the total population in Türkiye is 7.9%, while the proportion of men is 5.9%. This shows that the population density of disabled women is higher. Considering the population density in question, the labor force participation rate of the population with at least one disability was 35.4% for men and 12.5% for women. This

indicates that women with disabilities are disadvantaged in terms of labor force participation. Although there are various problems in the employment of disabled women in the labor market of Türkiye, in practice, there are various practices for the employment of disabled women under the active employment policy. These are vocational training and rehabilitation programs, work programs for the benefit of society, wage subsidies, on-the-job training programs, and entrepreneurship subsidies (Çakır, 2021). Despite the existence of these supports, it can be said that the targeted policies have not yet had the expected effect, considering the labor force participation of women with disabilities and the low employment rates. Another problem about disabled women is the gender distribution in the employment of disabled people in the public sector. Although most disabled people are employed in the “public sector”, in terms of the gender distribution of disabled civil servants, it is found that the percentage of women is quite low at 27.09%. Existing research results have revealed that decent working conditions are better for people with disabilities who are employed in the public sector when compared to those working in the private sector. (Doğan and Ünal, 2023) However, the fact that the rate of women with disabilities in public employment is very low compared to men also shows that disabled women have a significant distribution problem in accessing decent work conditions. In this sense, it can be claimed that disabled women in the labor market of Türkiye face a significant obstacle to “productive and full employment,” which is one of the requirements for standards of decent work.

#### **4. The Concept of Decent Work and Issues Related to the Employment of Women with Disabilities**

The eighth Sustainable Development Goal aims to guarantee that the equal pay for equal work principle is fully implemented by 2030 and that all women and men, including young people and persons with disabilities, have access to full and productive employment as well as decent work. The International Labor Organization (ILO) gave decent work’s first official definition in 1999, and it is based on the moral precepts of fairness and equality for human rights. Decent work has been identified as a sensitive tool for reducing the vulnerability of persons with disabilities, as well as an important goal of sustainable development. The ILO’s emphasis on the link between decent work and sustainable development clarifies the relationship between the two concepts. Both increasing job opportunities and ensuring that everyone has access to decent jobs are necessary for sustainable development. Inequalities and poverty are reduced and individuals are empowered through quality employment and decent working conditions, especially women, young people and the most vulnerable groups such as people with disabilities (Pouyaud, 2016).

Concepts like decent employment are used to define the quality of working life, but because of how vulnerable women with disabilities are on the job market, these concepts—which essentially refer to the existence of excellent and equitable working conditions—are given extra significance. The fact that state supports and incentive arrangements positively affect the employability of women with disabilities (Castello, 2012) causes the policies on this issue to be ‘publicly funded’. In this context, the International Labor Organization (ILO) is also known to emphasize the importance of public regulations and inspections in the employment of women with disabilities under decent working conditions in its various reports and recommendations. Four headings become clear upon analysis of the ILO’s Decent Work Agenda. These include full and productive employment, rights at work, social protection and promotion of social dialogue. The quality of working life is assessed in accordance with these indicators, and different sub-indicators explain these strategic aims. These indicators include employment opportunities, adequate earnings and productive work, decent working time, combining work, family and personal life, work that should be abolished, stability and security of work, equal opportunity and treatment in employment, safe work environment, social security and social dialogue, employers’ and workers’ representation. In essence, initiatives for providing individuals with disabilities with productive employment and decent working conditions have been organized into four areas by the United Nations ESCAP (2021). The first one is to assist people with disabilities through legal regulations and labor market policies. Implementation of employment quotas, preferential contracting, rules for job retention and return to work, social protection, and actions to lower the cost of employment for employers and employees with disabilities are all included under this heading. The second strategy heading is about employment services to facilitate the implementation of measures supporting disability-inclusive employment. The third strategy is training to prepare persons with disabilities for the labor market and deals with the employment of the disabled under three headings. These are vocational and technical education of the disabled, job coaching and increasing the job search skills of the disabled. The fourth and final section on promoting productivity and decent work in the employment of people with disabilities at UN addresses “supporting entrepreneurs with disabilities” through legal regulations and labor market policies. These relate to vocational and technical training for people with disabilities, job coaching practices, and improving job search skills.

Although these titles are implemented in line with the employment of disabled people in the labor market of Türkiye and ensuring their access to decent work, it is seen that the policies and measures implemented are insufficient when the current labor force participation

rates and statistics are taken into consideration. Accordingly, this research analyzes the current situation of women with disabilities in the labor market of Türkiye, which can be described with concepts such as “Twice Penalized” or “Intersectional Discrimination”, on the axis of “decent work”, one of the sustainable development goals. This analysis is based on the experiences of women with disabilities in the labor market with reference to ILO indicators. Due to the limited number of field studies directly examining the relationship between disabled employment and decent work, this research is unique. No field research on the direct relationship between the current situation of women with disabilities in employment in line with or inclusive of all decent work indicators was found in our literature review in WoS and SS-CI-based journals. In this context, this chapter will contribute not only to the current situation of women with disabilities in the labor market of Türkiye, market but also to the international literature. A limited and valuable study examining the employment of women with disabilities in terms of decent work standards, although not directly with women with disabilities, was conducted by Park (2016). The study analyzed 15 different types of disabilities using indicators of income, working hours, employment stability, fair treatment and social security. As a result of the research, the employment quality of individuals with intellectual disabilities, autism and epilepsy was found to be ‘very low’ in the earned income index and working hours, while employment security and social security indicators were found to be one of the areas where employment quality was ‘very low’ among most disability types. As a result, “decent work” indicators in disability employment are found to be quite weak for different types of disabilities. In this context, the research in this section of this book is conducted within the scope of the problem of employment of women with disabilities and examines these indicators qualitatively.

## **5. Methodology**

### **5.1. Purpose and Method of Research**

The aim of this study is to examine the employment conditions of women with disabilities, who are among the vulnerable and disadvantaged groups in the Turkish labour market, in terms of decent working conditions. The phenomenological approach, which is one of the qualitative research methods, was used in the research that explains the current situation of disabled women in the Turkish labour market by considering the concept of ‘decent work’. Thus, this research was conducted in line with the ‘discovery’ and ‘interpretation’ of the experiences of disabled women in the Turkish labour market. Indeed, the phenomenological approach is a form of qualitative research that focuses on the study of an individual’s lived experiences within the world (Neubauer et al. 2019:90) and provides an opportunity to learn

about how individuals participating in particular research experience the phenomenon under study (Matenge, 2015). Given that the aim of this research is to investigate and describe the experiences of women with disabilities in the labour market, the phenomenological approach is an appropriate framework for this study.

- *What challenges do women with disabilities face in the labor market of Türkiye in relation to the indicators of “Decent Work”?*
- *What issues and challenges do women with disabilities encounter while trying to find jobs in the labor market of Türkiye?*

As a result, this chapter attempts to understand the working conditions of women with disabilities in the Turkish labour market and the relations between their superiors and co-workers by examining their current and historical experiences. Through semi-structured interviews designed to address the stated research questions, it is aimed to examine the current situation by focusing on the experiences and stories of the participants. In addition, this study is exploratory in nature as it aims to analyze the quality of working conditions of women with disabilities on the basis of decent work in the labour market. Accordingly, the research was conducted using “in-depth interviews”, which is a highly efficient qualitative research method due to the nature of exploratory studies. The interviews in question were conducted “remotely” using digital tools such as the telephone and zoom and were recorded with the consent of the participants. The records obtained were transcribed, and the results were interpreted according to content analysis.

## **5.2. Sample Group and Interviewer Profile**

Within the scope of the research, 17 in-depth interviews were conducted. As part of the research, interviews were conducted with female participants with different types of disabilities, especially orthopedically disabled ones. Disabled women were reached using snowball sampling, and women with a disability report of 40% or more were included in the research. When the employment-related status of the participants is examined, it is seen that 10 disabled women, mostly in the public sector are in employment, while 7 women participants are unemployed. The study revealed that there is a heterogeneous structure in the education levels of the women interviewed. Accordingly, participants from different education levels, from primary school to university level took part in the interviews. There was no relationship between the employment status of the people and their level of education.

### 5.3. Ethical Standards of Research

Ethical standards were given special attention as the research involved the participation of a sensitive group. Since the participant profile was female, all interviews were conducted by a female researcher. Thus, the participants were made to feel more comfortable. Particular attention was paid to the privacy of the participants, and it was ensured that their personal information and the names of their workplaces were kept confidential. The statements given by the participants were presented with “pseudonym codes” (e.g. K1, K10, K12...). During the interview, the interviews were recorded and deciphered with the permission of the participants. The transcripts obtained were analyzed independently of the personal information of the participants, and the audio recordings were destroyed.

## 6. Findings

The interpretation of the results of the interviews conducted during the research was in accordance with the four strategic objectives established by the ILO. The titles in question were defined as “tools for decent work”, and when one of these tools about the work is missing or insufficient, the characteristic of decent work disappears. (Işığışık, 2018: 306). This is why the themes of the interviews with disabled women on the analysis of decent work were based on these methods. The results of the interviews were analyzed in accordance with the pertinent subject areas. Interviews with female participants with a variety of disabilities, primarily orthopedic disabilities, were done as part of the research. While 7 of the 17 female participants (working mainly in the public sector) were currently employed, 10 participants were unemployed. Since the research was designed phenomenologically, it was avoided using words for directional phrases for the participants and in this process, the working conditions of the participants in their current and past work experiences and their experiences in the job search processes were taken into account and the results were interpreted.

### 6.1. Full and Productive Employment

The first basic element of decent work is “employment”. For this reason, sometimes ‘mandatory’ policies play an important role in supporting full and productive employment, with support and incentives to increase the employability of people with disabilities. When the studies on the disabled and decent work are examined, it is stated that the quota system used for the employment of the disabled is effective in achieving sustainable development goals (Schneider et al., 2022). In the labor market of Türkiye, providing employment opportunities with a compulsory quota system in both the private and public sectors is the most frequently used employment method in the employment of the disabled. Employment of people with dis-



abilities is not only an economic activity but also important for their social inclusion. Therefore, the goal of promoting full and productive employment carries with it a greater impact. Thus, employment is a very important opportunity for people, especially the disadvantaged, to improve their well-being. Furthermore, it provides security and participation in life for people with disabilities, especially for women. As a matter of fact, one participant stated her ideas as follows, regarding the effect of employment on social inclusion:

*"I love to work, I relieve stress. Because I am disabled, I have to stay up to do the housework all the time. I can't do the housework. My neighbors and relatives, who see that I cannot do the housework properly, do not come to sit because they are worried that they will disturb me. I mean, they don't come at all... Well, when they don't come, I can't go to them this time. I am left alone. But when I come to the workplace, I can at least see one or two people, speak a word or two, and have a conversation. Even if I couldn't do anything, when I come home in the evening and go to work in the morning, I take a breath and walk. But when I stay at home on my annual leave or something, I don't go for a walk at all, I don't get that much air either. The only place I get air is the balcony of the house. I look around and I'm inside in less than a minute."* (K3, Orthopedically Disabled)

In addition to this, it is extremely important that the quality of jobs created is equally as important as their employment rate. (İşığışok, 2018:306). However, while providing employment opportunities constitutes the qualitative dimension of this discussion, the quantitative dimension of the issue also gains importance when the proportions of women with disabilities are examined in terms of entering the labor market. The fact that the labor force participation rate of women with disabilities is limited to 12.5% in the labor market Türkiye indicates the existence of a significant problem against women. This situation indicates the existence of an important problematic area for the labor market in Türkiye in terms of "creating employment", which is the prerequisite for the concept of decent work. The fact that most of the women with disabilities we randomly interviewed were not in employment supports these statistics. When the reasons why the interviewed women with disabilities could not participate in employment were examined, the following sub-codes were obtained: *Not giving disabled people a job suitable for the type of disability they have, prejudice and attitude of the employer, lack of social networks to find a job, high disability rate, insufficient employment quota for disabled people, insufficient employment consultancy services related to local governments, not being offered jobs suitable for the education of disabled people, having accessibility issues and fear of being harassed at work/in the job search process.* In these examples, the most frequently cited reasons for not being able to participate in employment are the code of high disability rate, which interacts with the problem of employer prejudice, and the fact that people are not

given jobs suitable for their type of disability. Accordingly, one participant stated the reasons for not being currently employed as follows:

*“For example, I am currently using a ‘wheelchair’, when I go for a job interview with some of the local supermarkets for a cashier job, the interviewer always says that ‘there will be problems with your wheelchair in getting in and out of the cash register’. Workplaces are generally not suitable for us, they do not have ramps. Also, I was not given a suitable job. When I go to İŞKUR for a job interview, I can do jobs such as secretarial and call center. I studied office management and I have an F Keyboard course certificate. But for example, they offer me an interview for the janitor.” (K2, Orthopedically Disabled)*

*“I went to 15 factories for job interviews through İŞKUR’s information. Of course, the factories prefer those who can stand. The same thing happened in a bank where I went for an interview before. When we went for the interviews, they only preferred the disabled people who could stand. I continue my life with a battery-powered vehicle. I am going and returning to work with my wheelchair. As I said, the bank preferred people with disabilities who could stand, as did the factories. They hired people with kidney disease or hearing impairment... in other words, they paid a lot of attention to the appearance of the disabled applicants (Orthopedically disabled)*

*“If you look like you are disabled, employers do not want to hire you. They see you as unable to work and have prejudices about why they should give a blind person a job. Now we are hearing that people with diabetes or other diseases can also get a disability card. If this is the case, the employer asks why should I hire someone who cannot see or walk and prefers other persons. As such, we can not get a job (P14, visually impaired and orthopedically disabled)*

Accordingly, some respondents indicated that they did not want to be hired by employers because of the ‘visibility’ of their current disability. As indicated by the research mentioned in the background section of our study, there is a significant risk that employers may hold prejudice against disabled women based on the nature of their disability. As a result of this situation, women with orthopedic disabilities may face more difficult barriers in entering employment. Accordingly, the first problem area cited by women with disabilities in the employment process was “*employer prejudice regarding the nature of the disability.*” Furthermore, participants indicated that they were unable to find a job because they were not offered jobs that were suitable for their current qualifications or the nature of their disability. One participant even summarized the problem as follows:

*“I have been to İŞKUR many times. But no suitable job has ever been found for me. I studied teaching and want to start my own business, but when I am disabled, they only offer me unskilled jobs. That’s why I can not work” (P4, orthopedically disabled)*

*“The employer does not want to hire you if they see that you are disabled. He considers you incapable of working. He approaches with prejudice and says why should I give a job to someone who can not see. Now we hear, for example, that someone with diabetes or other diseases can also get a disability card. So the employer asks why should they hire someone who can not see or walk and prefers them. So we can not get a job (K14, visually impaired and orthopedically disabled)*

When analyzing the interviews, it became clear that the jobs they do are not suitable for the type of disability of the disabled people or that they do not do the jobs that correspond to their current level of education, which has a negative psychological impact on these people. It was observed that prolonging this situation leads to damaging the sense of hope in the process of finding a job. When examining the existing subcodes (problems) related to non-employment, it becomes clear that there are areas that can characterize the common problems of all disabled people. However, the “concern of being harassed”, which is also encountered within the scope of these interviews, expresses one of the unique and important problems of “being a disabled woman”. A disabled female participant, who lives in a women’s shelter and is looking for a job, expressed the harassment problems she experienced during the job search process. This participant expressed one of the most common problems she had with this problem with a critique of how İŞKUR interviews are conducted as follows:

*“Sometimes İŞKUR invites us to group interviews. Instead of inviting us to group interviews, it would be better if they interviewed us individually in private rooms because others hear my private things there. For example, while one person is talking to me, another person is being interviewed by me on the other side. He is hearing my information. So I had a lot of problems in that direction. I talk to the employer and say, ‘I live in a women’s shelter, I need this job to get my life in order’ and explain my situation. The man next to me hears this and harasses me from a different perspective. He waits for me at the exit and says: ‘Come, let us live together, you are alone’. Unfortunately, I have also received such offers, and it happens frequently.” (K2, orthopedically disabled)*

The problem described by this participant also brought up the issue of “privacy” at the interview. This situation became an important example and a call for the introduction of forms for job interviews that do not interfere with women’s privacy. The fact that women are exposed to various dimensions of harassment in socioeconomic life, whether they are disabled or not, makes the issue of privacy in the job search increasingly important. This example was also an important example of women’s experiences of harassment in the job search process, and it was understood that İŞKUR’s group interviews could pose a problem for women’s privacy. This is an important problem in terms of quality of work life. Looking

at the available interviews, only 7 of the 17 respondents are women with disabilities who are currently employed, and almost all of these individuals are employed in the public sector. Looking at the current employment status of the participants interviewed in this research, we find that it is predominantly women with disabilities who are looking for jobs. Furthermore, the fact that people are not offered jobs that match their qualifications or training shows that there are problems with “*productivity in employment*”. Considering the above content and sub-codes describing the problems, it can be said that the employment condition, which is the first condition for decent work for women with disabilities, is not sufficiently provided in the labor market of Türkiye.

## 6.2. Guaranteeing Rights at Working Life

This section essentially refers to the full realization of socio-economic rights in the workplace. These labor rights refer to wages, working conditions and anti-discrimination policies (Tüzünkan, 2015:6). During the analysis of the interviews, it was found that women with disabilities have problems with their rights related to working life, especially about ‘discrimination’. This discrimination can be exercised directly by supervisors, managers and employers, but also by coworkers. One of the interesting findings of this research was that not only negative discrimination but also positive discrimination makes people unhappy in their working life. For example, one participant stated that the reason he left his previous job was because he was “not given work” by his colleagues because of his current disability. The disabled respondent stated that this situation isolated him in the workplace, in the following words.

*“I worked there for 4 years, or rather I sat there, they didn’t even give me a job. Nobody talked to me. I asked them to give me a job and they said sit down, don’t get involved in anything, don’t get tired. It was as if I was not there. I was just sitting there all day without talking to anyone, without doing any work, and I was going home in the evening.” (P1, Speech and Orthopedic Disability)*

Although it is a well-intentioned behavior to justify the lack of fatigue of the disabled person due to his current disability status, it led to the isolation and exclusion of this person. In this sense, the negative effects of the discrimination of not letting the disabled person work, which was positively intended, inevitably emerged. On the other hand, some participants stated that they were frequently exposed to words and behaviors that could be directly described as “*negative*” discrimination. The issue of wages categorized under the right to work is generally raised in the context of “*wage discrimination*” and “*decent wages*”. In the interviews we conducted, no negative experiences regarding wage discrimination were reported. However, it was observed that there were some problems with the problem of “decent wag-

es". Accordingly, the common point expressed by all participants is that health expenditures and medical care expenses are higher due to their current disability status. Accordingly, all participants stated that their current wage levels were not sufficient due to health expenditures. For this reason, some suggestions were given, and these suggestions were quoted and interpreted in the next section as they can be evaluated within the scope of '*social protection and social security*' measures. In terms of working conditions, the interviews were evaluated on the axis of appropriate working time, the impact of work on work-family life, harmful jobs, and job security. When the experiences of the participants were analyzed in the axis of these sub-headings, it was seen that the working participants did not pose a problem in terms of working hours since they were predominantly employed in the public sector. However, it was understood that women who worked independently with their work history in the private sector did not report any problems in this regard. However, when the issue of work-life balance was brought up, it was understood that some negative statements were made. It was understood that the problem in question did not stem from working hours but from gender perceptions and the domestic roles expected of women. Accordingly, it has been observed that women did not receive help from their husbands or other members of the household while doing household chores (cleaning, cooking, etc.). Furthermore, it was understood that due to their current disability status, they do these household chores more slowly and get tired. It was observed that one participant was included in the classification of harmful jobs related to her working conditions. Accordingly, a disabled participant who was selling handicraft products informally in the neighborhood market where she currently lives stated the following about her current working conditions:

*"...When I try to sell 3-5 pieces of booties that I have knitted with labor, the municipal police can prevent me. Sometimes shopkeepers intervene and say, "Don't touch her, she is disabled". I wish they would allow us, even give us special booths in the bazaars for free. For example, I always get wet when it rains because I am not in the bazaar. I cannot sell in winter." (P16, Orthopedically Disabled).*

The disabled woman stated that she had to work due to poverty, but that she worked in poor conditions because she could not afford to rent a stall (on the ground, in cold weather, in the rain, etc.). This example exemplifies an important need for local governments to provide neighborhood-level areas where women with disabilities can sell their products free of charge. Regulations on accessibility in the workplace are also one of the fundamental rights in working life. Physical accessibility is also an important issue in terms of occupational health and safety. In the interviews conducted, one participant stated that accessibility facilities were

lacking in the workplace (public) but stated that they did not have any problems or complaints about this. Accordingly, he used the following statements:

*“The building of the institution where I work is very old. I have been working in the same building for 37 years. There was no need for a ramp or something for the time being. Because I am disabled in one leg, I can climb up and down the stair railings. We do not have an employee who is completely forced into a wheelchair. We have a visually impaired switchboard operator who is more severely disabled than me. Thanks to his friends, they never leave him alone, they help him by holding his arm, including taking him to Friday prayers, and they say let’s go and take him away. They do not offend this person at all, so there is no need for way-finding bars. He can go anywhere easily by holding on to the wall” (K11, Orthopedically Disabled)*

Although this disabled person has no complaints, the lack of these infrastructure arrangements, which causes the limitation of the mobility of visually impaired colleagues, is an important problem for the criteria of decent work in the workplace. The fact that the visually impaired colleague of this disabled person in the workplace is dependent on other employees in terms of movement and that other friends help this person when this person needs their support is good in terms of solidarity in the workplace, but it can hurt the freedom of movement of this disabled person. The example of solidarity among employees creates a very good environment. However, if there is no such solidarity in a workplace and people with disabilities have to act dependent on others due to their lack of infrastructure, this may pose a problem for disabled employees. Another example given about negative situations in occupational health and safety is related to discrimination and exclusion. One participant expressed his past negative experience at his current workplace with the following statements.

*“First, they officially excluded me because I was newly appointed. They gave me a room. Not only for a visually impaired person, even a normal person cannot live in that room. No glass in the room, no light, moldy, a dark and dreary room. The room hadn’t even been cleaned. Look, I said I have a visually impaired report. I don’t have very good eyesight. He said to me, -what can I do? I said take me to another room. He said “handle it” and made me work in that room for a year. So I was tortured for a year. Then I said I’m going to complain about you now. then it allowed me to work in another room.” (K5, Visually Impaired)*

Accordingly, it was understood that this disabled person was forced to work in an environment where there were no decent working conditions. It has been seen that this was done for the purpose of exclusion by the superior because the person was ‘newly appointed’. The discriminatory attitude towards people with disabilities in a way different from the working conditions of other employees shows the existence of an important problem when the current

disability of this person is taken into account. The situation in question has become an example of an important problem as it makes the person vulnerable to accidents and risks that may further their existing disability. When we analyze all the interviews, it is seen that there are problems (insufficient ventilation, pollution, lack of equipment, etc.) in occupational health and safety as in a similar example. It has been observed that these problems are generally caused by supervisors and managers for lack of awareness or mobbing/exclusion. When we evaluated the interviews in question, it was revealed that there were problems with the issue of 'rights at work', which is an important component of decent work.

### **6.3. Social Protection and Social Security**

Another sub-title of decent work is related to adequate social protection and social security. It has been shown that the majority of the interviewed and employed women do not have any problems accessing social protection and social security since they are employed in the public sector. There is no doubt that the existence of a 'state guarantee' is dominant in this. On the other hand, considering the majority of women with disabilities who are not currently employed, both within the scope of this interview and in the labor market of Türkiye, it is understood that there are various problems despite the political measures taken regarding access to social security and social protection. The social security system in Türkiye is implemented in two different types, the contributory system and the non-contributory system. The non-contributory system mostly characterizes free services such as social assistance and social work practices. Disabled people who are not in employment in Türkiye can benefit from social assistance and social services under the 'non-contributory system'. Accordingly, the following services are provided under the non-contributory social service practices for the disabled in Türkiye: The Social Assistance and Solidarity Foundation provides disability pension to those with at least 40% disability. The needy pension is provided, home care pensions are given to those in need of care, and various tax exemptions and discounts are provided. (Income tax deduction, SCT exemption, Motor vehicle tax exemption, etc.) The fact that disabled pensions, which are specified in non-contributory social security practices, are only a right given to disabled people who are not in employment, has been a subject criticized by the participants. Because people with disabilities emphasized that their incomes were insufficient even though they were working. Accordingly, all the participants in employment stated that their current wage income is not sufficient due to the health expenditures they have made. The participants stated that they demanded that the disability pension assistance not be cut due to their employment. One participant used the following exemplary statements regarding this issue:



*"Thankfully, I have a job and an income, but nowadays it is very difficult to make a living. I'm the only one running the house. I'm divorced and my ex doesn't pay child support much. I have a son at home who goes to secondary school. For example, I will have a hernia surgery in my neck in the coming months. I have a lot of medication expenses. I'm having a hard time maintaining my family. I think disabled people should be able to receive disability pension even if they work. It's not a huge amount anyway. Even though we work, we do not have expenses like normal people. Our healthcare expenses are too high. At least we should be able to receive this pension unconditionally for our medicine and health expenses." (K7, Orthopedically Disabled)*

*"The disability pension is already a small amount. It is not enough even for the disabled people who are not working. That's why I don't feel like saying disability pension to be paid to us (for employees). After all, we have a job. However, the fact is that a significant portion of the wages we receive goes to drug treatments or medical devices. I started using a white cane and it's a new expense. Being disabled also has a psychological effect. Therefore, the situation regarding the termination of the disability pension of employees should be reconsidered. But as I said, these monthly allowances are already insufficient. First of all, the monthly amount should be increased" (P5, Visually Impaired)*

Accordingly, as a result of the interviews, the disabled people who work demanded that the disability pension benefit, which is provided only for disabled people who are not in employment, become an allowance for all disabled people within the scope of the health expenditures of the people. Accordingly, the demand for unconditional assistance to be given to all disabled people has an important place in social protection and social security opportunities. The contributory system, another form of social security practice in Türkiye, covers the insurance, pension and similar social security opportunities that a person obtains through employment and also by paying premiums. As one of the most important elements of social security, pension premium payment is a fundamental right, it becomes an important risk area for people who cannot be in employment for a long time. Considering the various difficulties regarding the entry and stay in employment of the disabled in Türkiye, it becomes more difficult for the disabled to retire than for everyone else. Considering this situation, various legal regulations and policies have been produced in the labor market of Türkiye. Whether a person is disabled from birth and starts working for the SSK (SSK: Social insurance institution), Bağ-Kur (Bağ-Kur: Pension fund for the self-employed), is a civil servant, or becomes disabled after getting a job; and all disabled employees with 40% or more loss of work power have the right to early retirement (Ministry of Family, Labor and Social Services, 2019:31). This is an important support for the right of access to retirement for people with disabilities who experience various problems in entering and staying in employment. Considering these situations,



it can be said that political measures are generally sufficient in terms of social security and social protection opportunities for the disabled in the labor market of Türkiye. However, the fact that no interviews were conducted with disabled women employed in the private sector within the scope of the research limits this research on social security opportunities. In the research conducted by Doğan and Ünal (2023), considering the prevalence of unregistered employment among the disabled, it is understood that social security opportunities and social protection constitute an important problematic area for disabled people working in the private sector and not working in the public sector. Since the disabled employees employed in the private sector were not interviewed within the scope of this research, an evaluation was not made on the existence of informal employment.

#### **6.4. Social Dialog**

The concept of social dialog is an important field defined in the narrow and broader sense. In the narrow sense, social dialog is defined as the structure that enables the development and implementation of economic and social policies between workers, employers and the state. In the broader sense, it refers to the processes and practices of discussion, cooperation and exchange of information on common problems related to economic and social policies between the state, workers' representatives and employers' representatives or only the employer (Oeren and Çevik, 2022:1). According to the International Labor Organization (ILO), social dialog between workers, employers, and governments is essential to achieve fair employment conditions, decent working conditions, safety and health at work, and development for the benefit of all. In this sense, social dialog takes on crucial importance for improving the quality of working life. This is because the existence of a strong social dialog mechanism has a positive impact on strengthening the fundamental rights of workers in working life. Through the instruments of the free participation in trade union activities and the participation in decision-making processes at the workplace, workers can ensure the improvement of their working conditions at the workplace. For this reason, disabled people who are currently employed were asked about their union membership and participation in decision-making processes at work. The interviews revealed that none of the women with disabilities are currently or have ever been members of a union. In this regard, it is generally believed that unions cannot influence working conditions. Since the fact that the women interviewed were not members of a union is a voluntary situation, it is assumed that there was no problem in terms of social dialog with regard to decent work. As far as participation in decision-making processes at the workplace is concerned, the situation is relatively better. Although they do not have a direct say in decision-making at work, some participants indicated that their supervisors regularly

ask them whether or not they have any demands. Accordingly, participants reported the following experiences with decision-making processes at work.

*"...What I am talking about is of course not a situation that determines the rules etc. at the workplace. Only the director and managers of the institution have meetings among themselves. But from time to time they come to us and ask us if we have a complaint or a request." (P5, Visually Impaired)*

*"I am really lucky to have such supervisors. They treat me like an elder sister, like a big brother. I have never felt like a stranger. Of course, we are not involved in the meetings between the managers themselves. That is another issue. But if there is an issue to be discussed jointly, we are informed about it." (P11, Orthopedically Disabled)*

The participant who had problems in her previous job reported slightly more negative experiences in this regard. As a matter of fact, she stated the following about participation in decision-making processes at the workplace:

*"In my previous job, nobody was talking to me anyway. There was no one even to greet me so that I could be consulted... I am in a better place now. But still, if I want to make a decision about my organization, I have no say at all."*

Analysis of these sample statements reveals that, in general, people with disabilities have no impact on involvement in workplace decision-making processes. It is acknowledged that such engagement is restricted to hearing the concerns and requests of the populace. It is evident that the organizational structure and workplace culture have a significant impact on how this situation has developed. All participants agreed on one thing, which was that only "managers and supervisors of the organization" had the authority to participate in decision-making procedures. Although this situation demonstrates that there is no genuine practice of participation in decision-making processes, it also demonstrates that employees value being heard when they have requests or grievances.

## 7. Conclusion

The issue of decent work, which has an important place in the Sustainable Development Goals, is vital for the quality of working life and the welfare of socio-economic life. The participation of people with disabilities in employment and their employment under decent work conditions becomes more important when the vulnerabilities in the labor market are taken into consideration. However, given the depth of the problems experienced by women in socio-economic life in gender studies, being a woman with a disability leads to a structure representing multiple disadvantages and bidirectional vulnerability in the labor market. Due to

this reason, it is acknowledged that women with disabilities constitute a category that requires special attention when examining the SDGs decent work heading's section on the accessibility of disabled persons to quality employment. This study uses the "ILO's decent work criteria" to interpret the current situation of women with disabilities in the labor market of Türkiye. This is because the lack of any of these decent work criteria indicates that the person is employed under non-decent working conditions. Accordingly, the current situation of women with disabilities in the labor market of Türkiye has been evaluated under the sub-headings of full and productive employment, securing fundamental rights related to working life, social protection-social security and social dialogue.

Considering the interviews conducted, it is understood that every participant does not have a proper job due to at least one indicator. This interpretation stems not only from the violation of the basic rights of the interviewees regarding working life or the problems they experience in social dialogue, but also from the deficiencies related to the heading of full and productive employment, which is the first heading of a decent job. As a matter of fact, it was observed that the majority of disabled women interviewed were unemployed. This situation, as can be seen from TUIK (Türkiye Statistical Institute) statistics, reveals that employment opportunities for women with disabilities are not sufficiently created in Türkiye. In addition, the fact that the unemployed women interviewed stated that they were not offered jobs suitable for their current type of disability or field of education shows that there are also problems in productive employment. Disabled women with associate or bachelor's degrees stated that they were mostly offered unskilled jobs (cleaning, etc.) by İŞKUR. Therefore, they stated that they are not in employment.

Additionally, one participant brought up the issue of privacy in group interviews and collective recruitment interviews during the hiring process at İŞKUR. She demonstrated that because job interviews take place in a public place, women are more susceptible to being harassed by having their private information overheard. This example highlights the importance of creating a job interview environment where women have more privacy in the interview process. Given that the primary requirement for decent work is full and productive employment, it may be claimed that Türkiye generally performs poorly for the SDG Goal 8's subheading "employment of women with disabilities." Furthermore, our research has shown that women with disabilities who are employed in the labor market of Türkiye continued to experience various problems in terms of decent work indicators. It is feasible to say that the employment of women with disabilities is not in a good enough situation in terms of decent work indicators, despite the fact that the majority of them are employed in the public sector. Since they work mostly in the public sector, it has been noticed that people do not experience

issues with social protection and social security measures. However, considering the multiplicity of problems such as participation in decision-making processes in the workplace, accessibility, and discrimination, it is seen that women with disabilities do not have decent work conditions despite being employed in public institutions. Accordingly, when the problems faced by women with disabilities in the labor market are taken into consideration, it becomes clear that inclusive and holistic policies need to be produced. Accordingly, not only employment policies but also social policy and social service practices need to be integrated more strongly into employment policies.

On this issue, participants primarily asked that their disability pensions not be cut due to their employment. It is also clear that they wanted more monitoring and support in the employment process. Accordingly, it can be said that employment policies should not only open up more employment opportunities for women with disabilities, but also focus specifically on fundamental rights and social dialog in working life. In addition, it was found that employability is negatively affected by employers' perceptions in cases where the disability is visible (orthopedic disability, visual impairment, etc.). Finally, our research found that labor market policies should take into account different types of disadvantages and the diversity of disabilities when promoting the inclusion of women with disabilities in the labor market. Therefore, it was found that it is necessary to develop specific policies in the formulation of employment policies for women with disabilities that correspond to the current types and rates of people's disabilities. Accordingly, our findings show that women with disabilities are widely employed in non-decent working conditions or do not have access to employment opportunities. For this reason, it is important for Türkiye to establish a special area of employment policies for women with disabilities in labor markets and expand needs assessment studies in this area to achieve the SDG's 8 targets.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







## CHAPTER 14

### A CRITICAL EVALUATION OF SUSTAINABILITY CRITERIA IN LARGE-SCALE INFRASTRUCTURE PROJECTS AND AN OVERVIEW OF TÜRKİYE'S INFRASTRUCTURAL INVESTMENTS THROUGH CRITICAL THINKING

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#### **Abstract**

In recent years, as large-scale infrastructure investments have been seen as a catalyst for economic revival, they have also become a part of the sustainable development agenda due to their huge economic, social and environmental impacts. Natural disasters, climate change and the pandemic have been seen as reasons for applying sustainability assessment to mega infrastructures by international organizations and multilateral initiatives. Such concerns have led to the development of many criteria to integrate social and environmental considerations in the building and operation processes of infrastructure projects. Based on these criteria, it is suggested that economic, environmental and social principles should be met for a resilient and sustainable infrastructure. In this context, this study firstly aims to question economic, environmental and social sustainability criteria and their applicability in large-scale infrastructure projects on a theoretical level. Secondly, it focuses on the empirical analysis of Türkiye's mega infrastructural investments, within the scope of projects built in the 2000s, which is a period when mega scale projects have become one of the key driving forces in economic growth. Accordingly, the paper will explore whether or to what extent Türkiye's large-scale infrastructure investments meet the economic, environmental and social criteria, even though this is a problematic evaluation under the capitalist relations of production. Accompanied by all these inquiries, the findings of the study are as follows: At the theoretical level, although the economic sustainability of infrastructure is evaluated based on criteria such as economic development, employment opportunities and intergenerational distribution, the achievement of sustainable development goals economically is a conflictual process. The risk of raising economic fragility due to the high costs of projects, the conflicts among SDG targets, the use of cost benefit analysis which does not sufficiently take into consideration social and environmental costs are the problems that arise in the evaluation of infrastructure projects in terms of economic sustainability. The environmental sustainability evaluation also has problems because the sustainable development

goals may prioritize economic concerns which may not be compatible with the natural cycle of renewal and weaknesses of the environmental assessment, such as stage of EIA, limited access to information or deficiencies in public involvement, and does not allow an adequate evaluation. Lastly, in applying social aspects to sustainability, the use of a social impact assessment has procedural and methodological problems in documenting and evaluating social impacts. As a second part of the findings, the empirical study of Türkiye's large-scale infrastructure investment shows that projects cannot meet the economic, environmental and social sustainability criteria which are even problematic themselves.

**Keywords:** Large-scale infrastructure investments, Sustainability evaluation, Critical approach to sustainability criteria, Türkiye's infrastructure investments

## 1. Introduction

Due to direct effects of infrastructure investments (such as transportation systems, energy generation facilities) on ecological and social issues, the development of infrastructures has entered the agenda of sustainable development discussions. Infrastructure investments are seen as a catalyst of or solution for sustainable development by international organizations, multilateral initiatives and advanced capitalist economies through discussions of their role for providing healthy environment, equitable economic development and resilient societies. In this respect, according to United Nations Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030 Agenda (UN SDG Indicators) under the goal 9, the relationship between the infrastructural projects and sustainable development is defined in terms of criteria like affordable and equitable infrastructure for all, the adoption of resource-use efficiency, the deployment of environmental technologies and innovation in these projects, and also providing financial, technical and technological support to developing countries for promoting sustainable infrastructure development (UN, 2017). That is, goal 9 deals with sustainability of infrastructure projects in terms of three main criteria: social, economic and environmental aspects.

The report of the United Nations Office for Project Services (UNOPS) displays the role of infrastructure on the SDG targets and sustainable development by giving examples from 16 different countries. The report suggests that infrastructure systems contribute to the achievement of all 17 SDG targets in diverse ways, nearly having an influence up to 92 per cent of the objectives. For example, the benefits of infrastructure systems influence targets of equitable access (goal 5 and 10), good health (goal 3), clean water (goal 6), resource-use efficiency (goal 12), or sustainable urbanization (goal 11) (UNOPS, 2018). In parallel, the OECD report remarks the growing importance of sustainable and resilient infrastructure considering sustainability criteria in line with SDG targets in infrastructure projects. OECD explains their

rising importance in relation to the COVID-19 pandemic which has showed infrastructures' role in logistic and supply chains. Not only the pandemic but also the harmful impacts of natural disasters and climate change on infrastructures are seen as other reasons for considering sustainability criteria (OECD, 2021).

As part of these discussions, the Global Infrastructure Hub (GIH), which was established by the G20 including heads of governments or heads of state, central bank governors, finance ministers and, foreign ministers in 2014, underlines the effects of infrastructure on sustainable development goals such as being responsible for 79% of global greenhouse gas emissions, 88% of adaptation costs and prepares the report "Infrastructure Transition Pathways" that integrate sustainability considerations in infrastructure policies and implementation. It aims to shift sustainable infrastructure investment by recognizing UN SDG targets and the standards of the United Nations Framework Convention on Climate Change (GIH, 2022). The G20 research group argue that sustainable infrastructure investments should be developed for sustainable economic recovery rather than keeping continuing infrastructure investments which generate 79% of global greenhouse gas emissions (G20 Indonesia: The Bali Summit, 2022).

As another multilateral initiative, the FAST-Infra Sustainable Infrastructure Label (SI Label) is designed to measure sustainability performance of projects in 2020. In doing so, the initiative aims for "transformation of sustainable infrastructure into a mainstream, liquid asset class", and thus attracting investors into infrastructure asset and developing new financial products and secondary financial market and promoting sustainable infrastructure assets in the market. Infrastructure asset is used to refer infrastructure projects that market participants looking for apply to the SI label. SI label is delivered according to fourteen required sustainability criteria ranging from environmental to resilience, social and governance requirements (Fast-Infra, 2021).

As can be seen in discussions of international organization or multilateral initiatives, infrastructure investments have become as part of sustainable development agenda. The construction of large-scale infrastructure projects, namely mega infrastructure investments, has led to the inclusion of sustainability principles into evaluation of these projects because they have long-terms effects, beyond the period they are built. The relationship between the mega infrastructure projects and sustainable development is framed around some questions and principles. For example, Sturup and Low ask these questions to examine this relationship: "What is being sustained in the megaprojects we build" or "how constructing and operating the megaproject will contribute sustainability" (Sturup and Low, 2019: 21). For Boxshall, Kupelian and Lambe (2016), meeting current and future needs and ensuring consistency

between economic, social and environmental goals are priority principles for infrastructure investments. Application of sustainable development approach to mega infrastructure investments is mainly revealed around the questioning of these projects in terms of delivering economic benefits for current and future generations, using natural resources in the regenerative capacity of natural systems and building it in socially fair manner (Sturup and Low, 2019: 24). Although the construction and operation of mega infrastructure projects are evaluated in different technical terms, such as project delivery concerns (being on time, within budget), or monetization of costs and benefits, by proponents of megaproject, investment communities, professions from financial and banking sectors, after recent developments in sustainable infrastructure, different disciplines, ranging from political science to ecological studies, development studies, geography and spatial planning, have discussed mega infrastructure investments in the context of sustainable development by taking a broader perspective on the impacts of these projects (Dimitriou and Field, 2019: 3-4).

In this context, the United Nations Environment Programme (UNEP) defines sustainable infrastructures as “those that are planned, designed, constructed, operated and decommissioned in a manner that ensures economic and financial, social, environmental (including climate resilience), and institutional sustainability over the entire lifecycle” (2021: 10). UNEP’s this definition and UN SDG targets depict main characteristics of sustainable infrastructure systems in three dimensions: social, economic and environmental. This study firstly aims to analyze the evaluation criteria in these dimensions by questioning limitations in these measurement methods. Secondly, it deals with whether or what extent Türkiye’s large-scale infrastructure investments meet the economic, environmental and social criteria, even this is a problematic evaluation.

## **2. Economic Dimension of Sustainability in Infrastructure Projects and Limitations of Criteria in Economic Evaluation**

The relationship between infrastructure investments and economic growth have drawn into mainstream economic discussions by Aschauer and Munnell (Blanche, 2019). Aschauer argues that investment in public infrastructure (such as highways, airports, waters systems) may stimulate productivity and economic growth by presenting results from his empirical study (1989: 193). In parallel, Munnell also confirms positive effect of public infrastructure investments on economic growth in his work (1992: 191-192). Regarding economic aspect, long term effects of infrastructure investments are specified as promoting supply capacity of economy, such as making workers more mobile and accordingly improving labor productivity through transport infrastructure investment, short term effect is pointed out as boosting aggregate demand through employment (Boxshall, Kupelian and Lambe, 2016; Blanche, 2019).

In recent years, discussions of infrastructure investments' contribution to the economic development have revived. Infrastructure investments have emerged as measure for economic challenges (such as, slow pace of recovery after the 2008 financial crisis, economic slowdown) facing the advanced capitalist economies. How infrastructure has become a priority for national economies in recent years can be seen from these examples: In the post-Covid-19 recovery, USD3.2 trillion (3.2% of G20 GDP) of infrastructure, which represents a 45% increase in the average yearly infrastructure investments (largely in transport and social infrastructure sectors), has been declared as a stimulus by G20 governments between February 2020 and August 2021 (GIH, 2021). GIH argues that infrastructure investments produce both economic development outcomes (economic growth, job creation) and transformative outcomes (environmental sustainability, resilience, inclusivity) which advances sustainability (infrastructure-outcomes.github.org). As another example, infrastructure investments have played a key role in European Union's response to the 2008 economic crisis, that can be seen by Investment Plan for Europe (IPE), referred as the Juncker Plan, establishment of European Fund for Strategic Investment (EFSI) which is seen as the primary development banking intervention in infrastructure, and also the legislation of the European Parliament and the Council of the 25 June 2015 that calls EU member states to increase investments (Paterson-Jones, 2019). While infrastructure investments stand out in the reports as the engine of economic revival, data on infrastructure gap have also begun to be shared to support this development. In this respect, OECD pays attention to the infrastructure needs that arise from "ageing and poorly maintained infrastructure stock" in advanced economies and "growing population, economic growth and industrialization" in developing countries (2021: 16)<sup>1</sup>. G20 researchers argue that the forecast of global investment gap is increased from US\$ 0.7 trillion a year to US\$ 3 trillion a year, and it is argued that it will continue grow considering the economic challenges and climate change (G20 Indonesia: The Bali Summit, 2022).

While infrastructure investments as economic stimulus enters the agenda of international institutions and national economies, sustainability dimension has also included in this agenda. Milne and Turnbull argue that the interest in the relationship between infrastructure investments and sustainable development has increased after the Covid 19 pandemic particularly. National economies and multilateral initiatives have included the issue of green and social

1 Although mega investments are on the agenda of international organizations as a catalyst for economic growth, there are many studies in the literature that make this claim questionable. See e.g., Flyvbjerg, Bruzelius and Rothengatter (2003), *Megaprojects and risks: An anatomy of ambition*, Cambridge University Press; del Cerro Santamaria (2013), *Urban Megaprojects: A worldwide view*, Emerald Publishing; Matheson (2012), *Assessing the infrastructure impact of mega-events in emerging economies*, Holy Cross Working Paper Series; Ansar, Flyvbjerg, Budzier, Lunn (2016), *Does infrastructure investment lead to economic growth or economic fragility? Evidence from China*, Oxford Review of Economic Policy.

infrastructure investment more on their agenda that can be seen through the packages of G20 governments, economic recovery plans of the UK (the National Infrastructure Strategy) and the US (Bipartisan Infrastructure Deal) (Milne and Turnbull, 2022). For example, EU 2020 strategy which notifies EU economic policy supports sustainable development. Thus, IPE and as part of it EFSI embrace environmental and financial sustainability obligations (Paterson-Jones, 2019: 56). EFSI has become a tool for supporting SDGs over time (Paterson-Jones, 2019: 70). As another example, G20 Initiative evaluate infrastructure investments by considering the criteria of UN SDGs (G20 Indonesia: The Bali Summit, 2022). On the other hand, due to the limited financial resources, increasing demand and ageing facilities, OECD (2021) asserts that efficiency of capital spending and sustainable and resilient infrastructure should be considered to overcome infrastructure gap. Particularly, considering that *“the global infrastructure gap-the difference between infrastructure needs and investment-is anticipated to reach US\$ 15 trillion by 2040”*, financial sustainability of megaprojects has also become another important dimension of these debates (Milne and Turnbull, 2022). As can be seen from the establishment of FAST-Infra Sustainable Infrastructure Label, mobilizing capital into green infrastructure has been a policy goal for some economies.

As the role of infrastructure as an enabler to sustainable development has gained importance, determination of criteria to measure sustainability of infrastructure investments has also become an important issue. In this respect, such questions have aroused as evaluation criteria of sustainability: “what is built or not built” in construction period of projects that effect their sustainability, and “what extent the infrastructure is used” (Sturup and Low, 2019: 8). UN SDG Indicators in goal 9 rely on the assessment of infrastructure project’s contribution to the economic development, employment and gross domestic product in terms of economic sustainability (UN, 2017). On the other hand, in the context of sustainable infrastructure discussions, OECD proposes a life-cycle approach and portfolio approach to infrastructure investment. The former one regards the monetary cost of a project (operation and maintenance costs) and affordability assessment. The latter one considers the management of risks and optimization of return. It is argued that asset management takes into account environmental and social aspects beyond financial and operational performance (OECD, 2021: 16-17).

In applying sustainability evaluation to infrastructure investments in terms of economic considerations, GIH assesses economic participation, in other words, “equal opportunity to access jobs created by infrastructure investments” (particularly improving woman’s access to job opportunities, well-paying jobs), development of skills, safe and healthy occupational conditions in the locations of infrastructure and surrounding communities (GIH, 2019).

Thus, economic aspects of sustainability in infrastructure investments are discussed regarding distribution of project impacts which is ignored in conventional economic analyses (Ward and Skayannis, 2019). In this regard, intergenerational distribution arises as an important component of distributional effects of projects. Intergenerational distribution is assessed with discount rates which is used to express the difference between the present and future cost and benefits of infrastructure projects (van Wee, Tavasszy, 2008: 56). The discount rate has a direct effect for evaluation of outcomes of investment projects. If a high discount rate is determined, which is particularly preferred by private sector for their returns, valuation of future effects of projects would lower. Such an approach would disregard future benefits which occurs in the long-term and is important for future generations, such as effect of reducing global warming. Therefore, in contrast to short-term focus of private sector, public sector considers long-term impacts of projects by setting lower discount rates (Ward and Skayannis, 2019: 38).

In short, sustainability evaluation of infrastructure in terms of economic dimension promotes discussions around such criteria: economic development, employment opportunities (particularly considering gender equality) and intergenerational distribution. The sustainability of an infrastructure project is evaluated based on whether it meets these criteria. However, economically, achievement of sustainable development goals through sustainable infrastructure is a conflictual process when considering these criteria. Therefore, limitations of evaluation criteria will be discussed in the following part.

First, considering the relationship between infrastructure investments and economic development for measuring sustainability, the contradictions of this evaluation can be seen through high costs of building and maintaining infrastructures. Although the costs are tried to be underestimated (Flyvbjerg, 2005: 18), or misestimated due to risks and uncertainty (Nijkamp, Ubbels, 1999: 28), high infrastructure cost is known. As Bhattacharya *et al.* (2012: 13-14) point out, the cost of finance will get higher in the case of higher risks, such as macro-economic risks (inflation, exchange rate fluctuations), political risks (corruption, instability), construction-phase risks (local opposition, changes in construction permits), revenue risks (lower than expected demand, regulating prices in local currency terms). They also remark that in a developing country due to low level technology and low capacity, preparation costs get higher when *including* the design cost and arranging financial support. In this context, considering the limited funds and debt-financed investment in the face of high costs, infrastructure projects may lead to debt burden and economic fragility (Blanche, 2019: 95-96). This makes infrastructure's (particularly mega infrastructure investments') contribution to the economic development and accordingly to sustainable development principles questionable.



Even in the report of workshop held by proponents of mega infrastructure investments, these problems have been clearly articulated. In the report of International Project Management Association Megaprojects Special Interest Group Workshops held in 2015 and 2017, problems of cost overruns and delays, insufficient emphasis on the contribution of megaprojects to community development and concealing the data and information on impacts of megaprojects appear as remarkable limitations of megaprojects development (Radujkovic, Misic, 2019).

Second, there is a conflict between the effort to promote sustainable infrastructure under goal 9 and to achieve other criteria of SDGs. Sturup and Low exemplifies as such (2019: 22): Given the development of infrastructure for palm oil industry in a poor country, although this investment strengthens the economic capacity, which contributes to solving poverty problem defined as priority by the UN, it is not considered sustainable due to being environmentally damaging by the UN. While SDG indicators prioritize solving hunger and poverty problems through infrastructure investments, this goal may collide with goals of environmental conservation. In a similar vein, OECD (2021: 17) remarks trade-offs between policy objectives and resilient infrastructure. For example, designing facilities by considering their adaptation to different climates may increase costs, or hard coastal defenses may harm ecosystems.

Third, the use of cost-benefit analysis (CBA) is problematic in the appraisal of infrastructure projects despite the inclusion of sustainability criteria in decision making process. Although CBA measures overall economic impact of the projects, sustainability criteria require to consider environmental impacts of projects and income distribution in terms of social aspect. However, as Lutz and Munasinghe (1994: 38) emphasize, CBA does not deal with “who the beneficiaries are” or whether benefits are largely delivered to the poor, in other words, disregard the equity problem. On the other hand, measuring environmental cost and benefits are difficult both in physical terms and monetary terms, for example, problems related to monetary valuation of ecosystem services with contingent valuation method, travel cost method, or hedonic pricing method (Uzunyayla, 2017). For example, one problem of contingent valuation method is to estimate value relying on how much monetary value participants attribute to ecological assets, in other words, depending on individual preferences of people (Prugh et al., 1999: 94); or as another example, the problem associated with travel cost method is to estimate value by considering only the access cost to a recreational site, and accordingly, not including other factors that affect the cost (Turner et al., 1994). Therefore, including environmental impacts of projects in CBA has also problems.

In addition to problems in relation to the disregard of equity and inclusion and monetization of environmental impacts, the other weakness of CBA is its sensitiveness to the

assumptions. Jones et al. (2014: 402) emphasize that different assumptions lead to different outcomes, for instance, an error in the assumption of cost estimation, demand forecasting, a non-priced impact, or regional and local impacts may change results from positive to negative. Vickerman (2007: 608-609) remarks that “the *ceteris paribus* assumption will not hold” in applying CBA particularly to large-scale infrastructure projects due to the scale of the project and also the length of the timescale. Moreover, large-scale projects require multiple sources of funding (public or private). Different funders have different targets and interest, that brings the problem of choosing appropriate discount rates in large scale infrastructure projects.

Fourth, as part of cost-benefit analyses the issue of discounting in the context of intergenerational distribution has several problems. As discussed above, discounting is used to compare costs and benefits of a project occurring at different times. Assumption of positive discounting is based on that if money is invested today, it will grow to projected future value. This approach assumes that there will be an indefinite economic growth and argues that technology can substitute for exhaustible natural resources, so making them less valuable in the future. On the contrary, critics underline that such an approach disregards not only economic decline but also natural resource depletion. Considering these two points, critics argue that each unit of economic output may generate greater future benefits relative to present. In addition, benefits of resources may also be higher due to resource scarcity in the future. Technological development may increase the use of new resources and accordingly their scarcity. Therefore, marginal utility of resources will increase (Rees *et al.*, 2007: 231-232; Ward and Skayannis, 2019: 38). Drawing on these arguments, they support a negative discount rate. Another criticism against supporters of discounting relies on time preference which means that people prefer the benefit of the present over the future because of being mortal, greedy and impatient. Considering the longer life span and less uncertainty of society than individuals, there will be difference between social decisions and individual decisions. Therefore, society will determine lower discount rates than individuals for intergenerational distribution (Lutz, Munasinghe, 1994: 40; Rees *et al.*, 2007: 232).

Overall, as discussed above, the risk of raising economic fragility due to the high costs of projects, the conflicts between the SDG targets, the use of CBA which has drawbacks to include social and environmental costs of projects and also the problems related to measuring outcomes of projects in terms of intergenerational distribution are the problems that arise in the evaluation of infrastructure projects in terms of economic sustainability. In the light of these criticisms, it can be argued that these problems lead to questioning the possibility of building sustainable infrastructures under the SDG targets.

### **3. Environmental Dimension of Sustainability in Infrastructure Projects and Limitations of Criteria in Environmental Evaluation**

Mega infrastructure investments carry environmental costs in their construction and production process like emitting greenhouse gases, changing land uses, generating waste (Sturup and Low, 2019: 17). Therefore, environmental sustainability issue has been included to project development and implementation processes by determining some criteria through discussion and reports of international organizations or multilateral initiatives. In this context, adopting clean and environmental technologies and increasing resource-use efficiency by 2030 appear as environmental criteria for building sustainable and resilient infrastructure according to the UN SDG Indicators (UN, 2017). In addition to these criteria, conservation of cultural heritage, sustainable consumption and production, reduction of waste and environmental degradation (such as, mitigation of climate change, limitation of carbon emissions) have appeared as other environmental visions and guidelines for evaluation of environmental sustainability of infrastructural projects (Ward and Skayannis, 2019: 36). Another perspective on the evaluation of environmental sustainability of mega infrastructure projects propose to consider how the project comply with provisions of international environmental agreements such as the Paris Agreement on Climate Change or the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (Sturup and Low, 2019: 21). Infrastructure investments from this point of view should display how they meet environmental goals of these accords such as increasing the use of renewable energy or mitigating climate change.

Beside alignment of infrastructure policies to SDG targets and environmental commitments, while GIH propose to consider ecosystem-based adaptation, use of green finance instruments and transparency in environmental impacts of entire process of infrastructure investments as environmental considerations (GIH, 2019), OECD draws attention to the integration of Nature-based solutions (NbS) in infrastructure policies and investments, which is defined as the protection and management of ecosystem that lead to production of ecosystem services (OECD, 2021: 20). OECD suggest that as diverse services are produced through NbS, they contribute to resilient and sustainable infrastructures. An example would be the expansion of urban green space which contributes to urban infrastructure resilience by reducing flood risk or impact of climatic factors (OECD, 2021: 50).

While OECD proposes NbS for building sustainable infrastructures, at the same time, it points out challenges for implementation of NbS which arise from its different characteristics from traditional infrastructure investments. For example, timeframe differences in developing and delivering benefits between grey infrastructure and NbS; differences in cost-benefit as-

assessments, such as not including environmental and economic benefits generated by NbS into traditional infrastructure investments; differences in operation, ownership and responsibility, such as requirement of support of citizens and landowners in NbS and a direct responsibility of service provider in grey infrastructure; the inconsistency between short and medium term return expectations of investors and non-tradable co-benefits of NbS which are accessible in the long-term; and lastly, the difference in monitoring between NbS and traditional infrastructure (OECD, 2021: 52-53). Although OECD explains the challenges related to some differences of NbS from traditional infrastructures, there is an inherent conflict between the aim of NbS and traditional infrastructure development, namely, a conflict which arise from differences between characteristics of capitalist development and natural cycles.

This contradiction arises from characteristic of capitalist development. Such characteristics of capitalist relations, the production of surplus value, speeding up capital accumulation and expansionary tendency in space are incompatible with natural time regime: Firstly, the impossibility of stationary capitalism<sup>2</sup>, in other words, the mantra of capitalist development which relies on the aim of promoting accumulation and generating profit is not ecologically sustainable due to requiring the use of energy and raw materials on an increasing scale, which put pressures on resources and absorbing capacity of ecosystems (sinks) (Foster, 2002: 75; Magdoff and Foster, 2011: 38). The other dimension of the process of capitalist production is the increase in entropy which results from the transformation of matter and energy. In capitalist development, the production of use value leads to production of waste. According to the law of entropy, *“it is impossible to transform 100% of energy-input and matter into products designed for the satisfaction of human needs”*, that leads to increasement of entropy which undermines the natural self-production (Altvater, 2004: 20). Hence, while *“capital is following a logic of reversibility and circularity”* due to appropriating surplus through new investments, *“natural processes of transformation of material and energy as well as the natural growth process of living beings like plants and animals are characterized by irreversibility”* (Altvater, 2004: 19). This brings to light an inherent contradiction between the development of nature and capitalist development. Secondly, the logic of the process of capitalist accumulation depends on acceleration of time (Altvater, 2004: 18). However, this logic has a contradictory relationship with time required for the natural conditions of production (energy, waste and raw materials). Therefore, *“the conflict between capitalist turnover and the replenishment and restoration of natural resources is further evidence of capitalism’s inherent non-sustainability”* (Williams, 2010: 209). Thirdly, the other dynamic of capitalist development is

2 It refers to “stationary state” in which capitalist economy will conclude “with little or no growth in population or output” (Foster, 2002: 77).

its expansionary tendency in space. The growing need for raw material for the surplus value production leads to spatial expansion of production which results in increasing the scale of environmental degradation and subjecting natural world to dictate of capital on a larger scale (Clark and York, 2008: 16-18, Altvater, 2004). The conflict between these characteristics of capitalist development and ecology enables us to grasp why it is unlikely to integrate NbS to traditional infrastructure investments. Traditional infrastructures have been developed for profit-making under the logic of capital accumulation. To achieve this goal, time is important in two aspects. On the one hand, it is due to the fact that infrastructure developers and investors would like to reach profit expectations in the short or medium period, that is, to increase the velocity of the circulation of capital. On the other hand, the rapid construction of infrastructures enables to shorten turnover time of capital to the extent that it improves transportation opportunities. In particular, considering the capitalist spatial expansion, the factor of rapidity in infrastructure investments gains importance on a world scale. However, solutions based on the self-renewal capacity of ecosystems, such as NbS, do not comply with the requirement of rapid infrastructure investments, which makes impossible to integrate them into traditional infrastructures under capitalist forms of production.

The other major issues related to environmental evaluation are problems arising from the use of environmental impact assessment (EIA). An important problem is at what stage of the infrastructure project the EIA is made. At the early stages of EIA process before proposing a project, there are problems in the selection of alternatives, namely, in the choice of means to achieve environmental goals. These problems can be as follows: narrow definition of the project's purpose (e.g., proposing a highway link for additional capacity between two highways only with a narrow consideration of different alignments of the highway instead of proposing a rail line); prioritizing project's objectives over alternatives, in other words, identifying the problem to justify the solution (e.g., proposing to construct a new reservoir for projected water demands instead of supplying water from neighboring areas or promoting water conservation); developing alternatives by focusing on symptoms instead of sources; dependency of alternative development to agencies' agenda (e.g., selecting alternatives used in past instead of developing more environmentally friendly alternatives, and accordingly, preventing questioning previous decisions and saving time); arbitrariness of screening criteria and evaluations which are determined by considering cost-effectiveness instead of more environmentally suitable alternatives (e.g., elimination of air quality criterion in the choice of alternatives between a highway or other transit systems in the initial phase of the EIA process, but identifying air quality impact between final set of highways alternatives after the elimination of more environmental friendly solutions); and lastly, developing alternatives too late

in the planning process (e.g., making an EIA for a highway project after the appropriation of land for the highway, which prevents designing new alternatives) (Steinemann, 2001: 10-17). Moreover, when EIA is carried out after the design of project, which is the most frequently used form, the cancellation of the project becomes difficult due to high political costs (Ward and Skayannis, 2019: 34). Overall, as Steinemann (2001: 14) emphasizes such an EIA process “*diminishes EIA’s ability to examine tradeoffs among genuine alternatives*”, and accordingly, disregards public values and more environmentally friendly approaches.

Another weakness of EIA stems from limited or no public involvement such as limited access to information or legal advice, poor information about planning or legal licensing issues, and deficiencies in participation in the decision-making process (Morgan, 2012: 9). EIA process places public participation after the design of alternatives by the agency, which is too late to affect decisions and to propose new alternatives, and also, ends public participation too soon which prevents public to involve monitoring process (Steinemann, 2001: 9). Therefore, EIA does not provide collaborative participation due to the power relations in the decision-making process.

In addition, other limitation of EIA comes from not including cumulative effects of projects in practice or assessing them insufficiently although referring them in EIA processes (Gunn and Noble, 2011; Morgan, 2012). Cumulative effect assessment is defined as specifying cumulative environmental change and interaction between stressors in the spatial and temporal environment of project. Challenges in integrating cumulative effect assessment to EIA are identified as follows: disagreement on the definition of cumulative effects (e.g., defining poorly or too general); aggregating environmental effects which is a view depending on dividing problem into parts and dealing with them individually; and lastly, lack of perception of ecological systems as interconnected systems, which lead to analyze cumulative effects in the project-specific dimension by disregarding interaction between regional, national and global environmental dynamics (Gunn and Noble, 2011: 155-157).

These criticisms to EIA show that although an environmental assessment is made in line with the sustainable development goals during the design and implementation processes in infrastructure investments, the goal of the project takes precedence over the environmental goals. This leads us to another discussion which relies on the difference between sustainable development and environmental sustainability. While sustainable development deals with combining economic concerns with environmental concerns (Hopwood et.al., 2005), environmental sustainability focuses on the maintenance of fundamental environmental services, such as source and sink functions (Goodland and Daly, 1996). Related to this point, the former one

is seen as an anthropocentric view that concentrates on economic prosperity considering the limits of natural resources, the latter one is seen as a broader perspective that gives importance to species as a whole and considers global and long-term effects of human activities on natural environment (Sturup and Low, 2019: 14). Therefore, applying sustainability evaluation to infrastructure may not make the projects more environmentally friendly because sustainable development goals may prioritize economic concerns compared to environmental concerns and weaknesses of environmental assessment that discussed above does not allow an adequate evaluation.

#### **4. Social Dimension of Sustainability in Infrastructure Projects and Limitations of Criteria in Social Evaluation**

In addition to economic and environmental aspects, United Nations SDG Indicators focuses on the social aspect as a criterion for evaluating the sustainability of infrastructural projects. This dimension focuses on social problems which arise from transformation in local environmental conditions and appearance of environmental injustice in the built and operation process of infrastructure projects. On this basis, by focusing on unequal consequences of projects, this criterion is based on the promotion of human wellbeing and the accessibility and affordability of infrastructure projects for all (UN, 2017). That is, reducing human inequality which is inherent to sustainable development approach becomes one of the fundamental principles of evaluation of sustainability of infrastructures.

Ward and Skayannis (2019: 40) summarize social policy guidelines for sustainable development in mega infrastructure investments as follows: social justice, socially inclusive communities, public participation, transparency in decision making processes and inter-generational equity. In this respect, the question “how, by whom (...) the infrastructure is used” comes into view for exploring social aspect of sustainability (Sturup and Low, 2019: 8). In parallel, GIH regards non-discriminatory access to infrastructure services, inclusive decision-making with affected communities, respecting human rights and needs of people (particularly, displaced communities, indigenous groups, marginalized populations, etc.) as social considerations in infrastructure investments (GIH, 2019).

As part of sustainable development goals, social dimension of projects is evaluated using social impact assessment (SIA). The main concern of SIA is to determine distribution of social impacts on different segments of society, in particular, on vulnerable groups, as well as, to empower disadvantaged groups and to reduce poverty and unequal relations in society (Vanclay, 2003: 3). Although SIA is seen as monitoring and mitigating adverse impacts, it has both



procedural and methodological problems. Burdge and Vanclay point out them as difficulties in advancing conceptual framework and effective measurement for assessing relationships between variables; difficulties in data collection which leads to make projections with insufficient information and not to conduct validity check; difficulties in documenting and evaluating social impacts due to the multiplicity and complexity of methodologies; problems with doing SIAs with unqualified consultants (people not knowing social science methodology or economic theory); problems with not checking reliability and validity of SIA reports by agencies and corporations; problems with not publishing SIA reports due to commercial secrecy concerns or publishing them without giving detail to assess validity of claims and methods used; problems with seeing SIA as a single event rather than a process in which mitigation measures are developed and planning is governed; problems with not addressing cumulative impacts due to SIA's project-based comprehension; problems with not considering results of SIAs and taking mitigation measures in a serious manner even though SIA exists as a statutory requirement in some countries (Burdge and Vanclay, 1996: 66-68). Howitt adds neutrality issue of SIA to these problems. He states that although SIA is considered as neutral technical advice to government agencies, the state is not neutral while functioning to promote capital accumulation. Through its legitimization function, although the state redirects some benefits to local groups, it prioritizes the goal of capital accumulation. Hence, *"apparently 'neutral' SIA effectively promotes corporate rather than community interest"* (1989: 159). As a result, although SIA is used to illustrate and evaluate unequal consequences of social change in the society in line with sustainable development goal, its procedural and methodological problems prevent an effective measurement. Like problems in incorporating environmental issues through EIAs, involving social issues through SIAs in infrastructure projects faces challenges under the capitalist relations of production.

## 5. Sustainability and Türkiye's Large-Scale Infrastructure Projects

Parallel to the revival of debates on the contribution of infrastructure investments to economic growth on a world scale, infrastructure development, particularly by initiating mega scale projects, has become one of the key driving forces in economic growth in Türkiye in the 2000s, and the construction of many infrastructure projects has begun. Although international organizations, multilateral initiatives and advanced capitalist economies have added the sustainability dimension to the agenda of their infrastructure discussions, it is questionable at what level sustainability debates have been included in infrastructure investments in Türkiye. In order to answer this question, in this section, it will be discussed whether economic sustainability evaluation is applied in the construction and operation of large-scale infrastruc-



ture investments in Türkiye, by considering the economic criteria used in the assessment of sustainability of infrastructures under SDG targets. Although the evaluation of economic sustainability contains many problems as discussed in the previous section, it will be investigated whether or to what extent even this problematic evaluation is met.

### 5.1. Evaluation of Economic Sustainability of Türkiye's Large-Scale Infrastructure Projects

The sustainability of large-scale infrastructure projects in Türkiye will be evaluated in terms of economic sustainability criteria, such as infrastructures' impact on economic development, employment opportunities or intergenerational distribution. This research will be carried out within the scope of projects built in the 2000s, when large-scale infrastructure projects have become a stimulus in the Turkish economy.

In the context of economic development, Türkiye's large-scale projects are very controversial due to their impact on budget. We can analyze these infrastructure investments by categorizing them as airports, bridges and highways. Considering the airports built with the public-private partnership models, for the construction and operation of the Zafer Airport in Kütahya in 2012, the government guaranteed that 850.000 passengers would use the airport, to be increased from year to year. In 2021, while it was guaranteed that there would be a total of 1,317,000 domestic and international airline passengers, the number of passengers was at the level of 11,196. This gap was 1,292,882 passengers in 2022. Hence, while the government paid 60 million 821 thousand Euros to the construction company in the period between 2012-2023 (January-February), this is expected to reach 208 million Euros until 2044, which is the year will be owned by the state (Sağkal, 2022; Ayhan 2023; sendika.org., Zafer Havalimanı Zarar Yazmaya Devam Ediyor, 2023). For airports built with public-private partnership models, the General Directorate of State Airports Authority (DHMİ) paid companies 42 million dollars in 2015; 47.4 million dollars in 2016; 60 million dollars in 2017; 65 million dollars in 2018; 133 million dollars in 2019; 172 million dollars in 2020; 172.6 million dollars in 2021 (Bıldırcın, 2022). For the six highway constructions<sup>3</sup> made with public-private partnership models, according to the report of Turkish Court of Accounts in 2020, the government guaranteed to pay 24 billion 871 million dollars and 2 billion 988 million Euros to the construction companies regardless of whether they are used or not (borsamanset.com, Dolar üzerinden garanti geçiş verilen köprüler için şok rakamlar, 2021). This fact is also similar for bridges built

3 These are the Gebze-Orhangazi-Izmir Highway, Odayeri-Paşaköy Section of the North Marmara Motorway, Kurtköy-Akyazı Section of the North Marmara Motorway, Kınalı-Odayeri Section of the North Marmara Motorway, İzmir Menemen-Alağa-Çandarlı Highway and Ankara-Niğde Highway.

with public-private partnership models. For instance, for Osmangazi Bridge, the government paid about 6 million TL to construction companies between the years of 2016 and 2019 due to the weak demand (Aslan, 2020: 82). As another example, for 1915 Çanakkale Bridge, government paid 256 million 50 thousand Euros due to weak demand in 2022. While 16 million 425 thousand vehicles were guaranteed to pass, only 2 million 200 thousand vehicles used the bridge (yenicaggazetesi.com.tr., Çanakkale Köprüsü'ndeki büyük zarara bakanlıktan akla ziyan savunma, 2023). Consequently, the debt burden on the state budget created by these infrastructure investments (bridges, highways, airports) which are made with the PPP models, makes these investments' contribution to economic development doubtful, and accordingly, it may be argued that these investments do not meet the economic sustainability criteria.

The fact that not only investments built with the PPP model, but also other infrastructure investments are made with a capacity far above the need, leads to questioning of them in terms of sustainability criteria. For example, according to the data of DHMİ, only 371 thousand 373 passengers used the Rize-Artvin airport, which was built with a passenger capacity of 3 million, between May and October 2002; only 61 thousand 629 passengers used Tokat Airport, which was built with a passenger capacity of 2 million, between March and October 2022 (birgun.net, Havalimanlarında kuş bile uçmadı, 2022). In addition to the airport investment that were built with a capacity far above the need, there are also airports that are never used. For example, Balıkesir Merkez Havalimanı, which was built with a budget of 76 million 521 thousand Turkish Liras, was completed in February 2020. However, no aircraft landed at the airport for 18 months after it was put into service (birgun.net, 76 Milyon TL'ye yapılan Balıkesir Merkez Havalimanı'na 18 ayda uçak inmedi, 2021). Although the electricity was used and approximately 100 personnel continued to work, the airport was not used for the next 6 months. Moreover, for the unused airport, while the Ministry of Transport and Infrastructure announced a tender for 1 million 150 thousand kW of electricity, DHMİ announced a tender for cleaning landing field which was covered with weed (İnmez, 2022). Therefore, it becomes questionable how these infrastructure investments, which are built with large budgets but have a very low utilization rates, will contribute to economic development, which is one of the economic sustainability criteria. It is unlikely to say that these infrastructure investments were made considering economic sustainability.

Considering the growing debt burden aroused from these infrastructure investments on the state budget, the sustainability of these infrastructures is also opened to question in terms of intergenerational distribution which is another economic sustainability principle. Infrastructure investments within the scope of the PPP are made with long-term contracts, and the

government gives a usage guarantee and a tariff guarantee, in other words, revenue guarantees to the companies during the contract period. To give a few examples for operation periods by private companies and usage guarantee given by the government: For Osmangazi Bridge, it is 15 years 7 months with a daily usage guarantee of 40.000 vehicles; for Çanakkale Bridge, it is 16 years 2 months with a daily usage guarantee of 45.000 vehicles; for North Marmara Motorway (Kınalı-Odayeri section and Kurtköy-Akyazı section), it is 6 years 9 months and 12 Days with a daily usage guarantee of 135,000 vehicles; for Ankara-Niğde Highway, it is 15 year 4 month with different usage guarantees in different sections of the highway; for Aydın-Denizli Highway, it is 17 years with a daily usage guarantee of 35,000 vehicles for Aydın-Kuyucak section and 32,000 vehicles for Kuyucak-Denizli section (Ekinci, 2021). Accordingly, when comparing usage guarantees with actual usage rates, the increase in government's debt obligations will be appeared due to the weak demand. Furthermore, considering the contract periods, it can be argued that these debt obligations are also future obligations. Therefore, not only current generations but also future generations will be affected by these obligations. Moreover, government guarantees are given in foreign currency. For example, the toll of 35 dollar plus VAT (value added tax) per auto in Osmangazi Bridge, the toll of 15 Euro plus VAT per auto in Çanakkale Bridge, the toll of 5 Euro per auto in Ankara-Niğde Highway, the toll of 5 Euro per auto in Aydın-Denizli Highway. This means that a foreign currency debt will be left to future generations. Hence, it may be argued that infrastructure investments may not meet economic sustainability criteria in terms of intergenerational distribution.

Another criterion for evaluation of economic sustainability is infrastructure projects' contribution to the employment opportunities. When Türkiye's large-scale infrastructure investments are examined in 2000s, it will be seen that employment opportunities expected to be created are quite limited. It also should be stated that temporary jobs are created by the projects especially during the construction phase of the projects. For example, according to the Environmental and Social Impact Assessment (ESIA) Report of North Marmara Motorway, it is stated that project will bring direct and indirect temporary employment opportunities. While direct temporary jobs will arise in the construction phase of project, indirect temporary ones will be related to the supply chains (goods and services) of the project (Kuzey Marmara Otoyol Projesi ÇSED Raporu, 2018). After the project (Kınalı-Akyazı section) is completed, Eyüp Vural Aydın who is head of İstanbul Public-Private Partnership Center of Excellence stated that 25,000 people were employed during the construction of project and 700 people were employed for operation and maintenance phase of project (Durdak, 2021). Therefore, it can be said that the project created mostly temporary employment compared to a permanent

employment of 700 people. In Eurasia Tunnel Project, according to the explanations of Eyüp Vural Aslan, more than 12,000 people were worked in the construction phase and 200 people were employed for operation phase. In Yavuz Sultan Selim Bridge Project, he stated that 10,000 people in the construction phase, 600 people in operation and maintenance phase and also 400 people in recreational areas were employed (Durdak, 2021). Accordingly, it is also seen that employments are mostly temporary in these mega infrastructure projects. Among the large-scale infrastructure projects, Istanbul Airport is shown as a project with a high contribution to employment. According to Adil Karaismailoğlu, minister of Transportation and Infrastructure, 972,000 people are employed at İstanbul Airport ([turkiyegazetesi.com.tr](http://turkiyegazetesi.com.tr), İstanbul Havalimanı'ndan Türkiye ekonomisine dev katkı, 2022). However, considering that Istanbul Airport became operational as a result of the closure of Atatürk Airport, the level of this contribution becomes questionable. It should also be noted that although 183,585 people were employed during the construction phase of the project (Durdak, 2021), this is a form of temporary employment. As a result, it can be said that the contribution of the projects to employment is mostly temporary compared to permanent jobs and therefore does not meet the economic sustainability criteria in terms of employment.

## **5.2. Evaluation of Environmental Sustainability of Türkiye's Large-Scale Infrastructure Projects**

It was previously discussed that the pursue of the environmental sustainability criteria within the scope of SDG targets in infrastructure investments leads to a contradictory process under capitalist relations of productions and that the evaluation criteria contain various problems. However, in order to evaluate environmental sustainability in the construction of infrastructure investments, various criteria have been determined and assessments have begun to be made around these criteria. In this respect, beyond the discussion of whether such an evaluation can be made within capitalist production relations, which is briefly discussed above, in this section, it will be discussed whether environmental sustainability criteria are included in the agenda of Türkiye's infrastructure investments. This assessment will be made in terms of environmental impacts of Türkiye's large-scale infrastructure investments by taking forests, water and air as analytical points.

In this regard, first of all, when considering projects' impact on forests, which have a key role for environmental sustainability due to mitigating climate change, it can be argued that large-scale infrastructure projects have caused forests damage which makes them questionable in terms of sustainability. For example, according to ESIA report of North Marmara Motorway Asia part, a study corridor of 9,068 hectares and 400 meters wide has been determined

to assess the impacts of the Project on land use. Report shows that 28.1% (2,552 hectares) of the entire study corridor is covered with forests (Kuzey Marmara Otoyol Projesi Nihai ÇSED Raporu, 2018). On the other hand, ESIA report of European part of motorway project announces that the study corridor consists of an area of 4,021 hectares (except tunnels and viaducts), of which 666.5 hectares (16,5%) are forest areas (North Marmara Motorway Project ESIA Report, 2018). In this respect, Northern Forest Defence (Kuzey Ormanları Savunması), which is a movement founded in July 2013 to protect forest lands, farmlands and watersheds, states that 3.7 million trees within the project area is destroyed until the year 2019 (Kuzey Ormanları Savunması, 2019). As another example, the İstanbul Airport which covers an area of 7,650 hectares, is located on a forest area of 6,172 hectares according to the ESIA report of airport (2015: 21). According to the first EIA report dated March 2013, there exist 2,513,341 trees in the project area (Northern Forest Defense, 2015: 18). However, Northern Forests Defense stated that at least 8 million trees were cut down, which is a much higher number of trees mentioned in the EIA report, between 2012 and 2019 by analyzing the satellite images of the airport (Kuzey Ormanları Savunması, 2019). In this respect, it is remarkable that the ESIA report states that the issues of climate change and carbon management is not considered (İstanbul New Airport ESIA report, 2015: 22). Another striking example is Yavuz Sultan Selim Bridge (namely, 3<sup>rd</sup> Bridge) which is in a route of *“34% of the private forests, 46% of the forest areas, 38% of the 2B areas and 43% of the agricultural areas”* (UCTEA Chamber of Urban Planners İstanbul Branch, 2010: 29). Chamber of Urban Planners has predicted in the evaluation report that *“more 2.5 million trees and 1453 hectares of forest areas that will be directly affected and entirely demolished”* when the bridge and its approach roads are constructed (2010: 29). However, there are different explanations for how many trees were cut down after the bridge was completed. According to Ahmet Arslan who is the minister of Transport, Maritime Affairs and Communications (this ministry was later changed to the Ministry of Transport and Infrastructure), 381,000 trees were cut down or removed (birgun.net, Bakan Arslan: 3. Köprü ve 3. Havalimanı için 9 milyon ağaç dikilecek, 2016). However, Green Party (Yeşiller Partisi) Campaign Director Serkan Köybaşı argued that 896,780 trees were cut down (cumhuriyet.com.tr, 896 bin 780 ağaç kesildi, daha da kesilecek, 2010) and, geodesy and photogrammetry engineer Mustafa Onur Girişken claimed that approximately 2175 hectares of forest area has been destroyed according to research based on satellite photo taken in December 2016. Girişken underlined that this amount is three times higher than the amount predicted in the ESIA report of the 3rd Bridge within the scope of the North Marmara Motorway Project in 2013 (Gümüşkaya, 2017). While large-scale projects lead to deforestation, they also cause to the loss of oxygen generation capacity and carbon capture capacity

even stated in projects' ESIA reports. Therefore, it can be said that the projects are not built in accordance with environmental sustainability criteria. However, it is claimed that the loss of forests will be compensated through the afforestation programs and transportation of trees in ESIA reports. Whereas Northern Forest Defense (2015: 19) drawing on explanations of experts remarks that such a solution would not be feasible because of not generating a unified ecosystem with its wildlife, endemic plants, etc. Furthermore, they also point out that even EIA reports state the impossibility of transportation of trees, by giving such an example: In the first EIA prepared for the 3rd airport, it was clearly stated that *"it is not possible for all the trees in the area to be transported"*, however, this expression was removed in the subsequent EIA reports and a softer expression was used (Northern Forest Defense, 2015: 26-27).

When considering projects' impact on water, it can be said that there is a danger of deterioration of the wetland areas and contamination of groundwater in the projects' areas of Türkiye. These risks are specified in the EIA reports as follows: The Asian and European ESIA reports of North Marmara Motorway Projects (2018) state the risk of generation of wastewater which may include toxic materials, heavy metals, etc. in the construction phase of project, the contamination risk of storm water which may carry away pollutants, the risk of discharging hazardous substance to surface water, the change of hydrological regime because of affecting beds and banks of rivers, the risk of contaminating aquifers due to "leakages from construction sites and refueling vehicles" or "accidental discharges of hazardous materials", the risk of dewatering in ground water due to the deep excavation, the risk of flood due to increase in impermeable surface aroused from the structure of motorway, bridges and culverts (North Marmara Motorway Project European Part ESIA report, 2018; Kuzey Marmara Otoyol Projesi Asya Kısmı ÇSED Raporu, 2018). In the Çanakkale Bridge ESIA report, the significant impacts of the project on water were analyzed by dividing them into different categories, namely the impacts on surface waters, groundwater and floods, and the impacts listed for the North Marmara Motorway are listed here as well. Although it is emphasized that these effects on water are important, it has been argued that these effects are expected to become insignificant after the necessary measures are taken (Çanakkale Köprüsü ÇSED Raporu, 2018: 176-198). It is seen that similar effects on water (practices that risk polluting groundwater and surface water) are also listed in the ESIA report of İstanbul Airport project and ESIA report of Eurasia Tunnel project (İstanbul New Airport ESIA Report, 2015: 44-51; Eurasia Tunnel Project EIA Report, 2011: 23). Although some measures to reduce these effects are mentioned in ESIA reports, experts underline the danger on water resources. For example, when considering the 3<sup>rd</sup> Airport EIA report, experts find insufficient the measures proposed in the report.

UCTEA Chamber of Geological Engineers İstanbul Branch points out that the statements in the EIA report that measures will be taken when faced with inconveniences are meaningless. Because it is not possible to take measures later for areas whose topographic structure has been deteriorated and ecological structure has been destroyed. The 3<sup>rd</sup> Airport, as a result of increasing concrete and impermeable surface in the northern forests, will irreversibly damage the aquifer systems (consists of sedimentary rocks which have a fractured and cracked nature) and destroy humus topsoil zones, and accordingly will prevent groundwater to be fed and cause them to dry out (TMMOB Jeoloji Mühendisleri Odası, 2014). Besides geological engineers, environmental engineers also remark that although problems were stated in the EIA report, no technical explanations were made about the solutions. However, there is a danger of extinction of water sources. 3<sup>rd</sup> Airport would affect the Terkos Lake, which is one of the significant drinking water sources of İstanbul, because of the dust and exhaust emissions, destructing of beds of rivers, disconnecting of two streams with lake and accordingly affecting Terkos stream flow routes (TMMOB Çevre Mühendisleri Odası İstanbul Şubesi, 2014: 20). In addition, as pointed out by Union of Chambers of Turkish Engineers and Architects, 3<sup>rd</sup> Airport project would lead to increase population density which in turn will cause to increase pollution in water basin in İstanbul (TMMOB İstanbul İl Koordinasyon Kurulu, 2014: 8). Overall, considering the reports prepared by experts on water pollution, it can be said that large-scale infrastructure projects will create significant effects on water basins, contrary to the measures specified in the EIA reports, and therefore these projects cannot meet the environmental sustainability criteria in terms of water sources.

As another environmental aspect of large-scale infrastructure projects, their effect on air is significant for evaluation of sustainability. In the EIA report of the 3<sup>rd</sup> Airport, it is surprisingly stated that air quality modeling was done, but when this was done, the project was at the “reference master plan stage” and therefore new air quality modeling should be done for both the construction and operation phases (İstanbul New Airport ESIA Report, 2015: 21). In other words, the effects of the project on air quality are not clearly revealed. On the other hand, the ESIA reports of North Marmara Motorway Project explicitly state that motorway project will lead to loss of carbon capture capacity due to the destruction of forests: *“According to the assessment, approximately %1,35 of the total carbon capture and oxygen generation capacities will be lost in the forests of District and Sub-District Directorates of Forestry”* (North Marmara Motorway Project ESIA Report, 2018, Annex 4: 8). One of the important effects of large-scale infrastructure projects on air quality is that they will cause regional climate change. For example, projects made or planned to be built in the northern forests of İstanbul will cre-



ate an “urban heat island” as a result of both changing land use (new housing projects, new industries, new concrete areas) and destroying forests that provide clean air. This means “*that Istanbul will be more frequently exposed to unfavorable weather conditions*”, such as flood disasters, hailstorms, etc. (Northern Forest Defense, 2015, 36). Therefore, these large-scale infrastructure project projects are also problematic in meeting environmental sustainability criteria in terms of air quality.

When the EIA reports are examined, it will be seen that the impacts of large-scale infrastructure projects are not limited to forests, wetlands and air, but also have effects ranging from pastures to agricultural areas and biodiversity. Thus, they have a larger-extent ecological consequence which makes them problematic in terms of environmental sustainability. In addition, other striking examples showing that the necessary importance is not given to the environmental sustainability criteria in infrastructure investments in Türkiye are the exemption of some projects from the EIA process or the initiation of projects before the decision of “EIA positive” is created. A striking example in this regard is the Osmangazi Bridge, which was exempt from EIA process. Other examples of poor EIA process were the start of construction 3<sup>rd</sup> Bridge before the decision EIA positive, or EIA exemption of the North Marmara Motorway first, but after bringing a lawsuit, the start of EIA process for the motorway project.

### **5.3. Evaluation of Social Aspect of Sustainability in Türkiye’s Large-Scale Infrastructure Projects**

Social dimension of infrastructure projects, as discussed above, is evaluated in terms of access of infrastructure projects, respect to human rights, public participation in decision making process, etc. Although this evaluation has many problems, in this part, it will be examined whether the social dimension of sustainability is taken into consideration in the built of the infrastructure projects in Türkiye.

In this respect, first, the importance given to public participation in projects as a social sustainability criterion will be examined through examples. As a first example, public participation in the decision-making process of Çanakkale Bridge will be discussed. In stakeholder engagement activities of Çanakkale Bridge, the following problems were mentioned in 2016 consultation activities and as part of the ESIA process in May and June 2017: the loss of agricultural land which will cause farmers to lose their livelihoods and accordingly migration; the lack of new fertile farmlands to compensate the loss in the area; travelling longer distances to reach lands due to the change of routes to the farm lands; the concern of sufficient payment for lands in the expropriation process; the project’s impact on fish migration routes, which



in turn affects fishing, which is an important source of livelihood in the region; the project's impact on nature and urbanization; the information vagueness such as disposal of excavation material; not giving enough information to NGOs about the project; or people of Çanakkale's information about the bridge in informal ways (Çanakkale Köprüsü ÇSED Raporu, 2018: 110-113). In the subsequent ESIA process, a field survey was conducted between 6-17 July 2017 with village headmen, farmers, fishermen, young and seasonal workers, local woman, particularly focusing on vulnerable people. Similar problems stated in the previous stakeholder engagement activities were submitted by the participants. For example, few information about the route of project; defining the biggest problems as the loss of agricultural land and the value for expropriated parts because "all 27 rural communities (excluding Lapseki and Gelibolu) depend on agriculture and husbandry for their livelihoods"; expropriation of the most productive lands; the concern for the region to resemble İstanbul, which means to increased urbanization; the risk of increasing tourism facilitates, housing and of filling coastal areas with properties for rich people as the transportation to İstanbul becomes easier, the increase in property values (Çanakkale Köprüsü ÇSED Raporu, 2018: 113-115). When compared with problems, it is seen that the expectations of the participants from the project are quite low in this survey. A striking point is that while the ESIA process of the bridge continue and public concerns remain as stated in stakeholder engagement activities, the tendering phase of the project was completed on January 6, 2017, and the foundation of the bridge was laid on March 18, 2017. Therefore, the problems of the public were identified in the ESIA, but the construction of the bridge was started without giving clear information on how to find solutions to their concerns. For example, for the problem of increased urbanization, the ESIA report states that it is a moderate impact and "no mitigation can be defined for this impact at project level" (2018: 293). While the participants in the survey talked about the problems that the ease of transportation to Istanbul would bring, the report says that this will provide economic development and evaluates it as a positive impact (2018: 293). For the problem of reduced access to farmlands, it is proposed that complaints will be recorded, and a solution will be created depending on the complaint (2018: 297). While the problem of displacement and effects of the bridge on livelihoods is seen as the biggest problem for participants, the report labels them as moderate impacts and states that after the mitigation measures, their residual impact will be minor. As mitigation measures, only information on the expropriation process is given, and no recommendations or solutions are offered for loss of local livelihoods (2018: 303-304). Although it was stated in the impact assessment that livestock activities, another important livelihood of the local people, would be significantly affected, as a solution, it has been proposed to provide access to separated pasturelands only by constructing underpasses, culverts and over bridges.

However, this solution has been expressed with conditional expressions instead of using a definite one, such as “feasible solutions will be developed and implemented, where possible” or “additional passageways that will be requested by local communities will be considered by COK A.S. if feasible and subject to KGM approval for design revision” (Çanakkale Köprüsü ÇSED Raporu, 2018: 305-306). In fact, the adequacy of the measures specified in the ESIA can also be questioned through the following statements in the report (2018: 285):

*It should be noted that there are a number of aspects of the Project that are unknown at this stage and that influences the magnitude of impacts to infrastructure and utilities. This includes the road network that will be used to transport project equipment, personnel and material to the construction areas, temporary traffic management (i.e. road diversions, road closures, etc.), and site drainage and waste management. The location of access roads and traffic counts are also not known at the time of writing.*

Although mitigation measures are included in the report, their adequacy and clarity are controversial as explained above examples. This displays the inadequacy of sustainability of the project in terms of social aspect. The loss of agricultural lands after the construction of the bridge is over, which strikingly demonstrates this inadequacy. Although ESIA report of bridge (2018: 307) states that “impacts to agricultural and pasture lands will be minimized as far as possible by keeping the Project construction footprint as narrow as possible”, according to UCTEA Chamber of Environmental Engineers Istanbul Branch Water and Waste Water Commission Chairman President Selahattin Beyaz, approximately 5,000 hectares of agricultural land was expropriated in the villages of Çanakkale, Lapseki and Gallipoli, and also 500,000 trees were cut down and many aquatic systems have been destroyed for the Çanakkale Bridge (evrensel.net, Çanakkale Köprüsü: Ranta köprü halka yük, 2022).

As another example, in the public engagement meeting of 3<sup>rd</sup> Airport, which was held on 6 November 2011, people basically stated their livelihood problems (agriculture, livestock and mining) and expropriation, like the ones at the Çanakkale Bridge. However, the answer given in the face of all the problems mentioned is that the prestige and income provided by the project is higher than the agriculture and livestock activities of the people. In addition, during the meeting, it was stated that due to the fact that the confidentiality decision regarding the project has not been lifted, no detailed information can be given about the amount of expropriation (İstanbul 3. Havalimanı Nihai Çed Raporu, 2013: 283-290). Therefore, it is difficult to say that the public’s concerns about the social impacts of the project could be resolved in this meeting and the project attaches the necessary importance to social sustainability.

As another social aspect of sustainability, when large-scale infrastructure projects are evaluated in terms of labour and working conditions impacts, ESIA report of Çanakkale Bridge lists the measures to be taken to identify and mitigate risks associated with the health and safety of labour (2018: 310-318). However, in order to complete Çanakkale Bridge in a short time, which is seen as a proud to have been completed such a short period of 4 years, production was not stopped by the subcontracting company that took the iron and steel lines work of the bridge, despite the cases of Covid 19 in the factory, and a worker named Yasin Çolak died at the factory by being under a pipe weighing tons (Bulut, 2020). In addition, in the images circulating on social media, it was seen that the Çanakkale Bridge workers continued to work at an altitude of 300 meters despite the southeastern storm (Sağlam, 2021). Other examples that call into question the importance given to labor and working conditions are: death of 52 workers in the 3<sup>rd</sup> Airport construction; protests by 3<sup>rd</sup> Airport workers for improving working and housing conditions and receiving salaries on time; arrest of 3<sup>rd</sup> Airport workers for protest; arrest of 3<sup>rd</sup> Airport workers who want union (cumhuriyet.com.tr, İstanbul Havalimanı'nda kaç kişi öldü? Resmi yanıt geldi, 2018); death of 3 workers in the 3<sup>rd</sup> Bridge construction (bianet.org, 3. Köprü'nün sekiz yıllık hikayesi, 2017); protest of 3<sup>rd</sup> Bridge workers because of not receiving their salaries on time and also salary cuts (cumhuriyet.com.tr, Üçüncü köprü işçileri eyleme başladı, 2016). All these examples show that the social dimension of sustainability in large-scale infrastructure construction is not given importance in terms of human rights, labour and working conditions.

As the last point, when infrastructure investments are evaluated in terms of their accessibility which is another social aspect of sustainability, it is seen that they are not used sufficiently, in other words, not accessible because the usage fees are expensive. The most striking examples in this respect are the Eurasia Tunnel and the Osmangazi Bridge. Although Eurasia Tunnel is a short way that connects Asia and European parts of İstanbul, people do not prefer to use it because expensive fees which can be seen from its failure to provide the number of vehicles passes guaranteed by the state. Similarly, Osmangazi Bridge is not used sufficiently by people due to high usage fees, although it reduces the crossing of the Gulf of İzmit from 90 kilometers to 12 kilometers (takes 6 minutes) and shortens the transportation distance between İstanbul and İzmir. The most striking evidence of this is that the guaranteed payments given to the company by the state could not be met even on April 22, 2023, when the bridge crossing record was broken. As a result, when Türkiye's infrastructure investments are evaluated in terms of social dimensions such as accessibility, human rights and public participation, it is not likely to say that these criteria are adequately considered.

## 6. Conclusion

Considering the impacts of large-scale infrastructure investments on nature and society, application of sustainable development goals to large-scale infrastructure projects have entered the agenda of international organizations and multinational initiatives. Such a development, on the one hand, has revealed the efforts to determine criteria and to measure the economic, environmental and social sustainability of infrastructure projects. On the other hand, it has revealed the weaknesses of measurement methodology and contradictory nature of such an evaluation under the relations of capitalist production. Because "...a degradation or even destruction of natural conditions of production and reproduction, ..., is nothing external to the economy, but belongs to its contradictory development" (Altwater, 2004: 12). Therefore, although sustainability goals and evaluation consider social and environmental costs, it does not question the capitalist social relations that produce them, leading to a contradiction.

In contrast, for those who are concerned primarily with sustaining the earth and creating livable, sustainable communities, rather than with sustaining development or expanding profits, the conflict between economic growth and environment is much more likely to be emphasized. This alternative view starts out by recognizing that most economic activity demands raw materials and energy from the planet and generates waste that the planet must absorb (Foster, 2002: 80).

The examples presented regarding Türkiye throughout the study demonstrate the contradiction in applying sustainability evaluation to infrastructures. EIA or ESIA reports have been prepared in order to identify and eliminate the social and environmental impacts of infrastructure investments. However, as discussed above, either these impacts could not be prevented or clear solutions were not offered to prevent them, in other words, the projects could not meet the "sustainability" criteria. Because the reports highlighted the economic returns to be obtained from these infrastructure investments in line with a capitalist development approach and looked at the ecological and social results of the projects as secondary problems in the face of these economic gains. Because "sustainable development, despite its environmental associations, remains primarily an economic concept serving narrow economic ends" (Foster, 2002: 79). In short, although sustainable development aims to provide a balance between the economic development and protection of natural resources, it would be impossible due to avoiding from internalization of environmental and social costs within the context of a profit driven, capitalist economy.

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## CHAPTER 15

### EVALUATING THE SIGNIFICANCE OF RESEARCH AND DEVELOPMENT (R&D) ACTIVITIES IN THE TURKISH ECONOMY: A COMPARATIVE STUDY IN THE CONTEXT OF SDG 9 - TARGET 9.5

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#### **Abstract**

The objective of this study is to evaluate Türkiye's standing in research and development (R&D) activities throughout the 2000s through a comparative approach, in line with the aims of Target 9.5 within Sustainable Development Goal (SDG) 9. This target seeks to stimulate innovation and significantly raise the number of research and development professionals per one million individuals. Moreover, it endeavours to enhance both public and private expenditures in research and experimental development. The data analysis reveals that despite a substantial increase from 2000 to 2021, Türkiye still lags behind the majority of selected countries in terms of the proportion of gross domestic R&D expenditure (GERD) in GDP and the number of researchers per one million inhabitants, both of which are crucial indicators for monitoring progress towards Target 9.5. Furthermore, based on the 2021 data, Türkiye ranks behind most of the selected countries in terms of the proportion of business enterprise (private) R&D expenditures (BERD), government (public) R&D expenditures (GOVERD), and higher education R&D expenditures (HERD) to GDP. Between 2000 and 2021, there was a significant increase in the business enterprise sector's contribution to GERD, reaching 70.7%, whereas the higher education sector's share (23.7%) declined by more than half. Furthermore, Türkiye falls behind most selected countries in terms of the government's share (5.6%) in GERD. The percentage of total researchers employed in the business enterprise sector (61.8%) in Türkiye has significantly increased since 2000, while the share of both the higher education (4.2%) and government (34%) sectors in this employment has decreased by more than half. Business enterprise (private) R&D expenditure (BERD), which not only forms the largest share but also contributes significantly to Türkiye's overall GERD increased from 1.5 billion dollars in 2000 to 21.1 billion dollars in 2021, with its share in GDP rising from 0.16% to 0.80% during the same period. Investments in R&D within the manufacturing industry play a crucial role both in the conversion of R&D investments into tangible, fruitful innovations and in advancing both Target 9.2 and Target 9.5 under SDG 9. The most recent data reveals that the manufacturing industry accounts for 57.1% of the total R&D expenditures within the business enterprise sector. Türkiye has the highest rate of BERD for the computer, electronics, and optics sector (14.7% in 2020) among high-tech industries such as pharmaceuticals and aerospace, compared to the chosen countries. However, Türkiye has one of the lowest market shares in the exports of these high-tech industries among the selected countries. Consequently, Türkiye consistently maintains a negative foreign trade balance for all of these

sectors in the 2000-2020 period. The challenge lies in the complex process of transforming Türkiye's consistent growth in R&D spending and the presence of highly qualified R&D professionals, in line with Target 9.5 of SDG 9, into enhanced productivity and expanded export shares in high-tech industries. This process involves effectively converting R&D investments into concrete and fruitful innovations. This transition can be monitored by examining indicators such as the number of patent applications per million inhabitants. In 2021, Türkiye had a mere 8.73 patent applications per million inhabitants submitted to the European Patent Office (EPO), while in the same period, the Netherlands had 375.18, Germany had 311.20, and Poland had 13.83 patent applications per million inhabitants. This data indicates that if we take R&D as a measure of knowledge input and patents as an indicator of knowledge output, as is often done in the literature, Türkiye faces difficulties in efficiently converting this input into tangible output.

**Keywords:** Sustainable Development Goal 9, Target 9.5, Gross Domestic R&D Expenditure (GERD), Business Enterprise R&D Expenditure (BERD), Government R&D Expenditure (GOVERD), Higher Education R&D Expenditure (HERD), R&D Personnel

## 1. Introduction: Conceptual Framework

Goal 9 of the Sustainable Development Goals (SDGs) encompasses the fields of industry, innovation, and infrastructure. More specifically, this goal is summarized as building resilient infrastructure and promoting inclusive and sustainable industrialization and innovation. Comprising 8 specific targets and 12 essential indicators, Goal 9 comprehensively addresses several facets of sustainability. These cover both measures of sustainable infrastructures (9.1, 9.4) and measures of sustainable industrialization (9.2, 9.4). Furthermore, it seeks to enhance access to financial services (9.3) and promote scientific research (9.5) (European Commission, 2023).

In this study, we focus on Target 9.5 of SDG 9 which aims to enhance scientific research and elevate the technological capacities of industrial sectors globally, with a particular focus on developing countries. By 2030, this goal seeks to foster innovation and significantly boost the density of research and development professionals, measured as the number of workers per one million people, in addition to increasing both public and private investments in research and development (European Commission, 2023).

In this context, Target 9.5 urges countries to encourage innovation and substantially increase the number of researchers, as well as public and private spending on research and experimental development.

Research and development (R&D), a key driver of technological advancement and innovation, plays a critical role in shaping the developmental disparities among countries. Both developing and developed countries now recognize the significance of allocating increased resources to R&D expenditures.

According to the OECD, “Research and experimental development comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications” (OECD, 2015). R&D can be decomposed into basic research, applied research and experimental development. It can be performed and/or funded by the business enterprise sector, government, higher education and private non-profit organisations (OECD, 2015).

Robert Solow’s pioneering work (Solow, 1956) shed light on the importance of R&D as a driver of technological change, innovation and economic growth. This work gave a major impetus to both theoretical and empirical research on the economic impacts of R&D investments. Governments around the world are actively pursuing strategies to promote innovation driven by R&D through various financial and nonfinancial instruments. Among these, providing direct financial support to business R&D in the form of R&D grants, loans, public procurement, and in some instances, tax incentives, stands out as a prominent policy tool (OECD, 2015).

R&D expenditures have been considered as investments in a stock of knowledge since the late 50s and early 60s (Griliches, 1964); (Mansfield, 1965). A large literature has considered this stock of knowledge as a determinant of productivity. According to Z. Griliches who made significant contributions to the economics of technology and growth (Diamond, 2004), “The major sources of productivity growth were seen as coming from improvements in the quality of labour and capital and from other, not otherwise measured, sources of efficiency and technical change, the latter being in turn the product of formal and informal R&D investments by individuals, firms, and governments, and of the largely unmeasured contributions of science and other spillovers” (Griliches, 1998)<sup>1</sup>.

In addition to its role as a measure of innovation input, research and development (R&D) can also be viewed as a means to acquire knowledge, enhancing the capacity to assimilate external knowledge effectively. In this context, it resembles an educational investment aimed at increasing the absorption capacity (Mohnen, 2019).

Over recent decades, numerous studies have extensively explored the connections between technological change and productivity growth, often employing R&D expenditures as an indicator of the intensity of technological change. However, there are multiple stages involved in progressing from R&D expenditures to increased productivity. Specifically, R&D must result in successful innovation, which then needs to be effectively commercialized and

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1 See also (Griliches, 1995); (Hall B. H., 1996); (Hall B. M., 2010).

widely adopted. Nevertheless, these studies have generally found substantial returns on R&D investments in comparison to other forms of investment. This suggests, by implication, that a significant portion of economic growth can be attributed to the introduction of novel technologies (Englander & Evenson, 2005).

Joseph Schumpeter was one of the pioneering economists who explored the link between industrial innovation and macro-level economic growth (Hasan & Tucci, 2010). Schumpeter provided a brief definition of innovation as “setting up a new production function” (Schumpeter, 1939). Since a production function includes inputs, outputs and the nature of their relationship, endogenous changes in any such element involve an innovation process (Schumpeter, 1934). Schumpeter defined innovation as “new combinations”, including at least five cases: new goods, new production methods, new markets, new inputs, and new market organizations (Schumpeter, 1934).

A substantial body of literature explores the relationship between R&D and economic growth. During the late 1980s, endogenous growth models, influenced by the ground-breaking research of Romer and Lucas, incorporated R&D as an endogenous variable in economic growth models (Romer, 1986); (Lucas, 1988). There is general support in this literature for the significant role of research and development (R&D) in fostering economic growth. For example, Grossman and Helpman considered industrial innovation, stemming from R&D investments, as the fundamental driver of economic growth (Grossman & Helpman, 1994). Aghion and Howitt contend that economic growth is based on technological development, which results from competition among research firms that focus on innovation (Aghion & Howitt, 1992). Barro and Sala-i Martin modelled technological progress as enhancement of intermediate goods used in the production process (Barro & Sala-i-Martin, 2004).

Furthermore, the econometric findings in existing literature consistently reinforce the idea that R&D exerts substantial and beneficial impacts on productivity and economic growth at firm, industry and country levels. Private rates of return to R&D investments (before accounting for depreciation) surpass those seen in regular capital investments. Moreover, the societal benefits stemming from R&D tend to far outweigh private gains. Nevertheless, it's important to note that the estimated impacts of R&D exhibit considerable variation, reflecting differences in the scale of these impacts across different groups of firms, industries and countries (OECD, 2015).

Firm-level evidence indicates that companies operating in high-tech sectors not only experience higher returns from their R&D investments (Kwon & Inui, 2003) but also demonstrate higher R&D output elasticity (Kafourous, 2005). Moreover, the responsiveness of

output to external R&D is more pronounced for companies employing advanced technologies and maintaining a moderate level of R&D intensity (Beneito, 2001). This suggests that these firms possess a relatively robust capacity for absorbing knowledge.

Country-level studies similarly point out to the role of knowledge absorption capacity in determining the benefits derived from external R&D capital. Specifically, countries with a high ranking in terms of quality of tertiary education system and ease of doing business tend to exhibit higher output elasticity concerning own and external R&D (Coe & Helpman, 2009).

Empirical studies in the literature focusing on manufacturing industries have consistently revealed a robust positive correlation between R&D expenditures and total factor productivity (TFP). In particular, the industry groups such as chemicals and machinery, which exhibit substantial R&D utilization and contain most of the high-tech industries, show very strong responses to both R&D use and spending. The textile industry is an exception in that it also demonstrates a strong response but is not very R&D-intensive (Englander & Evenson, 2005).

However, studies on the Turkish economy, particularly in the manufacturing industry, indicate that Türkiye did not achieve a structural transformation in the 2000s in terms of production, value-added, employment, foreign trade, and technology (Taymaz & Suiçmez, 2005); (Taymaz, Voyvoda, & Yılmaz, 2008). To realize such a transformation, it is crucial to implement long-term and consistent policies that prioritize the development of new technologies and the widespread and effective utilization of existing technologies.

This implies that Türkiye has the potential to significantly improve its economic performance by enhancing its focus on R&D and technology-driven growth strategies, similar to the successful examples seen in high-tech industries worldwide.

Türkiye should transform its industry and export structure into technology-intensive products. The development of technology-intensive industries is central to the development of new products and process technologies and their diffusion throughout the economy. These industries also develop “technology assimilation capability”, which is crucial for understanding and applying innovations abroad (Taymaz, 2001).

In the process of industrialization, countries that prioritize production, export, and competition based on technology capacity rather than labour-intensive and low-cost manufacturing industries have seen an increase in the share of the high-tech manufacturing industry in total production and export. The industrialization success of countries like South Korea, Taiwan, Singapore, and Ireland can be attributed to their ability to enhance high-tech industrial production and export rates (Gürlel, 2009).

To achieve such a transformation and improve its competitive position, Türkiye requires a well-defined development strategy and comprehensive industry, technology, and innovation policies. The key elements of such a strategy can be summarized as follows: promoting R&D and directing it to dynamic export activities; providing skilled workforce training to meet the demands of emerging technologies and significant export sectors; strengthening relations between scientific research institutions and industries; and supporting small and medium-sized enterprises (SMEs) through measures aimed at enhancing productivity levels and facilitating the adoption of new technologies (Lall, 2000).

Within the framework of SDG 9, particularly target 9.5, this study examines the content and significance of research and development (R&D) activities, which serve as crucial elements of technology and innovation policies, to facilitate the essential transformation within the Turkish economy. We undertake a comparative analysis with a group of selected countries to provide valuable insights. The data employed for this investigation were mainly created using the OECD database and belong to the 2000s.

Country selections were made by identifying countries that closely resemble Türkiye in terms of population, per capita GDP, and trade variables such as exports and imports, obtained from the World Bank database (World Bank, 2023)<sup>2</sup>. Based on these criteria, the following countries were selected: Poland, the Czech Republic, Hungary, Romania, Portugal, and Spain. Furthermore, Germany, Italy, France, and the Netherlands, which are major export destinations for Türkiye, were included in the list.

Following the introduction part, which establishes the conceptual framework focusing on research and development (R&D) as a key driver of technological advancement and innovation, as well as the significant necessity for structural transformation within the Turkish economy, with a particular emphasis on the manufacturing industry, the second part of this study aims to analyze key R&D indicators. This analysis operates in the scope of Target 9.5 within SDG 9, examining trends in Türkiye alongside selected countries throughout the 2000s.

This section presents comparative data on gross domestic expenditure on R&D (GERD) in terms of its evolution over the years and its contribution to GDP. It further examines GERD by sector of performance (business enterprise, government, higher education), source of funds (business enterprise, government, higher education, private non-profit, and funds

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2 The formula  $K = (X_i - X_{TR})^2$  was used to select countries similar to Türkiye. Current population, per capita income, export and import indicators are utilized instead of X variable. These indicators are taken from the World Bank World Development Indicators database. The series obtained from the formula were ordered from smallest to largest and the 20 countries with the smallest values were selected. Among the 20 countries selected for each indicator, the most common countries in these groups were identified as countries similar to Türkiye.

from the rest of the world), field of research (natural sciences, engineering and technology; social sciences, humanities, and the arts), and various socio-economic objectives (such as industrial production and technology, agriculture, and the advancement of knowledge in general). Furthermore, this section provides data on R&D personnel classified by sector of employment, gender, and qualification for both Türkiye and the selected countries.

In the third part, we focus on analyzing key indicators related to business enterprise (private) R&D (BERD), which accounts for 70.7% of Türkiye's gross domestic expenditure on R&D (GERD) in 2021. This section examines BERD data in comparison with the selected countries, considering its share in GDP and industry value added. The analysis also includes BERD by source of funds and number of persons employed, as well as by industry based on the ISIC Revision 4 classification and the proportion of high-tech industries. In this section, the significant role of R&D expenditures in the manufacturing industry in advancing both Target 9.2 and Target 9.5 of Sustainable Development Goal (SDG) 9 is emphasized. The final section comprises a summary of the findings and the concluding remarks.

## **2. Research and Development (R&D) Indicators for Türkiye and Selected Countries in line with Target 9.5 of SDG 9**

Within the framework of Sustainable Development Goal 9 (SDG 9), Target 9.5 encourages countries to actively promote innovation, while substantially increasing the number of researchers, as well as public and private spending on research and experimental development (R&D).

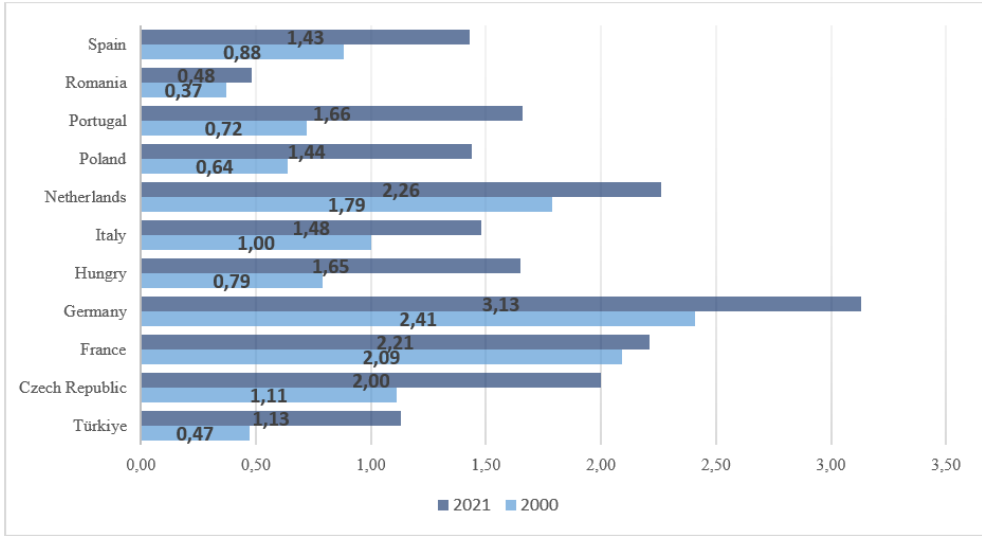
Countries have selected two indicators to monitor progress toward this target: R&D expenditure as a proportion of GDP and the number of researchers (measured in full-time equivalent) per one million inhabitants (UNESCO Institute for Statistics, 2023).

Besides these variables, this research employs a wider range of comprehensive, policy-relevant, and internationally comparable science, technology, and innovation (STI) indicators. These indicators provide a more intricate perspective on the targets of SDG 9 and the evaluation of advancement in accordance with national, regional, and global development goals.

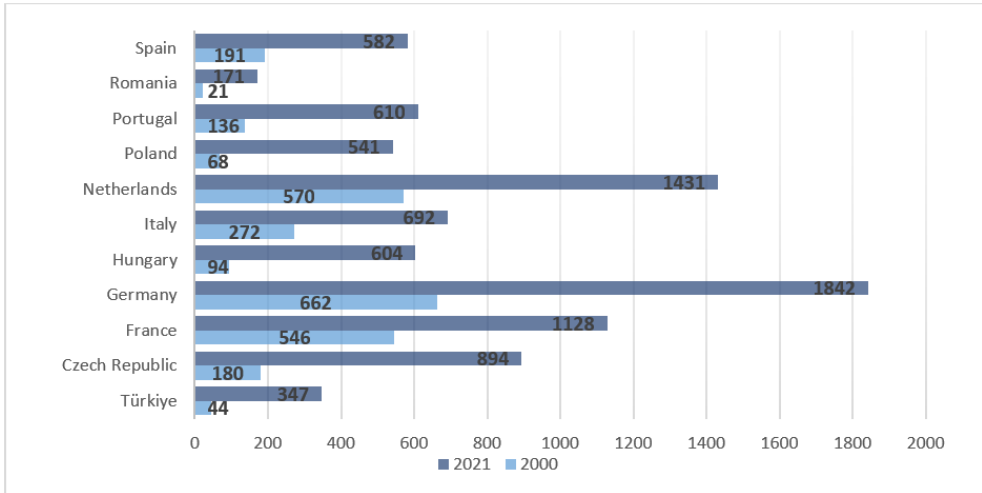
In this section, we analyze a range of indicators pertaining to gross domestic R&D expenditures and researchers in Türkiye, comparing them with those of selected countries. Our objective is to assess Türkiye's position in the context of Target 9.5 as part of SDG 9.







**Figure 1.** Gross Domestic Expenditure on R&D, 2000, 2021 (as a percentage of GDP)  
**Source:** (OECD, 2023).



**Figure 2.** Gross Domestic Expenditure on R&D, 2000, 2021 (Per Capita Population, current PPP \$)  
**Source:** (OECD, 2023).

<b>Table 2. Gross Domestic Expenditure on R&amp;D by Sector of Performance, 2000-2021</b>						
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2021</b>
<b>TÜRKİYE</b> (Millions Dollar – 2015 Prices)	<b>4 508</b>	<b>6 932</b>	<b>11 406</b>	<b>17 734</b>	<b>25 873</b>	<b>29 909</b>
Business Enterprise (%)	33.4	33.8	42.5	50.0	64.8	70.7
<b>Government (%)</b>	<b>6.2</b>	<b>11.6</b>	<b>11.4</b>	<b>10.3</b>	<b>6.8</b>	<b>5.6</b>
Higher Education (%)	60.4	54.6	46.0	39.7	28.4	23.7
<b>CZECH REPUBLIC</b> (Millions Dollar – 2015 Prices)	<b>2 665</b>	<b>3 376</b>	<b>4 361</b>	<b>6 853</b>	<b>7 694</b>	<b>8 008</b>
Business Enterprise (%)	60.0	58.2	56.7	54.3	61.0	62.8
<b>Government (%)</b>	<b>25.3</b>	<b>22.8</b>	<b>22.7</b>	<b>20.4</b>	<b>17.1</b>	<b>16.7</b>
Higher Education (%)	14.2	18.6	20.0	24.9	21.6	20.3
<b>FRANCE</b> (Millions Dollar – 2015 Prices)	<b>47 748</b>	<b>50 868</b>	<b>56 271</b>	<b>60 541</b>	<b>61 960</b>	<b>63 543</b>
Business Enterprise %	62.5	62.1	63.2	64.7	66.0	65.6
<b>Government %</b>	<b>17.3</b>	<b>17.8</b>	<b>14.0</b>	<b>13.0</b>	<b>11.7</b>	<b>12.2</b>
Higher Education %	18.8	18.8	21.6	20.8	20.3	20.3
<b>GERMANY</b> (Millions Dollar – 2015 Prices)	<b>79 146</b>	<b>82 366</b>	<b>97 655</b>	<b>114 098</b>	<b>125 567</b>	<b>128 678</b>
Business Enterprise %	70.0	69.2	67.0	68.7	66.6	66.8
<b>Government %</b>	<b>13.5</b>	<b>14.1</b>	<b>14.8</b>	<b>14.1</b>	<b>14.6</b>	<b>14.9</b>
Higher Education %	16.4	16.8	18.2	17.3	18.7	18.3
<b>HUNGARY</b> (Millions Dollar – 2015 Prices)	<b>1 526</b>	<b>2 204</b>	<b>2 689</b>	<b>3 534</b>	<b>4 724</b>	<b>5 227</b>
Business Enterprise %	44.3	43.2	59.8	73.4	76.5	75.5
<b>Government %</b>	<b>26.1</b>	<b>28.0</b>	<b>18.5</b>	<b>13.3</b>	<b>9.9</b>	<b>10.2</b>
Higher Education %	24.0	25.1	19.9	12.1	13.0	13.8
<b>ITALY</b> (Millions Dollar – 2015 Prices)	<b>22 558</b>	<b>24 566</b>	<b>28 240</b>	<b>29 995</b>	<b>32 098</b>	<b>33 806</b>
Business Enterprise %	50.1	50.4	53.9	58.2	61.8	61.4
<b>Government %</b>	<b>18.9</b>	<b>17.3</b>	<b>13.7</b>	<b>13.1</b>	<b>13.2</b>	<b>13.5</b>
Higher Education %	31.0	30.2	28.8	25.5	23.1	23.3
<b>NETHERLANDS</b> (Millions Dollar – 2015 Prices)	<b>12 832</b>	<b>13 595</b>	<b>13 985</b>	<b>18 282</b>	<b>20 865</b>	<b>21 256</b>
Business Enterprise %	55.1	52.9	47.9	64.3	66.6	67.5
<b>Government %</b>	<b>12.0</b>	<b>12.4</b>	<b>11.7</b>	<b>6.1</b>	<b>5.6</b>	<b>5.6</b>
Higher Education %	31.9	34.7	40.4	29.7	27.8	26.9
<b>POLAND</b> (Millions Dollar – 2015 Prices)	<b>3 845</b>	<b>3 924</b>	<b>6 346</b>	<b>10 232</b>	<b>16 575</b>	<b>18 346</b>
Business Enterprise %	36.1	31.8	26.6	46.6	62.8	63.1
<b>Government %</b>	<b>32.2</b>	<b>36.4</b>	<b>35.9</b>	<b>24.4</b>	<b>2.0</b>	<b>2.0</b>
Higher Education %	31.5	31.6	37.2	28.9	34.9	34.7
<b>PORTUGAL</b> (Millions Dollar – 2015 Prices)	<b>2 150</b>	<b>2 357</b>	<b>4 920</b>	<b>3 820</b>	<b>5 071</b>	<b>5 571</b>
Business Enterprise %	27.8	38.5	45.9	46.4	57.0	59.7
<b>Government %</b>	<b>23.9</b>	<b>14.6</b>	<b>7.1</b>	<b>6.5</b>	<b>4.9</b>	<b>4.7</b>
Higher Education %	37.5	35.4	36.9	45.5	36.0	33.3

<b>Table 2.</b> Continued						
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2021</b>
<b>ROMANIA</b> (Millions Dollar – 2015 Prices)	<b>901</b>	<b>1 335</b>	<b>1 699</b>	<b>2 091</b>	<b>2 363</b>	<b>2 536</b>
Business Enterprise %	69.4	49.7	38.3	44.0	59.0	60.4
<b>Government %</b>	<b>18.8</b>	<b>34.2</b>	<b>36.8</b>	<b>38.3</b>	<b>31.9</b>	<b>30.0</b>
Higher Education %	11.8	13.7	24.5	17.4	8.8	9.2
<b>SPAIN</b> (Millions Dollar – 2015 Prices)	<b>11 623</b>	<b>17 016</b>	<b>22 074</b>	<b>19 815</b>	<b>22 450</b>	<b>24 007</b>
Business Enterprise %	53.7	53.8	51.5	52.5	55.6	56.2
<b>Government %</b>	<b>15.8</b>	<b>17.0</b>	<b>20.1</b>	<b>19.1</b>	<b>17.5</b>	<b>16.9</b>
Higher Education %	29.6	29.0	28.3	28.1	26.6	26.6
<b>Source:</b> Created using OECD Research and Development Statistics (OECD, 2023).						

**Table 2** above presents gross domestic R&D expenditures (GERD) by sector of performance, including business enterprise, government, and higher education. In 2000, the business enterprise sector accounted for 33.4% of Türkiye's GERD, the government sector accounted for 6.2%, and the higher education sector accounted for 60.4%. However, in 2021, these percentages changed to 70.7% for the business enterprise sector, 5.6% for the government sector, and 23.7% for the higher education sector, considering a total R&D expenditure of around 29.9 billion dollars.

The data demonstrates a significant increase in the share of the business enterprise sector and a notable decrease of over half in the share of the higher education sector in Türkiye's gross domestic R&D expenditures between 2000 and 2021. Similar transformations can be observed in Hungary, Poland, and Portugal regarding the performance of the business enterprise sector. However, the share of the higher education sector in R&D expenditures has remained relatively stable in these countries, except for Hungary.

Furthermore, Türkiye lags behind most selected countries in terms of the government's share in GERD. In 2021, the government's share of gross domestic R&D expenditures was 16.7% in the Czech Republic, 12.2% in France, 14.9% in Germany, 10.2% in Hungary, 13.5% in Italy, 30.0% in Romania, and 16.9% in Spain. However, notable decreases in the government's share of GERD have been observed in some countries, such as Hungary, the Netherlands, Poland and Portugal since 2000.

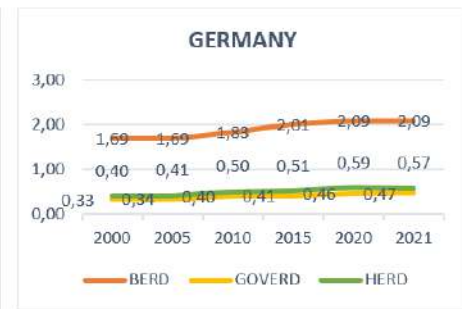
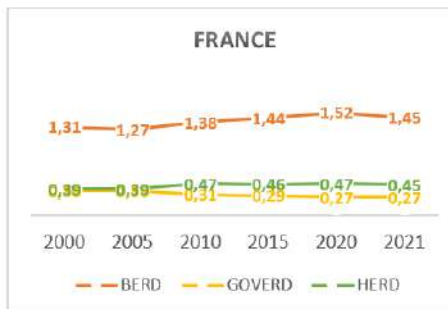
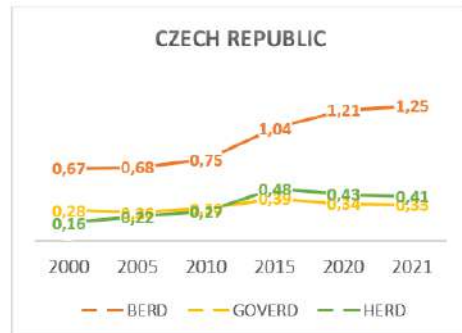
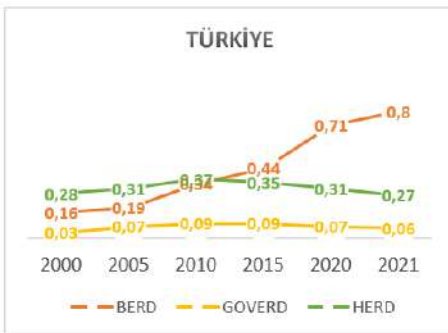
**Figure 3** presents business enterprise R&D expenditure (BERD), government R&D expenditure (GOVERD), and higher education R&D expenditure (HERD) as a percentage of GDP for Türkiye and selected countries from 2000 to 2021. These indicators are part of the primary set of parameters utilized to evaluate the progress in achieving Target 9.5 within the framework of SDG 9.

In Türkiye, the share of BERD in GDP increased fivefold between 2000 and 2021, from

0.16% to 0.80%. However, GOVERD's share only increased from 0.03% to 0.06%, while HERD's share in GDP slightly decreased from 0.28% to 0.27% during the same period.

Based on the 2021 data, Türkiye, along with Spain, has the lowest share of business enterprise R&D expenditures in GDP among the selected countries. It also has the lowest value after Poland in terms of the share of government R&D expenditures in GDP. Regarding the share of higher education R&D expenditures, only Romania and Hungary have lower rates than Türkiye. However, Türkiye was surpassing many countries in the share of HERD in GDP in 2000.

In 2021, among the selected countries, Germany has the highest shares of BERD and GOVERD in GDP, while the Netherlands rank first in the share of HERD. Poland, which is the closest country to Türkiye in terms of macroeconomic indicators used in the country selection for this study, has higher shares than Türkiye for both business enterprise and higher education R&D expenditures in GDP. Between 2000 and 2021, there has been a remarkable increase in the ratio of R&D expenditures of these sectors to GDP in Poland.





**Figure 3.** Business Enterprise R&D, Government R&D and Higher Education R&D, 2000-2021  
(as a percentage of GDP)  
**Source:** (OECD, 2023)

Furthermore, according to the data on the gross domestic expenditures on R&D (GERD) by sector of performance (business enterprise, government, and higher education) and by field of research (natural sciences, engineering and technology; social sciences, humanities, and the arts). Since research and development (R&D) expenditures are commonly utilized as an indicator for measuring the extent of technological advancement and productivity enhancement, their allocation among the fields of natural sciences, technology and social sciences is of great importance.

In Türkiye, natural sciences, engineering, and technology accounted for 89.4% of the total GERD in 2020, while social sciences, humanities, and arts accounted for 10.6%. The distribution of business enterprise R&D expenditures (BERD) by natural and social sciences fields in 2020 was 99.4% and 0.6%, respectively, and the distribution of government R&D expenditures (GOVERD) by the same fields was 97% and 2.9%. It is evident that natural sciences and technology fields have a significant weight in the R&D expenditures of both the business enterprise and government sectors in Türkiye.

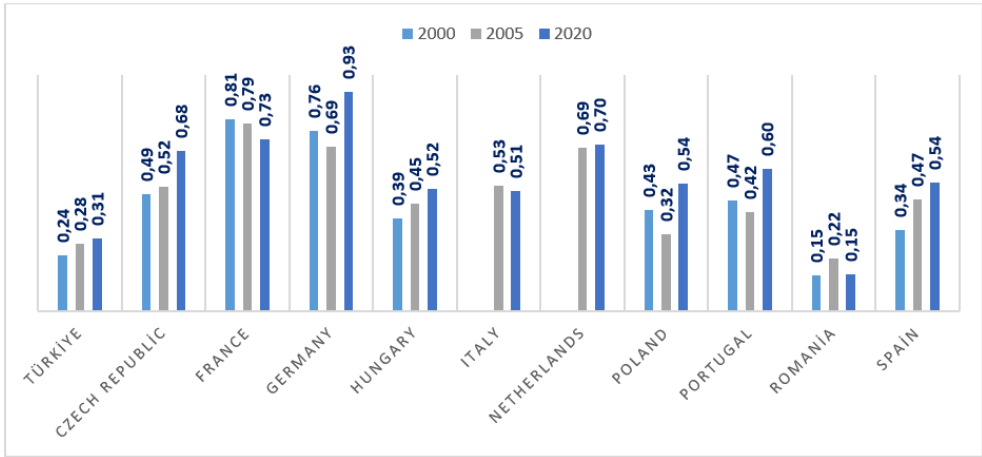
On the other hand, in the same year, 64.6% of higher education R&D expenditures (HERD) were allocated to natural sciences, while 36.4% were allocated to social sciences. It is observed that a significant portion of the R&D expenditures made in the field of social sciences in Türkiye is realized by the higher education sector. Since the data on the distribution of gross domestic R&D expenditures by research areas are not complete, it is difficult to compare the countries in the table in terms of this variable. However, when compared to countries with complete data, Türkiye ranks the lowest in terms of the share of social sciences in the distribution of government R&D expenditures (OECD, 2023).

The data in **Table 3** provide information on the gross domestic R&D expenditure by source of funds (business enterprise, government, higher education, private non-profit, and funds from the rest of the world). In this context, government funds include public general university funds and direct government funds, while funds from the rest of the world include funds from business enterprises, international organizations, and other sources.

According to the data, in 2020, 57.2% of the total GERD of approximately 25.9 billion dollars in Türkiye was financed by the business enterprise sector, 28.4% by the government, 12.3% by the higher education sector, 2% by the rest of the world, and 0.1% by the private non-profit sector. In 2010, the business sector financed 38.2% of the total R&D expenditures, the government financed 43.1%, and the higher education sector financed 16.8%. Over the period analysed, there has been a remarkable decline in the government's share in financing

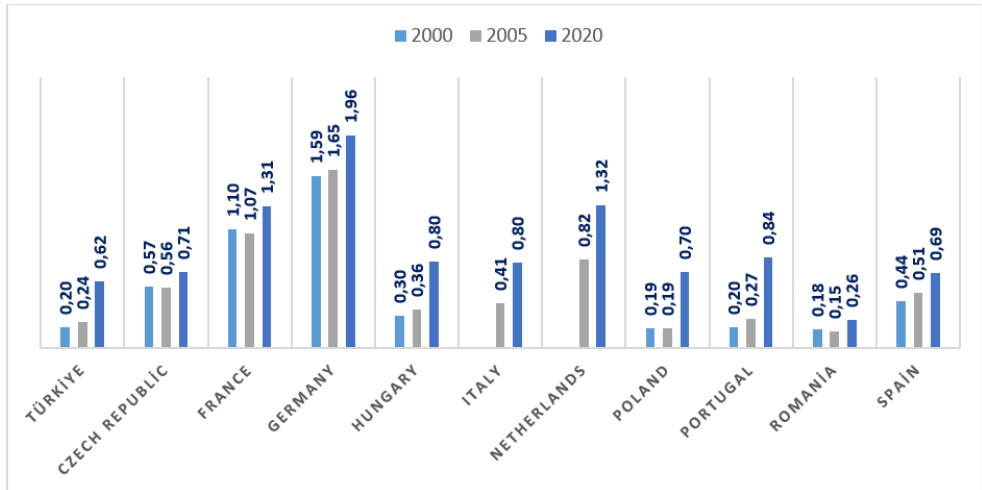






**Figure 4.** Government - Financed GERD, 2000-2020 (as a percentage of GDP)\*

**Source:** (OECD, 2023). (\*) The data for the year 2000 are not available for Italy and the Netherlands.



**Figure 5.** Business - Financed GERD, 2000-2020 (as a percentage of GDP)\*

**Source:** (OECD, 2023). (\*) The data for the year 2000 are not available for Italy and the Netherlands.

**Figures 4 and 5** illustrate the government and business enterprise-funded gross domestic R&D expenditures (GERD) as a percentage of GDP for the years 2000, 2005 and 2020, in comparison with other countries. In Türkiye, government-funded GERD increased from 0.24% to 0.31% of GDP between 2000 and 2020, while business enterprise-funded GERD increased from 0.20% to 0.62% of GDP during the same period.

According to the 2020 data, Türkiye has the lowest rates among the selected countries, except Romania, in terms of both government and business-financed gross domestic R&D expenditures as a percentage of GDP. Germany, which has the highest values among the countries in the table, has rates of 0.93% and 1.96% for government and business-funded GERD as a percentage of GDP, respectively. In Poland, which is the closest country to Türkiye in terms of the macroeconomic indicators used in this study's country selection, the ratios of R&D expenditures financed by the government and business enterprises to GDP are 0.54% and 0.70%, respectively, in 2020.

**Table 4.** Gross Domestic Expenditure on R&D by Government and by Socio-Economic Objectives: Industrial Production and Technology, Agriculture and General Advancement of Knowledge 2000-2020

	2000	2005	2010	2015	2020
<b>Türkiye (Mil. Dollar–2015 Prices)</b>	<b>279</b>	<b>801</b>	<b>1 305</b>	<b>1 833</b>	<b>1 750</b>
Industrial Prod.-Tech. (%)	-	21.9	16.9	20.3	8.8
Agriculture (%)	-	0.9	19.1	18.4	15.1
General Advancement of Knowledge (%)	-	1.0	2.8	4.4	20.2*
<b>Germany (Mil. Dollar–2015 Prices)</b>	<b>10 703</b>	<b>11 596</b>	<b>14 441</b>	<b>16 046</b>	<b>18 366</b>
Industrial Prod.-Tech. (%)	19.2	-	-	-	11.7
Agriculture (%)	6.5	-	-	-	3.9
General Advancement of Knowledge (%)	27.7	-	-	-	-
<b>Hungary (Mil. Dollar–2015 Prices)</b>	<b>398</b>	<b>617</b>	<b>498</b>	<b>470</b>	<b>469</b>
Industrial Prod.-Tech. (%)	7.4	6.4	7.3	3.6	8.6
Agriculture (%)	20.7	16.1	15.1	14.9	12.7
General Advancement of Knowledge (%)	23.8	24.0	22.2	28.2	-
<b>Italy (Mil. Dollar–2015 Prices)</b>	<b>4 266</b>	<b>4 254</b>	<b>3 867</b>	<b>3 940</b>	<b>4 241</b>
Industrial Prod.-Tech. (%)	10.5	9.2	9.5	11.3	9.4
Agriculture (%)	7.3	7.6	8.9	8.9	8.0
General Advancement of Knowledge (%)	22.6	22.3	-	-	-
<b>Poland (Mil. Dollar–2015 Prices)</b>	<b>1 240</b>	<b>-</b>	<b>2 278</b>	<b>-</b>	<b>327</b>
Industrial Prod.-Tech. (%)	-	-	16.0	-	2.5
Agriculture (%)	-	-	12.1	-	13.9
General Advancement of Knowledge (%)	-	-	25.7	-	-
<b>Portugal (Mil. Dollar–2015 Prices)</b>	<b>514</b>	<b>344</b>	<b>350</b>	<b>248</b>	<b>251</b>
Industrial Prod.-Tech. (%)	7.2	7.9	2.0	2.6	5.7
Agriculture (%)	29.8	28.9	17.5	9.2	9.6
General Advancement of Knowledge (%)	4.9	7.2	7.6	3.3	-
<b>Romania (Mil. Dollar–2015 Prices)</b>	<b>169</b>	<b>456</b>	<b>625</b>	<b>800</b>	<b>755</b>
Industrial Prod.-Tech. (%)	8.8	20.0	9.6	8.6	7.9
Agriculture (%)	4.6	2.0	7.4	10.1	15.5
General Advancement of Knowledge (%)	43.3	39.5	61.9	49.6	50.8
<b>Spain (Mil. Dollar–2015 Prices)</b>	<b>1 839</b>	<b>2 900</b>	<b>4 434</b>	<b>3 791</b>	<b>3 920</b>
Industrial Prod.-Tech. (%)	7.6	7.7	7.5	6.5	6.0
Agriculture (%)	22.4	17.5	14.5	11.9	11.2
General Advancement of Knowledge (%)	13.1	16.2	9.4	9.9	9.3

**Source:** Created using OECD Research and Development Statistics (*OECD, 2023*). (\*) It belongs to 2019.

**Table 4** presents data on the gross domestic expenditure on R&D (GERD) by the government, categorized by socio-economic objectives such as industrial production and technology, agriculture, and the general advancement of knowledge, for Türkiye and selected countries. According to the data, the share of industrial production and technology in the government's gross domestic R&D expenditures in Türkiye decreased from 21.9% in 2005 to 8.8% in 2020, while the share of agriculture increased from 0.9% to 15.1%. Notably, the share of the general advancement of knowledge in GERD by the government significantly increased from 1% in 2005 to 20.2% in 2019.

In this table, Türkiye is one of the countries where agriculture has the highest share in the government's gross domestic R&D expenditures since 2010. Additionally, Germany ranks first in terms of the share of industrial production and technology (11.7% in 2020) in the government's gross R&D expenditure, while Romania leads in the share of the general advancement of knowledge (50.3% in 2020).

## 2.2. R&D Personnel by Sector of Employment, Gender and Qualification

While Target 9.5 within SDG 9 utilizes the count of researchers (measured in full-time equivalent) per one million inhabitants as an indicator to track progress, this study takes a comprehensive approach to assess this measure, considering both its quantitative and qualitative dimensions.

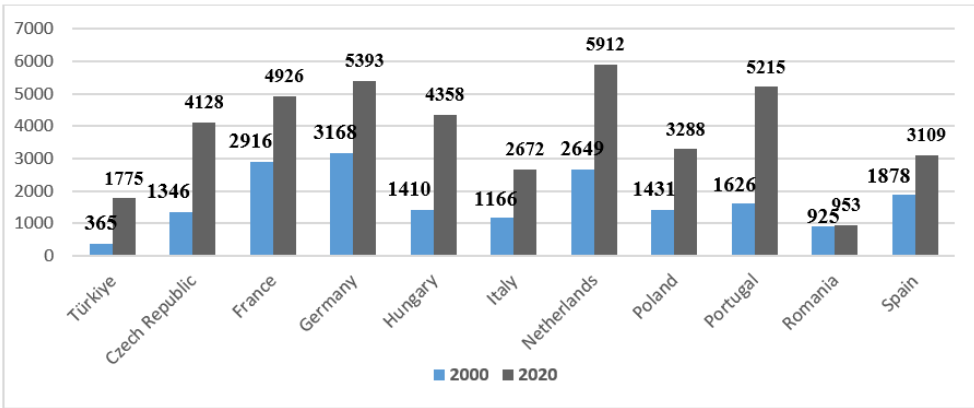
**Table 5** displays data on the total number of researchers in full-time equivalent (FTE) for the period 2000-2021 in Türkiye and selected countries. According to the data, the total number of researchers in Türkiye increased by 631.6% between 2000 and 2021. Among the selected countries, Germany, which has a population very close to Türkiye, has the highest number of researchers. In Poland, a country similar to Türkiye in terms of macroeconomic indicators used in this study's country selection, the total number of researchers in 2021 was 135650, representing an increase of 145.9% over the 2000-2021 period. Although Poland may appear to have fewer researchers compared to Türkiye, it should be noted that it has less than half the population.

Taking into consideration Target 9.5 criterion, the data in **Figure 6** shows the number of researchers per million inhabitants in Türkiye. This number increased from 365 in 2000 to 1775 in 2020 with an increase of 386.3%. Despite this high increase, Türkiye is behind all selected countries, except Romania in this indicator. In 2020, the countries with the highest number of researchers per million inhabitants in the table are the Netherlands, Germany, Portugal and France, respectively.

**Table 5.** Total Researchers, 2000-2021 (FTE)

Country	2000	2005	2010	2015	2020	2021
<b>Türkiye</b>	23 083	39 139	64 341	95 161	149 731	168 879
<b>Czech Republic</b>	13 852	24 169	29 228	38 081	44 206	48 080
<b>France</b>	172 070	202 507	243 533	279 470	321 550	340 004
<b>Germany</b>	257 874	272 148	327 996	387 982	450 796	459 510
<b>Hungary</b>	14 406	15 878	21 342	25 316	42 099	43 324
<b>Italy</b>	66 110	82 489	103 424	125 875	156 989	172 719
<b>Netherlands</b>	42 194	47 854	53 703	83 488	102 077	106 064
<b>Poland</b>	55 174	62 162	64 511	82 594	124 600	135 650
<b>Portugal</b>	16 738	21 126	41 523	38 672	53 174	56 202
<b>Romania</b>	20 476	22 958	19 780	17 459	18 331	19 113
<b>Spain</b>	76 670	109 720	134 653	122 437	145 372	154 125

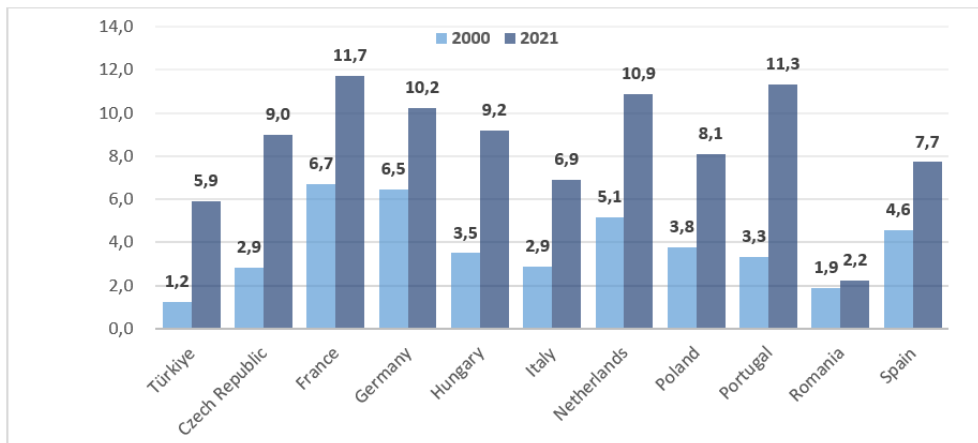
Source: (OECD, 2023).

**Figure 6.** Researchers per million Inhabitants, 2000 vs 2020 (FTE)

Source: (UNESCO Institute for Statistics, 2022)

**Figure 7** provides information on the number of researchers per thousand total employment in Türkiye and selected countries for the years 2000 and 2021. In Türkiye, the number of researchers per thousand total employment increased from 1.2 to 5.9 between 2000 and 2021. However, Türkiye lags behind all selected countries except Romania in this indicator related to research and development personnel.

Among the selected countries, France, Portugal, the Netherlands, and Germany have the highest number of researchers per thousand total employment, respectively.



**Figure 7.** Total Researchers per Thousand Total Employment, 2000 vs 2021  
**Source:** (OECD, 2023)

**Table 6** presents data on the percentage of full-time equivalent researchers by sector of employment and gender out of the total researchers in Türkiye and selected countries for the period 2000-2019. The sectors of employment include business enterprise, government, and higher education. In Türkiye, the distribution of total researchers among these sectors was 61.8% in the business enterprise sector, 4.2% in the government sector, and 34% in the higher education sector in 2019. There has been a significant shift in this distribution between 2000 and 2019, as the majority of total researchers were employed in the higher education sector (73.2%) and only 16% were employed in the business enterprise sector in 2000. During this time, the percentage of total researchers employed in the business enterprise sector increased significantly, while the share of both the higher education and government sectors in researcher employment decreased by more than half.

A similar trend is observed in the employment of female researchers across sectors in Türkiye. The proportion of female researchers employed in the business enterprise sector increased from 18.3% in 2005 to 50% in 2019, while the percentage of women working in the government and higher education sectors decreased from 8.5% and 73.2% to 4.2% and 45.8%, respectively, during the same period.

**Table 6.** Researchers by Sector of Employment and Gender<sup>3</sup>, 2000-2019  
(as a percentage of Total Researchers)

	2000	2005	2010	2015	2019
<b>TÜRKİYE-TOTAL</b>	<b>23 083</b>	<b>39 139</b>	<b>64 341</b>	<b>95 161</b>	<b>135 515</b>
<b>Female</b>	-	<b>13 381</b>	<b>21 056</b>	<b>31 385</b>	<b>43 940</b>
Business Enterprise-Total (%)	16.0	24.2	39.4	47.6	61.8
<b>-Female (%)</b>	-	<b>18.3</b>	<b>28.3</b>	<b>35.4</b>	<b>50.0</b>
Government-Total (%)	10.7	10.9	9.5	6.9	4.2
<b>-Female (%)</b>	-	<b>8.5</b>	<b>8.1</b>	<b>6.3</b>	<b>4.2</b>
Higher Education-Total (%)	73.2	65.0	51.2	45.5	34.0
<b>Female (%)</b>	-	<b>73.2</b>	<b>63.6</b>	<b>58.3</b>	<b>45.8</b>
<b>CZECH REPUBLIC - TOTAL</b>	<b>13 852</b>	<b>24 169</b>	<b>29 228</b>	<b>38 081</b>	<b>42 500</b>
<b>Female</b>	<b>3 551</b>	<b>6 349</b>	<b>7 429</b>	<b>8 923</b>	<b>10 154</b>
Business Enterprise-Total (%)	39.9	40.2	42.2	50.3	51.1
<b>-Female (%)</b>	<b>25.6</b>	<b>21.6</b>	<b>22.0</b>	<b>26.5</b>	<b>27.5</b>
Government-Total (%)	31.9	27.2	22.5	19.4	18.7
<b>-Female (%)</b>	<b>39.4</b>	<b>37.6</b>	<b>32.3</b>	<b>31.5</b>	<b>30.6</b>
Higher Education-Total (%)	27.2	32.1	34.6	29.8	29.8
<b>-Female (%)</b>	<b>34.4</b>	<b>39.6</b>	<b>44.5</b>	<b>41.2</b>	<b>41.1</b>
<b>FRANCE - TOTAL</b>	<b>172 070</b>	<b>202 507</b>	<b>243 533</b>	<b>277 631</b>	-
<b>-Female</b>	-	-	<b>46 001</b>	-	-
Business Enterprise-Total (%)	47.1	52.8	59.1	59.7	-
<b>-Female (%)</b>	-	-	-	-	-
Government-Total (%)	15.2	12.8	10.9	10.2	-
<b>-Female (%)</b>	-	-	-	-	-
Higher Education-Total (%)	35.8	32.7	28.9	28.7	-
<b>-Female (%)</b>	-	-	-	-	-
<b>GERMANY - TOTAL</b>	<b>257 874</b>	<b>272 148</b>	<b>327 996</b>	<b>387 982</b>	<b>450 697</b>
<b>-Female</b>	-	<b>47 666</b>	<b>45 650</b>	<b>87 756</b>	<b>102 453</b>
Business Enterprise-Total (%)	59.4	61.3	56.7	59.5	61.5
<b>-Female (%)</b>	-	<b>39.9</b>	-	<b>37.5</b>	<b>39.1</b>
Government-Total (%)	14.6	14.7	15.8	13.9	13.1
<b>-Female (%)</b>	-	<b>21.8</b>	<b>34.6</b>	<b>19.9</b>	<b>19.8</b>
Higher Education-Total (%)	26.0	24.0	27.6	26.6	25.4
<b>-Female (%)</b>	-	<b>38.3</b>	<b>65.4</b>	<b>42.6</b>	<b>41.0</b>
<b>HUNGARY - TOTAL</b>	<b>14 406</b>	<b>15 878</b>	<b>21 342</b>	<b>25 316</b>	<b>39 295</b>
<b>-Female</b>	-	-	<b>6 447</b>	<b>6 799</b>	<b>10534</b>
Business Enterprise-Total (%)	27.1	31.5	48.1	59.4	58.0
<b>-Female (%)</b>	-	-	<b>35.3</b>	<b>40.6</b>	<b>38.3</b>
Government-Total (%)	32.3	31.2	23.6	18.5	16.5
<b>-Female (%)</b>	-	-	<b>31.4</b>	<b>27.2</b>	<b>25.8</b>
Higher Education-Total (%)	40.6	37.2	28.3	22.2	25.4
<b>-Female (%)</b>	-	-	<b>33.3</b>	<b>32.2</b>	<b>35.9</b>

3 Unit of measure used here for researchers is Full Time Equivalent on R&amp;D (OECD, 2023).

<b>Table 6. Continued</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2019</b>
<b>ITALY-TOTAL</b>	<b>66 110</b>	<b>82 489</b>	<b>103 424</b>	<b>125 875</b>	<b>160 824</b>
<b>-Female</b>	<b>-</b>	<b>26 797</b>	<b>35 792</b>	<b>45 447</b>	<b>55 477</b>
Business Enterprise-Total (%)	39.5	33.9	37.0	40.1	48.6
<b>-Female (%)</b>	<b>-</b>	<b>21.3</b>	<b>21.8</b>	<b>25.1</b>	<b>31.9</b>
Government-Total (%)	21.7	17.5	16.9	17.2	14.5
<b>-Female (%)</b>	<b>-</b>	<b>21.0</b>	<b>21.5</b>	<b>22.6</b>	<b>20.1</b>
Higher Education-Total (%)	38.9	44.9	42.0	38.8	33.9
<b>-Female (%)</b>	<b>-</b>	<b>51.8</b>	<b>50.8</b>	<b>46.6</b>	<b>43.2</b>
<b>NETHERLANDS-TOTAL</b>	<b>42 194</b>	<b>47 854</b>	<b>53 703</b>	<b>83 488</b>	<b>97 713</b>
<b>-Female</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Business Enterprise-Total (%)	47.5	47.8	49.5	66.6	69.4
<b>-Female (%)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Government-Total (%)	14.1	14.7	13.0	6.6	6.2
<b>-Female (%)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Higher Education-Total (%)	36.9	37.5	37.5	26.8	24.4
<b>-Female (%)</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>POLAND-TOTAL</b>	<b>55 174</b>	<b>62 162</b>	<b>64 511</b>	<b>82 594</b>	<b>120 780</b>
<b>-Female</b>	<b>-</b>	<b>24 521</b>	<b>24 745</b>	<b>29 190</b>	<b>42 804</b>
Business Enterprise-Total (%)	17.8	15.1	18.2	34.8	47.9
<b>-Female (%)</b>	<b>-</b>	<b>10.5</b>	<b>9.9</b>	<b>20.1</b>	<b>31.1</b>
Government-Total (%)	20.1	19.6	21.0	16.5	1.8
<b>-Female (%)</b>	<b>-</b>	<b>20.0</b>	<b>23.0</b>	<b>19.3</b>	<b>3.1</b>
Higher Education-Total (%)	62.1	65.1	60.7	48.6	49.6
<b>-Female (%)</b>	<b>-</b>	<b>69.3</b>	<b>67.0</b>	<b>60.4</b>	<b>65.0</b>
<b>PORTUGAL – TOTAL</b>	<b>16 738</b>	<b>21 126</b>	<b>41 523</b>	<b>38 672</b>	<b>50 166</b>
<b>-Female</b>	<b>7 437</b>	<b>9 530</b>	<b>18 175</b>	<b>16 769</b>	<b>21 279</b>
Business Enterprise-Total (%)	14.1	19.0	25.5	30.5	38.3
<b>-Female (%)</b>	<b>8.2</b>	<b>11.3</b>	<b>16.4</b>	<b>19.5</b>	<b>25.1</b>
Government-Total (%)	21.2	15.8	5.9	3.5	3.2
<b>-Female (%)</b>	<b>26.3</b>	<b>20.3</b>	<b>8.0</b>	<b>4.7</b>	<b>4.3</b>
Higher Education-Total (%)	51.3	51.9	57.5	64.8	57.4
<b>-Female (%)</b>	<b>53.6</b>	<b>55.5</b>	<b>64.0</b>	<b>74.3</b>	<b>69.3</b>
<b>ROMANIA - TOTAL</b>	<b>20 476</b>	<b>22 958</b>	<b>19 780</b>	<b>17 459</b>	<b>17 350</b>
<b>-Female</b>	<b>8 785</b>	<b>10 617</b>	<b>8 797</b>	<b>7 898</b>	<b>8 029</b>
Business Enterprise-Total (%)	62.0	44.9	29.6	24.3	26.5
<b>-Female (%)</b>	<b>60.8</b>	<b>41.5</b>	<b>24.9</b>	<b>19.0</b>	<b>19.2</b>
Government-Total (%)	25.6	30.8	28.3	38.1	39.2
<b>-Female (%)</b>	<b>29.3</b>	<b>37.7</b>	<b>31.8</b>	<b>41.9</b>	<b>41.3</b>
Higher Education-Total (%)	12.4	23.5	41.7	37.1	33.3
<b>-Female (%)</b>	<b>9.9</b>	<b>19.9</b>	<b>42.8</b>	<b>38.5</b>	<b>38.6</b>
<b>SPAIN - TOTAL</b>	<b>76 670</b>	<b>109 720</b>	<b>134 653</b>	<b>122 437</b>	<b>143 974</b>
<b>-Female</b>	<b>-</b>	<b>41 371</b>	<b>51 831</b>	<b>47 729</b>	<b>57 380</b>
Business Enterprise-Total (%)	27.2	31.9	33.7	36.9	38.1
<b>-Female (%)</b>	<b>-</b>	<b>23.1</b>	<b>26.2</b>	<b>29.3</b>	<b>30.8</b>
Government-Total (%)	16.6	18.6	18.1	16.3	15.4
<b>-Female (%)</b>	<b>-</b>	<b>23.8</b>	<b>22.4</b>	<b>19.6</b>	<b>19.3</b>
Higher Education-Total (%)	54.9	49.2	48.0	46.6	46.3
<b>-Female (%)</b>	<b>-</b>	<b>52.9</b>	<b>51.2</b>	<b>50.9</b>	<b>49.6</b>
<b>Source:</b> Created using OECD Research and Development Statistics (OECD, 2023).					

According to the latest data, Türkiye stands out as one of the countries with the highest percentage of total and female researchers employed in the business enterprise sector among the selected countries. However, it also ranks among the countries with the lowest share of the government sector in both total and female researcher employment. In terms of the share of the higher education sector in the employment of total and female researchers, Türkiye follows Portugal, Poland, and Spain among the countries listed in the table.

**Table 7** provides the number of total R&D personnel with doctoral or equivalent qualifications, categorized by sector of employment (business enterprise, government, and higher education) and gender for Türkiye and selected countries<sup>4</sup>. The data reveals that the total number of R&D personnel with doctoral or equivalent qualifications in Türkiye experienced a significant increase of 262.7% between 2000 and 2020, constituting 32.1% (103041) of the total internal R&D personnel across all sectors. The higher education sector employs the largest number of R&D personnel holding a PhD, accounting for 94.3% of the total. This trend has remained relatively stable from 2000 to 2020. Conversely, the business enterprise sector employs only 4.2% of R&D personnel with a PhD, although there has been a notable increase in this percentage since 2000.

Furthermore, in 2020, 40.3% (41762) of the total R&D personnel with doctoral or equivalent qualifications in Türkiye were women, experiencing a substantial growth of 384.8% from 2000 to 2020. The majority (95.9%) of female R&D personnel with a PhD degree are employed in the higher education sector. In Türkiye, only 2.5% and 1.6% of female R&D personnel with doctoral or equivalent qualifications are employed in the business enterprise and government sectors, respectively. These rates were 0.6% and 3.1% in 2000.

<b>Table 7. Total R&amp;D Personnel with Doctoral or Equivalent Qualifications (Headcount)</b>						
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2019</b>	<b>2020</b>
<b>TÜRKİYE – Total R&amp;D Personnel</b>	<b>76 074</b>	<b>97 355</b>	<b>147 417</b>	<b>224 284</b>	<b>305 811</b>	<b>321 392</b>
Total R&D Personnel with PhD	28 407	35 713	49 625	77 651	100 295	103 041
<b>-Female</b>	<b>8 614</b>	<b>11 151</b>	<b>16 829</b>	<b>28 056</b>	<b>40 536</b>	<b>41 762</b>
Business Enterprise-Total	319	538	1 271	3 060	4 379	4 302
<b>-Female</b>	<b>49</b>	<b>95</b>	<b>255</b>	<b>672</b>	<b>1 034</b>	<b>1 047</b>
Government-Total	757	1522	1 382	1 552	1 551	1 611
<b>-Female</b>	<b>269</b>	<b>512</b>	<b>535</b>	<b>591</b>	<b>654</b>	<b>668</b>
Higher Education-Total	27 331	33 653	46 972	73 039	94 365	97 128
<b>-Female</b>	<b>8 296</b>	<b>10 544</b>	<b>16 039</b>	<b>26 793</b>	<b>38 848</b>	<b>40 047</b>

4 Due to the absence of data on this topic, not all selected countries are included in this table (OECD, 2023).



**Table 7. Continued**

	2000	2005	2010	2015	2019	
<b>CZECH REPUBLIC-Total R&amp;D Personnel</b>	<b>53 506</b>	<b>65 379</b>	<b>77 903</b>	<b>100 128</b>	-	-
Total R&D Personnel with PhD	13 119	16 997	-	26 421	-	-
<b>-Female</b>	<b>2 985</b>	<b>4 478</b>	-	<b>8 214</b>	-	-
Business Enterprise-Total	1 757	1 636	-	2 597	-	-
<b>-Female</b>	<b>391</b>	<b>243</b>	-	<b>427</b>	-	-
Government-Total	3 566	4 092	-	5 913	-	-
<b>-Female</b>	<b>688</b>	<b>1 199</b>	-	<b>1 925</b>	-	-
Higher Education-Total	7 403	11 237	-	17 849	-	-
<b>-Female</b>	<b>1 816</b>	<b>3 030</b>	-	<b>5 845</b>	-	-
<b>HUNGARY - Total R&amp;D Personnel</b>	<b>45 325</b>	<b>49 723</b>	<b>53 991</b>	<b>56 235</b>	<b>84 651</b>	-
Total R&D Personnel with PhD	7 092	11 876	13 156	15 456	17 847	-
<b>-Female</b>	-	<b>3 343</b>	<b>3 995</b>	<b>5 406</b>	<b>6 443</b>	-
Business Enterprise-Total	337	682	1 345	1 616	1 807	-
<b>-Female</b>	-	<b>207</b>	<b>369</b>	<b>433</b>	<b>489</b>	-
Government-Total	1 498	2 493	2 703	3 388	3 566	-
<b>-Female</b>	-	<b>750</b>	<b>826</b>	<b>1 223</b>	<b>1 316</b>	-
Higher Education-Total	5 257	8 701	9 108	10 452	12 474	-
<b>-Female</b>	-	<b>2 386</b>	<b>2 800</b>	<b>3 750</b>	<b>4 638</b>	-
<b>POLAND - Total R&amp;D Personnel</b>	<b>125 614</b>	<b>123 431</b>	<b>129 792</b>	<b>157 921</b>	<b>271 025</b>	-
Total R&D Personnel with PhD	50 938	61 608	69 843	74 362	92 344	-
<b>-Female</b>	-	<b>22 390</b>	<b>27 671</b>	<b>31 257</b>	<b>39 271</b>	-
Business Enterprise-Total	2 236	1 682	1 006	2 056	8 483	-
<b>-Female</b>	-	<b>484</b>	<b>211</b>	<b>611</b>	<b>2 568</b>	-
Government-Total	6 601	7 236	8 898	9 450	1 611	-
<b>-Female</b>	-	<b>2 592</b>	<b>3 528</b>	-	<b>756</b>	-
Higher Education-Total	42 087	52 656	59 918	62 786	81 164	-
<b>-Female</b>	-	<b>19 307</b>	<b>23 924</b>	<b>26 734</b>	<b>35 541</b>	-
<b>PORTUGAL - Total R&amp;D Personnel</b>	<b>38 018</b>	<b>44 585</b>	<b>91 917</b>	<b>103 291</b>	<b>123 012</b>	<b>131 128</b>
Total R&D Personnel with PhD	16 400	21 727	24 887	31 924	38 888	38 986
<b>-Female</b>	<b>6 734</b>	<b>9 557</b>	<b>10 649</b>	<b>15 040</b>	<b>19 090</b>	<b>19 263</b>
Business Enterprise-Total	341	555	540	1 236	2 045	2 177
<b>-Female</b>	<b>74</b>	<b>150</b>	<b>171</b>	<b>419</b>	<b>813</b>	<b>861</b>
Government-Total	1 590	1 807	1 133	1 118	1 469	1 527
<b>-Female</b>	<b>778</b>	<b>940</b>	<b>595</b>	<b>605</b>	<b>808</b>	<b>852</b>
Higher Education-Total	12 157	16 364	20 028	29 277	34 934	34 698
<b>-Female</b>	<b>5 117</b>	<b>7 309</b>	<b>8 579</b>	<b>13 850</b>	<b>17 236</b>	<b>17 242</b>
<b>ROMANIA- Total R&amp;D Personnel</b>	<b>37 241</b>	<b>41 035</b>	<b>39 065</b>	<b>43 448</b>	<b>43 973</b>	-
Total R&D Personnel with PhD	5 166	8 746	15 468	17 267	18 249	-
<b>-Female</b>	<b>1 734</b>	<b>3 563</b>	<b>6 696</b>	<b>8 350</b>	<b>8 986</b>	-
Business Enterprise-Total	948	1 398	833	868	647	-
<b>-Female</b>	<b>318</b>	<b>552</b>	<b>331</b>	<b>317</b>	<b>253</b>	-
Government-Total	1 736	2 068	2 380	4 138	4 638	-
<b>-Female</b>	<b>686</b>	<b>966</b>	<b>1 144</b>	<b>2 030</b>	<b>2 285</b>	-
Higher Education-Total	2 482	5 219	12 177	12 134	12 792	-
<b>-Female</b>	<b>730</b>	<b>2 022</b>	<b>5 188</b>	<b>5 943</b>	<b>6 377</b>	-
<b>SPAIN- Total R&amp;D Personnel</b>	-	<b>282 804</b>	<b>360 229</b>	<b>338 179</b>	<b>377 862</b>	<b>378 296</b>
Total R&D Personnel with PhD	-	-	-	-	-	119 661
<b>-Female</b>	-	-	-	-	-	<b>51 372</b>
Business Enterprise-Total	-	-	-	-	-	12 041
<b>-Female</b>	-	-	-	-	-	<b>5 042</b>
Government-Total	7 268	-	14 995	13 950	15 928	16 152
<b>-Female</b>	-	-	<b>6 578</b>	<b>6 460</b>	<b>7 441</b>	<b>7 616</b>
Higher Education-Total	48 795	-	75 153	80 319	91 142	91 287
<b>-Female</b>	-	-	<b>27 980</b>	<b>32 140</b>	<b>38 271</b>	<b>38 629</b>

Source: Created using OECD Research and Development Statistics (OECD, 2023).

Among the countries listed in the table, Türkiye exhibits the lowest employment rate of total and female R&D personnel with a PhD in the business and government sectors. For instance, the government sector employs more than 20% of R&D personnel with doctoral degrees in the Czech Republic, Hungary, and Romania, while in Spain, around 10% work in the business enterprise sector.

### **3. Business Enterprise R&D (BERD) Indicators for Türkiye and Selected Countries**

In 2021, the business enterprise (private) sector in Türkiye contributed to 70.7% of the country's gross domestic R&D expenditures (GERD) and there has been a significant increase in this share between 2000 and 2021. Furthermore, the proportion of business enterprise R&D (BERD) in GDP has grown fivefold over the same period, rising from 0.16% to 0.80%. The percentage of total researchers employed in the business enterprise sector (61.8%) in Türkiye has also significantly increased since 2000.

Furthermore, the latest data show that 57.2% of the total GERD was financed by the business enterprise sector. In the last ten years, there has been a remarkable increase in the business sector's share in financing R&D expenditures, while the share of the government (public) sector has significantly decreased. All of this data clearly illustrates that the private sector is the primary driving force behind R&D activities in Türkiye.

As outlined in the theoretical approaches summarized in the first section, there is an emphasis on the positive impact of R&D investments made by private sector firms on productivity within the market mechanism. Firm-level evidence indicates that companies in high-tech sectors achieve higher returns on their R&D investments (Kwon & Inui, 2003) and display greater R&D output elasticity (Kafourous, 2005). Additionally, firms that use advanced technologies and maintain a moderate R&D intensity are more responsive to external R&D (Beneito, 2001).

As Target 9.5 of SDG 9 emphasizes encouraging innovation and increasing research and development (R&D) spending, this section provides key indicators for business enterprise R&D expenditure (BERD).

#### **3.1. Business Enterprise R&D Expenditure**

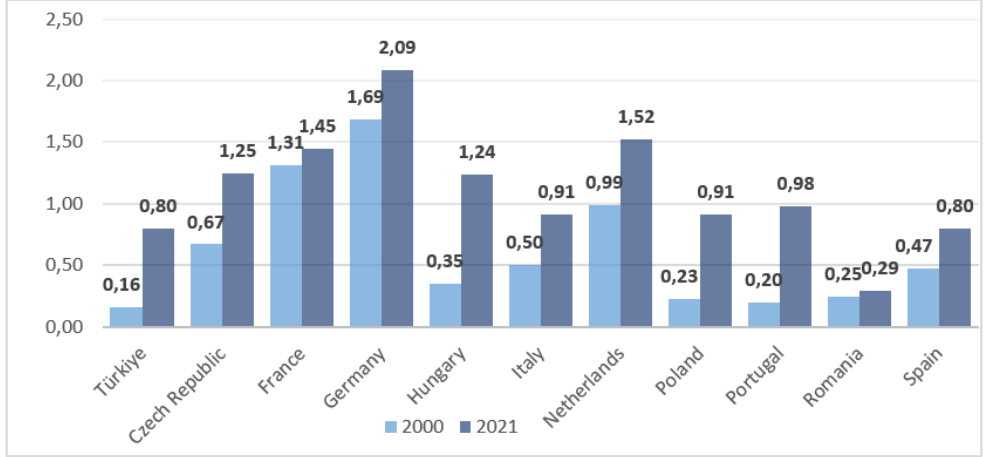
According to the data in **Table 8**, Türkiye's BERD, at 2015 prices, increased from 1.5 billion dollars in 2000 to 21.1 billion dollars in 2021, representing a remarkable growth of 1301.8%. Consequently, the share of R&D expenditures of business enterprises in GDP

increased from 0.16% to 0.80% in Türkiye, and its share in industry value added rose from 0.22% to 1.08% during the same period. Based on the 2021 data, Türkiye ranks third in BERD, trailing behind Germany and France among the selected countries. However, in terms of the share of BERD in GDP and industrial value added, Türkiye falls behind all the countries in the table except Romania, and this position has not changed much throughout the 2000-2021 period (Figures 8 and 9).

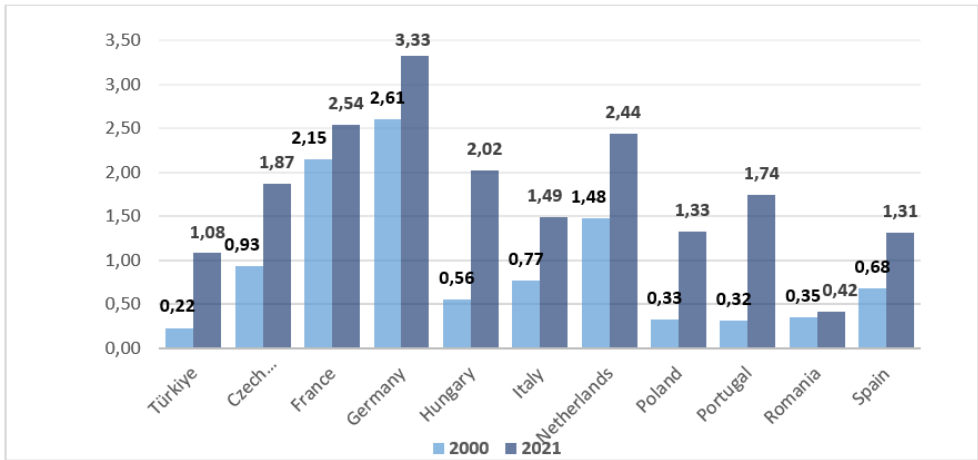
**Table 8.** Business Enterprise Expenditure on R&D, 2000-2021 (Millions Dollar, 2015 Prices)

Country	2000	2005	2010	2015	2020	2021
Türkiye	1 508	2 345	4 853	8 868	16 771	21 133
Czech Republic	1 598	1 964	2 471	3 721	4 690	5 028
France	29 847	31 597	35 541	39 155	40 904	41 677
Germany	55 437	56 972	65 456	78 332	83 684	85 953
Hungary	676	952	1 609	2 595	3 612	3 944
Italy	11 295	12 372	15 223	17 445	19 836	20 753
Netherlands	7 071	7 191	6 700	11 747	13 893	14 341
Poland	1 387	1 246	1 690	4 765	10 415	11 574
Portugal	598	907	2 259	1 772	2 889	3 259
Romania	625	664	651	920	1 394	1 533
Spain	6 237	9 153	11 358	10 410	12 482	13 495

Source: (OECD, 2023).



**Figure 8.** Business Enterprise R&D, 2000 vs 2021 (as a percentage of GDP)  
**Source:** (OECD, 2023)



**Figure 9.** Business Enterprise R&D, 2000 vs 2021 (as a percentage of value-added in industry)

Source: (OECD, 2023)

**Table 9** below presents business enterprise R&D expenditure (BERD) by source of funds as a percentage of total BERD for Türkiye and selected countries from 2000 to 2020. According to the data, in 2020, the business sector financed 87% of the R&D expenditures of business enterprises in Türkiye, while the government contributed 10.9%, and the higher education sector accounted for only 0.12%.

Among the selected countries, Türkiye stands out with a high share of the business sector and government in financing BERD. Over the 2000-2020 period, the proportion of business-funded BERD decreased, while government-financed BERD experienced significant growth. Based on the data presented in the tables, Portugal, Germany, and Türkiye have the highest share of the business sector in financing BERD in 2020, whereas Hungary, Poland, and Türkiye rank first in terms of the ratio of government-financed BERD.

However, higher education-financed business enterprise R&D expenditure in Türkiye, as a percentage of BERD, declined from 1.40% in 2000 and 2.02% in 2005 to 0.12% in 2020.

In Türkiye, business-financed BERD constituted 0.87% of the value added in the industry, while government-financed BERD accounted for 0.08% of GDP in 2020, and these rates have increased between 2000 and 2020. In Germany, business-financed BERD represented 2.95% of the industry value added in 2020 (OECD, 2023).

**Table 9.** Business Enterprise R&D Expenditure by Source of Funds, 2000-2020  
(as a percentage of total BERD)

Country		2000	2005	2010	2015	2020
TÜRKİYE	Business - Financed	92.4	90.8	88.0	87.6	87.0
	Government - Financed	4.3	6.9	10.4	10.6	10.9
	Higher Education - Financed	1.40	2.02	0.19	0.14	0.12
CZECH REPUBLIC	Business-Financed	80.6	78.8	69.2	60.5	56.2
	Government - Financed	14.7	15.6	14.5	7.6	6.8
	Higher Education - Financed	1.01	0.10	0.09	0.05	0.06
FRANCE	Business-Financed	81.0	80.7	82.0	82.2	83.2
	Government - Financed	9.9	10.1	8.7	8.9	8.5
	Higher Education - Financed	0.05	0.05	0.10	0.08	0.08
GERMANY	Business-Financed	90.8	92.1	92.0	89.9	88.2
	Government - Financed	6.9	4.5	4.5	3.3	3.2
	Higher Education - Financed	0.20	0.17	0.09	0.15	0.15
HUNGARY	Business-Financed	75.8	77.8	70.8	64.8	65.0
	Government - Financed	6.1	3.9	14.0	19.4	15.7
	Higher Education - Financed	0.03	0.06	0.26	0.04	0.09
ITALY	Business-Financed	80.5	76.8	80.7	84.2	82.3
	Government - Financed	11.0	11.0	5.9	5.5	4.7
	Higher Education - Financed	0.33	0.11	0.21	0.34	0.16
NETHERLANDS	Business-Financed	-	79.0	-	80.3	81.5
	Government - Financed	4.7	3.4	7.4	6.3	6.7
	Higher Education - Financed	-	0.33	-	0.68	1.04
POLAND	Business-Financed	66.3	83.0	79.2	79.8	78.9
	Government - Financed	32.0	13.7	13.8	10.0	13.6
	Higher Education - Financed	0.13	0.08	0.09	0.14	0.24
PORTUGAL	Business-Financed	90.8	91.4	94.0	89.7	89.7
	Government - Financed	4.2	4.2	4.3	5.5	6.4
	Higher Education - Financed	0.00	0.00	0.00	0.02	0.05
ROMANIA	Business-Financed	63.1	57.5	62.5	69.5	85.4
	Government - Financed	34.0	36.8	30.1	13.7	5.2
	Higher Education - Financed	0.58	0.16	0.37	0.28	0.12
SPAIN	Business-Financed	86.7	79.9	76.3	81.9	83.2
	Government - Financed	7.2	13.6	16.6	9.4	9.6
	Higher Education - Financed	2.33	0.68	0.30	0.85	0.15

**Source:** (OECD, 2023).

**Table 10.** Business Enterprise R&D Expenditure by Source of Funds and by Number of Persons Employed<sup>5</sup>

Source of Funds / Number of Persons Employed	TÜRKİYE		CZECH REPUBLIC		FRANCE		GERMANY		HUNGARY		ITALY	
	2015	2020	2010	2020	2010	2017	2009	2019	2010	2020	2010	2020
<b>TOTAL BERD</b> (Millions Dollar) 2015 prices	8 868	16 771	2 471	4 690	35 541	40 425	63 556	90 954	1 609	3 612	15 223	19 836
<b>From 1 to 249 Employees – SMEs (%)</b>	35.2	35.7	45.8	27.0	23.4	27.0	11.0	8.8	39.1	38.6	22.5	31.5
250 Employees or more (%)	64.7	64.3	54.0	72.9	76.6	73.0	89.0	91.2	57.1	60.7	77.5	68.5
<b>Business- Financed BERD</b> (Millions Dollar) 2015 prices	7 770	14 590	1 711	2 638	29 142	33 622	58 484	80 190	1 138	2 349	12 292	16 318
<b>From 1 to 249 Employees - SMEs (%)</b>	34.2	38.0	43.7	28.5	24.2	28.3	9.8	7.6	31.1	32.0	24.5	33.6
250 Employees or more (%)	65.7	62.0	56.1	71.3	75.8	71.7	90.8	92.4	65.5	67.6	75.5	66.4
<b>Government- Financed BERD</b> (Millions Dollar) 2015 prices	941	1 824	359	319	3 104	3 235	2 838	2 903	225	569	897	934
<b>From 1 to 249 Employees - SMEs (%)</b>	43.1	19.1	65.6	62.9	23.0	26.3	31.4	48.7	83.4	75.4	23.4	34.0
250 Employees or more (%)	56.6	80.9	33.4	37.0	77.0	73.7	57.5	51.3	7.4	22.3	76.6	66.0

5 The reason why the periods in this table differ from country to country is due to the limited data available on these subjects.

<b>Table 10. Continued</b>										
<b>Source of Funds / Number of Persons Employed</b>	<b>NETHERLANDS</b>		<b>POLAND</b>		<b>PORTUGAL</b>		<b>ROMANIA</b>		<b>SPAIN</b>	
	<b>2011</b>	<b>2020</b>	<b>2010</b>	<b>2020</b>	<b>2010</b>	<b>2020</b>	<b>2010</b>	<b>2019</b>	<b>2010</b>	<b>2020</b>
<b>TOTAL BERD (Millions Dollar) 2015 prices</b>	8 870	13 893	1 690	10 415	2 259	2 889	651	1 448	11 358	12 482
<b>From 1 to 249 Employees - SMEs (%)</b>	<b>45.2</b>	<b>-</b>	<b>-</b>	<b>33.1</b>	<b>33.3</b>	<b>49.9</b>	<b>53.2</b>	<b>9.1</b>	<b>50.2</b>	<b>46.6</b>
250 Employees or more (%)	54.3	67.6	70.8	66.8	66.7	50.1	46.6	90.9	49.8	53.4
<b>Business-Financed BERD (Millions Dollar) 2015 prices</b>	7 294	11 316	1 339	8 215	2 124	2 591	407	1 257	8 666	10 386
<b>From 1 to 249 Employees - SMEs (%)</b>	<b>46.2</b>	<b>-</b>	<b>26.8</b>	<b>27.0</b>	<b>30.6</b>	<b>46.7</b>	<b>47.3</b>	<b>5.3</b>	<b>47.8</b>	<b>46.2</b>
250 Employees or more (%)	53.8	67.1	73.2	72.9	69.4	53.3	52.4	94.7	52.2	53.8
<b>Government-Financed BERD (Millions Dollar) 2015 prices</b>	339	938	233	1 413	98	185	196	71	1 884	1196
<b>From 1 to 249 Employees - SMEs (%)</b>	<b>48.2</b>	<b>-</b>	<b>-</b>	<b>51.6</b>	<b>77.3</b>	<b>75.3</b>	<b>58.5</b>	<b>36.7</b>	<b>67.3</b>	<b>59.2</b>
250 Employees or more (%)	45.2	83.9	56.9	48.3	22.7	24.7	41.4	63.3	32.7	41.0
<b>Source:</b> Created using OECD Research and Development Statistics (OECD, 2023).										

**Table 10** presents research and development (R&D) expenditures carried out in the business enterprise sector, categorized by size (number of persons employed) and source of funds, for Türkiye and selected countries. The data indicate that in Türkiye, 35.7% of the total business enterprise R&D expenditure (BERD) of around 16.8 billion dollars in 2020 is attributed to small and medium-sized enterprises (SMEs) with less than 250 employees, while 64.3% is accounted for by large enterprises with 250 or more employees. The share of SMEs in Türkiye in the total BERD financed by the business enterprise sector and government is 38.0 % and 19.1%, respectively in 2020. However, the share of SMEs in government-financed BERD was 43.1% in 2015, indicating a significant decline in this proportion between 2015

and 2020. In Türkiye, it is evident that large firms play a substantial role in the total BERD, particularly in government-funded R&D expenditures of the business enterprise sector.

Regarding the countries listed in the table, although SMEs have a higher proportion in government-financed BERD in some countries such as the Czech Republic, Hungary, Poland, Portugal, Romania (2010), and Spain, unlike Türkiye, large firms generally account for a greater share of the total BERD and business-financed BERD, similar to the situation in Türkiye.

### 3.2. Business Enterprise R&D Expenditure by Industry

R&D expenditures in the manufacturing industry are of particular significance in working towards both Target 9.2 and Target 9.5 within SDG 9.

Target 9.2 focuses on promoting inclusive and sustainable industrialization, aiming to increase industry's contribution to employment and GDP significantly, especially in developing countries. It's about fostering the growth of industries sustainably and equitably. Furthermore, Target 9.5 seeks to improve scientific research and enhance the technological capabilities of industrial sectors worldwide, particularly in developing countries, by encouraging innovation. Essentially, it's about boosting innovation and research capacities (European Commission, 2023).

The connection between these two targets lies in the idea that industrialization, as promoted by Target 9.2, often goes hand in hand with technological progress and innovation. As countries develop their industrial sectors and invest more in research and development to remain competitive and sustainable, Target 9.5 becomes relevant.

In other words, Target 9.2 is about industrial growth, and Target 9.5 is about ensuring that this growth is underpinned by scientific research, technological advancement, and innovation. They are complementary in the broader goal of fostering sustainable and inclusive economic development.

In this context, the data presented below aligns with the indicators of Target 9.5. These indicators pertain to research and development expenditures, funded both publicly and privately, within the manufacturing industry sectors, as well as the number of research and development personnel employed in these sectors.

**Table 11** displays business enterprise R&D expenditure (BERD) by industry as a percentage of the total BERD within the manufacturing industry, following the International Standard Industrial Classification (ISIC) revision 4, for Türkiye and selected countries. The data indicate that the total BERD value in the manufacturing industry of Türkiye was approximately 9.6 billion dollars in 2020, accounting for 57.1% of the total R&D expenditures of the business enterprise sector. This value, which stood at around 2.5 billion dollars in 2010, represented 51.6% of Türkiye's total BERD and witnessed a significant increase of 282.2% over a decade.



**Table 11.** Business Enterprise R&D Expenditure by Industry (As a Percentage of total BERD in the manufacturing industry, %)

SECTORS (ISIC Rev. 4 )	TÜRKİYE		CZECH REPUBLIC		FRANCE		GERMANY		HUNGARY		ITALY	
	2010	2020	2010	2020	2010	2017	2010	2019	2010	2019	2010	2019
<b>TOTAL BERD</b> (Millions Dollar) 2015 prices	4 853	16 771	2 471	4 690	35 541	40 425	65 456	90 954	1 609	3 436	15 223	21 614
<b>MANUFACTURING</b> (Millions Dollar) 2015 prices	<b>2 505</b>	<b>9 573</b>	<b>1 300</b>	<b>2 373</b>	<b>17 897</b>	<b>19 667</b>	<b>56 127</b>	<b>77 197</b>	<b>1 046</b>	<b>1 564</b>	<b>10 905</b>	<b>14 301</b>
<b>MANUFACTURING (%)</b>	<b>51.6</b>	<b>57.1</b>	<b>52.6</b>	<b>50.6</b>	<b>50.4</b>	<b>48.7</b>	<b>85.7</b>	<b>84.9</b>	<b>65.0</b>	<b>45.5</b>	<b>71.6</b>	<b>66.2</b>
<b>10-11.</b> Food and Beverages	3.0	1.9	2.1	0.9	-	-	-	-	-	-	-	-
<b>13.</b> Textiles	2.5	1.9	1.3	1.0	0.6	0.7	0.2	0.1	-	0.1	1.5	1.8
<b>14.</b> Wearing Apparel	0.6	0.5	0.2	0.1	0.3	0.2	0.1	0.1	-	-	2.7	3.1
<b>15.</b> Leather and Related Products	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	-	-	1.3	2.3
<b>16.</b> Wood and Wood and Cork Products	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.3	0.2	0.4
<b>17.</b> Paper and Paper Products	0.2	0.5	0.0	0.1	0.2	0.3	0.2	0.1	0.3	0.3	0.6	0.7
<b>18.</b> Printing and Reproduction of Recorded media	0.2	0.1	0.2	0.1	0.1	0.1	0.3	0.2	0.5	1.6	0.1	0.3
<b>19.</b> Coke and Refined Petroleum Products	-	0.4	0.1	0.0	0.8	0.3	0.2	0.2	1.2	-	0.1	0.1
<b>20.</b> Chemicals and Chemical Products	7.0	3.1	6.1	2.9	7.8	6.3	7.8	6.9	2.6	2.0	4.8	4.8
<b>21.</b> Basic Pharmaceutical Products and Pharmaceutical Preparations	4.5	2.8	6.7	3.8	6.0	5.2	9.3	8.4	<b>46.3</b>	<b>29.0</b>	7.4	6.0
<b>22.</b> Rubber and Plastic Products	3.2	2.0	4.2	3.2	4.8	4.6	2.1	2.1	1.2	2.9	3.1	3.5
<b>23.</b> Other Non-Metallic Mineral Products	2.6	1.2	2.5	1.9	1.2	0.9	0.7	0.6	0.7	0.6	1.2	1.3
<b>24.</b> Basic Metals	1.4	1.4	1.5	0.5	0.9	0.9	1.2	0.8	0.9	0.6	1.3	1.1
<b>25.</b> Fabricated Metal Products, except machinery and equipment	8.1	3.4	5.0	4.4	4.6	4.2	1.8	1.6	0.9	4.3	3.5	4.2
<b>26.</b> Computer, Electronic and Optical Products	6.0	<b>25.7</b>	7.5	9.5	<b>22.4</b>	<b>23.4</b>	14.9	13.6	12.1	4.8	<b>18.2</b>	9.9
<b>27.</b> Electrical Equipment	10.7	7.9	8.8	14.3	4.6	5.2	3.3	4.2	4.4	6.3	5.7	6.3
<b>28.</b> Machinery and Equipment n.e.c.	8.4	8.1	15.8	12.9	6.9	7.1	11.4	11.6	6.8	7.2	14.0	<b>18.4</b>
<b>29.</b> Motor vehicles, Trailers and Semi- Trailers	<b>28.8</b>	17.2	<b>21.8</b>	<b>30.2</b>	13.1	15.0	<b>36.8</b>	<b>43.9</b>	14.9	28.9	14.2	15.3
<b>30.</b> Other Transport Equipment	10.7	19.7	9.3	7.9	19.7	18.1	6.2	3.1	0.2	1.2	15.0	13.7
<b>31.</b> Furniture	0.6	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-	0.7	0.9
<b>32.</b> Other Manufacturing	0.8	0.8	1.8	1.2	1.6	2.2	1.1	1.7	2.0	2.9	1.2	1.8
<b>33.</b> Repair and Installation of Machinery and Equipment	0.6	0.6	4.5	4.6	1.4	2.7	1.4	0.3	1.7	2.5	0.9	1.0

**Table 11.** Continued

SECTORS (ISIC Rev. 4)	NETHERLANDS		POLAND		PORTUGAL		ROMANIA		SPAIN	
	2010	2019	2010	2019	2010	2020	2010	2019	2010	2019
<b>TOTAL BERD</b>	6 700	13 622	1 691	10 104	2 259	2 890	651	1 448	11 358	12 615
<b>MANUFACTURING</b>	<b>4 547</b>	-	<b>861</b>	<b>4 302</b>	<b>736</b>	<b>1 044</b>	<b>264</b>	<b>486</b>	<b>5 063</b>	<b>5 619</b>
<b>MANUFACTURING (%)</b>	<b>67.9</b>	-	<b>50.9</b>	<b>42.6</b>	<b>32.6</b>	<b>36.1</b>	<b>40.6</b>	<b>33.6</b>	<b>44.6</b>	<b>44.5</b>
<b>10-11. Food and Beverages</b>	9.3	-	7.4	6.8	11.4	9.7	0.8	0.6	-	-
<b>13. Textiles</b>	0.3	-	-	2.1	3.4	3.5	0.4	0.0	0.9	0.6
<b>14. Wearing Apparel</b>	0.0	-	0.1	-	0.7	2.0	-	0.1	1.2	1.1
<b>15. Leather and Related Products</b>	0.02	-	-	-	1.0	1.5	0.8	0.0	0.4	0.2
<b>16. Wood and Wood and Cork Products</b>	0.1	-	0.6	1.3	1.6	3.6	-	0.0	0.5	0.3
<b>17. Paper and Paper Products</b>	0.4	-	-	0.5	1.9	3.3	-	0.1	0.5	0.4
<b>18. Printing and Reproduction of Recorded media</b>	0.1	-	-	0.6	2.6	2.6	-	0.0	0.4	0.5
<b>19. Coke and Refined Petroleum Products</b>	0.4	-	-	1.2	-	1.1	0.4	0.0	1.8	1.6
<b>20. Chemicals and Chemical Products</b>	19.4	-	7.1	5.6	7.3	5.6	16.3	1.0	7.4	7.9
<b>21. Basic Pharmaceutical Products and Pharmaceutical Preparations</b>	10.8	-	11.0	5.7	<b>18.9</b>	<b>13.6</b>	3.4	3.9	<b>18.8</b>	<b>20.2</b>
<b>22. Rubber and Plastic Products</b>	1.1	-	-	3.4	4.9	6.9	0.8	0.0	3.1	2.4
<b>23. Other Non-Metallic Mineral Products</b>	0.5	-	3.1	3.8	5.4	6.1	0.8	0.0	2.1	1.5
<b>24. Basic Metals</b>	-	-	3.4	2.9	3.0	1.7	2.3	1.4	2.2	1.7
<b>25. Fabricated Metal Products, except machinery and equipment</b>	1.9	-	5.9	8.0	6.5	6.9	2.3	0.6	4.1	3.9
<b>26. Computer, Electronic and Optical Products</b>	15.8	-	10.8	10.2	4.8	7.6	5.7	2.3	6.9	5.4
<b>27. Electrical Equipment</b>	12.1	-	<b>13.8</b>	8.4	8.3	5.9	6.8	5.3	6.1	5.0
<b>28. Machinery and Equipment n.e.c.</b>	<b>20.6</b>	-	8.7	6.7	3.4	6.0	7.2	3.7	6.4	6.9
<b>29. Motor vehicles, Trailers and Semi-Trailers</b>	2.0	-	6.4	<b>21.1</b>	9.8	6.3	<b>39.0</b>	<b>77.6</b>	11.4	14.0
<b>30. Other Transport Equipment</b>	1.8	-	8.0	5.5	0.7	1.1	8.0	2.5	17.1	16.9
<b>31. Furniture</b>	0.3	-	-	2.1	1.2	1.1	-	0.2	0.6	0.4
<b>32. Other Manufacturing</b>	-	-	-	1.9	0.7	1.1	4.2	0.0	1.6	1.7
<b>33. Repair and Installation of Machinery and Equipment</b>	0.5	-	4.1	1.8	1.0	2.8	1.1	0.4	0.4	0.5

**Source:** Created using OECD Research and Development Statistics (OECD, 2023).

The sectors with the highest shares in the total R&D expenditures of the business sector in the Turkish manufacturing industry in 2020 were the manufacture of computer, electronic and optical products (25.7%), manufacture of other transport equipment (19.7%), manufacture of motor vehicles, trailers and semi-trailers (17.2%), manufacture of machinery and equipment (8.1%), and manufacture of electrical equipment (7.9%). In 2010, the motor vehicles, trailers, and semi-trailers industry held the highest share (28.8%) in the total R&D expenditures of the business sector in the Turkish manufacturing industry, while the share of the computer, electronic, and optical products industry was only around 6.0%.

Among the selected countries, Germany (84.9% in 2019) and Italy (66.2% in 2019) recorded the highest rates of total R&D expenditures by the business enterprise sector in the manufacturing industry. In the German manufacturing industry, the motor vehicles, trailers and semi-trailers, and the computer, electronics and optical products industries accounted for the largest share of total R&D spending (43.9% and 13.6% in 2019, respectively). In the Italian manufacturing industry, the machinery and equipment, and the motor vehicles, trailers, and semi-trailers sectors held the highest shares of the total R&D expenditures (18.4% and 15.3% in 2019, respectively). It's worth mentioning that in Romania, 77.6% of the total business enterprise research and development (BERD) expenditure in the manufacturing industry was directed towards the motor vehicles, trailers, and semi-trailers sector in 2019.

**Table 12** includes R&D expenditures of the business enterprise sector in the manufacturing industry, categorized by the source of funds (business enterprise, government, rest of the world, higher education, and private non-profit sectors) for Türkiye and selected countries. According to the data, 81% of the R&D expenditures in the Turkish manufacturing industry by the business enterprise sector in 2020 were financed by the business enterprise sector itself, while 16.1% were funded by the government sector. The rest of the world and the higher education sector contributed 2.7% and only 0.02%, respectively, to the financing of R&D expenditures. Türkiye stands out among the selected countries as one of the countries where the government sector's contribution to financing R&D expenditures in the manufacturing industry of the business enterprise sector is the highest.

**Table 13** displays the percentage distribution of total R&D personnel in the business enterprise sector by industry, measured in full-time equivalent and classified according to the International Standard Industrial Classification (ISIC) revision 4, in Türkiye and selected countries within the manufacturing industry. The number of total R&D personnel employed in the manufacturing industry of Türkiye increased from 19534 in 2010 to 60980 in 2020, accounting for 46.8% of the business enterprise sector's total R&D personnel.

**Table 12.** Business Enterprise R&D Expenditures in the Manufacturing Industry by Source of Funds

Source of Funds	TÜRKİYE		CZECH REPUBLIC		FRANCE		GERMANY		HUNGARY		ITALY	
	2010	2020	2010	2020	2010	2017	2009	2019	2010	2019	2010	2019
MANUFACTURING (Millions Dollar) Constant prices - 2015	2 505	9 573	1 300	2 373	17 897	19 667	54 343	77 197	1 046	1 564	10 905	14 301
Business Enterprise Sector (%)	83.6	81.0	78.9	68.8	75.9	77.2	94.1	89.0	81.1	74.1	83.4	88.5
Rest of the World (%)	2.3	2.7	8.6	27.5	10.8	10.7	2.9	8.9	10.9	11.9	11.3	8.4
Government Sector (%)	14.0	16.1	12.4	3.7	13.2	12.1	3.0	2.0	7.7	14.0	5.2	3.1
Higher Education Sector (%)	0.02	0.02	0.0	0.1	0.02	-	-	-	-	0.00	0.01	0.03
Private Non-Profit Sector (%)	0.12	0.11	0.0	0.0	0.00	-	0.06	0.13	0.3	0.00	0.15	0.00
Source of Funds	NETHERLANDS		POLAND		PORTUGAL		ROMANIA		SPAIN			
	2010	2019	2010	2019	2010	2020	2010	2019	2010		2019	
MANUFACTURING (Millions Dollar) Constant prices - 2015	4 547	-	861	4 302	736	1 044	264	486	5 063		5 619	
Business Enterprise Sector (%)	-	-	82.1	84.6	95.5	92.0	84.9	94.8	80.5		88.0	
Rest of the World (%)	-	-	5.0	5.4	0.2	1.6	7.0	4.7	6.5		4.8	
Government Sector (%)	-	-	12.9	9.9	4.3	6.4	8.0	0.5	12.9		7.2	
Higher Education Sector (%)	-	-	-	-	-	0.01	0.18	0.01	0.00		0.00	
Private Non-Profit Sector (%)	-	-	-	-	0.00	0.00	-	0.00	0.07		0.03	
Source: Created using OECD Research and Development Statistics (OECD, 2023).												

In 2020, the sector with the highest number of R&D personnel is the computer, electronic and optical products industry, which constitutes 18.0% of the total R&D personnel employed in the Turkish manufacturing industry<sup>6</sup>. This is followed by the motor vehicles, trailers and semi-trailers, and machinery and equipment sectors, which make up 13.4% and 12.8% of the total R&D personnel employed in the manufacturing industry of Türkiye, respectively.

Among the selected countries, Germany employs the highest number of R&D personnel in the manufacturing industry, with a ratio of 78.8% to the total R&D personnel in the business enterprise sector in 2019. In the German manufacturing industry, the motor vehicles, trailers, and semi-trailers sector employs the highest proportion of R&D personnel (37.2%), followed by the computer, electronic, and optical products sector (16%). It should be noted that the number of R&D personnel employed in just one sector in the German manufacturing industry is higher than the total number of R&D personnel working in the Turkish manufacturing industry.

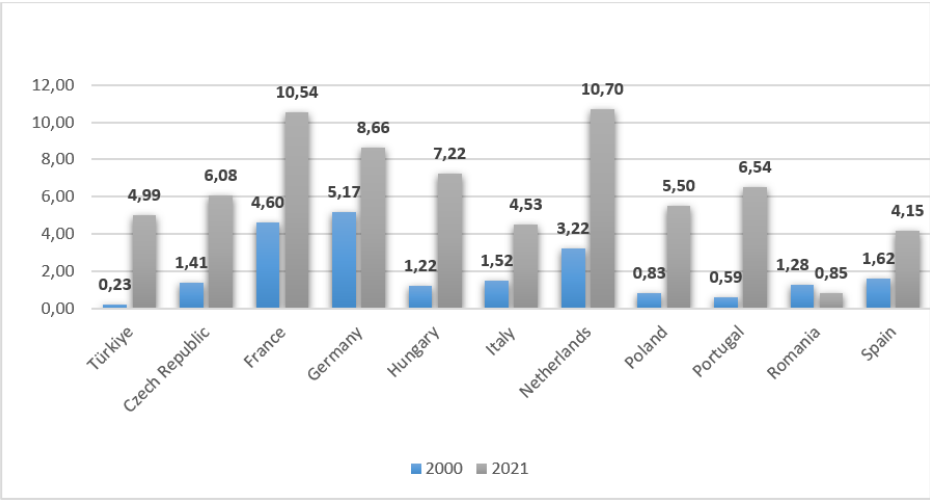
6 Its share was only 7.1% in 2010.

<b>Table 13. Business Enterprise Sector R&amp;D Personnel by Industry (FTE) (as a percentage of total R&amp;D personnel in the manufacturing industry, %)</b>												
SECTORS ISIC Rev. 4	TÜRKİYE		CZECH REPUBLIC		FRANCE		GERMANY		HUNGARY		ITALY	
	2010	2020	2010	2020	2010	2017	2010	2019	2010	2019	2010	2019
TOTAL BERD	37 522	1 30 279	26 541	46 234	235 588	265 701	337 211	475 676	14 999	33 124	112 212	225 056
MANUFACTURING	19 534	60 980	14 057	21 961	113 134	124 612	279 422	375 006	8 640	13 794	78 729	136 295
MANUFACTURING(%)	52.1	46.8	53.0	47.5	48.0	46.9	82.9	78.8	57.6	41.6	70.2	60.6
10-11. Food and Beverages	3.3	3.6	1.5	1.4	-	-	-	0.7	-	-	-	-
13. Textiles	3.7	3.8	1.4	1.0	0.9	0.8	0.2	0.2	-	0.2	2.4	2.6
14. Wearing Apparel	1.3	1.2	0.3	0.2	0.6	0.4	0.2	0.1	-	-	5.5	4.8
15. Leather and Related Products	0.2	0.1	0.2	0.1	0.1	0.1	0.02	0.02	-	-	2.1	3.0
16. Wood and Wood and Cork Products	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.5	0.4	0.8
17. Paper and Paper Products	0.2	0.8	0.0	0.2	0.3	0.3	0.2	0.2	0.4	0.3	0.8	1.0
18. Printing and Reproduction of Recorded media	0.2	0.1	0.0	0.1	0.2	0.2	0.3	0.2	0.2	1.3	0.2	0.6
19. Coke and Refined Petroleum Products	-	0.4	0.1	0.1	0.6	0.2	0.1	0.1	0.6	-	0.1	0.1
20. Chemicals and Chemical Products	7.7	4.8	5.6	4.4	8.1	6.7	7.9	6.2	4.7	2.9	5.1	4.8
21. Basic Pharmaceutical Products and Pharmaceutical Preparations	2.9	2.9	4.0	2.7	4.9	4.6	6.9	5.8	29.3	18.0	4.9	3.8
22. Rubber and Plastic Products	3.8	3.4	4.3	3.8	6.3	5.1	2.7	2.4	3.8	3.0	3.1	4.0
23. Other Non-Metallic Mineral Products	3.1	1.8	2.5	2.2	1.3	1.0	0.8	0.8	1.3	1.6	1.8	1.8
24. Basic Metals	1.7	1.9	1.9	0.7	0.9	0.9	1.6	1.2	1.3	0.9	1.6	1.4
25. Fabricated Metal Products, except machinery and equipment	6.2	5.1	5.3	5.9	4.8	4.5	2.5	2.3	2.1	6.0	4.9	6.8
26. Computer, Electronic and Optical Products	7.1	18.0	10.2	10.9	23.2	24.1	18.4	16.0	17.5	9.8	14.2	8.1
27. Electrical Equipment	12.2	11.3	9.5	16.5	5.6	5.7	4.8	6.1	5.5	5.2	7.5	6.6
28. Machinery and Equipment n.e.c.	13.3	12.8	18.0	15.2	8.4	8.1	13.6	14.1	8.8	11.2	17.4	20.7
29. Motor vehicles, Trailers and Semi-Trailers	20.9	13.4	21.9	22.0	11.6	12.4	31.6	37.2	12.9	24.6	12.8	10.8
30. Other Transport Equipment	7.9	10.1	4.7	5.2	15.1	16.8	4.3	3.6	0.8	1.9	8.2	8.4
31. Furniture	1.6	1.3	0.5	0.2	0.2	0.1	0.2	0.1	0.5	-	1.2	1.6
32. Other Manufacturing	1.4	1.6	2.8	1.9	2.1	2.1	1.4	2.2	3.5	2.6	1.8	2.5
33. Repair and Installation of Machinery and Equipment	1.2	1.4	5.2	5.0	1.8	2.5	1.1	0.4	2.2	3.4	1.5	1.7

**Table 13.** Continued

SECTORS (ISIC Rev. 4)	NETHERLANDS		POLAND		PORTUGAL		ROMANIA		SPAIN	
	2010	2018	2010	2019	2010	2020	2010	2019	2010	2019
<b>TOTAL BERD</b>	54 139	112 807	18 424	86 742	14 036	30 872	8 271	11 628	92 221	106 435
<b>MANUFACTURING</b>	<b>31 522</b>	-	<b>8 617</b>	<b>31 411</b>	<b>5 144</b>	<b>10 999</b>	<b>4 170</b>	<b>4 860</b>	<b>37 445</b>	<b>40 867</b>
<b>MANUFACTURING (%)</b>	<b>58.2</b>	-	<b>46.8</b>	<b>36.2</b>	<b>36.6</b>	<b>35.6</b>	<b>50.4</b>	<b>41.8</b>	<b>40.6</b>	<b>38.4</b>
<b>10-11. Food and Beverages</b>	9.4	-	4.5	4.0	6.9	9.8	0.5	1.4	-	-
<b>13. Textiles</b>	0.4	-	1.6	1.7	4.8	4.4	0.9	0.1	1.3	1.0
<b>14. Wearing Apparel</b>	0.0	-	-	0.3	1.1	2.7	0.1	0.3	2.0	1.2
<b>15. Leather and Related Products</b>	0.0	-	-	0.1	1.7	2.2	0.3	0.1	0.6	0.3
<b>16. Wood and Wood and Cork Products</b>	0.1	-	0.8	0.8	2.1	3.2	-	0.0	0.6	0.3
<b>17. Paper and Paper Products</b>	0.7	-	-	0.7	1.3	2.9	0.2	0.2	0.6	0.5
<b>18. Printing and Reproduction of Recorded media</b>	0.2	-	-	0.8	3.7	2.2	-	0.0	0.4	1.1
<b>19. Coke and Refined Petroleum Products</b>	0.2	-	0.3	0.3	-	0.4	1.1	0.0	1.2	0.8
<b>20. Chemicals and Chemical Products</b>	17.6	-	8.5	5.5	6.2	5.8	16.9	1.6	9.1	10.4
<b>21. Basic Pharmaceutical Products and Pharmaceutical Preparations</b>	7.3	-	9.5	4.3	9.5	8.2	5.1	8.7	<b>12.5</b>	12.8
<b>22. Rubber and Plastic Products</b>	2.0	-	2.1	4.0	6.5	7.3	2.0	0.1	3.7	3.1
<b>23. Other Non-Metallic Mineral Products</b>	0.7	-	1.6	1.9	5.5	5.1	1.0	0.0	2.3	1.6
<b>24. Basic Metals</b>	2.0	-	1.9	1.8	0.9	0.8	3.1	2.0	2.2	1.6
<b>25. Fabricated Metal Products, except machinery and equipment</b>	3.0	-	4.7	8.5	7.9	8.0	4.4	2.7	5.0	4.3
<b>26. Computer, Electronic and Optical Products</b>	15.7	-	12.1	14.6	7.5	<b>8.3</b>	6.3	2.8	10.0	8.2
<b>27. Electrical Equipment</b>	11.8	-	10.5	9.1	8.2	5.5	7.9	6.8	7.6	6.4
<b>28. Machinery and Equipment n.e.c.</b>	<b>19.8</b>	-	10.6	7.9	6.3	<b>8.3</b>	12.3	6.0	8.7	9.7
<b>29. Motor vehicles, Trailers and Semi-Trailers</b>	3.0	-	6.8	<b>20.4</b>	<b>14.2</b>	8.0	<b>25.5</b>	<b>61.4</b>	8.9	<b>12.9</b>
<b>30. Other Transport Equipment</b>	2.9	-	<b>13.5</b>	6.0	0.7	1.7	8.8	4.2	11.9	11.8
<b>31. Furniture</b>	0.8	-	2.1	3.0	1.7	1.5	0.2	0.4	1.0	0.6
<b>32. Other Manufacturing</b>	1.0	-	2.0	2.2	0.9	1.3	1.2	0.5	2.5	2.5
<b>33. Repair and Installation of Machinery and Equipment</b>	1.0	-	5.8	2.0	1.6	2.3	2.2	0.7	0.7	0.7
<b>Source:</b> Created using OECD Research and Development Statistics (OECD, 2023).										

On the other hand, the number of researchers employed in the business enterprise sector per thousand employment in industry in Türkiye rose from 0.23 in 2000 to 4.99 in 2021 (**Figure 10**). This number is 10.70 for the Netherlands, 10.54 for France, and 8.66 for Germany in 2021. Despite the significant increase between 2000 and 2021, Türkiye remains one of the countries with the lowest number of researchers in the business sector per thousand employment in the industry among the selected countries.



**Figure 10.** Business Enterprise Sector Researchers per Thousand Employment in Industry, 2000 vs 2021  
**Source:** (OECD, 2023)

**3.3. The Influence of R&D Investments in High-Tech Industries by Business Enterprises on Foreign Trade Performance: A Complementary Relationship between SDG 9 Targets 9.5 and 9.2**

Empirical studies within the manufacturing sector consistently demonstrate a strong and positive relationship between expenditures on R&D and total factor productivity (TFP). In particular, the industry groups characterized by significant R&D investments and contain most of the high-tech industries, exhibit particularly pronounced improvements in TFP in response to increased R&D activities and expenditures (Englander & Evenson, 2005).

Considering that high-tech manufacturing industries with significant R&D investments tend to exhibit greater productivity and contribute more to employment and the overall gross domestic product, it is valuable to analyze the allocation of business enterprise R&D expenditures in these high-tech sectors and assess their competitive performance.

Target 9.2 focuses on industrial growth, while Target 9.5 emphasizes the importance of embedding this growth in scientific research, technological progress, and innovation. They are complementary in the broader goal of fostering sustainable and inclusive economic development.

**Table 14** presents the percentage of business enterprise R&D (BERD) allocated to high-tech industries such as pharmaceutical, computer, electronic, and optics for Türkiye and selected countries. While Türkiye allocated 2.3% of BERD to the pharmaceutical sector and 3.1% to the

computer, electronics, and optics sector in 2010, these figures were 1.6% and 14.7%, respectively in 2020. Particularly, despite the decline in the pharmaceutical sector, the increase in business enterprise R&D in the computer, electronics, and optics sectors over the past decade is remarkable. As of 2020, Türkiye has the highest percentage of BERD in the computer, electronics, and optics sectors among the selected countries. Nevertheless, the percentage of private R&D expenditures for the pharmaceutical industry in Türkiye is one of the lowest among the other countries.

However, with the exception of Romania and Spain, there is a declining trend in the percentage of business enterprise R&D allocated to the pharmaceutical industry among all countries listed in the table between 2010 and 2020. Similarly, the computer, electronics, and optics sector experienced a decrease in the percentage of BERD in most countries during this period, except for Türkiye, the Czech Republic, France, and Portugal.

<b>Table 14.</b> Percentage of Business Enterprise R&D Performed in the High-Tech Industries <sup>7</sup> 2000-2020 (%)				
<b>Country</b>	<b>Sectors</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>TÜRKİYE</b>	Pharmaceutical Industry	2.3	2.3	1.6
	<b>Computer, Electronic and Optical Industry</b>	<b>3.1</b>	<b>3.3</b>	<b>14.7</b>
<b>CZECH REPUBLIC</b>	Pharmaceutical Industry	3.5	2.3	1.9
	<b>Computer, Electronic and Optical Industry</b>	<b>4.0</b>	<b>4.1</b>	<b>4.8</b>
<b>FRANCE</b>	Pharmaceutical Industry	3.0	2.8	-
	<b>Computer, Electronic and Optical Industry</b>	<b>11.3</b>	<b>11.9</b>	-
<b>GERMANY</b>	Pharmaceutical Industry	8.0	6.5	7.4
	<b>Computer, Electronic and Optical Industry</b>	<b>12.8</b>	<b>12.4</b>	<b>12.2</b>
<b>HUNGARY</b>	Pharmaceutical Industry	26.7	15.7	17.8
	<b>Computer, Electronic and Optical Industry</b>	<b>6.1</b>	<b>1.5</b>	<b>2.5</b>
<b>ITALY</b>	Pharmaceutical Industry	5.3	4.2	4.9
	<b>Computer, Electronic and Optical Industry</b>	<b>13.0</b>	<b>10.6</b>	<b>7.1</b>
<b>NETHERLANDS</b>	Pharmaceutical Industry	7.3	3.4	-
	<b>Computer, Electronic and Optical Industry</b>	<b>10.8</b>	<b>8.0</b>	-
<b>POLAND</b>	Pharmaceutical Industry	5.6	4.5	1.7
	<b>Computer, Electronic and Optical Industry</b>	<b>5.5</b>	<b>2.4</b>	<b>5.0</b>
<b>PORTUGAL</b>	Pharmaceutical Industry	6.2	7.2	4.9
	<b>Computer, Electronic and Optical Industry</b>	<b>1.5</b>	<b>3.0</b>	<b>2.7</b>
<b>ROMANIA</b>	Pharmaceutical Industry	1.3	3.0	1.4
	<b>Computer, Electronic and Optical Industry</b>	<b>2.3</b>	<b>4.1</b>	<b>1.6</b>
<b>SPAIN</b>	Pharmaceutical Industry	8.4	8.6	8.8
	<b>Computer, Electronic and Optical Industry</b>	<b>3.1</b>	<b>2.4</b>	<b>2.1</b>
<b>Source:</b> Created using OECD Research and Development Statistics (OECD, 2023).				

7 As there is no data available for Türkiye for 2000 and 2005, this table begins with the year 2010.



**Table 15** illustrates the number of patent<sup>8</sup> applications in the ICT and biotechnology sectors for Türkiye and selected countries from 2000 to 2020. In 2000, Türkiye obtained only 11 patents in the ICT sector and 1 patent in the biotechnology sector. However, these numbers increased significantly to 203 and 68 respectively in 2020.

In spite of significant increases in R&D investments, particularly in high-tech industries like computer, electronics, and optics, Türkiye still lags behind many countries listed in the table in terms of the number of patent applications in these sectors. In 2020, Germany (2877, 773), France (1149, 532), and the Netherlands (519, 283) have the highest number of patent applications in the ICT and biotechnology sectors.

Furthermore, when considering the number of patent applications per million inhabitants in different countries, the deficiency of Türkiye in this area becomes more apparent (**Table 16**). In 2021, Türkiye had a mere 8.73 patent applications per million inhabitants submitted to the European Patent Office (EPO). In contrast, the Netherlands had 375.18, Germany had 311.20, France had 157.83, Italy had 83.24, and Poland had 13.83 patent applications per million inhabitants during the same period.

Given that existing literature commonly employs R&D as a measure of knowledge input and patents as an indicator of knowledge output (as explained in footnote 8), the data suggests that Türkiye encounters challenges in effectively converting this input into tangible output.

**Table 17** displays the export market shares of high-tech industries for selected countries between 2000 and 2020. In 2020, the pharmaceutical; computer, electronics and optics; and aerospace sectors accounted for 0.26%, 0.08%, and 0.42%, respectively, of Türkiye's exports, compared to 0.14%, 0.09%, and 0.50%, respectively, in 2000. In 2020, Germany, being the most industrialized country among those listed, held export market shares of 13.96%, 4.54%, and 11.65% in the same sectors. Poland, which shares some basic macroeconomic indicators with Türkiye, also had higher export market shares of 0.56%, 0.78%, and 0.93%, respectively.

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8 In the literature exploring the relationship between R&D and productivity, or when estimating a knowledge production function, R&D is used as a measure of knowledge input, while patents are utilized to measure knowledge output. In other words, in the estimation of a knowledge production function, knowledge inputs in the form of R&D are linked with knowledge outputs in the form of patents. As a measure of knowledge output, patents can then be inserted in the explanation of other economic variables like productivity or market value. The output measured here is closer to the concept of invention rather than innovation. Patents essentially function as a means of protecting intellectual property, which can facilitate the introduction of new products or processes to the market (Mohnen, 2019). See also (Griliches, 1990).

**Table 15.** Number of Patent Applications to the EPO in the ICT and Biotechnology Sectors 2000-2020

Country	Sectors	2000	2005	2010	2015	2020
TÜRKİYE	ICT	11	11	41	153	203
	Biotechnology	1	2	6	16	68
CZECH REPUBLIC	ICT	8	18	15	21	15
	Biotechnology	1	5	4	14	13
FRANCE	ICT	1 008	1 494	1 298	1 319	1 149
	Biotechnology	437	341	498	547	532
GERMANY	ICT	2 200	2 271	2 184	2 497	2 877
	Biotechnology	1 041	702	729	707	773
HUNGARY	ICT	48	27	51	55	75
	Biotechnology	13	10	9	16	13
ITALY	ICT	175	343	284	302	360
	Biotechnology	129	169	175	148	214
NETHERLANDS	ICT	1 330	1 266	575	577	519
	Biotechnology	199	235	239	257	283
POLAND	ICT	9	13	64	103	105
	Biotechnology	3	10	23	33	43
PORTUGAL	ICT	2	20	24	33	41
	Biotechnology	6	10	10	17	30
ROMANIA	ICT	2	6	12	35	25
	Biotechnology	0.0	1.0	0.3	2.3	1.1
SPAIN	ICT	63	130	263	174	276
	Biotechnology	62	123	195	172	197

Source: Created using OECD Research and Development Statistics (OECD, 2023).

**Table 16.** Patent Applications to the EPO per Million Inhabitants, 2005-2021

COUNTRY	2005	2010	2015	2020	2021
Türkiye	0.99	3.87	5.71	7.26	8.73
Czech Republic	7.15	15.94	20.20	19.26	19.13
France	127.52	147.72	161.69	157.08	157.83
Germany	288.46	334.18	303.69	311.23	311.20
Hungary	8.03	10.70	9.85	11.18	12.26
Italy	72.43	68.80	65.63	77.71	83.24
Netherlands	477.88	359.00	421.90	366.14	375.18
Poland	2.91	5.39	14.90	12.61	13.83
Portugal	3.90	7.66	13.61	24.38	28.09
Romania	0.38	0.69	1.51	2.85	1.62
Spain	22.27	30.70	32.68	37.88	41.02

Source: (EUROSTAT, 2023)

Among the chosen countries, Türkiye holds the smallest market share in exports within the computer, electronics and optics sector. Furthermore, it ranks the lowest in market share for pharmaceutical sector exports, only after Romania and Portugal. Additionally, it also has the smallest market share in aerospace sector exports, trailing behind Hungary, Romania, Portugal, and the Czech Republic.

**Table 17.** Export Market Share by Selected Countries in the High-Tech Industries, 2000-2020 (%)

Country	Sectors	2000	2005	2010	2015	2020
TÜRKİYE	Pharmaceutical Industry	0.14	0.11	0.14	0.22	0.26
	<b>Computer, Electronic and Optical Industry</b>	<b>0.09</b>	<b>0.21</b>	<b>0.11</b>	<b>0.13</b>	<b>0.08</b>
	Aerospace Industry	0.50	0.19	0.17	0.26	0.42
CZECH REPUBLIC	Pharmaceutical Industry	0.19	0.23	0.35	0.47	0.47
	<b>Computer, Electronic and Optical Industry</b>	<b>0.18</b>	<b>0.64</b>	<b>1.04</b>	<b>1.01</b>	<b>1.33</b>
	Aerospace Industry	0.05	0.17	0.24	0.18	0.28
FRANCE	Pharmaceutical Industry	9.44	8.17	7.66	6.10	5.41
	<b>Computer, Electronic and Optical Industry</b>	<b>3.14</b>	<b>2.40</b>	<b>1.69</b>	<b>1.41</b>	<b>1.09</b>
	Aerospace Industry	13.69	15.22	21.12	15.99	12.86
GERMANY	Pharmaceutical Industry	12.69	13.54	14.66	15.08	13.96
	<b>Computer, Electronic and Optical Industry</b>	<b>5.51</b>	<b>6.88</b>	<b>5.15</b>	<b>4.65</b>	<b>4.54</b>
	Aerospace Industry	13.33	13.84	14.75	12.35	11.65
HUNGARY	Pharmaceutical Industry	0.33	0.52	0.82	0.93	0.93
	<b>Computer, Electronic and Optical Industry</b>	<b>0.66</b>	<b>1.10</b>	<b>1.27</b>	<b>0.58</b>	<b>0.65</b>
	Aerospace Industry	0.00	0.01	0.02	0.03	0.04
ITALY	Pharmaceutical Industry	5.97	4.74	3.93	4.18	5.26
	<b>Computer, Electronic and Optical Industry</b>	<b>1.15</b>	<b>1.06</b>	<b>0.75</b>	<b>0.65</b>	<b>0.63</b>
	Aerospace Industry	3.01	2.13	2.25	1.56	1.82
NETHERLANDS	Pharmaceutical Industry	3.94	4.06	6.19	4.58	4.74
	<b>Computer, Electronic and Optical Industry</b>	<b>3.78</b>	<b>4.48</b>	<b>3.47</b>	<b>2.57</b>	<b>2.66</b>
	Aerospace Industry	1.06	0.94	1.11	0.88	1.30
POLAND	Pharmaceutical Industry	0.15	0.20	0.49	0.61	0.56
	<b>Computer, Electronic and Optical Industry</b>	<b>0.12</b>	<b>0.26</b>	<b>0.76</b>	<b>0.74</b>	<b>0.78</b>
	Aerospace Industry	0.17	0.16	0.54	0.56	0.93
PORTUGAL	Pharmaceutical Industry	0.26	0.14	0.15	0.20	0.22
	<b>Computer, Electronic and Optical Industry</b>	<b>0.16</b>	<b>0.21</b>	<b>0.11</b>	<b>0.09</b>	<b>0.14</b>
	Aerospace Industry	0.16	0.17	0.08	0.06	0.15
ROMANIA	Pharmaceutical Industry	0.02	0.02	0.17	0.19	0.14
	<b>Computer, Electronic and Optical Industry</b>	<b>0.05</b>	<b>0.05</b>	<b>0.22</b>	<b>0.13</b>	<b>0.17</b>
	Aerospace Industry	0.02	0.06	0.07	0.07	0.12
SPAIN	Pharmaceutical Industry	1.92	2.40	2.62	2.37	1.99
	<b>Computer, Electronic and Optical Industry</b>	<b>0.53</b>	<b>0.55</b>	<b>0.35</b>	<b>0.26</b>	<b>0.28</b>
	Aerospace Industry	1.00	1.79	1.64	1.28	1.95

Source: Created using OECD Research and Development Statistics (OECD, 2023).

**Table 18.** Trade Balance by Selected Countries in the High-Tech Industries, 2000-2020 (Million Dollars, Current Prices)

Country	Sectors	2000	2005	2010	2015	2020
<b>TÜRKİYE</b>	Pharmaceutical Industry	-1 186	-2 858	-4 165	-3 652	-3 500
	<b>Computer, Electronic and Optical Industry</b>	<b>-5 288</b>	<b>-5 333</b>	<b>-8 325</b>	<b>-12 409</b>	<b>-11 378</b>
	Aerospace Industry	-366	-10	-3 264	-3 460	-3 211
<b>CZECH REPUBLIC</b>	Pharmaceutical Industry	-545	-1 410	-2 120	-1 666	-2 647
	<b>Computer, Electronic and Optical Industry</b>	<b>-1 951</b>	<b>-117</b>	<b>-2 789</b>	<b>-955</b>	<b>-44</b>
	Aerospace Industry	-233	-420	-140	348	459
<b>FRANCE</b>	Pharmaceutical Industry	2 350	5 753	5 995	4 666	5 728
	<b>Computer, Electronic and Optical Industry</b>	<b>-5 245</b>	<b>-13 513</b>	<b>-21 170</b>	<b>-17 011</b>	<b>-21 383</b>
	Aerospace Industry	8 686	13 419	23 851	24 610	18 361
<b>GERMANY</b>	Pharmaceutical Industry	4 155	7 315	18 077	28 328	30 877
	<b>Computer, Electronic and Optical Industry</b>	<b>-8 265</b>	<b>2 127</b>	<b>-13 954</b>	<b>-7 936</b>	<b>-8 539</b>
	Aerospace Industry	-833	1 364	4 183	16 376	12 658
<b>HUNGARY</b>	Pharmaceutical Industry	-229	-289	145	749	482
	<b>Computer, Electronic and Optical Industry</b>	<b>33</b>	<b>3 208</b>	<b>6 899</b>	<b>456</b>	<b>134</b>
	Aerospace Industry	-18	-53	-80	-688	-1 069
<b>ITALY</b>	Pharmaceutical Industry	444	-637	-3 972	-2 469	5 862
	<b>Computer, Electronic and Optical Industry</b>	<b>-12 169</b>	<b>-17 055</b>	<b>-29 880</b>	<b>-13 796</b>	<b>-14 929</b>
	Aerospace Industry	460	568	3 422	2 714	2 032
<b>NETHERLANDS</b>	Pharmaceutical Industry	242	205	1 509	8 354	12 630
	<b>Computer, Electronic and Optical Industry</b>	<b>-334</b>	<b>5 506</b>	<b>832</b>	<b>-2 994</b>	<b>-7 994</b>
	Aerospace Industry	-884	228	378	-391	65
<b>POLAND</b>	Pharmaceutical Industry	-1 416	-2 588	-3 630	-2 231	-4 715
	<b>Computer, Electronic and Optical Industry</b>	<b>-3 942</b>	<b>-5 383</b>	<b>-5 202</b>	<b>-4 269</b>	<b>-7 980</b>
	Aerospace Industry	-464	-116	324	831	450
<b>PORTUGAL</b>	Pharmaceutical Industry	-634	-1 651	-2 290	-1 568	-1 874
	<b>Computer, Electronic and Optical Industry</b>	<b>-1 946</b>	<b>-2 652</b>	<b>-2 856</b>	<b>-2 102</b>	<b>-2 430</b>
	Aerospace Industry	-453	-357	-256	-227	-621
<b>ROMANIA</b>	Pharmaceutical Industry	-277	-1 068	-2 030	-1 931	-3 301
	<b>Computer, Electronic and Optical Industry</b>	<b>-1 034</b>	<b>-2 562</b>	<b>-1 996</b>	<b>-3 270</b>	<b>-4 498</b>
	Aerospace Industry	-1	-8	-15	114	85
<b>SPAIN</b>	Pharmaceutical Industry	-1 540	-2 241	-3 314	-3 198	-3 494
	<b>Computer, Electronic and Optical Industry</b>	<b>-9 344</b>	<b>-16 808</b>	<b>-18 164</b>	<b>-14 661</b>	<b>-16 243</b>
	Aerospace Industry	-1 725	-674	713	701	1 919

Source: Created using OECD Research and Development Statistics (OECD, 2023).

The data on the foreign trade balance of selected countries in these high-tech industries supports the previous findings. In **Table 18**, Portugal and Türkiye are the only countries with a consistently negative trade balance across all three sectors (pharmaceutical; computer, electronics and optics; and aerospace) between 2000 and 2020. Among the chosen countries, the Czech Republic, Germany, The Netherlands, Poland, Romania and Spain managed to transform a foreign trade deficit in the aerospace industry in 2000 into a surplus by 2020.

The findings in this section support the general view that the countries with the highest rate of R&D expenditure in GDP and with the highest number of researchers per one million inhabitants (key indicators of Target 9.5 within SDG 9) tend to achieve inclusive and sustainable industrialization. This involves fostering more productive and competitive sectors that utilize advanced technologies, which, in turn, enhances a country's production, export and employment capacity – a key aspect of Target 9.2 within SDG 9.

#### **4. Conclusion**

In this study, our primary emphasis has been on Target 9.5 within the framework of SDG 9, which has the objective of advancing scientific research and elevating the technological capabilities of industrial sectors worldwide, with a specific focus on developing countries. This goal aims to stimulate innovation and substantially increase the number of research and development workers per one million people. Additionally, it strives to augment both public and private spending on research and experimental development.

We have examined various indicators related to gross domestic R&D expenditures, R&D personnel, and, specifically, business enterprise (private) R&D investments in Türkiye and have conducted a comparative analysis with selected countries to evaluate Türkiye's standing concerning Target 9.5 within the framework of SDG 9. The key findings from this analysis can be summarized as follows:

\* Despite substantial growth from 2000 to 2021, Türkiye continues to lag behind all the selected countries except Romania in key Target 9.5 indicators, including the proportion of gross domestic R&D expenditure (GERD) in GDP and the number of researchers per one million inhabitants.

\* Moreover, Türkiye ranks lower compared to the selected countries in terms of the proportion of business enterprise R&D expenditures (BERD), government R&D expenditures (GOVERD), and higher education R&D expenditures (HERD) relative to GDP. These indicators are also key parameters used to assess the advancement towards Target 9.5 within the framework of SDG 9.

\* The business enterprise (private) sector's share in GERD in Türkiye increased significantly to 70.7% between 2000 and 2021, while the higher education sector's share declined to 23.7%. Furthermore, Türkiye falls behind most of the selected countries when it comes to the government's (public) share in GERD, which stands at 5.6%.

\* Among the countries selected for this study, Germany leads in terms of the proportion of business enterprise R&D expenditures (BERD) and government R&D expenditures (GOVERD) relative to GDP. The Netherlands has the highest higher education R&D expenditures (HERD) share in GDP. Poland, which shares similarities with Türkiye in macroeconomic indicators, outperforms Türkiye in both BERD and HERD as a percentage of GDP. Poland has significantly increased these ratios from 2000 to 2021.

\* Given that R&D expenditures are often employed as an indicator to measure the level of technological advancement and productivity improvement, it becomes crucial to examine how these expenditures are distributed across the fields of natural sciences, technology, and social sciences.

\* According to the latest data, Türkiye allocated the majority of its gross domestic expenditures on R&D (GERD) to natural sciences, engineering, and technology, making up 89.4% of the total GERD, while the remaining 10.6% was directed towards social sciences, humanities, and arts. Furthermore, in Türkiye, the fields of natural sciences and technology carry substantial weight in the R&D expenditures of both the business enterprise sector (99.4% in 2020) and the government sector (97.0% in 2020).

\* As of 2020, Türkiye had the smallest government contribution to GERD financing among the selected countries, reflecting a broader trend of reduced government-funded research and development spending across these nations since the early 2000s. However, Türkiye stood out with the highest business sector contribution to GERD after Germany in the same year.

\* Between 2010 and 2020, the business enterprise sector's contribution to total gross domestic R&D expenditures (GERD) increased significantly, from 38.2% to 57.2%. In contrast, the shares of the government and higher education sectors decreased from 43.1% and 16.8% to 28.4% and 12.3%, respectively during the same period.

\* Nevertheless, when considering both government and business-funded gross domestic R&D expenditures as a percentage of GDP, Türkiye exhibits the lowest rates among the selected countries, except Romania.

\* Although the number of total researchers per thousand total employment has grown from 1.2 to 5.9 since 2000, Türkiye still falls behind all selected countries, with the exception of

Romania, in this indicator. Among the chosen countries, France, Portugal, the Netherlands, and Germany have the highest number of researchers per thousand total employment, respectively.

\* The percentage of total researchers employed in the business enterprise sector (61.8%) in Türkiye has significantly increased since 2000, while the share of both the higher education (4.2%) and government (34%) sectors in this employment has decreased by more than half. The same trend is observed in the employment of female researchers across sectors.

\* Among the selected countries, Türkiye has the highest rate of total and female researcher employment in the business enterprise sector and the lowest rate in the government sector. When considering the share of employment in the higher education sector, Türkiye follows Portugal, Poland, and Spain among the selected countries.

\* Between 2000 and 2020, the total number of R&D personnel with doctoral or equivalent qualifications in Türkiye increased by 262.7%, constituting 32.1% of the overall internal R&D personnel across all sectors. The higher education sector has the highest number of R&D personnel holding a PhD, accounting for 94.3% of the total. In 2020, 40.3% of the total R&D personnel with doctoral or equivalent qualifications in Türkiye were women, representing a remarkable 384.8% increase since 2000. Similarly, the vast majority (95.9%) of female R&D personnel with a PhD are employed within the higher education sector.

\* In comparison to the countries presented in the table, Türkiye has the lowest employment rate for both total and female R&D personnel holding a PhD in the business and government sectors. For instance, the government sector in the Czech Republic, Hungary, and Romania employs over 20% of R&D personnel with doctoral qualifications, while in Spain, approximately 10% are engaged in the business enterprise sector.

\* Target 9.5 of SDG 9 emphasizes the importance of promoting innovation and increasing both public and private R&D spending. In this context, particular attention should be given to business enterprise (private) R&D expenditure (BERD), which not only forms the largest share but also contributes significantly to Türkiye's overall gross domestic R&D expenditure (GERD).

\* The share of business enterprise R&D expenditure (BERD) in both GDP and industry value added have increased from 0.16% and 0.22% to 0.80% and 1.08%, respectively, since 2000.

\* It is noteworthy that a substantial majority of both total BERD (64.3% in 2020) and business-funded BERD (62% in 2020) in Türkiye is linked to large enterprises with 250 or more employees.

\* The value of the total BERD in the Turkish manufacturing industry in 2020 accounts for 57.1% of the total R&D expenditures of the business enterprise sector. Moreover, the manufacturing industry in Türkiye employed a significant portion of the business enterprise sector's total R&D personnel, making up 46.8% of the workforce.

\* The highest shares of the total BERD in the manufacturing industry of Türkiye were directed towards the manufacture of computer, electronic, and optical products (25.7%), followed by the manufacture of other transport equipment (19.7%), and the manufacture of motor vehicles, trailers, and semi-trailers (17.2%). Especially, the computer, electronic, and optical products industry saw a substantial increase in its share compared to 2010 when it accounted for only around 6.0% of the total R&D expenditures.

\* Accordingly, the computer, electronic, and optical products sector led in terms of R&D personnel numbers, comprising 18.0% of the total R&D personnel within the Turkish manufacturing industry. It's worth noting that this industry's share was just 7.1% in 2010, indicating substantial growth.

\* The number of researchers employed in the business enterprise sector per thousand industrial workers in Türkiye has increased significantly since 2000, climbing from 0.23 to 4.99. Nevertheless, this figure was higher in other countries, with values of 10.70 for the Netherlands, 10.54 for France, and 8.66 for Germany in 2021.

\* Among the selected countries, Germany (84.9% in 2019) and Italy (66.2% in 2019) have the highest percentages of total R&D expenditures originating from the business enterprise sector within the manufacturing industry. The German manufacturing industry's total R&D expenditures are primarily concentrated in the motor vehicles, trailers, and semi-trailers industry (43.9% in 2019), followed by the computer, electronic, and optical products sector (13.6% in 2019).

\* Although Türkiye outperforms the selected countries with the highest rate of business enterprise R&D (BERD) in the computer, electronics, and optics sector (14.7% in 2020) among high-tech industries like pharmaceuticals, and computer, electronic and optical, and aerospace, it has not made significant advancements in its export shares within these high-tech industries from 2000 to 2020.

\* The most recent data reveals that Türkiye holds the smallest market share among the selected countries in computer, electronics, and optics sector exports. It outperforms only Romania and Portugal in pharmaceutical sector exports and Hungary, Romania, Portugal, and Czech Republic in aerospace sector exports. As a result, Türkiye maintains a consistently negative foreign trade balance in all these sectors throughout the 2000-2020 period.



\* Up to this point, a comprehensive overview of the data on gross domestic R&D expenditure (GERD), R&D personnel and business enterprise (private) R&D expenditure (BERD), sheds light on the ongoing challenges faced by Türkiye.

\* Despite significant increases in R&D expenditures and the number of R&D personnel within the time frame examined in this study, Türkiye is behind most of the chosen countries. These countries either share similar macroeconomic characteristics with Türkiye, such as Poland or represent highly industrialized trade partners, like Germany. This gap is evident across various indicators employed in this analysis.

\* Numerous studies in the literature exploring the connections between technological change and productivity growth employ research and development (R&D) expenditures as an indicator of the intensity of technological change. Nonetheless, the path from R&D spending to heightened productivity involves multiple stages. This includes the transformation of R&D efforts into successful innovations, followed by efficient commercialization and widespread adoption.

\* The reason why Türkiye's consistent growth in R&D spending and the presence of highly qualified R&D professionals, aligned with Target 9.5 of SDG 9, do not translate into increased productivity or greater export shares in high-tech industries is because it involves a complex process. This process encompasses the conversion of R&D investments into tangible, productive innovations.

\* We can track this process through the number of patent applications or a more refined measure like the number of patent applications per million inhabitants. In 2021, Türkiye recorded only 8.73 patent applications per million inhabitants submitted to the European Patent Office (EPO). In contrast, the Netherlands had 375.18, Germany had 311.20, France had 157.83, Italy had 83.24, and Poland had 13.83 patent applications per million inhabitants during the same period.

\* This data suggests that when we consider R&D as a measure of knowledge input and patents as an indicator of knowledge output, as is commonly done in the literature, Türkiye encounters challenges in effectively translating this input into concrete output.

\* In this context, investments in R&D within the manufacturing industry play a crucial role both in the conversion of R&D investments into tangible, fruitful innovations and in advancing both Target 9.2 and Target 9.5 under SDG 9.

\* Target 9.2 concentrates on the promotion of inclusive and sustainable industrialization, to significantly elevate the contribution of industries to employment and GDP, particularly in

developing countries. It underlines the sustainable and equitable growth of industries.

\* Target 9.5 aims to enhance scientific research and support the technological capabilities of industrial sectors globally, with a special focus on developing countries, by stimulating innovation. In essence, it strives to enhance innovation and research capabilities.

\* The link between these two targets is rooted in the concept that industrialization, advocated by Target 9.2, typically accompanies technological advancements and innovation. As countries advance their industrial sectors and increase investments in research and development to ensure competitiveness and sustainability, Target 9.5 gains significance. These two targets work in tandem with the broader objective of promoting sustainable and inclusive economic development.

\* Considering this perspective, the findings of this study support the general view that the countries with the highest rate of R&D expenditure in GDP and with the highest number of researchers per one million inhabitants (key indicators of Target 9.5 within SDG 9) often succeed in attaining inclusive and sustainable industrialization. This is evident in various industry-related indicators, as exemplified by the export market share of high-tech industries and the trade balance of these sectors, both of which we have employed in this study. This involves encouraging sectors that are more efficient and competitive and utilize advanced technologies, consequently enhancing a country's capabilities in production, exports, and employment – a fundamental aspect of Target 9.2 within SDG 9.

\* In this context, Poland, whose business enterprise and higher education R&D expenditures as a percentage of GDP have increased substantially since 2000, offers a striking example. Poland managed to transform a foreign trade deficit in the aerospace industry in 2000 (-464 million dollars) into a surplus (450 million dollars) by 2020.

\* This study shows an important issue regarding Türkiye's R&D policy during the 2000s is that the most important source of gross domestic R&D expenditures is primarily the business enterprise sector, while the share of the government and higher education sectors is gradually decreasing.

\* Türkiye has one of the lowest shares of the government in GERD among the selected countries. In 2021, the government's share of gross domestic R&D expenditures was 30.0% in Romania, 16.9% in Spain, 16.7% in the Czech Republic, 14.9% in Germany, 13.5% in Italy, 12.2% in France, 10.2% in Hungary, and only 5.6% in Türkiye.

\* The industrialization strategy, which is probably the most crucial part of the development strategy to realize the necessary transformation in the Turkish economy, requires the government to take a greater role in planning and implementing R&D activities, for example, in determining which sectors' exports can be increased further with R&D expenditures.

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## CHAPTER 16

### DIMENSIONS OF INCOME INEQUALITY AND EVALUATION OF THE REDISTRIBUTIVE ROLE OF FISCAL POLICIES IN TERMS OF FUNCTIONAL PUBLIC EXPENDITURES IN TÜRKİYE

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#### Abstract

Goal 10 of the Sustainable Development Goals (SDGs), which is composed of ten targets and relevant indicators, is about reducing inequality both within and among countries. Concerns about inequality have increased in the early 21st century, particularly with the severe impacts of the 2007-2009 Global Crisis and the COVID-19 Crisis. As a result of the devastating effects of these two crises, which emerged almost ten years apart, concerns have been raised about the success of the SDGs as the target year 2030 approaches. In this chapter, the state of income inequality in Türkiye will be discussed, with an emphasis on the role of fiscal policies -specifically, public expenditures- on redistributive issues. Target 4 of Goal 10 is about embracing policies, especially fiscal, wage and social protection policies, in the pursuit of achieving greater equality. In this context, the chapter will initially provide a brief outline of the process towards the SDGs and the goal of reducing inequalities. Following the analysis of the main inequality indicators in Türkiye, disaggregated public expenditures via the Classification of the Functions of Government (COFOG) will be evaluated. The development goals cannot be met unless the required improvements in certain indicators, such as education, health, and material standard of living, are achieved. Therefore, an analysis of functional public expenditures may provide insights for evaluating the current problems and developing relevant policy proposals. Briefly, the chapter will focus on the income distribution indicators in Türkiye through an analysis of the role of fiscal policies in general and public expenditures in particular.

**Keywords:** SDG 10, income inequality, redistribution, fiscal policy, functional expenditures



## 1. Introduction

The Sustainable Development Goals (SDGs), which were preceded by the Millennium Development Goals (MDGs), set the agenda for post-2015 development goals and policies. However, economic and social indicators during the two major crises, the 2007-2009 Global Crisis and the COVID-19 Crisis, set off alarm bells, and unsurprisingly, concerns about the achievability of the targets have been raised. In addition to the poverty and inequality-increasing impacts of these crises around the world, additional strain was placed on countries that already had high levels of inequality and poverty. According to The Sustainable Development Goals Report 2022, income inequality among countries has increased as a result of the COVID-19 Pandemic (United Nations, 2022, p. 17).

Measuring inequality is a complex issue, in terms of both the definition and the data. The concept of inequality has usually been associated with income inequality; however, in recent years, it has been widely acknowledged that the issue has several dimensions, including but not limited to wealth inequality, opportunity inequality, and gender inequality. With respect to the data, availability is one of the major problems along with the difficulties due to variations in content, scope, and methodology. The multidimensionality of inequality -both in terms of aspects and impacts- is a significant issue that should not be overlooked. According to Doyle and Stiglitz (2014, p. 10), health inequality may arise as a result of income inequality, but it may also contribute to an increase in income inequality, or education inequality can effect both income inequality and opportunity inequality. Inequality of opportunity is emphasized as “the worst dimension of inequality” because the barriers that prevent individuals from reaching their potential have a substantial impact on society (Doyle & Stiglitz, 2014, pp. 7, 9-10; see also Stiglitz, 2012, pp. 18, 92). The problems related to the measurement of opportunity inequalities are also emphasized by Beasley (2018, pp. 24-25). Freistein and Mahler (2016, p. 2145) pointed out that the significance of Goal 10 of the SDGs is to address not only outcome inequalities but also opportunity inequalities. Bourguignon (2018, p. 102) discussed the concept of inequality with respect to “ex post” and “ex ante” views of the issue; the ex post view refers to income inequality as an outcome inequality, while the ex ante view refers to the involuntary situations that the individual cannot avoid and therefore struggles in a more disadvantaged condition relative to other individuals and also refers to the unfairness of procedures. Meanwhile, it is also emphasized that while addressing inequality, outcome inequalities and opportunity inequalities should be targeted together (United Nations Development Programme, 2013, pp. 4, 33).

The organization of the chapter is as follows. In the next section, a brief overview of the process towards the SDGs is provided through various evaluations of the movement from the MDGs to the SDGs, together with details of the goal of inequality reduction. Alternative measures of well-being, which have been developed particularly since the late 20<sup>th</sup> century, are discussed in the framework of “beyond GDP” arguments and the human-centered development paradigm. These approaches affected economic policy design, thereby affecting taxation policy and tax revenues, as well as the composition of public expenditures. Following the analysis of the main income inequality indicators in Türkiye, disaggregated public expenditures are examined via the Classification of the Functions of Government (COFOG) Database, and the final section concludes with an assessment of recent developments.

## **2. Process Towards the SDGs and the Goal of Reducing Inequalities**

There has been a vibrant debate on alternative measures of well-being since the 1970s; yet, the progress has been significant, particularly in the last three decades. In this context, the human development index, beyond GDP arguments, the better life index, and more recently, the planetary pressures adjustment index, have been the most prominent, among others. Ignorance of broad distributional issues was among the main critiques against the mere focus on GDP as a measure of social welfare (Kanbur, Patel, & Stiglitz, 2018, p. 34). At the beginning of the 21<sup>st</sup> century, the development agenda was set with the MDGs, which were composed of eight goals that were to be reached by 2015. This was followed by the SDGs, which are composed of 17 goals to be reached by the target year 2030. The issues concerning inequality were not included in the MDGs and this was criticized as a shortcoming. Since economic and social interactions including trade, financial flows, migration etc. have significant impacts on society (Melamed & Samman, 2013, p. 22), an inadequate focus on inequality was acknowledged as a serious flaw. However, it should also be noted that the MDGs included some dimensions of inequality through the relevant education, gender, and health-related targets (Freistein & Mahler, 2016, p. 2151).

The eight targets of the MDGs to be achieved by 2015 were (United Nations, 2001, pp. 56-58):

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health

6. Combat HIV/AIDS, malaria, and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Regarding the process towards the SDGs, Fukuda-Parr (2016, pp. 44-45) emphasized the differences between MDGs and SDGs in three topics. The first difference is that the MDGs concentrated on development in the Global South and the North's role in aid provision, whereas the SDGs are perceived as "a global agenda for sustainable development", of which the goals and relevant targets do not exclusively address the developing world. The second difference is related to the scope of the goals that were emphasized. The SDGs' scope is wider with a broader framework, while the MDGs' focus is narrower as the goals are basically related to poverty issues. The third difference is the weak formulation of the MDGs, in that they were designed by UN technocrats without adequate consultation. Furthermore, in an assessment of the MDGs, Sachs (2012, p. 2206) underlined the inadequacy of official development assistance provided by developed countries.

The SDGs, which were launched in 2015 (United Nations, 2015), were seriously jeopardized by two major crises that the world economy suffered from: the 2007-2009 Global Crisis and the COVID-19 Crisis. Unlike the previous crises that developing countries experienced in the last two decades of the 20<sup>th</sup> century, the Global Crisis emerged in and affected developed countries. It is widely acknowledged that the crisis was not limited to low- and middle-income countries but detrimentally affected the whole world, especially in 2009. In this process, rising inequality and the associated social and economic problems have been addressed in many studies. The seminal contribution of Piketty (2014), which emphasized the increasing inequality and wealth concentration in the 21<sup>st</sup> century, attracted great attention. Moreover, contrary to the predominant paradigm, increasing demand in favor of state intervention as a response to the severe impacts of the 2007-2009 Global Crisis was remarkable. While the economic and social damage caused by the Global Crisis had not been completely overcome, the pandemic broke out. Eğılmez (2020, p. 97) evaluated the Global Crisis process in three stages; the emergence of the crisis in the USA was defined as the first stage, the spread of the crisis to other developed countries, particularly in Europe, was defined as the second stage, and the state of the world economy in the last quarter of 2019 was defined as the third stage, which was important because the pandemic also emerged in this stage of the Global Crisis. Furthermore, the impact of increased migration and the costs associated with it, along with the structural problems of countries, have brought about debates on whether the SDGs can be achieved. Rising inequality is one of the most significant outcomes associated with these

phenomena. One of the critical impacts of rising inequality is related to its negative effect on growth, and since the gains throughout the growth process were expected to reduce poverty, the target for alleviating poverty would also be affected as a result of this negative impact on growth (Kabeer & Santos, 2017; United Nations Development Programme, 2013, p. 1).

The report of the Commission on the Measurement of Economic Performance and Social Progress, which is widely known as the Stiglitz, Sen, Fitoussi report, emphasized the limitations of using GDP as an indicator of economic and social conditions and also the importance of developing alternative indicators associated with the improvement of databases (Stiglitz, Sen, & Fitoussi, 2009, p. 7). There were twelve recommendations in the Stiglitz, Sen, Fitoussi report, of which the fourth one directly addressed the question of inequality and was stated as “Give more prominence to the distribution of income, consumption and wealth” and the seventh one was stated as “Quality-of-life indicators in all the dimensions covered should assess inequalities in a comprehensive way” (Stiglitz et al., 2009, pp. 13-15).

As the prevailing perspective on the global development agenda for the post-2015 period, the SDGs were built upon the MDGs. In terms of the MDGs, although there was progress in some of the goals at the global level, the targets could not be fully achieved at the country level (Doyle & Stiglitz, 2014, p. 6). Doyle and Stiglitz (2014, p. 6) pointed to the “equitable development” perspective as a missing component and suggested that “eliminating extreme inequality” should be included in these goals. The question of inequality was not directly included in the MDGs; however, with the SDGs and the relevant 2030 agenda, the inequality issue has been included in its various dimensions. It should be noted that the remaining goals, as well, have several aspects that address inequality issues (Kanbur, 2021, p. 3). In other words, SDG 10, which directly points to reducing inequalities, is not the sole goal to address inequality concerns (Freistein & Mahler, 2016); most of the remaining goals, although the degree of their effectiveness would vary, have a strong impact on reducing inequalities in cases where targets could be achieved.

The SDGs are composed of 17 goals with a total of 169 targets (United Nations, Department of Economic and Social Affairs, Sustainable Development):

1. No poverty (7 targets)
2. Zero hunger (8 targets)
3. Good health and well-being (13 targets)
4. Quality education (10 targets)
5. Gender equality (9 targets)

6. Clean water and sanitation (8 targets)
7. Affordable and clean energy (5 targets)
8. Decent work and economic growth (12 targets)
9. Industry, innovation, and infrastructure (8 targets)
10. Reduced inequalities (10 targets)
11. Sustainable cities and communities (10 targets)
12. Responsible consumption and production (11 targets)
13. Climate action (5 targets)
14. Life below water (10 targets)
15. Life on land (12 targets)
16. Peace, justice, and strong institutions (12 targets)
17. Partnerships for the goals (19 targets)

Eleven of the goals are related to inequality questions, including SDG 1, SDG 3, SDG 4, SDG 5, SDG 6, SDG 7, SDG 8, SDG 9, SDG 11, SDG 16, and SDG 17, while SDG 10 is the one that directly addresses inequality reduction in its various dimensions (Freistein, & Mahler, 2016, p. 2145). The multidimensional impact of decreasing inequality may generate various external benefits. Gaspar, Amaglobeli, Garcia-Escribano, Prady, & Soto (2019, p. 8) emphasize that the countries' SDG performance improves in the case of lower inequality.

SDG 10 is about reducing inequality within and among countries. Table 1 displays the targets and the relevant indicators for this goal.

<b>Table 1.</b> SDG 10 - Reduced inequalities: Targets and indicators	
<b>Target 10.1</b>	By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average
Indicator	Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population
<b>Target 10.2</b>	By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status
Indicator	Proportion of people living below 50 per cent of median income, by sex, age and persons with disabilities
<b>Target 10.3</b>	Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard
Indicator	Proportion of population reporting having personally felt discriminated against or harassed within the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law

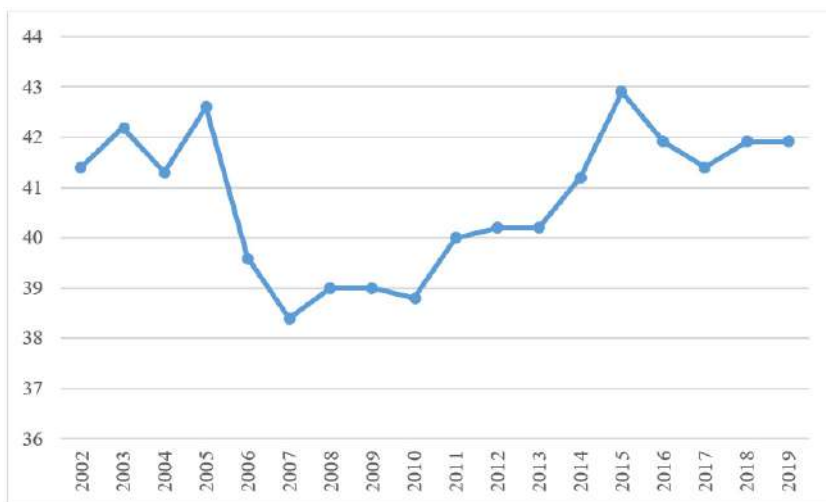
<b>Table 1. Continued</b>	
<b>Target 10.4</b>	Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality
Indicators	<ul style="list-style-type: none"> <li>• Labour share of GDP</li> <li>• Redistributive impact of fiscal policy</li> </ul>
<b>Target 10.5</b>	Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations
Indicator	Financial Soundness Indicators
<b>Target 10.6</b>	Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions
Indicator	Proportion of members and voting rights of developing countries in international organizations
<b>Target 10.7</b>	Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies
Indicators	<ul style="list-style-type: none"> <li>• Recruitment cost borne by employee as a proportion of monthly income earned in country of destination</li> <li>• Number of countries with migration policies that facilitate orderly, safe, regular and responsible migration and mobility of people</li> <li>• Number of people who died or disappeared in the process of migration towards an international destination</li> <li>• Proportion of the population who are refugees, by country of origin</li> </ul>
<b>Target 10.a</b>	Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements
Indicator	Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff
<b>Target 10.b</b>	Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes
Indicator	Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)
<b>Target 10.c</b>	By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent
Indicator	Remittance costs as a proportion of the amount remitted
<b>Source:</b> Compiled from the United Nations, Department of Economic and Social Affairs, Sustainable Development	

The rise in inequality has been dramatic, especially in recent years. According to the Organisation for Economic Co-operation and Development (2022a), the bottom 40% of the population has scanty gained from the growth process in a large number of OECD countries, and although the role of redistribution policies is widely acknowledged, their impacts have diminished in recent years. Meanwhile, Pogge and Sengupta (2015, p. 60) underlined the lack of clarity in SDG targets; accordingly, target 1 of SDG 10 could still be achieved even if the income shares of the bottom 40% of the population continue to shrink, and they proposed that

the relevant target should include a comparison of the income shares of the bottom 40% of the population at the start of the period and the target year, and that the realized increase should be markedly higher. Fukuda-Parr (2019, pp. 63, 67) emphasized that the targets of SDG 10 reflect a perspective of inclusive growth and inclusion policies rather than targeting extreme inequalities, and the author underlined the importance of this perspective in determining relevant policies, as the former would be achieved through increased social services, whereas the latter would require a more radical approach.

### 3. Basic Indicators of Income Inequality in Türkiye

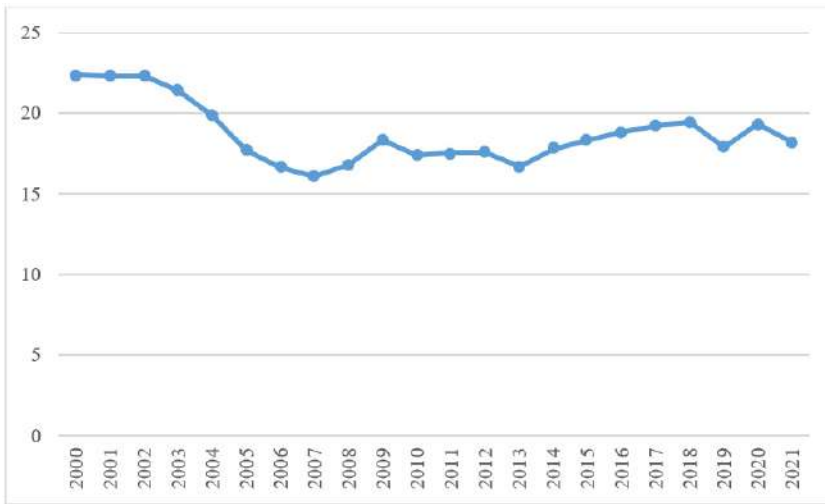
In this section, basic indicators of income inequality in Türkiye are analyzed in the context of SDG 10. As a starting point, the Gini index, which is one of the most commonly used indicators regarding inequality issues, is presented. Figure 1 displays the Gini index of Türkiye. Accordingly, except for the notable decrease in 2006 and 2007, the Gini index has risen almost continuously since 2008, with the exception of relatively small improvements in 2010, 2016, and 2017.



**Figure 1.** Gini index, 2002-2019

**Source:** The World Bank, World Development Indicators Database

Figure 2 displays the ratio between the pre-tax national income shares of the top 10% and the bottom 50% in Türkiye. Accordingly, at the beginning of the period, the ratio was 22.4 in 2000, while it decreased to 18.2 in 2021. It is remarkable that the top 10 to bottom 50 ratio decreased significantly between 2003 and 2007; however, it has increased since 2008.

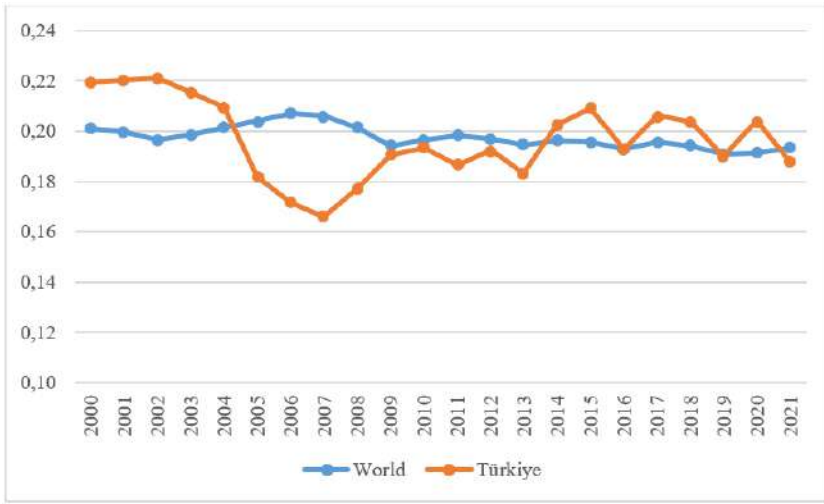


**Figure 2.** Top 10 / Bottom 50 ratio, 2000-2021 (Adults-equal split)  
**Source:** World Inequality Database

According to the Press Release of the Turkish Statistical Institute (2023b), food and non-alcoholic beverages, housing and rent, and transportation accounted for the largest share of household expenditures in 2022, with a total of 66.5%, and the food expenditures in the lowest quintile were more than double compared to those in the highest quintile, 35.8% and 16.6%, respectively.

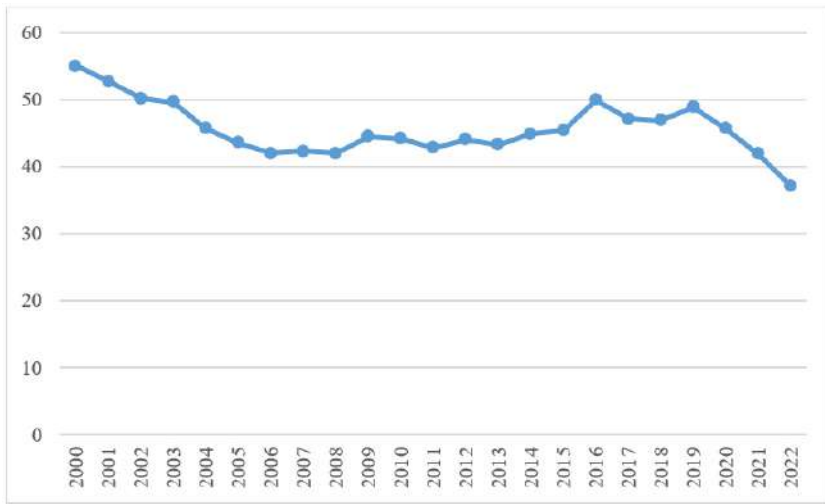
Figure 3 displays the income shares of the top 1% in the world and in Türkiye. It is notable that the income share of the top 1% in Türkiye is lower than the world average between the years 2005 and 2013. However, the income share of the top 1% started to increase by the year 2008, and since 2014, it has fluctuated above the world average, which has continued until 2021. It is also noteworthy that, at the global scale, the income share held by the top 1% started to increase prior to the Global Crisis.





**Figure 3.** Top 1% shares of income in the world and in Türkiye, 2000-2021 (Pre-tax national income)  
**Source:** World Inequality Database

As an indicator of rising inequality on a global scale, the labor income share of GDP declined from 54.1% in 2004 to 52.6% in 2019 (United Nations, 2023, p. 17). The adjusted wage share as a percent of GDP in Türkiye is displayed in Figure 4. Accordingly, the wage share in GDP was 55.0% in 2000, and it decreased to 37.1% in 2022. The rise in the wage share in the crisis year of 2009 was attributed to the loss in labor productivity that exceeded the loss in real wages (Onaran & Oyvat, 2016, p. 290). Among the OECD countries, Chile, Colombia, Greece, Ireland, Italy, Mexico, Poland, and Türkiye are emphasized as having a long distance to the relevant SDG target when compared to top-performing members (Organisation for Economic Co-operation and Development, 2022a, p. 174).

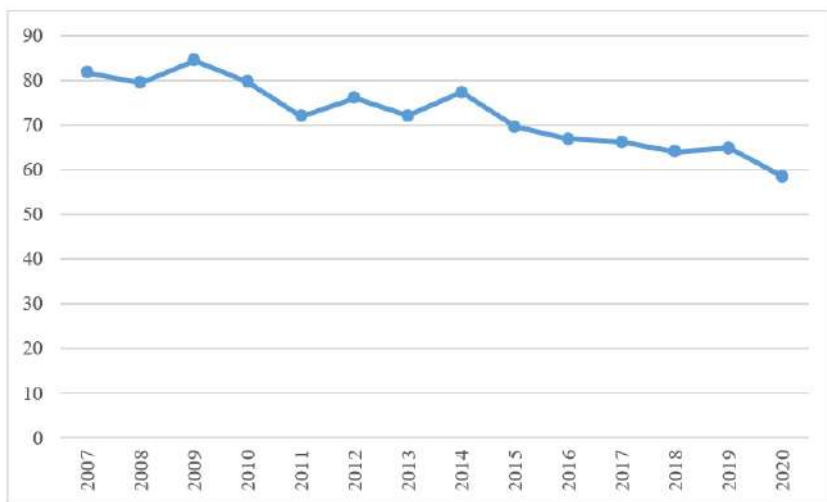


**Figure 4.** Adjusted wage share, 2000-2022 (Total economy, percent of GDP at current prices)

**Source:** Compiled from European Commission Economic and Financial Affairs, AMECO Database

According to a Press Release of the Turkish Statistical Institute (2023a), the share of wages and salaries in total equivalised household disposable income decreased by 0.9 points in 2022 compared to 2021, social transfers decreased by 3.7 points, and the entrepreneurial incomes increased by 3.5 points. Low wage policy in order to increase competitive capacity in international markets, speculative inflows, the increased role of the construction sector in economic activity, and the high level of current account deficit are defined as the basic features of the growth process in Türkiye that also contributed to raising fragility and therefore to a crisis-prone economy (Onaran & Oyvatt, 2016, pp. 270, 271, 302).

The risks carried by the structural imbalances, along with the need for foreign exchange and the destabilizing effects of the high volatility of capital flows, have been emphasized in numerous studies. For example, Cornia and Kiiski (2001) underline capital account liberalization as the most important factor contributing to inequality. Target 5 of SDG 10, which is related to regulation of global financial markets, is of critical significance in confronting inequality issues. According to the SDG Indicators Database, “liquid assets to short-term liabilities” is one of the indicators used to measure financial soundness. Figure 5 displays the ratio of liquid assets to short-term liabilities in Türkiye; the period after 2009 is remarkable for decreasing ratios, except for the years 2012, 2014, and 2019.



**Figure 5.** Liquid assets to short-term liabilities, 2007-2020 (Percent)

**Source:** United Nations, Department of Economic and Social Affairs, Statistics, SDG Indicators Database

Particularly during the last decade, the growth model in Türkiye depended on the construction sector, which, compounded with the deindustrialization process, led to an unstable growth path with critical employment and inequality issues (Boratav & Orhangazi, 2022, p. 291). According to the Country Notes of the Organisation for Economic Co-operation and Development (2022b, p. 2), the uneven distribution of the gains from growth is a significant problem in Türkiye. The average earnings of employees are half the OECD average, the unemployment rate is high, social protection coverage is low, and fiscal tools for redistribution are not adequate. Furthermore, the rate of NEET, which is the acronym for the share of young people who are aged 15-29 years, not in employment, education or training, was 29% in 2019. The long distance for Türkiye to reach human capital-linked targets is also emphasized, with associated concerns about educational outcomes. The distances to the targets of SDG 10 for Türkiye, as provided by the OECD, are displayed in Table 2.

**Table 2.** Distances to targets and recent trends for Türkiye for SDG10

Target	Short Label	Distance to Target (s.u.)	Trend Assessment	OECD Average Distance (s.u.)	OECD Trend Assessment
10.1	Income distribution	1.72	n.a.	1.23	No progress or moving away from the SDG target
10.2	Social Inclusion	2.41	Progress has been made, but is insufficient to meet the target	1.54	No progress or moving away from the SDG target

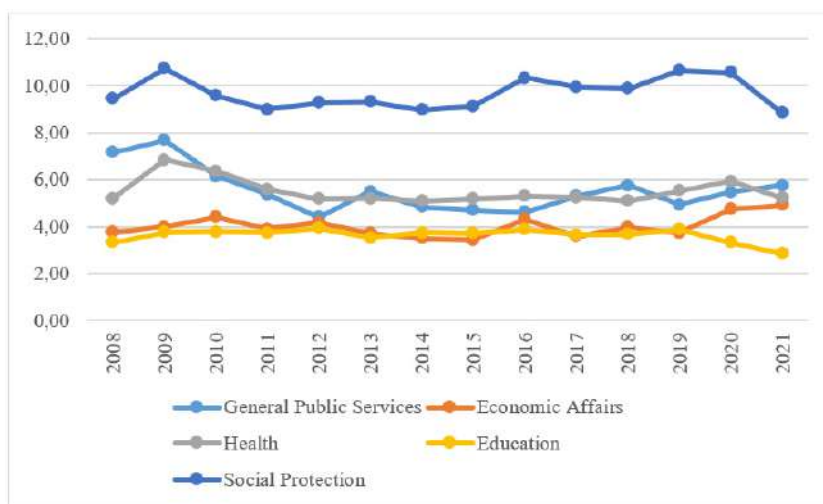
**Table 2.** Continued

10.3	Inequalities of outcome	1.79	No progress or moving away from the SDG target	1.27	Progress has been made, but is insufficient to meet the target
10.4	Redistribution	2.94	Progress has been made, but is insufficient to meet the target	1.12	No progress or moving away from the SDG target
10.5	Financial markets	0.76	No progress or moving away from the SDG target	0.90	No progress or moving away from the SDG target
10.7	Migration	1.76	n.a.	0.69	n.a.
10.a	Tariff-lines	2.60	Progress has been made, but is insufficient to meet the target	0.93	Progress has been made, but is insufficient to meet the target
10.c	Remittances	3.96	n.a.	2.21	n.a
<i>s.u.: standardised measurement unit.</i>					
<i>Only the information related to SDG10 is included.</i>					
<b>Source:</b> Compiled from the Organisation for Economic Co-operation and Development (2022b, p. 7)					

According to the Sustainable Development Report (Sachs, Lafortune, Fuller, & Drumm, 2023, pp. 37, 476), given the SDG dashboards and trends, major challenges remain with a stagnating trend in Türkiye in terms of SDG 10.

#### 4. Functional Public Expenditures in Türkiye

Human-centered approaches have shaped development policy, particularly since the 1990s. The human development approach, beyond GDP arguments, and the OECD Better Life Initiative can be given as examples of remarkable approaches in terms of alternating measures of economic and social progress. These improvements are expected to affect economic and fiscal policy design and, therefore, the composition of fiscal policy tools such as tax revenues and public expenditures. However, the dominance of neoliberal economic policies in compliance with the global capital accumulation process has seriously affected the design of fiscal policies around the world. In this section, selected functional public expenditures in Türkiye will be analyzed. The data is obtained from the International Monetary Fund's Government Finance Statistics (GFS), Functional Expenditures (COFOG) Database. Among the ten functional expenditures, the top five with the highest share of GDP are displayed in Figure 6. Accordingly, social protection expenditures have the highest share as a percent of GDP, and all of the expenditures increased during the COVID-19 Pandemic as part of the measures addressing the concomitant health and economic problems of the process, with the exception of education expenditures, in which the ratio declined from 3.9 in 2019 to 2.9 in 2021.

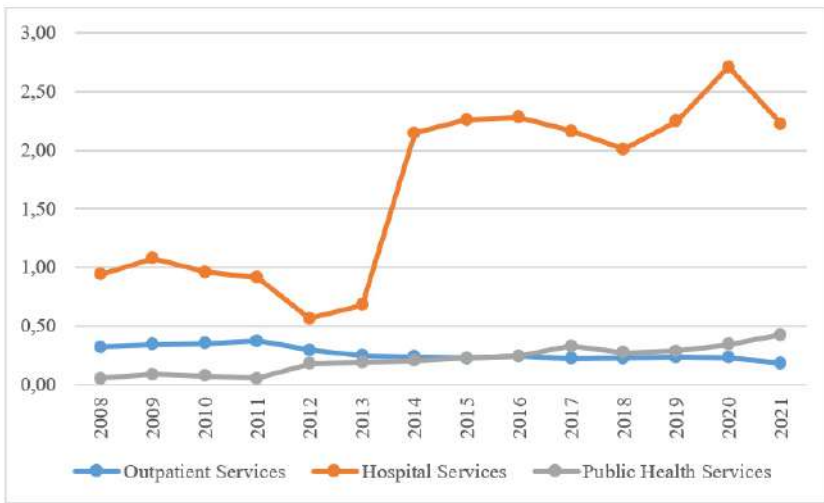


**Figure 6.** Selected functional expenditures, 2008-2021 (Percent of GDP)

**Source:** Author's compilation from International Monetary Fund, Government Finance Statistics Database, Functional Expenditures

The functional composition of public expenditures has a significant role in economic analysis as it reveals how the resources are allocated for public use. If the development targets require an investment increase in sectors such as education and health, but the expenditures are not allocated accordingly, then this situation raises serious concerns about the success of the development policy. Following the transition to analytical budget classification and compliance with international standards, an analysis of the composition of public expenditures will provide insights for the use of fiscal policy towards the achievement of the SDGs, among other goals.

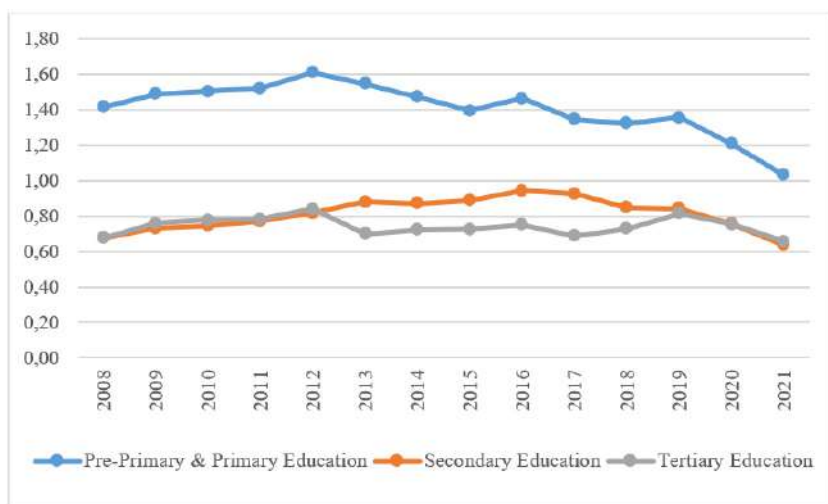
The decomposition of health expenditures is displayed in Figure 7. The total of the health expenditures in the figure does not sum up to the ratios available in Figure 6, since only the expenditures on outpatient services, hospital services, and public health services were available in the GFS-COFOG Database. Accordingly, there has been a remarkable increase in hospital services since 2014. It is also notable that, with reference to the official data, “non-classified health services” have the highest amount compared to other health expenditures, except for the years 2020 and 2022 (Republic of Türkiye Ministry of Treasury and Finance).



**Figure 7.** Health expenditures, 2008-2021 (Percent of GDP)

**Source:** Author's compilation from International Monetary Fund, Government Finance Statistics Database, Functional Expenditures

The decomposition of education expenditures is displayed in Figure 8. Like health expenditures, the total of the education expenditures in the figure does not sum up to the ratios available in Figure 6, since only the expenditures on pre-primary and primary education, secondary education, and tertiary education were available in the GFS-COFOG database. Accordingly, pre-primary and primary education expenditures have been declining since 2013, and the decrease is particularly remarkable during the COVID-19 Pandemic. There was a slight increase in secondary education expenditures until 2017, which has started to decline since then. Meanwhile, according to the official data, expenditures on post-secondary vocational education services increased in 2018, 2021, and 2022. Furthermore, expenditure on educational research and development services reached its highest level of TL 2,859,139,902 in 2018 but gradually decreased to TL 1,725,715,102 as of 2022 (Republic of Türkiye Ministry of Treasury and Finance). Expenditure increases on educational research and development services should be evaluated within the context of their external benefits. Also, the continuation of the increase in expenditures on post-secondary vocational education services can have significant socio-economic contributions.



**Figure 8.** Education expenditures, 2008-2021 (Percent of GDP)

**Source:** Author's compilation from International Monetary Fund, Government Finance Statistics Database, Functional Expenditures

One of the most significant practices in terms of redistribution policies has been the rise in transfer payments to low-income households. Onaran and Oyvat (2016, p. 294) pointed to this situation and emphasized that transfer payments continued to increase during the Global Crisis, and compounded with the rise in minimum wages along with the decrease in informality, led to decreased inequality; however, the redistribution process was not stemming from increased taxes on capital income but rather reflected a transfer from the middle-income group, that is, from the organized blue-collar and white-collar employees. Also, it is important to note the remarkably high share of “non-classified social security and social assistance services” in total social security and social assistance services; e.g., the relevant ratio was 21.9% in 2022. (Republic of Türkiye Ministry of Treasury and Finance).

## 5. Conclusion

There has been comprehensive and fruitful research on the alternating measures of well-being and social progress within the context of the human-centered development paradigm. The international global development agenda has been shaped by the SDGs announced in September 2015, with 17 goals to be reached by the year 2030. While there is not much time left for the target year, the 2007-2009 Global Crisis and the COVID-19 Crisis detrimentally affected the world economy, and within this conjecture, a variety of significant crises, conflicts, and wars in some individual countries have further raised concerns about the

achievability of the targets. In fact, issues related to inequality have been critically affected during this process. SDG 10 is about reducing inequality, both within and among countries. However, besides this distinct target, any progress or achievement in other goals of the SDGs may, as well, contribute to inequality reduction. For instance, progress in poverty reduction, increasing the quality of education, gender policy, and decent work opportunities can all have inequality-reducing effects. On the other hand, rising inequality may function as a global public bad, affecting a variety of significant indicators of economic and social development. Due to the multidimensional structure of inequality, the impacts of rising inequality will also be multidimensional and far-reaching.

In this chapter, the state of income distribution in Türkiye is evaluated, with a particular emphasis on the role of public expenditures as an important fiscal policy tool concerning redistribution issues. In this framework, initially, a brief outline of the process towards the SDGs is presented with discussions on the developments from the MDGs to the SDGs. Then, basic inequality indicators in Türkiye, including the Gini index, the ratio between the income shares of the top 10% and the bottom 50%, the income shares of the top 1% of the population, the adjusted wage share, and liquid assets to short-term liabilities, are evaluated. This section is followed by an analysis of selected functional public expenditures, such as social protection, health, and education expenditures, that have significant impacts in terms of redistributive purposes. A detailed analysis of functional public expenditures can provide insights on evaluating the problems and developing appropriate policies. There was a decrease in inequality in terms of the Gini index in Türkiye particularly in the years between 2006 and 2010. However, compounded with the negative impacts of the 2007-2009 Global Crisis and the COVID-19 Crisis, country-specific economic conditions have raised concerns about economic and social issues, especially those related to increasing inequality. In recent years, destabilizing effects have increased, particularly due to the inadequacy of foreign exchange reserves and their effects on the balance of payments account, and inflationary pressures have repercussions on the deteriorating conditions for wider segments of society; not only the already poor and disadvantaged but also the white-collar employees living in relatively large cities have been affected throughout this process. Exorbitant price hikes, particularly in rents and consumer goods, have seriously affected material well-being in society. As a result, it became an elusive goal to expect an increase in household savings, as the income earned could barely cover living expenses. Food price inflation has reached its peak among the OECD countries. Therefore, purchasing power has decreased continuously, while foreign exchange and import dependency in the economy have critically contributed to the rise in inflation. The burden on



the government budget has considerably risen through the increased share of foreign currency-protected deposit practices. The devastating impacts of the earthquake that took place on February 6, 2023, caused deep pain to all people, especially the survivors of the earthquake. Since all these current challenges are not yet reflected in the data, a clear assessment cannot be made regarding their impact on inequality; however, apparently they will impose a serious burden on the budget, which will be reflected in society.

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## CHAPTER 17

### REDUCING INCOME INEQUALITY IN TÜRKİYE: WHAT HAS CHANGED AND WHAT CAN BE DONE?

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#### **Abstract**

Growing inequalities across the globe since the 1980s have preoccupied the policy agenda of intergovernmental development organizations. The Millennium Development Goals launched in 2000 focused on eradicating poverty by 2015 as their primary goal. Still, all measures of income distribution present the same picture: the falling share of wages in gross domestic product cointegrates with the rise in overall income inequality and the top 1 percent income share. As this challenge has become a universal issue, working towards a more equal distribution of incomes is now part of the United Nations' Sustainable Development Goals. This chapter combines the personal and functional distribution of income approaches to understand Türkiye's income inequality. To reach this aim, the study focuses on the share of wages and personal income inequality to show how a rising return to capital relative to wage incomes can surge top income shares. Using a range of data sources from 1970 to 2022, the study conducts a retrospective analysis to evaluate Türkiye's performance concerning indicators linked to the Sustainable Development Goals. On this basis, the chapter identifies the potential of Sustainable Development Goal Target 10 for reversing income inequalities in Türkiye. It formulates several policy reforms and institutional arrangements to reduce inequalities and flags policy areas that might conflict with tackling widening economic inequality targets.

**Keywords:** Income inequality, wage share, redistribution, Türkiye, sustainable development goals

## 1. Introduction

Inequality has a multifaceted nature and is a blend of social, political, and economic factors. Different dimensions of inequality are associated with many spheres of human life, such as health status and well-being, educational attainment, capability, employment, crime and violence, and access to food and clean water. As inequality can take many forms, a high level of inequality is an indicator of many basic problems within societies (Wilkinson & Pickett, 2010). Also, the costs of inequality can be mitigated by improvements in the above-mentioned factors. This dynamic process makes inequality endogenous, i.e., it is determined from within the economic, social, and political systems. Hence, reducing inequality matters, given its complex nature and its correlation with numerous key indicators.

Studies on inequality have begun to increase gradually since the 2000s. From a policy perspective, the distributional objectives have been officially adopted in the past 20 years at a global level, starting with the Millennium Development Goals (MDGs). MDGs specifically focus on the eradication of poverty by halving the proportion of people whose income was less than \$1 a day between 1990 and 2015. The national policy targets, on the other hand, varied across countries. Yet, no ambitious agenda was set to fight inequality among developed and developing economies in the same period. Recognizing that there is still room for undoing global inequalities, Sustainable Development Goals (SDGs) Target 10 as part of a global agenda to transform society by the United Nations (UN), which was established in 2015, commits countries to ‘reduce inequalities within and among countries’.

Before starting the analysis, it is crucial to define and frame the concept of inequality. As one of the critical fields in economics, economic inequality refers to an unequal distribution of resources, income, or opportunity among individuals, households, or social groups. Roemer’s (1998, 2002) pervasive formalization of the concept of inequality of opportunity disentangles inequalities by “circumstances” in which individuals cannot be deemed responsible, and efforts, in which individuals should be deemed responsible. *Equality of opportunity* can be attained when circumstances do not exert any influence on the eventual outcome. This requires all individuals to encounter the same opportunity set. For this reason, it is an ex-ante concept. The ex-post approach, on the other hand, aims for *equality of outcomes* among individuals who have applied an equivalent level of effort, irrespective of their circumstances (Roemer, 1998). As evident from the target title, SDG 10 focuses on both types of inequalities. These inequalities refer to both inequality of opportunity (such as inequalities based on age, sex, disability, race, ethnicity, origin, and religion) and inequality of outcomes (such as monetary inequalities). Based on this distinction, this chapter limits its attention to equality of outcomes

and focuses on monetary inequalities, rather than equality of opportunity. Monetary inequality signifies currency-valued magnitudes associated with the economic activity of an individual or a household (Atkinson & Bourguignon, 2014, p. xxi). Income distribution will be the focus within the context of these economic activities.

The analysis of economic inequality can be categorized into two distinct aspects: the *functional* distribution of incomes and the *size* distribution of incomes. The former takes a macro approach by focusing on the distribution of income between the main factors of production. The latter, on the other hand, is concerned with the distribution of income among individuals or households and focuses on the micro perspective. Income distribution analyses ultimately focus on the individual distribution of economic welfare. Nonetheless, similar underlying factors might influence both functional and personal income distributions. This chapter posits that functional income distribution is the crux of economic inequality, as the distribution of income among wages and profits impacts personal income distribution.

A first glimpse of the evidence suggests that there has been an upsurge in income inequality within countries since the 1980s (see, e.g., Atkinson, 2015; Piketty & Saez, 2014). This increase was accompanied by a significant decline in the share of wages in GDP worldwide. According to the World Inequality Report (2022), the richest 10% of the global population takes 52% of global income, while the poorest half of the population earns only 8.5% of the total global income. According to the same report, in Türkiye, these ratios are 54.5% and 12%, respectively. There is also a marked deterioration of the share of wages in GDP following the 1980s in Türkiye, along with other developing and developed countries (see Figures 2 and 3). These initial observations lead us to focus on how rising income inequality in recent decades may be related to an increase in the share of income held by the top earners in addition to a falling wage share.

There is a common set of driving forces for the divergence of the top incomes and a falling share of wages. The decline in the wage share can be linked to technological advancements, trade globalization, financialization, and declining labor bargaining power (ILO, 2012). These factors lead to uneven growth that affects different segments of the population disproportionately. While reducing welfare benefits hurts low-income groups more, technological change impacts unskilled workers (Giovanni et al., 2014). International trade generates domestic winners and losers. Financialization, on the other hand, might have played a more substantial role than ever before by strengthening the relative position of the rich, as the rich own most financial assets. The resulting income gap between these groups has widened recently, giving rise to increased personal income inequality. Thus, understanding the distribution of functional income is also important to assess personal income inequality.

Although Türkiye is among the fastest-growing OECD economies, challenges remain in terms of reducing inequalities. Data on monetary inequalities has not shown any improvement for more than a decade. There is an 8-fold difference between the share of income held by the bottom and the top 20 percent: in 2020, the share of the bottom 20 percent of the total disposable income was 6.1%, while the income share of the top 20 percent was 47% (Turkish Statistical Institute, 2022). This observation becomes obvious when checking Türkiye's distance from achieving SDG targets based on data availability (OECD, 2022). The most unsatisfactory progress has been recorded for the targets of reduced inequalities (SDG 10), poverty reduction (SDG 1), and human capital (SDG 4). The endogeneity of these goals points out an uneven distribution of growth benefits among society and the failure of pro-poor growth through low educational outcomes, lower average earnings of employees than the national median, continuing high multi-dimensional poverty, high income inequality, and limited redistribution policies. The inadequate performance of Türkiye in reducing income inequalities since the end of the 2000s requires a leap to meet Target 10 by 2030.

Against this backdrop, this chapter aims to explore the economic dimension of inequality by focusing on both personal and functional income distribution. To reach this aim, we report the progress of Türkiye in implementing SDG 10, the potential of it to reverse income inequalities and discuss the road ahead in 2030 for building a more inclusive society. When linking the falling labor share to a growing gap between top and bottom incomes, we will direct our attention toward SDG targets 10.1 and 10.4. Because the data on these targets serve as proxies for monetary inequalities in assessing the performance of Türkiye.

The present chapter proceeds in four steps. Section 2 examines the factors behind why within-country inequality has become a global sustainable development concern, and its subsequent designation as a distinct SDG target. Türkiye's development policy on SDG 10 is also evaluated in this section. Section 3 surveys expanding literature on the determinants of the declining share of labor, and its link with personal income distribution. The main empirical facts about income distribution in Türkiye are summarized in Section 4. In the last section, we look at future policy prospects in Türkiye. The last section concludes.

## **2. A Transformative Agenda for Reduced Inequalities? The Implementation of SDG 10 in Türkiye**

Research on the disparities between developed and developing countries has revealed that from 1820 to 1950, a noticeable divergence in per capita income occurred between these two groups. However, since the 1950s, and notably in the 1990s, there has been evidence of con-

vergence at the global level in terms of purchasing power parity (PPP) (Bourguignon, 2015; Milanovic & Milanovic, 2010; Stiglitz, 2012). Much of this catch-up occurred between the 1950s and 1970s. The developing world has cut its distance from the most developed countries by a quarter from a centennial perspective (Paprotny, 2021). The process of global convergence was mostly due to Asian countries, especially China and India, and subsequently to Latin American countries. Conversely, the contributions of Africa and Oceania to the overall global convergence have been comparatively limited. However, a pivotal inquiry arises as to the potential sustainability of this convergence in the wake of new issues such as the environment and exhaustible resources. Therefore, global economic development requires a set of shared regulations arising from the significant challenges to promote inclusive growth. Notably, the 2030 Agenda for Sustainable Development was established as the first comprehensive framework for all nations worldwide. Its principal objective is to combat poverty while also fostering the attainment of 17 sustainable objectives across all facets of human life by 2030.

The United Nations SDG 10 mandates the “*reduce inequality within and among countries*”, underscoring the global imperative to address this concern (United Nations, 2018). This goal calls on countries to commit to progress on 10 sub-targets, where each of them identifies various dimensions of inequality. First, SDG 10 focuses on both inter-country and intra-country inequalities<sup>1</sup>. Second, it concentrates on both *horizontal inequalities* (corresponding to the distribution of income among different categories of people such as gender, ethnicity, location, religion, etc.) and *vertical inequalities* (corresponding to the distribution of income among individuals and households within a nation).

In the context of reduced inequality *within* countries (i.e., intra-country inequalities), three national challenges are mentioned:

- i. Targets 10.1 and 10.4 focus on progressively reducing *income* inequalities *within* a country and stress the distribution of income and earnings and its links with macroeconomics.
- ii. From the perspective of the Leave No One Behind (LNOB) principle, targets 10.2 and 10.3 focuses on reducing inequalities of *outcome* by ensuring access to equal opportunities and promoting social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, religion, or other status relevant within society.
- iii. Connected with the previous group, target 10.7 aims to solve the new form of inequality based on the migration and mobility of people.

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1 Inter-country inequality refers to variations in inequalities among different countries, whereas intra-country inequality pertains to inequalities within a specific country.



SDG 10 also promotes reduced inequality *among* countries (i.e., inter-country inequalities) based on the convergence-divergence debate. In this context, it aims to enhance the representation of developing countries in decision-making in global international economic and financial institutions in targets 10.5, 10.6, and 10. a, 10. b, and 10. c.

SDG 10 recognizes the rising inequality within and among nations as an impediment to achieving inclusive development. However, the implementation of SDG 10 presents three potential challenges: (1) the ambiguous conceptualization of the targets due to a lack of specific guidance as to how to reduce inequalities, and the inadequate criteria to measure progress, (2) the absence of requisite data to estimate necessary measures for attaining the targets. Specifically, data for targets 10.1, 10.2, 10.4, and 10. a, 10. b and 10. c can be easily accessed, while data related to targets on reducing inequalities of outcome is more challenging, and (3) the omission of wealth inequality from the targets, which is intricately linked with income and earning inequalities. Consequently, the complexity of the targets renders the official progress reporting by the United Nations on SDG 10 a formidable undertaking.

The activities to support the adoption of Agenda 2030 by Türkiye started quite early. Türkiye was among the first 22 Voluntary National Review Reporter countries in 2016. The implementation of the agenda has been initiated through the integration of SDGs with National Development Plans (NDPs) and sectoral strategies. Sustainable Development Coordination Commission (SDCC) is coordinated by the Ministry of Development of Türkiye, and SDGs have become a shared responsibility of all ministries. So, SDGs entered into various strategy and policy documents at both central and local levels, according to the VNR report (United Nations, 2019). The Ministry of Development is actively collaborating with a wide range of stakeholders, which includes academia, practitioners, and local administrations, to facilitate the exchange of knowledge and best practices under the name of the Stocktaking Analysis Project. It was identified that projects related to SDG 10 are more beneficial for localizing SDGs. Union of Municipalities of Türkiye (UMT) is responsible for coordinating and informing the institutions under its responsibility to provide their input and submit their practices to the system to achieve SDG 10 by operationalizing the National Database for Best Practices and Projects. Also, institutional responsibility for SDG 10 belongs to the Human Rights and Equality Institution of Türkiye.

In 2022, UN Türkiye dedicated 7.4% of the total \$347 million available resources to contribute to SDG 10 (*Sustainable Development Goals | United Nations in Türkiye*, n.d.). The recent 10th Development Plan mentions that the program gives special attention to tackling horizontal inequalities. It aims to formulate appropriate redistributive policies such as reduc-

ing the heavy burden of taxes and increasing the opportunities of social transfers to achieve easier access to opportunities. However, the ratio of produced indicators by TurkStat is not sufficient to assess the SDG 10 targets. According to the distribution of indicators by SDGs, only 40% of SDG 10 indicators are available for Türkiye. Stocktaking Analysis Projects' compliance level map which ranks the state of consistency of the stakeholders' inputs with SDGs indicates that in terms of policy and strategy, legislation, and institutional framework, at least half of the targets have already been achieved, while in terms of project inventory and implementation, less than half of the targets have been attained.

The mutual interaction among the SDG targets highlights the necessity of a holistic approach when implementing policies to attain the goals. From the theoretical perspective, as Atkinson (2000, p.4) mentioned, "income distribution assists our understanding of various fields of economics", and "...the study of economic inequality should be at the heart of economic analysis" (Atkinson & Bourguignon, 2014, p. xviii). The map of interaction between SDGs prepared by the Türkiye VNR report in 2019 states that SDG 1 and SDG 10 are strongly impacted by SDG 4, 8, 9, and 13, and have an indirect impact on other targets. The endogeneity of these goals points out an uneven distribution of growth benefits among society and the failure of pro-poor growth through low educational outcomes, lower average earnings of employees than the national median, continuing high multi-dimensional poverty, high-income inequality, and limited redistribution policies. The key target for income inequality is SDG 10.1, 'progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average'. However, this target fails to adequately tackle the problem of vertical inequality: the gap between the richest and the poorest is at the core of monetary inequalities. This gap can still widen even if the bottom 40 percent records higher income growth compared to the national average.

Another challenge is the insufficiency of disaggregated data, which hampers the monitoring process, crafting of policies for tackling inequalities, and evaluation of policy implementations. For Türkiye, what is needed to achieve SDG 10 is to improve the capability for data-driven analysis and ease the process of integrating verified data by UN agencies into the UN SDG database. Specifically, targets 10.2-10.4, which represent horizontal inequalities, suffer more from the lack of appropriate indicators and the absence of concrete benchmarks. For example, SDG 10.2 aims to "2030, empower and promote the social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status". The indicator to measure progress towards this goal is given as "Proportion of people living below 50 percent of median income, by sex, age, and persons with disabilities".

In Türkiye, the assessment of SDG 10 is undertaken through three focus areas: (i) strengthening economic and social equality, (ii) addressing global mobility, and (iii) collaborating with international economic and financial institutions (United Nations, 2019, p. 95). Through cumulative efforts, some progress has been observed at the national level regarding the selected indicators under SDG 10 in Türkiye. According to the SILC 2022 report prepared by TurkStat, the Gini coefficient<sup>2</sup> decreased from 0.428 in 2006 to 0.415 in 2021. VNR Report for Türkiye (2019, p.95) states that the target is set to further reduce it to 0.36 by 2023. The share of the richest 20% in 2002 was approximately 9.6 times higher than the share of the poorest 20%. This ratio decreased to 7.9 in 2021. In the past 20 years, Türkiye has made significant progress in reducing poverty. The poverty gap, calculated based on 60% of the median income and measuring the distance to the poverty line, decreased from 33.6% in 2006 to 25.6% in 2022. The severe material deprivation rate decreased from 60.4% in 2006 to 28.4% during the same period (Turkish Statistical Institute, 2023). Also, the report claims that wage earners' income increased through significant social protection expenses from 2000 to 2018.

Table 1. Türkiye distances to SDG 10 and recent trends				
SDG global target	Distance to target	Trend Assessment	OECD Average distance	OECD Trend Assessment
10.1 By 2030, progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average	1.72	n.a.	1.23	No progress or moving away from the SDG target
10.2 By 2030, empower and promote the social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion, or economic or other status	2.41	Progress has been made, but is insufficient to meet the target	1.54	No progress or moving away from the SDG target
10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies, and practices and promoting appropriate legislation, policies, and action in this regard	1.79	No progress or moving away from the SDG target	1.27	Progress has been made, but is insufficient to meet the target

2 Gini coefficient measures inequality on a scale of 0 to 1, with higher values indicating greater inequality. Alternatively, it can be expressed as a percentage ranging from 0 to 100%, referred to as the Gini Index.

Table 1. Continued				
10.4 Adopt policies, especially fiscal, wage, and social protection policies, and progressively achieve greater equality	2.94	Progress has been made, but is insufficient to meet the target	1.12	No progress or moving away from the SDG target
Performance of Türkiye on indicators for SDG 10	Current value	Assessment	National target value for 2030	
Gini coefficient	0.415 (2021)	Major challenges remain.	0.36 (According to the VNR for Türkiye, United Nations, 2019). 0.275 (Not a national target, this value is the average of best performers according to Sachs et al., 2022).	
Palma ratio	2.01 (2021)	Major challenges remain.	0.9 (Not a national target, this value is the average of best performers according to Sachs et al., 2022).	
<b>Source:</b> OECD, 2022. Data is from UN DESA (2021), SDG Global Database, and OECD (2021) <b>Notes:</b> Values in the distance to target and OECD average distance columns show that a target is classified as a challenge when the distance from the target exceeds 1.5 standard units (s.u.), signifying a substantial deviation. Or when the country's position concerning the target surpasses that of the average observed across the OECD.				

These funds were allocated particularly through wage subsidies and incentives targeting women, young people, and minimum wage earners. However, adjusted wage share data from the AMECO database (European Commission, 2022) points out otherwise. The share of wages in GDP experienced a significant decline, dropping from 61.4% in 2000 to 40.6% in 2021, reaching its lowest ebb since 1988.

The primary challenge for Türkiye remains to be the unequal distribution of the benefits of economic growth. Inefficient redistributive policies hinder the achievement of Target 10.4, leading to profit-led growth (Target 10.1), and high poverty rates (Target 10.2). The report also indicates that 35% of the Turkish population believes that the country is not a suitable place for ethnic and racial minorities to reside (Target 10.3) (OECD, 2022). Table 1 presents Türkiye's progress toward targets for SDG 10. According to Table 1, all the sub-targets of SDG 10 shown in the first column are a challenge for Türkiye, as the distance to the target value in the second column is higher than 1.5. Moreover, Türkiye is further away from all the targets than those of OECD averages, especially for target 10.4. The data provided above and in the next section also confirm the findings of the table. OECD's (2022) country report shows that the current pace of progress for targets 10.2 and 10.4 is insufficient to meet the target by 2030. Besides, recent changes in target 10.3 have been stagnating or moving them further away from the target.

UN DESA (2021) SDG Global Database indicates that for SDG 10.1, the proportion of

people living below 50 percent of median income increased from 16.8% in 1994 to 17.3% in 2019, while for SDG 10.4, the share of GDP from labor, including wages and social protection transfers, exhibited a slight increase from 33.7% to 35.7% between 2004 and 2020. Taken together, Türkiye is committed to addressing economic and social inequalities and demonstrates efforts to promote a more equitable distribution of income and wealth within the country. However further policies are needed to enhance income distribution. Türkiye faces many challenges in progressing SDG 10 targets, especially in the last few years.

Recognizing the insufficient progress of Türkiye to achieve SDG 10 goals by 2030, we explore the links between functional and personal income distribution by using data on SDG targets 10.1 and 10.4. Thus, the study uses income distribution measured at both the individual/household level and the factor shares as its entry point into the analysis of inequality. We turn in the next section to justify this particular emphasis by relying on the literature that has investigated trends in labor share and rising disparities at the individual level. This approach allows us to question whether the recent decline in labor share offers a rethink of the inequality concept.

### **3. Equitable Growth: Factor Shares and Personal Income Distribution**

Until the second half of the 20th century, the relative constancy of factor incomes was conceptualized as a “stylized fact” (Kaldor, 1961) and formulated as Bowley’s Law. After years of empirical observation of the relatively stable wage share, its visible decline starting in the 1980s marked a notable shift. The period of a fall in profit share observed between 1973 and 1979 was reversed from the 1980s onward, leading to profit recoveries in both the OECD and many European countries. In Germany, the United Kingdom, and Austria, a decrease of approximately 12% in wage share has been witnessed from the 1980s to the present day. In Japan, a similar trend led to a decline of around 15%. This comparable pattern is also observed in Türkiye, Mexico, and Korea, where a pronounced and consistent reduction in wage share is evident (European Commission, 2022).

Simultaneously, data indicates that income inequality has risen in numerous countries in recent years. For example, according to the World Inequality Report (2022), on average, a person within the top 10% of the global income distribution earns \$122,100 annually, while a person from the bottom half of the global income distribution earns \$3,920 per year. It is natural to conjecture that both facts, i.e., the rise in income inequality and the decrease in labor share are linked. Nonetheless, this relationship has been subject to limited investigation thus far.

At first glance, the connection between falling labor share and growing income inequality might appear evident. Personal income distribution depends on the distribution of labor and capital endowments. If the distribution of capital is more unequal than that of labor, a decrease

in the labor share would increase personal income inequality (Björklund & Jäntti, 1997; Daud-ey & Garcia-Penalosa, 2007; Wolff & Zacharias, 2007)2007. However, the two processes are also influenced by additional factors, such as the impact of social transfers and taxes, which may exert opposing effects. For example, from 2000 to 2015, inequality has risen (declined) even as labor share has risen (declined) in some countries, including Russia, Mexico, and Brazil (International Labour Organization, 2015, p. 14). Moreover, wage dispersion also plays a crucial role in increasing income inequality. Executive pay constitutes part of labor compensation and is encompassed within the labor share. The share of labor income has decreased recently even as the income of rich workers, including CEOs, has risen significantly.

Consequently, the reduction in the labor share doesn't reveal but instead masks the majority of the considerable increase in inequality witnessed in recent decades. The documented drop in the labor share would be notably greater if the gains experienced by the top 1 percent in terms of payroll and self-employment income were considered (Elsby et al., 2013, p. 47). Accordingly, the relationship between labor share and income inequality is more intricate than it might initially appear. Nevertheless, the decline in labor share is closely linked with income inequality, especially in advanced economies where the wage disparities are larger. This is expected because the share of labor constitutes a greater proportion of overall income for individuals within the lower and middle-income brackets.

Equally significant as a justification point for this link between the two is that factor shares connect income to productive activity. First, the long-term trend towards a falling share of wages alongside a rising share of profits in Türkiye and worldwide indicates that wages and labor productivity growth have become disconnected. An equitable income distribution could be seen as one in which higher labor productivity corresponds to higher compensation for labor (Atkinson, 2009). Second, because the factors that lead to a fall in the share of labor produce biased growth, the whole population will be affected unequally. Therefore, both the functional and the personal income distribution are influenced by the same factors, and a change in one affects the other. To tackle the inequalities suggested by SDG 10, distributional changes in both approaches must be treated together.

Various explanations have been put forth to explain the fall in the share of labor in the literature. In this part of our study, we explore theoretical perspectives and the growing empirical literature concerning possible factors influencing the functional distribution of income. Four principal explanations stand out: technological change, economic liberalization, international trade, declining bargaining power of labor, and financialization (ILO, 2012; Elsby et al., 2013, Giovanni et al., 2014; Furceri & Loungani, 2015).

Previous research often highlighted technological change as a significant contributing factor, with the notion that these changes tended to be generally capital-augmenting rather than labor-augmenting (Karabarbounis & Neiman, 2014; Rognlie, 2015; Velazquez, 2023). In particular, the substitution rate between capital and labor has shown a consistent upward trend since the 1980s. This has led to an increased demand for capital and high-skilled labor, provided that high-skilled workers adopt new technologies and are complementary with equipment, thus showing high capital-skill complementarity (Maliar et al., 2022). This simultaneously reduced the demand for low-skilled workers. The transition from labor-augmenting to capital-augmenting technology was largely driven by significant advancements in information and communication technology (ICT). But, the increase in marginal productivity of labor has outpaced the increase in workers' compensation over the past five decades. For example, in the US, between 1948 and 1979, productivity grew by around 118.4%, while hourly wages for non-supervisory production workers expanded by about 107.5%. However, between 1973 and 2021, despite productivity growth of 64.6%, the hourly wage growth for the same group of workers was only 17.3% (Economic Policy Institute, 2022). In the case of Türkiye, average real wages in manufacturing increased by 120% between 1987 and 93 due to populist economic policies and increased activism among the labor unions. In the meantime, labor productivity increased, on average, by 14 % per year from 1988 to 1992. From 1993 to 2000, real wages increased by only 1.2% per year, whereas labor productivity growth was 0.1 % (Taymaz et al., 2021). From 2002–2012, labor productivity in the Turkish manufacturing industry rose sharply, while real wages continued to stagnate. Consequently, the slower expansion of labor income in comparison to overall income growth has contributed to the decline in the wage share. The decline in the relative cost of investment goods also led to the substitution of labor with capital, which in turn played a significant role in the reduction of the wage share.

Research reveals that globalization also tends to have adverse impacts on the labor share (Guscina, 2007; Harrison, 2005; Autor et al., 2013). Over the last four decades, there has been a significant increase in the trade volume between developed and developing countries. During the same period, there has also been a noticeable decrease in the labor share in developed countries. Both the comparative advantage model and the factor proportions model anticipate that firms tend to segment the production process across various countries. They relocate specific components to foreign nations that possess a comparative advantage in producing those particular parts. Accordingly, many developed economies have shifted the manufacturing of labor-intensive intermediate and final goods to countries with abundant labor and lower labor costs. This phenomenon is often referred to as offshoring. According to

Krugman (2008), developing countries mainly exported raw materials before the late 1970s. Since then, they have transitioned to being major exporters of manufactured goods and, more recently, selected services as well. Thus, wages in developed countries are likely to be suppressed when these countries engage in trade with developing nations that offer lower wages.

Increased capital mobility, openness, and globalization lead to a situation where labor becomes more substitutable, resulting in a reduction of labor's bargaining power (Rodrik, 1998). A significant shift in the institutional framework of the labor market of many developed and developing economies, including Türkiye has been the decrease in union membership. Thus, recent literature has discussed the effect of weakening labor market institutions and other related variables such as factors such as declining union density, minimum wage legislations, and lower unemployment benefits on the declining share of labor. Given that globalization is characterized by increased capital mobility relative to labor mobility, trade liberalization favors capital, decreases labor's ability to bargain, and results in a decline in the share of income (Stockhammer, 2013). This decline would likely be most pronounced in sectors experiencing the most significant drops in union coverage. For example, Kristal (2013) found that for the US, the reduction in the labor share of income was primarily concentrated in sectors that had previously exhibited higher levels of unionization.

Finally and most importantly, the globalization of financial markets and financialization have been introduced relatively recently into the discussion. First, non-financial corporations in developing economies have increasingly derived income from financial assets, held a growing share of financial assets relative to fixed capital in their portfolios, and transferred an ever-larger share of their earnings to financial markets in the forms of interest and dividend payments and stock buybacks over the last two decades. This was due to changes in corporate governance and the objectives of top management towards short-termism in firm decision-making and shareholder value maximization. A shift in the pattern of capital accumulation from the real to the financial sector through financial liberalization in developing countries was corroborated by the findings of several studies (Araújo et al., 2012; Correa et al., 2012; Demir, 2007). A transition to a more market-based financial system from the bank-based system, the increasing role of investment banks rather than development banks within the capital accumulation process, and the entry of foreign banks ensured the hegemony of financial capital. Second, the internationalization of production inevitably deepened the concentration of wealth and other financial instruments in ever fewer hands. This strengthened the position of capitalists and rentiers at the expense of the working class. While top executives might have gained from the financialization phenomenon by receiving compensation in the



form of pension funds and capital gains, for the typical worker, the available evidence suggests that the scope and magnitude of such benefits are notably restricted (ILO, 2012). This brought about the problem of a shortfall in aggregate demand due to a falling share of wages and capital in the form of money that cannot be used for productive investment.

Technology, trade, weakening labor market institutions, and financialization don't solely impact labor shares but also lead to larger inequalities. These factors disproportionately affect the relative positions of poor and low-skilled labor compared to high-skilled labor and capitalists. Thus, they result in uneven growth, affecting different segments of the population in varying ways. The empirical evidence supports this view. Daudey and García-Peñalosa (2007) found that a higher labor share is linked to lower inequality in 39 countries from 1970 to 1994. Adler and Schmid (2013) observed that declining labor income shares contributed to growing inequality in Germany from 2002 to 2008. Jacobson and Occhino (2012) suggest that lower labor share was associated with high inequality in the US until 2010. Dao et al. (2017) also found a negative correlation between labor share and the Gini coefficient in 49 countries for the period between 1991–2014. Sauer et al. (2020) identified that declining labor share is a key factor contributing to increased income inequality across 73 countries, mainly in advanced OECD countries, spanning 1981 to 2010. Erauskin (2020) examined the connection between labor share and income inequality using the Gini coefficient and income shares for various quintiles across 62 developed and developing countries from 1990 to 2015. The analysis revealed a robust link between lower labor share and increased Gini coefficient.

#### **4. Monetary Inequalities in Türkiye: Where Do We Stand?**

As we have noted above, in the case of Türkiye, it is crucial to focus not only on the high overall inequality, as measured by indices like the Gini coefficient. Examining the disparities at the top and bottom ends of the income distribution and functional distribution of income comparatively becomes necessary, as they have a common set of drivers. Thus, in the retrospective analysis for Türkiye presented in this section, we focus on how rising inequality in recent decades has been accompanied by a falling wage share.

When examining the historical development of personal income inequalities, the Turkish economy had an even more skewed income distribution in the past.<sup>3</sup> Studies conducted regarding income distribution between 1963 and 1994 are presented in Table 2, which presents

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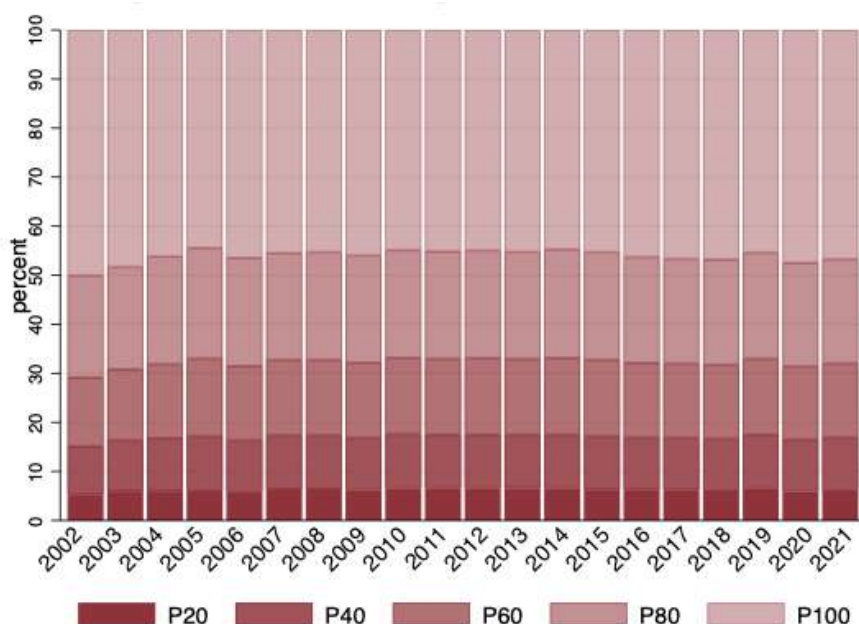
3 It should be noted that the first Income Distribution Survey was conducted by the Turkish Statistical Institute (TurkStat) in 2002. The income distribution surveys conducted before 2002 were carried out irregularly by different researchers and institutions. Therefore, the results of these studies are not directly comparable with the period after 2002 as these studies do not align methodologically.

the distribution of annual income by quintiles and the Gini coefficient. The income distribution in the Turkish economy up until the 1980s indicated substantial inequalities within the country. At the end of the 1980s, a slight improvement occurred in the personal distribution of income. However, the Gini coefficient was reported as 0.43 in 1987 and 0.49 in 1994. These results show a significant deterioration in income distribution in the Turkish economy between 1987 and 1994.

**Table 2.** Results of income distribution studies in Türkiye, 1963-1994.

	1963	1968	1973	1978	1983	1986	1987	1994
First quantile (P20)	4.5	3.0	3.5	2.9	2.7	3.9	5.2	4.9
Second quantile (P40)	8.5	7.0	8.0	7.4	7.0	8.4	9.6	8.6
Third quantile (P60)	11.5	10.0	12.5	13.0	12.6	12.6	14.1	12.6
Fourth quantile (P80)	18.5	20.0	19.5	22.12	21.9	19.2	21.2	19.0
Last quantile (P100)	57.0	60.0	56.5	54.7	55.8	55.9	49.9	54.9
Gini coefficient	0.55	0.56	0.51	0.51	0.52	0.50	0.43	0.49
Source: Gürsel et al. (2000).								

While there was a tendency to decrease income inequality between 2002 and 2007, there was no significant progress in inequality measures during the period from 2007 to 2021. All indicators of income inequality point to a shift in the year 2007. Improvement in income distribution during the first period was largely influenced by a proportional decrease in the incomes of the richest income group at the upper end of the income distribution. According to the data obtained from The Household Budget Survey (HBS) between 2002 and 2005 and the Income and Living Conditions Survey (SILC) since 2006 by the Turkish Statistical Institute (TurkStat), inequality trends in Türkiye in the last 20 years show that there has been some improvement in income inequality and poverty rate. The median equivalised household disposable income in 2021 has increased fivefold compared to 2006, reaching from 6.328 TL to 28,069 TL. There is a 10-fold difference between the income share of the bottom 20% and the richest 20%, which received 5.2% and 50% of the total disposable income, respectively, in 2002. By 2021, this difference decreased to 7 times, and the bottom 20% and the richest 20% of income groups received 6.5 and 46.7% of the total disposable income, respectively (Figure 1). While the income of low-income groups has been growing at a faster rate than the top income groups and the median income, it is observed that the income levels of the 40th, 50th, 60th, and 70th percentiles, representing the middle-income segment, have not significantly changed compared to the lowest and highest income groups. The main change is attributed to the increase in income among the low-income group. Moreover, income inequality has remained relatively stable throughout the last decade, as depicted in Figure 1.

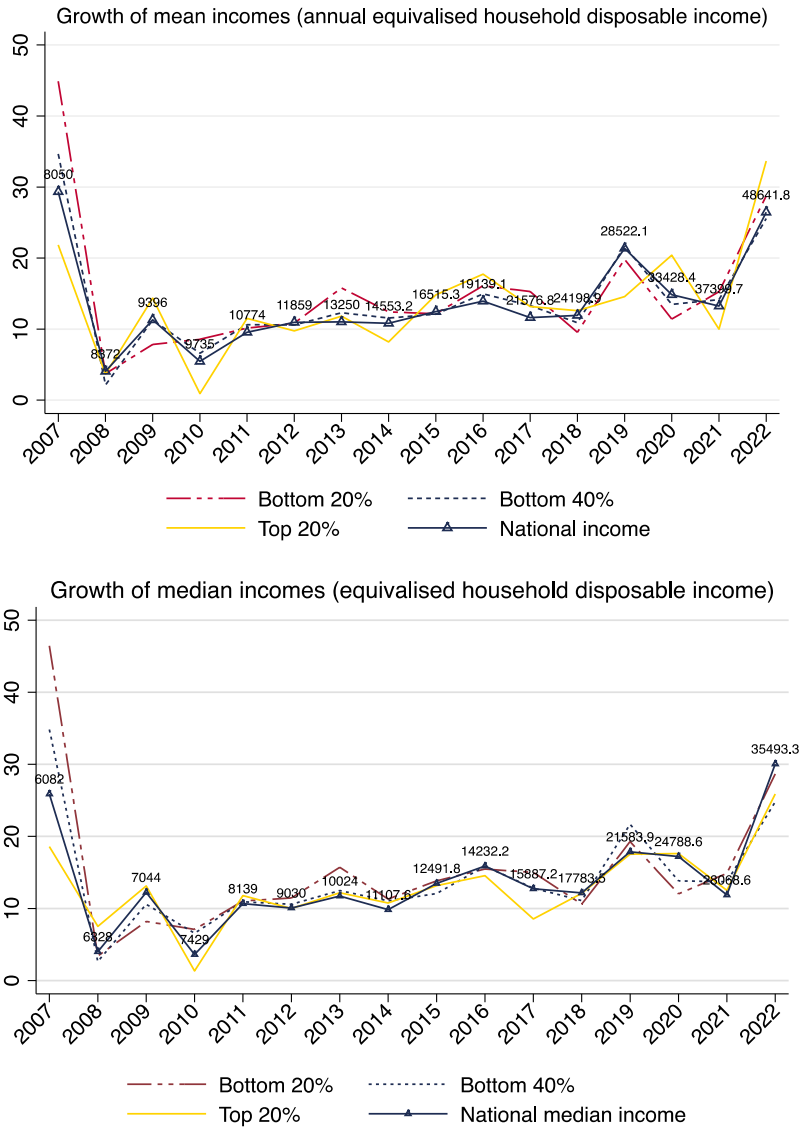


**Figure 1.** Distribution of annual equivalised household disposable income by quintiles ordered by equivalised household disposable income, 2002-2021.

**Source:** TurkStat (2022) Income and Living Conditions Survey (SILC).

**Notes:** The reference period of income is the previous calendar year.

SDG 10.1 dictates higher-than-average income growth for the bottom 40% of the population. Figure 5 compares the growth rate of annual equivalised household disposable income for the bottom 20% and 40% shares with that of the top 20% and the total annual equivalised household disposable income. We present data for both mean and median incomes, as income distribution is right-skewed, and using median data provides a more meaningful representation in this context. The growth rates of the mean bottom 20% and 40% shares have experienced slightly higher growth rates than the total income growth, except for the 2008-2010 and 2017-2021 periods. On the other hand, the growth rate of the share of the top 20% was higher-than-average growth during the Great financial crisis period until 2010, during the 2015-2018 period, and it has been on the rise since the last year. The growth rates of the percentiles based on median income tell a slightly different story. But the gist of what Figure 2 says is that the volatile and insufficient income growth for the bottom 40% challenges achieving SDG 10.1 by 2030. To record the desired achievement for the low-income groups, sustained and significantly higher growth rates for the bottom 40% must be attained.



**Figure 2.** Growth of mean and median incomes of the Bottom 20%, 40%, and Top 20% compared to national income growth in Türkiye

**Notes:** National mean and median income as shown by the hollow triangle line plot indicates the growth rate in annual equivalised household disposable income, while data labels represent the total annual equivalised household disposable income in Turkish liras.

**Sources:** TurkStat (2022) Income and Living Conditions Survey (SILC).

Figure 3 reveals an asymmetrical pattern of economic benefits, where the poor have experienced some improvement while the rich continue to benefit disproportionately from

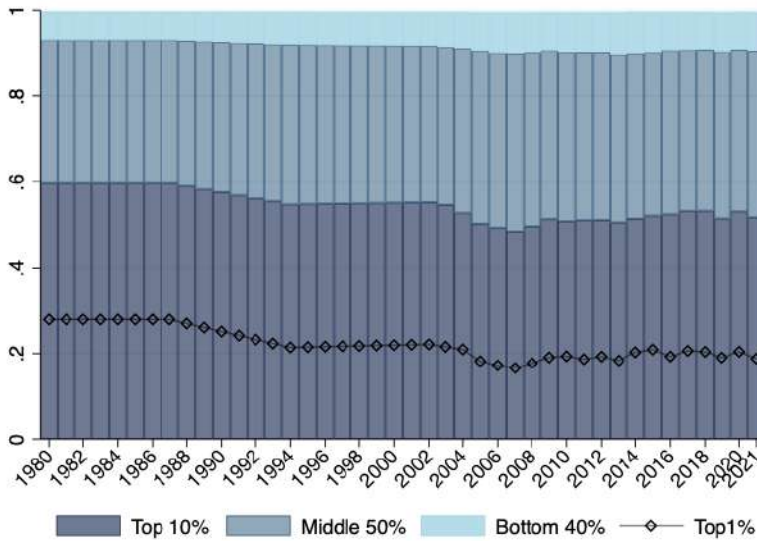
economic growth. Despite a decrease in inequality from 1980 to 2021, vertical inequalities persist and have not been sufficiently reduced over the years. In 1980, the top 10% of the population accounted for 60% of the national income, which decreased to 51.6% in 2021, as an encouraging development. During the same period, the average share of the bottom 40% in national income was 8%, with a rise from 6.5% in 1980 to 9% in 2021. This represents a 38% increase in the share of the bottom 40% over the same period.

On the other hand, the middle 50% did not experience significant improvement, with their share rising by only 15% within 45 years. The 5% annual average growth rate between 2002 and 2011, which were the golden years of growth in Türkiye expanded the middle class and increased the income share of the middle 50 percent during this period. However, following recessions caused by crises, the post-2010 period has revealed a middle class with shrinking incomes and living conditions.

The national income share of the top 1% population in Türkiye has remained relatively stable with minor fluctuations in recent years after exhibiting a steady fall from 1980 to 2006. However, it is important to note that the share of the top 1% remains significantly high compared to other countries, indicating a concentration of wealth in a small portion of the population. The latest available Palma ratio<sup>4</sup> reveals that Nordic countries such as Iceland, Norway, Sweden, Denmark, and Belgium exhibit a Palma ratio equal to or below 1, while the OECD average is 1.3. Türkiye stands out with a Palma ratio of 2.01, ranking as the third highest among OECD countries, surpassed only by Mexico and Costa Rica. This data confirms the concentration of wealth among the wealthiest individuals in Türkiye, highlighting the pronounced income inequality within the country (OECD, 2023). This guarded outlook confirms the latest report of OECD (2023) which indicates that Türkiye is stagnating or moving further away from the target 10.1.

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4 The Palma ratio is the ratio of the richest 10% of the population's share of gross national income (GNI) divided by the poorest 40% share.

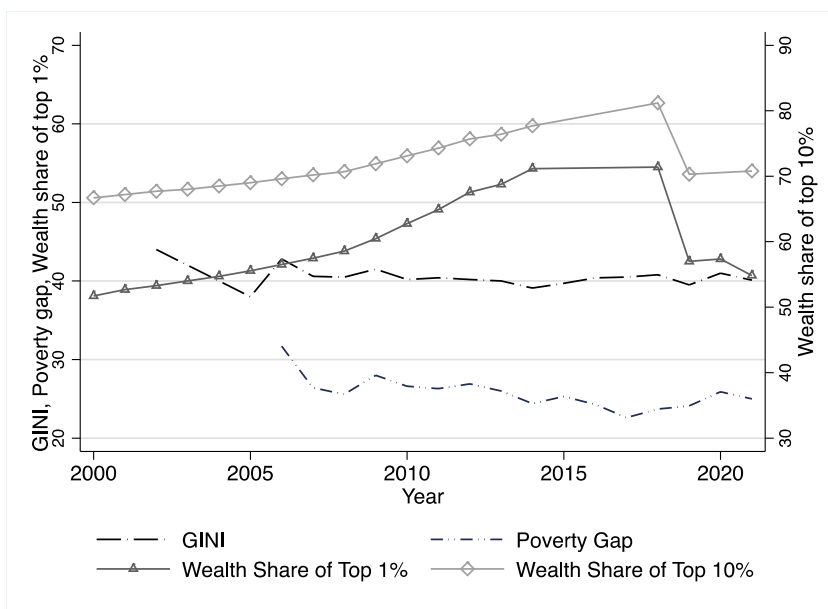


**Figure 3.** National income distribution for Türkiye (%).

**Notes:** The reader should be cautious about reading the data as the indicators are constructed by using pre-tax national income. For methodology, see 2020 Distributional National Accounts (DINA) guidelines, <https://wid.world/document/distributional-national-accounts-guidelines-2020-concepts-and-methods-used-in-the-world-inequality-database/>

**Source:** World Bank, World Inequality Database (2023), [https://wid.world/data/#countrytimeseries/sptinc\\_p99p100\\_z;sptinc\\_p90p100\\_z;sptinc\\_p0p40\\_z;sptinc\\_p40p90\\_z/TR/1820/2021/eu/k/p/yearly/s](https://wid.world/data/#countrytimeseries/sptinc_p99p100_z;sptinc_p90p100_z;sptinc_p0p40_z;sptinc_p40p90_z/TR/1820/2021/eu/k/p/yearly/s)

There has been significant progress in economic development in the 21st century, but this progress has come hand in hand with the concentration of wealth in the hands of a small group of individuals (Figure 4). In the year 2000, the top 10% of the population held 66.7% of the total wealth in Türkiye, where the median wealth per adult was \$3,838 and an average adult enjoyed \$12,324 per capita of wealth (Credit Suisse, 2014). Over time, wealth inequality estimates displayed an upward time trend, and the wealth gap between the richest and the poorest has widened. In 2021, the top 10% of the population held 70.8% of the total wealth while the gap between median wealth per adult and capita wealth was \$13,532. As wealth is more concentrated than income, the poorest percentile holds negative wealth. Additionally, more than one-third of all wealth, which is 40.7% is held by the richest 1% in 2021 (Credit Suisse, 2021).

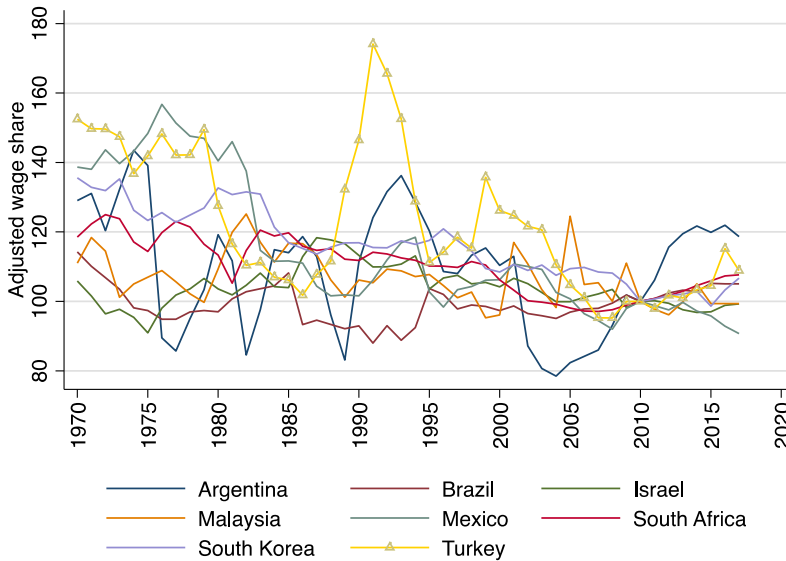


**Figure 4.** Income and wealth inequality measures for Türkiye between 2000-2022.

**Notes:** Wealth share of top 1% and 10% in GDP, poverty gap, and Gini coefficient for Türkiye over time.

**Source:** For the wealth share of the top 1% and 10%, Credit Suisse Global Wealth Databook (2014, 2018, 2021). For Gini and poverty gap, TurkStat (2022) Income and Living Conditions Survey (SILC).

The share of wages in total income has also decreased continuously, alongside the polarization in wealth distribution until 2020. Figure 5 demonstrates a prominent downward trend in the adjusted share of wages for selected countries over the past three decades. For Türkiye, the share of wages in GDP displayed a stable trend until the 1980s, while decreased by approximately 25% between 1979 and 1988. In the 1990s, strengthened union activities led to an increase in real wages, and the wage share reached its peak in 1991. However, following the crisis in 1994, expansionary monetary policies were implemented to address the growing current account deficit and deteriorating fiscal balance, aiming to suppress real wages and contract domestic demand. As a result, the wage share experienced a sharp decline after 1994. Subsequently, wages continued to remain at a lower level compared to the period before 1980.



**Figure 5.** The adjusted share of labor in GDP over time in selected countries.

**Notes:** The data selects 7 emerging economies economically similar to Türkiye and have higher inequality levels compared to the world average in terms of Gini coefficients, (i.e., South Korea, Brazil, Argentina, Mexico, Israel, Malaysia, and South Africa) between 1970 and 2017.

**Sources:** The adjusted labor share is adjusted for the self-employed income and thus yields a mean value above 100. In constructing the labor share series, the study relies on various data sources for each country. The data was primarily extracted from the AMECO database released by the European Commission and the Organization for Economic Co-operation and Development (OECD, n.d.). It is worth noting that the AMECO calculations for the wage share adjusted for self-employment result in a significantly higher share of GDP at factor costs (excluding taxes and subsidies) compared to other data sources. This difference arises because self-employment income is adjusted based on the proportion of employees among the total number of employed individuals. To ensure data comparability, the index of the adjusted labor share for all countries was calculated with the base year 2010 set at 100.

Developing countries depicted in Figure 5, namely Korea, Mexico, and Türkiye, also indicate that the global economic crisis in 2008 briefly halted this downward trend in the share of wages. But this lasted only for a short period. On the other hand, developed economies experienced an initial rebound in the wage share after the crisis began, followed by a subsequent decline from 2009 onwards. This phenomenon reflects the countercyclical behavior of the wage share, where wages tend to exhibit less volatility compared to profits during economic downturns.

Table 3 illustrates this fact. Income data of household disposable income quintiles has been disaggregated into 8 income groups as presented in the table below, based on the sources from which they were derived. According to Table 3, the main sources of income for low and middle-income groups typically derive their income from wage and salary in 2006. For the top



20% of income earners, the entrepreneurial, rental, and property income become important, as expected. In 2022, the significance of entrepreneurial income for all income quintiles except the top 20% has substantially decreased. Rental and property income the top 20% derived from also increased from 2006 to 2022.

**Table 3.** Distribution of annual equivalised household disposable income quintiles by type of income in Türkiye (in %) (Comparison of 2006 and 2022)

		P20	P40	P60	P80	P100
2006	Wage and salary	2.3	8.4	14.4	23.2	51.7
	Casual	28	27.8	19.8	15.1	9.2
	Entrepreneurial	4.4	8.5	10.9	17.3	58.9
	Rental income	1.6	3.3	7.1	15.8	72.2
	Property income	2.0	5.8	9.9	19.3	63.1
	Social transfers	3.1	8	18	26.2	44.7
	Inter-household transfers (Received)	11.0	14	16.1	21.5	37.4
	Other incomes	4.3	8.7	17.9	24.9	44.2
2022	Wage and salary	4.4	9.4	14.4	23.4	48.4
	Casual	29.2	24.9	21.6	16.4	7.9
	Entrepreneurial	2.7	5.3	7.9	13.1	71.1
	Rental income	1.3	3	8	14.8	72.9
	Property income	3.9	6.8	10.4	14.8	64.1
	Social transfers	5.4	12.4	19.5	25.6	37.2
	Inter-household transfers (Received)	10.6	14.2	18.8	20.4	36
	Other incomes	21.8	24.3	23.1	17.4	13.3

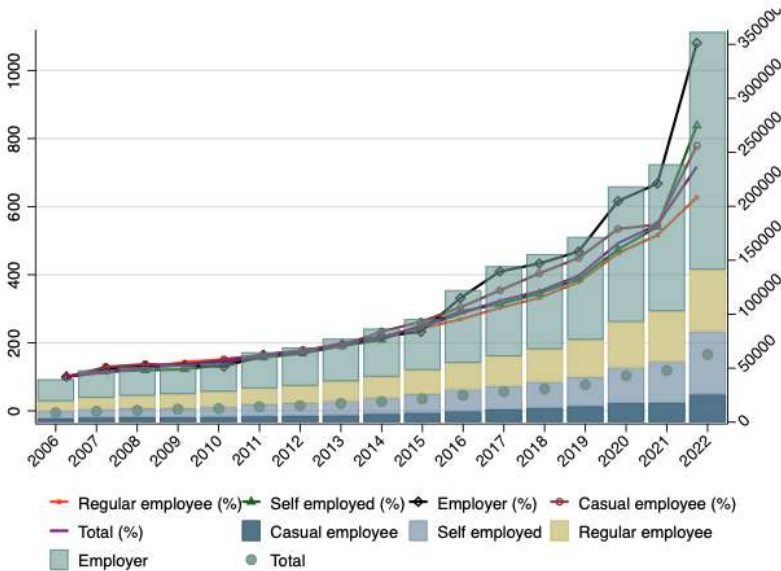
Source: TurkStat (2022) Income and Living Conditions Survey (SILC).

According to Table 4, the highest annual average income is earned by the employers, amounting to 220,481 TL in 2022. For wage and salaried workers (regular employees), the average income is calculated as 56,899 TL, for self-employed it is 58,696 TL, and for daily wage workers (casual employees) it is 25,632 TL. Compared to 2006, the income of wage and salaried workers increased by 527% in 2022, while the income of employers increased by 980% (Figure 6). In Türkiye, between 2006 and 2022, the proportion of employed individuals earning wage income increased to 70%, while the proportion of employers showed a decrease. Therefore, it is expected that the labor share would increase during the examined period. However, while the annual average income of employers increased more than that of wage and salaried workers between 2006 and 2022, the labor share decreased substantially, according to Figure 5. This indicates, in line with the developments discussed above, that lower wage shares are accompanied by a high degree of income inequality.

**Table 4.** Employed by status in employment and mean annual income at the main job in Türkiye (2006-2022)

		2006	2018	2022
Employed by status in employment (%)	Regular employees and casual employees	58.9	68	70
	Own account worker	22.3	17.1	16
	Unpaid family worker	13.1	10.5	9.5
	Employer	5.7	4.5	4.4
Mean annual income at the main job by employment status (TL)	Regular employee	9.069	30.106	56.899
	Casual employee	3.289	13.280	25.632
	Self-employed	7.002	24.134	58.696
	Employer	20.403	88.285	220.481

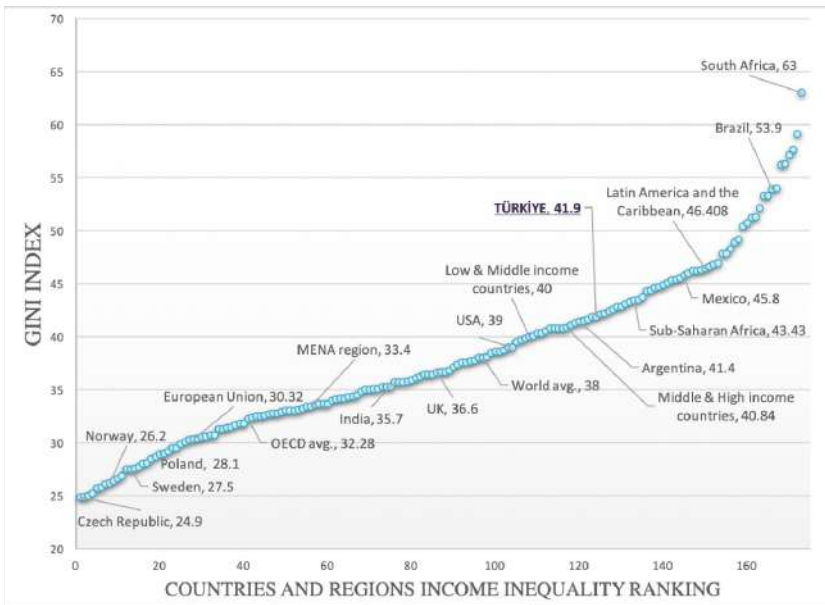
Source: Employed by status in employment (%): TurkStat (2022), Labor force statistics. Mean annual income at the main job by employment status, 2006-2022: TurkStat (2022) Income and Living Conditions Survey (SILC).

**Figure 6.** Index of mean annual income and mean incomes in TL at the main job by employment status in Türkiye (2006-2022).

**Notes:** An index has been created to show the development of a mean annual income at the main job by employment status (2006-2022), which is shown in the vertical axis on the left. The reference value (base year) is set to 100 in 2006. The vertical axis on the right indicates the mean annual income at the main job by employment status, measured in TL. Line graphs show the cumulative percentage change in mean incomes at the main job by employment status, and bar graphs show mean annual income and mean incomes at the main job by employment status in TL. The reference period of income is the previous calendar year.

**Source:** TurkStat (2022) Income and Living Conditions Survey (SILC).

The World Bank report (2019) indicates that inequalities have narrowed in the last 10 years in Türkiye which is classified in the group of middle-high income countries compared to other OECD countries. For example, between the mid-1980s and the late 2000s, there was a notable increase in the Gini coefficient among OECD countries, with a rise of 10%. Additionally, the ratio of the top 10% to the bottom 10% of income earners reached its highest level during the same period. However, when evaluated in line with international comparisons, Türkiye lags behind many European and OECD member countries in terms of income inequality. According to Figure 7, which shows the most recent Gini coefficient data for 165 countries and 8 regions, the countries with the lowest Gini values are Western and Central Europe, former Eastern Bloc, and Scandinavian countries, whereas the average Gini coefficient values of the European Union and OECD member countries are 30,32 and 32.28, respectively. The Gini coefficient value for 2018 is calculated as 41.9 for Türkiye, which is 3.9 points above the world average Gini index value calculated for the countries covered and exceeds the average value of 40 for low and middle-income countries and middle-high-income countries. When evaluated from this perspective, Türkiye is positioned among the countries with high Gini values in the world ranking, along with Latin American and Caribbean countries.



**Figure 7.** Gini index of income inequality in 165 countries and 8 regions.

**Notes:** This figure uses data on the Income Gini coefficient. In the case of regions, the study uses the median as a measure of central tendency and location.

**Source:** World Bank, World Development Indicators (2021). <https://databank.worldbank.org/source/world-development-indicators>

## 5. Paths to Achieving an Inclusive Society: Future Policy Prospects in Türkiye

The majority of income for the wealthiest income group comes from entrepreneurial and interest income, and the substantial contribution of these income sources to inequality compared to other sources remains the main source of income inequality. Different functional income groups can be asymmetrically affected by economic policies. Therefore, it is critical to formulate policies that focus on different income groups, as inequalities among different factor incomes are an important determinant of inequalities in the Turkish economy.

### *Redistributive policies*

Income distribution primarily results from the income-generation processes through which different income groups derive their earnings. Inevitably, inequality arises because of economic policies affecting different income-generation processes in various ways. The fight against income inequality should directly aim to eliminate the inequalities generated by different income-generating structures, such as increasing real wages to increase the share of the bottom 40% or taxing high-income earners.

They are considering social transfers and the tax system in Türkiye, Cuevas et al. (2020) but also to poverty and inequality reduction. This paper provides the most comprehensive assessment of the distributional incidence of Türkiye's fiscal policy to date. It analyzes the combined and individual incidence of direct and indirect taxes, transfers, and social spending and benchmarks Türkiye's achievements against peer countries. The results show that fiscal policy significantly reduces income inequality in Türkiye, driven by social spending on education and health, and complemented by direct taxes and transfer schemes that countervail the inequality-increasing impact of indirect taxes. At the bottom of the income distribution, targeted transfers are insufficient to compensate for the effect of taxes, resulting in net increases in poverty. In the context of upper-middle-income countries, Türkiye's performance is below the median. This is driven by the relatively larger negative impacts of indirect taxes and the more limited positive impacts of direct transfers and taxes. From a policy perspective, the paper contributes to identifying entry points for improving the equity impact of the fiscal package. Among these, targeting the minimum subsistence allowance (AGI notes that indirect taxes, which constitute 10.3% of the gross domestic product (GDP), form the primary source of revenue for the central budget in Türkiye. They also highlight those social expenditures accounted for 18% of the total GDP in 2016, with 16% of these expenditures allocated to education and healthcare. Reports analyzing the impact of taxes and social transfers on

income inequality and poverty suggest that fiscal policy has been successful in reducing income inequality, particularly through the redistributive effects of education and healthcare expenditures, resulting in a decrease in the market Gini coefficient from 0.48 to 0.38 after accounting for taxes and transfers. However, due to the disproportionate tax burden placed on the poor through indirect taxes, the report argues that the poverty gap ratio has increased from 2.7 to 5.3.

In Türkiye, since the implementation of neoliberal policies after the 1980s, the regulatory measures aimed at reducing corporate taxes have led to an increase in indirect taxes. The new tax structure at the expense of indirect taxes has resulted in an increased tax burden on labor. Because the middle-class groups can be considered wage earners, and they have a higher propensity to consume than that top income earners, they allocate nearly one-third of their budget for essential consumption items such as food and clothing, making them regular and high contributors to the tax system (OECD, 2019). From this perspective, as indicated in the policy framework section of VNR (2019) for Türkiye, restructuring the tax system and reducing the proportion of indirect taxes would contribute to achieving income distribution fairness and alleviating poverty in Türkiye, and thereby attain SDG 10 by 2030.

### ***Wage policies***

Policymakers should strive for policies that foster a strong correlation between the increase in labor productivity and the growth of workers' compensation. Linking labor productivity with the growth of real wages is key to keeping the share of labor in national income constant. This requires strengthening labor market institutions, stronger wage protection, and setting a framework to provide adequate minimum wages. This may not only help diminish wage disparities, but it can also potentially enhance labor productivity.

### ***Poverty reduction policies targeted at regions***

Addressing the needs of less developed regions is crucial. However, regional inequality is more complex and influenced by an interrelated set of several elements. First, there are broader societal and political implications for this type of inequality, and they can be persistent and self-sustaining. Second, many developing countries face challenges in producing regional data due to limited capacities and lower standards within their statistical authorities. A primary challenge in sub-national economic analysis is the definition of the unit of analysis, as the term region can encompass different meanings, varying both within individual countries and across different countries. For the majority of developing countries using survey information to assess income distribution, conventional cross-sectional indicators of income inequality

and relative poverty at the regional level are estimated with limited accuracy in the smallest regions, owing to small sample sizes (OECD, 2014).

Türkiye's diverse development levels and population size create disparities in poverty and inequality. The number of the regional poverty rate by equivalised household disposable income according to the 50% of the median income by SR Level 2 classification indicates that in 2022, the Türkiye average is 14.4% (TurkStat, 2022). Among the 26 regions, the poverty rate ranges from 3.7% to 15%. Türkiye can establish funds to boost economic and social progress that lag behind the national average in terms of inequality and poverty rates.

### ***Policies for closing the gaps in the skills of the workforce by building an inclusive education***

If we are heading towards higher structural unemployment in the future due to the latest advancements in information technology and its impact on the future job markets remains an important issue to be solved. To adapt to the changes in rapidly changing job markets, Türkiye must establish mechanisms for training the workforce in future skills via developing courses, vocational training programs, industry-academia partnerships, hands-on training for advanced technologies, and government initiatives to equip the youth with the necessary skills to meet future demands. Increases in human capital must go hand in hand with technology, and these labor market policies will contribute to reversing higher inequalities caused by technological change via increasing human capital and the supply of skills. Inequalities stemming from earnings dispersion and the gap between wage and profit earners that the study highlights can be reduced by helping these groups to acquire educational qualifications, and record increases in their lifetime incomes. Considering the interaction between SDGs, the study mentioned that Targets SDG 1 and SDG 10 are strongly impacted by targets under education (SDG 4) and economic growth (SDG 8). Thus, implementing inclusive education policies for future skills is also effective on all these endogenous targets where Türkiye records slower progress among the others. Introducing social protection schemes in developing countries like Türkiye is key in this regard.

### ***Regulating financial markets***

The concentration of wealth and financialization is a crucial source of inequality and societal tension. In the case of Türkiye, the integration of financial markets and capital account liberalization increased financial fragility, aggravating general economic instability, and triggering the crisis. Unregulated financial markets have not only worsened inequality but have also reinforced instability. Regulation of the financial sector and reestablishing its function in directing resources toward productive and sustainable investments is crucial.

## 6. Conclusion

In this study, we claimed that to address the question of personal income inequality, it is necessary to examine the changes in functional income distribution. A statistical preliminary analysis that has been presented focused on the reduced labor share and an unsatisfactory improvement in personal income inequalities. We have also highlighted the underlying reasons for this claim.

Since 2010, the issue of inequality has come to the fore and has become a central topic of discussion in academia and among policymakers. The rising levels of income inequality have captured the interest of international organizations such as the International Monetary Fund (IMF), OECD, World Bank, and United Nations. However, the question arises as to whether SDGs effectively address the broader issue of inequality, other than recognizing the importance of tackling inequality on a global scale by incorporating a specific goal that addresses both vertical and horizontal inequalities.

We have pointed out that the current formulation of SDG 10, as it stands, faces considerable challenges in adequately addressing the increasing levels of inequality within and between countries because the absence of benchmarks or variables for measuring inequality reduction is an issue throughout SDG 10. Thus, SDG 10 should be viewed not as a framework for substantial achievements in reducing inequality at the national and global levels by 2030, but rather as an initial step in including inequality issues in the global agenda and establishing foundations for further progress in the future.

This chapter examined the trends in income, wages, and wealth distribution, which represent the monetary inequalities since the year 2000. Despite observing a decline in income inequality since the 2000s, the data on income and poverty indicates there has been limited improvement since 2006. There continues to be a deepening income gap between the poorest 20% and the richest 10%. The share of wages in total income has consistently decreased, while polarization in wealth distribution has been increasing until 2022. Furthermore, the redistribution of income through labor market policies, taxation, and transfers has been insufficient in reducing the tension caused by inequality and poverty within society. These findings indicate that Türkiye still faces substantial challenges in achieving the SDG 10 target by 2030. To make significant progress, Türkiye must undertake a comprehensive range of policies and strategies to effectively reduce inequality. These measures should encompass the implementation of inclusive education policies rising inequality in recent decades is related to an increase in the share of income held by the top wage earners, regional policies to combat

the divergence in poverty rates, and provide poor relief to regions that lag behind the national averages, and restructuring tax-transfer system which will improve the redistributive potential of fiscal policy to mitigate the market income disparities. Lastly, one limitation of this study is the lack of regional inequality assessment. Aggregate national averages that we have addressed above conceal significant variations in poverty and inequality within a country. Dividing data into regional segments proves valuable in comprehending the origins and trends of income inequalities and poverty in Türkiye and developing countries.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 18

### THE QUADRUPLE HELIX INTO THE EFFORT OF SUSTAINABLE CITIES AND COMMUNITIES: THE CASE OF MARMARA URBAN FORUM IN TÜRKİYE

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#### Abstract

According to population projections, more than half of the world's population will live in cities by 2030 and nearly two-thirds by 2050. This is one of the reasons why sustainable cities and communities are one of the Sustainable Development Goals. Goal 11 aims to make cities and human settlements inclusive, safe, resilient, and sustainable. The aim of this study is to try to evaluate the university-industry-government-civil society cooperation for the realisation of this development goal in the context of the Marmara Urban Forum (MARUF19) organised by the Marmara Municipalities Union in 2019. MARUF19, which is a first in the world with its content and structure, is addressed in two aspects from the perspective of the quadruple helix innovation model. (1) In this forum, where a large number of organisations from each helix of the model come together, how do the participants interact with each other within the framework of the development goal of Sustainable Cities and Communities? (2) What role does the forum play in this respect in terms of providing a consensus space for stakeholders and representing the fourth stakeholder of the helix as an intermediary organisation? In other words, the case of MARUF19 is examined as it can enrich and enhance the understanding of both how an organisation representing the fourth stakeholder of the quadruple helix as an intermediary organisation can create a consensus space by bringing together different actors and how stakeholders coming together from all spheres of the quadruple helix interact in terms of participation.

**Keywords:** Sustainable cities, sustainable communities, quadruple helix model, Marmara urban forum, consensus space, intermediary organisations.

## 1. Introduction

Innovation, an undisputed factor for a sustainable system (Adams et al., 2016; Kuzma et al., 2020), is at the centre of economic growth and development (Dhar et al., 2023; Fagerberg et al., 2010). Research on sustainability suggests that organisations that generate innovation have a greater impact on sustainable development (Silvestre and Tirca, 2019). Knowledge, as a crucial element in driving an innovation-based economy, is an important determinant of global, national and regional competitiveness and value-creation capabilities (Damaskopoulos, 2005; Carayannis and Campbell, 2012). Helix models are seen among the various existing systemic approaches that examine innovation. The triple helix proposed by Etzkowitz and Leydesdorff (1995) is a basic model of innovation that constitutes the knowledge economy with a focus on higher education. The model is based on the relationship, interaction and cooperation between university, industry and government. In its initial stages, a structure is constructed in which the fields affect each other, and then hybrid models emerge in which multidirectional and mutual relations are transformed into capital thanks to the interaction areas in which stakeholders are intertwined (Etzkowitz, 2002; Etzkowitz and Leydesdorff, 2000; Ranga and Etzkowitz, 2013). It also forms the basis of regional development policy studies and smart specialisation strategies that have recently attracted attention (Roman et al., 2020).

To extend the triple helix and provide a broader context for the innovation model, Carayannis and Campbell (2009) developed a quadruple helix model, emphasising the importance of civil society. This quadruple helix innovation system suggests that for sustainable development in the economy, the knowledge economy, knowledge society and knowledge democracy need to evolve together. It emphasises the knowledge society and knowledge democracy for support, encouragement and progress in the production (research) and application (innovation) of knowledge (Carayannis and Campbell, 2010, 2012, 2017). In the model, in addition to corporate stakeholders who adopt the goal of an advanced economy and long-term sustainable development, society, which is the user of the innovation developed, is also part of the process. It also has a say in the innovation developed within the scope of the collaboration and directs the foci of the collaboration according to social needs and problems. Thus, collaborations in the model are supported by the co-creation process (Carayannis and Campbell, 2009, 2012; Campbell et al., 2015). The inter-organisational collaboration that shapes these models is seen as a key element in fostering innovation from a theoretical and practical perspective. However, for the model to be accomplished, the stakeholders need to develop harmonious relationships through a deeper understanding of each other's priorities and approaches through a process of co-creation and co-specialisation (Carayannis and Campbell, 2009, 2010, 2011;

Campbell et al., 2015). In this context, this study aims to contribute to the field by examining the quadruple helix model in a developing ecosystem in light of the eleventh global goal at a micro level with a single case study.

The framework of the study is shaped by the quadruple helix innovation model developed from the triple helix structure. MARUF19, which is the case of the study, is not only a fourth stakeholder in the helix system in question but also includes four stakeholders in terms of content. In these respects, the quadruple helix model perspective is used twice in the study: (1) the quadruple helix model perspective that treats MARUF19 as an intermediary organisation in cooperation with other stakeholders as the fourth helix, and (2) the quadruple helix model perspective that includes four different stakeholders that benefit from the consensus space provided by it. At the beginning of the conceptual and theoretical section, the topic of sustainable cities and communities, which stand out as the eleventh topic under the United Nations' Sustainable Development Goals, is discussed and briefly evaluated. Subsequently, the triple helix model, which is the core model, is explained and then the structure and basic features of the quadruple helix model, which constitutes the framework of the study, are discussed. Then, the concept of the fourth helix and the concept of the intermediary organisation as the fourth stakeholder of the helix model, as represented by MARUF19 in this study, are explained. In the next section, an assessment of the areas of consensus in the formation of helix systems is provided in order to deepen the role of MARUF19. The research methodology section details the design, analysis and evaluation processes of the study. It then elaborates on the nature and content of MARUF19 in an attempt to reveal its intermediary and consensus function in the field. This is followed by findings on the approaches of the four stakeholder groups towards the sub-targets of the eleventh global goal and their interactions with each other. Finally, the findings and conclusions are discussed in the light of the quadruple helix model and the sub-targets of the eleventh global goal.

## **2. Conceptual and Theoretical Framework**

### **2.1. Sustainable Cities and Communities**

The history of the concept of a sustainable city – which would later gain political connotations with the Brundtland Commission – is closely related to the concept of sustainable development and goes back to the regulations on forestry management in 18th-century Germany (Pinto et al., 2019). Although sustainability is generally understood as an environmental theme today, John Elkington, with his conceptual framework, the Triple Bottom Line (TBL), put forward in 1998, revealed that sustainability has economic and social dimensions as



well as environmental (Reis et al., 2021). This shows that the issue should be handled in a multidimensional manner. Although it has academic and practical aspects, it carries a multi-faceted content in which many stakeholders, from social scientists to environmental experts, engineers to artists, assume responsibility (Williams, 2010). In order to evaluate this content correctly, it is essential to organise discussions open to multi-stakeholder participation. It will be possible to share experiences in solving problems through local, regional and international meetings with not only national but also international participation. In this sense, the Marmara Urban Forum (MARUF), organised by the Marmara Municipalities Union, stands out as an organisation that can set an example to the whole world with its structure and approach that can be shown as an example for these discussion platforms. In this study, the international organisation of MARUF held in 2019 (MARUF19) is analysed.

When the United Nations developed the concept of Sustainable Development Goals, it declared that one of the 17 topics was Sustainable Cities and Communities. By identifying ten sub-targets, it declared that the issue is very complicated and has inherent problems that need to be solved urgently. Seven years before 2030, the concept of sustainable cities concerns developing countries such as Türkiye more than developed countries (Zhou et al., 2021). The historical baggage of developing countries also shows that this is the case. While developed countries learnt from each other's experiences, developing countries chose the unsustainable path by importing highly polluting production equipment abandoned by developed countries (Zhou et al., 2021). The environmental, economic and social problems created by unsustainable development moves such as these, the fact of being late, and new problems awaiting urgent solutions force countries and the world to be creative in producing new solution strategies and, more importantly, provide motivation to act together. One of the main lessons learned from previous similar UN programmes, such as the Millennium Development Goals, is that global actions should involve more active participation of industry and academia as well as governments (Lahi, 2019). This structure, which is shaped by the cooperation of university, industry and government and defined as a triple helix model, turns into a quadruple helix innovation model with the inclusion of civil society as the fourth helix (Carayannis and Campbell, 2009, 2012). Thus, the goal of sustainable cities and communities, which is also the subject of this study, and its sub-targets are analysed within the quadruple helix model.

An analysis of sustainable cities and communities in Türkiye shows that the fourth main heading in the section of the 11th Development Plan, which was expected to be implemented between 2019 and 2023, where the goals and policies are shaped, is "livable cities and sustainable environment". This plan has been expanded and elaborated with the subheadings of "regional

development”, “urbanisation”, “housing”, “urban transformation”, “urban infrastructure”, “rural development”, “environmental protection” and “disaster management”. In the 10th Development Plan, this title was constructed as “sustainable spaces and sustainable environment”. The sub-headings are “regional development and regional competitiveness”, “spatial development and planning”, “urban transformation and housing”, “urban infrastructure”, “local administrations”, “rural development”, “environmental protection, soil and water resources management” and “disaster management”. It is understood that sustainability is the main motive in both development plans; however, the 11th Development Plan gives more importance to the concept of a sustainable city. There are strong indications that a similar momentum will develop in favour of sustainable cities in the 12th Development Plan, which will cover the years 2024-2028.

## 2.2. Quadruple Helix Model

For sustainable value-added generation, it is necessary to focus on innovation and knowledge generation (Carayannis and Campbell, 2012). However, compared to other types of innovation, the development and implementation of sustainability-oriented innovation is complex, dynamic and uncertain (Silvestre and Tirca, 2019). In this context, helix models of innovation that bring together different institutional spheres stand out. As a foundational concept, the triple helix model emerged to foster the development of knowledge-based economies by focusing on the relationships between universities, industries, and governments to promote knowledge-based innovation (Etzkowitz and Leydesdorff, 2000; Ranga and Etzkowitz, 2013). In the course of time, a quadruple helix innovation model has emerged, transforming the triple helix model into a broader and more inclusive model with the inclusion of civil society as the fourth helix (Carayannis and Campbell, 2009, 2012). This helix structure focuses on intertwined collaboration, co-evolution and co-specialisation within a dynamic framework of institutions and stakeholders (Carayannis, 2008; Carayannis and Campbell, 2009, 2012). This system emphasises the fact that sustainable development in the economy (knowledge economy) requires the co-evolution of both the knowledge economy, the knowledge society and the knowledge democracy (Carayannis and Campbell, 2017). According to the model, civil society is an important and central element for the successful realisation of knowledge and innovation policies and strategies. The users and demanders of innovation (civil society) or citizens are the owners and managers of innovation processes; in this context, the development of appropriate innovations for them is encouraged (Carayannis and Grigoroudis, 2016; Carayannis and Rakhmatullin, 2014; Carayannis et al., 2017, 2018).

Civil society, culture-based society, the nature of democracy and sustainable development illustrate the need to conceptualise democracy more broadly (Carayannis and Camp-

bell, 2014). In the model, the emphasis is on the structures and processes of the gloCalising (global and local) knowledge economy and knowledge society, as well as on the “innovation ecosystem” that connects and integrates social and natural systems and environments, and pluralism of diverse actors and organisations. In this respect, in addition to the fourth helix (the knowledge society), knowledge democracy, which develops with the knowledge society and the knowledge economy, also stands out (Carayannis and Campbell, 2011, 2012, 2017; Carayannis et al., 2012). The key role of democracy implies a co-evolution between the processes of advancing democracy and the processes of advancing knowledge and innovation (Carayannis and Campbell, 2012: 19). The development of knowledge and innovation and the increase in society’s access to these foundations increase the quality of sustainable development and democracy. Therefore, the interaction between the quality of democracy and the innovation system develops together in a mutually reinforcing cross-helix manner (Campbell et al., 2015: 489). There is a certain coherence between the processes and structures of advanced knowledge democracy, knowledge society and knowledge economy, and knowledge democracy represents an important reference for the expansion of the knowledge society and knowledge economy (Campbell, 2019; Carayannis and Campbell, 2010, 2012, 2017). Furthermore, the quadruple helix model considers universities of arts as well as universities of sciences and other higher education institutions as a source of progress towards new innovation systems, where the alliance between arts and sciences is expected to generate interdisciplinarity and transdisciplinarity, which are crucial for the development of innovation, and this collaboration is a decisive alignment that fosters innovation (Carayannis and Campbell, 2011, 2017). In addition, sustainable development requires not only innovation but also innovation flows based on “creative knowledge” that generate new knowledge. There is a co-evolution between knowledge, innovation and creativity on the one hand and the knowledge economy (creativity economy) and knowledge society (creativity society) on the other, so that more knowledge, innovation and creativity are absorbed and also in demand for further progress (Dubina et al., 2012).

It seems that civil society as the fourth helix is defined differently depending on the context. Although it is difficult to define civil society, civil society actors are specifically defined as “media, creative industries, cultural activities, consumers, entrepreneurs, business groups, NGOs, innovation professionals, researchers, government, entrepreneurs and mentors” (González-Martínez et al., 2021). Furthermore, Hasche et al. (2020) report that in order to comprehensively understand the four-helix model, it is necessary to go beyond perceiving the fourth helix as only the user or end-user: Instead, the fourth helix should be seen as an

arena in which social value production takes place through dynamic interactions (activities, resources and actors) between university, industry and government in terms of their activities, resources and actors. When analysing the stakeholders in the quadruple helix model that come together in MARUF19 as an intermediary institution in this research, the fourth helix is defined as an area that includes all civil society actors, in the light of the definitions made by González-Martínez et al. (2021) and Hasche et al. (2020), in the model. It is one of two uses of the quadruple helix model in this study.

In empirical applications, it is possible to see a diverse range of definitions of the fourth helix in relation to “consumers” (e.g. Ivanova, 2014), “users” (e.g. Arnkil et al., 2010; Miller et al., 2018), “civil society organisations” (e.g. Lindberg et al., 2014), “community” (e.g. Doh, 2018). The most recent and fairly comprehensive content analysis by González-Martínez et al. (2021) identifies four perspectives from which studies focus on the concept of civil society in the literature: (1) the demand perspective, (2) the perspective of media and culture, (3) the perspective of independent non-profit organisations, and (4) the perspective of intermediary organisations. Among these definitions, the intermediary organisation perspective, which emphasises acting as an intermediary between the three-helix institutions to support innovation, has been used in many studies (see, e.g. Ahonen and Hämäläinen, 2012; Cooper, 2009; Iqbal et al., 2018; Kimatu, 2016; Kolehmainen et al., 2016; MacGregor et al., 2010; Malva et al., 2018; Nordberg, 2015; Parveen et al., 2015; Ponchek, 2016; Schoonmaker and Carayannis, 2013; Van Horne and Dutot, 2017; Yang and Holgaard, 2012). According to the prominent common definition, intermediary organisations are defined as “an organisation or body that acts as an agent or broker in any aspect of the innovation process between two or more parties” (Howells, 2006: 720). They are also important from a policy perspective as they increase linkages through bridges within the system and also act as catalysts by creating new opportunities and dynamism (Howells, 2006). These intermediary organisations are usually non-profit organisations, including professional associations, foundations, consortia, independent research support organisations and special interest groups (Metcalf, 2010). Much work in this field is done within organisations that maintain a close formal connection with their environment and reject change and external influence (Poppen and Decker, 2018). Accordingly, an intermediary between fields is a great opportunity to optimise collaborations and establish dialogues as open as possible (Bellgardt et al., 2014; Howells, 2006). In the context of the quadruple helix, intermediaries are needed to help remove the barriers of the quadruple helix (Howells, 2006; Mitton et al., 2007) and to advocate the value of knowledge transfer and advance the quadruple helix process (Miller et al., 2016). The MARUF19 in this study

represents the perspective of the intermediary organisation, which acts as an intermediary between the three spheres in the quadruple helix-based innovation generation process and is the fourth helix in the model. It is the second one of the two uses of the quadruple helix model in this study.

Regarding intermediary organisations, there is an opportunity to explain the consensus space from the three spaces (knowledge, innovation and consensus) of the core model (triple helix model) and consider the urban forum specifically as a consensus space. The consensus space is the basis for the formation of the helix system (Ranga and Etzkowitz, 2013). In this space, designs and plans are evaluated and discussed, and helix actors are brought together to develop inter-organisational relationships to move towards a system based on knowledge and innovation (Etzkowitz, 2008; Ranga and Etzkowitz, 2013). A consensus space generates social and relational capital through its activities, thus facilitating coordination within and between various institutional spaces (Villarreal and Calvo, 2015). It is a platform that brings together relevant actors for new ideas, cooperation, brainstorming, analysing problems and designing plans (Champenois and Etzkowitz, 2018; Etzkowitz, 2008). When these actors formulate a strategy and gather the necessary resources to implement it, the process of regional development moves forward (Etzkowitz, 2008: 76-77). The effort to build a new hybrid entity is likened to a social movement that brings together resources, people and networks (Etzkowitz, 2008: 81). It also offers a choice environment that gives rise to technological developments by providing balance and consensus between those responsible for the production and utilisation of knowledge and those who oversee and direct the progress and pace of these endeavours (Barrie et al., 2017). Additionally, consensus space, which is a space for strategy formulation and review where actors from different branches of the helix structure are brought together, can be associated with a range of mediating roles and functions for these activities (Meyer et al., 2019). Furthermore, the formation of the consensus space is seen as closely linked to the development of social capital, which provides trust between network actors; when the environment and opportunities for institutional growth, networking and the development of social capital are insufficient, the progress of innovation is considered to be limited (Yokakul and Zawdie, 2009). The existence of a consensus space is a prerequisite for a hybrid organisation to foster innovation in response to local conditions by leveraging the resources to be gathered in this space. Indeed, hybrid autonomous organisations often emerge within a consensus space (Etzkowitz 2002; Etzkowitz 2008; Ranga and Etzkowitz 2013). Based on such information, this study proposes that MARUF19, as an intermediary organisation, provides a consensus space for the participants, bringing together different institutional sectors and engaging in

discussions. This can create a space for consensus, paving the way for the transformation of stakeholders' roles and relationships and their mutual commitment to innovation.

### **3. Methodology**

#### **3.1. Case Study**

Field research indicates that a more detailed examination of the dynamic relationship between the different actors in the quadruple helix model is required. More case-based research at micro levels is needed to fully understand the complexity of the activities taking place in a quadruple helix environment (Cunningham et al., 2018; Edquist, 2011; Höglund and Linton, 2018; McAdam and Debackere, 2018; McAdam et al., 2012; Miller et al., 2016). Such case study research can provide new insights that can improve and further develop existing theoretical knowledge (Eisenhardt & Graebner, 2007; Siggelkow, 2007). Robert Stake states that the aim of case study research is “a specific, unique, limited system” (2003: 136). In this respect, in a sense, the three key points at the centre of the single case study research principles also emerge. For this reason, in this study, the case study research design was chosen, and the focus was on a single case (MARUF19). In addition, it is possible to make conceptual and theoretical contributions by going beyond a specific case with a single case study that is well grounded in the existing literature in the research field (Siggelkow, 2007). Single case studies contribute to the creation of empirically rich, context-specific and holistic explanations (Willis, 2014). However, generalising from a single case study is not widely accepted. However, Flyvbjerg, who states that generalisation can generally be made on the basis of a single case and that case studies are at the centre of scientific development through generalisation, emphasises “the force of example” instead of over-valuing formal generalisation as a source of scientific development (2006: 228). In light of all this information, the case of MARUF19 was chosen as it can enrich and enhance the understanding of both how an organisation representing the fourth stakeholder in the quadruple helix as an intermediary organisation can create a consensus space by bringing together different actors and how stakeholders coming together from all spheres of the quadruple helix interact in terms of participation.

MARUF19 also fits the description of an autonomous organisation designed with the goal of integrating all triple helix domains in an effort to foster innovation (Champenois & Etkowitz, 2018). As explained above, the triple helix model is the basic model of the innovation core, and thus, the quadruple helix model and the triple helix system formation are very closely related to the consensus space. Moreover, among the various conceptual definitions of civil society, the intermediary organisation approach stands out. Therefore, MARUF19

is a consensus space that creates an environment of cooperation between a large number of organisations, including universities, industrial organisations, municipalities and regional and local governments and forms the fourth stakeholder of the helix as an intermediary organisation. Secondly, MARUF19 builds and includes a quadruple helix model with its participants because the participants of the organisation include universities, industry, government and civil society. In other words, MARUF19 is not only a fourth stakeholder in the helix system but also includes four stakeholders in terms of content. This aspect is also worth analysing with a quadruple helix perspective. In other words, the quadruple helix model perspective is used twice in this article: it considers and discusses the quadruple helix model perspective, which takes into account the fourth helix, that is, MARUF19 as an intermediary organisation in cooperation with other helices, and the quadruple helix model perspective, which includes four different stakeholders who benefit from the consensus space it provides.

### **3.2. Data and Analytical Process**

Qualitative data and their analyses give the opportunity to reveal social and contextual elements and fine details. Qualitative content analysis provides this richness for researchers (Roller, 2019). This analysis method includes six key components that (1) cover all qualitative data sources, (2) proceed systematically and in a process-oriented manner, (3) offer meaningful interpretations and inferences, (4) have a contextual basis, (5) enable the reduction of data while preserving the content, and (6) identify themes and patterns (Roller and Lavrakas: 2015: 232). A unique feature of qualitative content analysis is that it focuses on the process of continuously reviewing and developing meanings in the data based on new discoveries (Roller and Lavrakas: 2015: 233). The researcher proceeds in a cycle of interpretation in which, as Krippendorff (2013) notes, interpretations are reshaped, for example, by new understandings of the wider context. The content is analysed repeatedly to develop a better understanding of each relevant part and its relationship (Roller and Lavrakas: 2015: 234). Guided by these elements, an approach focusing on the content and details of the situation in this research was adopted. In order to develop a rich understanding of the structure, participants and activities of MARUF19 from a quadruple helix perspective, the report text, including all its elements, was investigated in detail and analysed through qualitative content analysis. Since the source is textual, the primary method was used for content analysis.

Attention was paid to the recommended method selection, coding, categorisation, category development, consideration of outliers, and justification of results for the qualitative content analysis method as a way to consider and incorporate quality principles at every stage of the research process (Kuckartz, 2014). A comprehensive plan for a qualitative approach was fol-



lowed from the design: (1) selection of the unit of analysis, (2) development of codes and a coding schedule with an emphasis on context, (3) pre-testing of codes and inter-coder checking, (4) defining categories, and (5) defining themes and facilitating the results with visual representations (Roller and Lavrakas, 2015: 241-244). In the first stage of the study design, since the case (MARUF19) was analysed in the context of sustainable cities and communities, the sub-targets of the global goal were considered as a guiding framework and used in the development of codes. In addition to the goals, the quadruple helix theory was used to reveal the concepts in the forum sessions. During the study, forum themes were used to expand the categories. Following these assessments, relationship analyses were conducted to better understand the relationship between themes, solution proposals and quadruple helix stakeholders for the global goal. Thus, how the role and function of the forum as an intermediary organisation as the fourth party of the quadruple helix was reflected in practice was revealed within the framework of the consensus space. As the forum involved all four stakeholders in terms of their participants, their interactions were also analysed. The case study analysis was analysed within the framework of the eleventh global goal and its sub-targets.

A holistic approach was followed in the design of the case study research (Yin, 2018). Furthermore, the challenge of conceptualising and implementing research designs that result in rich contextual findings was taken into account while incorporating qualitative research principles to maximise the discovery of valid interpretations that ensure the ultimate usefulness of the research (Roller, 2019). In seeking answers to the research questions, the report text and analyses were read several times and reviewed by two researchers. Triangulation was used to verify analysis interpretations of the situation. Team coding and review added credibility to the findings.

#### **4. The Case of Marmara Urban Forum 19 (MARUF19)**

The case study in the research is the urban forum titled MARUF19, and this forum is organised by the Marmara Municipalities Union (MMU). MMU, which is the first union of municipalities in Türkiye and headquartered in Istanbul, operates on a regional scale in 11 provinces (Balıkesir, Bilecik, Bursa, Çanakkale, Edirne, Istanbul, Kırklareli, Kocaeli, Sakarya, Tekirdağ and Yalova), six of which are metropolitan cities, and 188 municipalities are members. It provides managerial, financial and legal consultancy and training services, supports scientific studies and organises organisations and meetings that bring together relevant stakeholders in order to improve the institutional capacity of local governments in areas such as environmental management, urbanisation, migration and social cohesion, local diplomacy, local development, urban technologies and innovation (Marmara Municipalities Union, 2023).



The Marmara Urban Forum (MARUF), which has been held every two years at the international level since 2019, is one of the organisations held by MMU. It is organised with the motto of “Cities Developing Solutions” and reveals the effort to seek solutions together with all stakeholders of the city by evaluating the global agenda and local needs and priorities together. In this context, it aims to create a basis for the exchange of information, experience and opportunities between the public sector, local administrations, industrial organisations, universities and other relevant stakeholders, and to evaluate different approaches to urban services and urban management together. For this purpose, in order to contribute to the implementation of the New Urban Agenda, it brings together local and international knowledge and experience and opens the issues to be analysed from alternative sides of the debate. MARUF aims to (1) examine in solidarity and cooperation at local, regional, national and international levels the economic, political, social, and ecological changes and problems created by the urbanisation process in the lives of individuals and societies and in the city, together with solutions, (2) strengthen the role of local governments and cities in situations of crisis and human mobility due to various reasons, (3) raise awareness on safe, inclusive, resilient and sustainable urbanisation, (4) contribute to the formation of a more livable and equitable urban world, and (5) ensure the flow of information between cities and city-regions and support the relationship networks between cities (Marmara Urban Forum, 2023).

MARUF was organised for the first time in Istanbul in 2019 under the name MARUF19. The design process started in 2018. As a result of in-house meetings, MMU Council meetings and meetings with the MMU Advisory Board, the organisation’s work started. A working team, executive board and advisory board were established for MARUF19. Through a participatory planning process, the forum brought together different organisations that have a say on cities: 66 supporting institutions, 14 academic partners, 10 municipalities, three associations of municipalities, five development agencies, 15 international institutions and organisations, four media sponsors, three sponsors and 12 NGOs and other local actors (Marmara Municipalities Union, 2020: 54-55). MARUF19, which broke new ground with its innovative sessions and is one of the most influential urban forums in the world, focused on “Cities Developing Solutions” and created a platform where knowledge, experience and opportunities are shared among the public, industrial organisations, non-governmental organisations, universities, local governments and all other relevant stakeholders. The MARUF19 report, which includes the prominent topics, solution proposals and good practices in the sessions, comprehensively covers the organisation process, activities, events and post-event evaluations based on the motto of “Cities Developing Solutions” (Marmara Municipalities Union, 2023; Marmara Urban Forum, 2023).

According to the report, within the scope of MARUF19, which hosted 250 speakers and 5440 participants from 25 countries, 50 sessions under 12 themes were held for three days with 5440 participants and 250 speakers. In addition, simultaneous panels, round table meetings, workshops, exhibitions, technical trips and cultural events were organised (Marmara Municipalities Union, 2020: 54). The themes consisted of environment and climate change, resilience, migration, public space, urban networks, urban infrastructure, housing and built environment, social inclusion, urban technologies and innovation, transport and mobility, local development and governance (Marmara Municipalities Union, 2020: 86). The relationship network between these themes and the sub-targets of the eleventh global goal can be seen in Figure 1.



**Figure 1.** Relationship between MARUF19 Themes and Sub-Targets of SDG 11.

**Source:** Marmara Municipalities Union, 2020: 206.

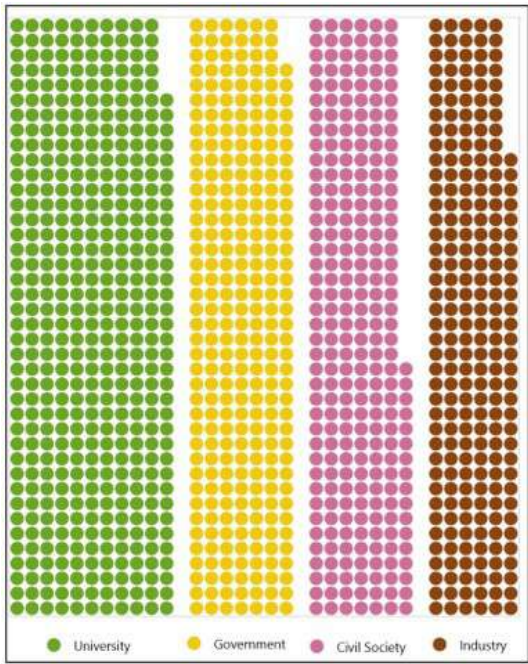
The number of unique participants who participated in MARUF19 was 3660. When the number of participants for the three days is analysed separately, the total number of participants was 5554. Most of the participants were from universities and local administrations. There were also participants from industry and NGOs. According to the ratios, 41% of the participants were from universities, 24.25% from local governments, 13.6% from other, 10.85% from industry, 6.3% from NGOs and 2% from the central government. When evaluated on the basis of sessions, it is seen that an average of 152 people attended per session. According to the participation rate of the audience, the most popular themes were urban technologies and

innovation, public space, transport and mobility and social inclusion (Marmara Municipalities Union, 2020: 87).

For the forum, international embassies, local government associations, city networks, expert organisations and individuals were contacted, and their contributions were received. From the start, MARUF19 aimed to appeal to many different segments of society and that for speakers to come from different sectors and experience as much as possible. To this end, MARUF19 hosted a total of 250 speakers from 25 different countries. These countries were; Albania, Belgium, Canada, Chile, China, England, France, Germany, Greece, India, Italy, Japan, Lebanon, Macedonia, Netherlands, Norway, Senegal, Slovakia, Spain, Sweden, Switzerland, the USA, and Türkiye (Marmara Municipalities Union, 2020: 89).

## **5. Findings**

Within the scope of this study, the final report of MARUF19 was analysed. During MARUF19, a total of 45 sessions were held, including one opening and closing session, 31 sessions designed around 12 themes, three sessions focused on Marmara Region, two habitat special sessions and seven special sessions. The report includes the speakers of these sessions, session summaries, solution proposals expressed by the speakers and the notes taken during the sessions. In the first stage of the analysis, the speakers were classified in accordance with the quadruple helix model (Figure 2). Accordingly, the most intense participation was from universities. Immediately afterwards, there were participants from the government, civil society and industry, respectively.



**Figure 2.** Quadruple Helix Document Portrait.  
**Source:** Compiled from research data.

MARUF19 was designed as a regional and national as well as an international discussion platform (Figure 3). According to this, 21 international speakers were invited against 76 national speakers representing the university stakeholder. 11 international speakers took part in the forum against 54 national speakers representing the government stakeholder. Representing the civil society stakeholders, 21 international speakers were present in response to 36 national speakers. Finally, there were 21 international speakers against 27 national speakers representing the industry stakeholders. Proportionally, this is the participation with the highest level of internationalisation. Looking at the numbers, it becomes clear that the forum was an international organisation.

	University	Government	Civil Society	Industry
Origin of Speakers (MARUF19)				
National	76	54	36	27
International	21	11	25	21

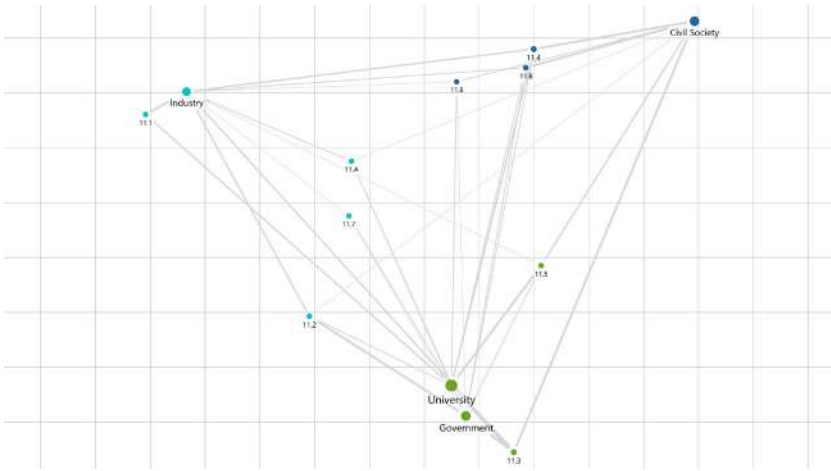
**Figure 3.** Origin of Speakers.  
**Source:** Compiled from research data.

In this study, the MARUF19 report was analysed within the framework of SDG 11 on Sustainable Cities and Communities and its sub-targets. In the first stage of the analysis

process, all sessions organised in the forum were matched with the sub-targets of SDG 11 in accordance with their content (Table 1). Accordingly, the most matched sub-targets of the sessions are Inclusive and Sustainable Urbanisation and Protection of the World’s Cultural and Natural Heritage. The forum did not include any session on the topic of Supporting Least Developed Countries for Sustainable and Resilient Buildings. Nine of the sessions did not match any sub-target under the title of Sustainable Cities and Communities.

<b>Table 1. MARUF19 Sessions- SDG 11 Matches</b>	
<b>11. Sustainable Cities and Communities</b>	<b>Session</b>
11.1. Safe and Affordable Housing	3
11.2. Affordable and Sustainable Transport Systems	4
11.3. Inclusive and Sustainable Urbanisation	8
11.4. Protection of the World’s Cultural and Natural Heritage	7
11.5. Reducing the Adverse Effects of Natural Disasters	4
11.6. Reducing the Environmental Impact of Cities	2
11.7. Providing Access to Safe and Inclusive Green and Public Spaces	2
11.A. Strong National and Regional Development Planning	2
11.B. Implementation of Policies for Inclusion, Resource Efficiency and Disaster Risk Reduction	4
11.C. Support Least Developed Countries in Sustainable and Resilient Building	0
Others	9
Total	45
<b>Source:</b> Compiled from research data.	

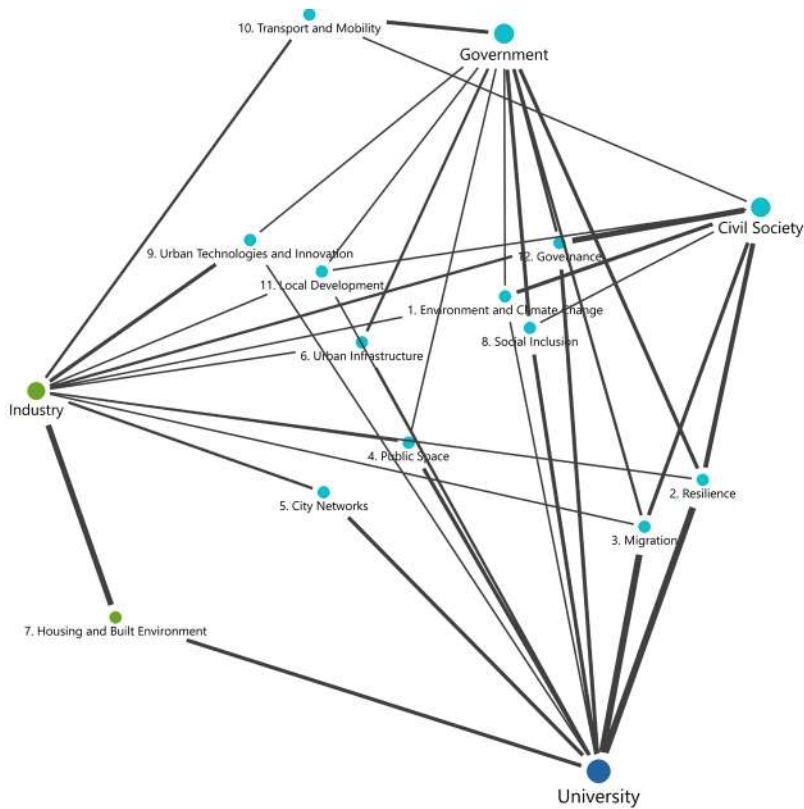
The analysis first focused on the relevance of the stakeholders of the quadruple helix model to the sub-targets under the Sustainable Cities and Communities heading (Figure 4). In this context, it was seen that the government and university mostly act together, and it was understood that special importance was given to the title of Inclusive and Sustainable Urbanisation. The industrial sector, however, focuses on the sub-target of Safe and Affordable Housing. However, it was observed that the sub-target on which the government, university and industrial sector focus together is Affordable and Sustainable Transport Systems. The common interest of the government, universities, and civil society is towards the sub-target of Reducing the Adverse Effects of Natural Disasters. The common denominator of civil society and the industrial sector is the Protection of the World’s Cultural and Natural Heritage, Implementation of Policies for Inclusion, Resource Efficiency, and Reduction of the Environmental Impact of Cities. The common interest of all four stakeholders is to Provide Access to Safe and Inclusive Green and Public Spaces through Strong National and Regional Development Plans.



**Figure 4.** Relationship between Quadruple Helix Model Stakeholders and SDG 11 Sub-targets.

**Source:** Compiled from research data.

Two-thirds of the sessions held at MARUF19 were organised around 12 themes: “environment and climate change”, “resilience”, “migration”, “public space”, “urban networks”, “urban infrastructure”, “housing and built environment”, “social inclusion”, “urban technologies and innovation”, “transport and mobility”, “local development” and “governance”. The data were analysed by comparing these themes with the participants who are the stakeholders of the quadruple helix model (Figure 5). In this context, it is seen that participants from industry and universities are concentrated in the themes of “housing and built environment” and “urban networks”. It is understood that there were participants from universities and civil society on “migration” and “resilience”. Although the government stakeholder is predominant under the heading of “transport and mobility”, it has been determined that there were also representatives from the industrial sector. It is noteworthy that there were participants from the government, university and civil society in the themes of “social inclusion” and “governance”. The themes of “urban technologies and innovation”, “urban infrastructure” and “public space” were shared by industry, government and university. “Environment and climate change” and “local development” stand out as the only themes common to all four stakeholders.



**Figure 5.** Relationship between Quadruple Helix Model Stakeholders and 12 Thematic Headings.  
**Source:** Compiled from research data.

In all sessions of MARUF19, 165 solution proposals were included. When these solution proposals were coded thematically, the approaches and perspectives of the participants towards the solution proposals were revealed (Figure 6). It was understood that the participants mostly approached the solution of the problems from an “economic/financial” perspective, emphasised “scientific” and focused on “social” rather than individual solutions. It was emphasised that the problems are generally “infrastructural” and that “administrative/managerial” solutions should be produced for this. In addition, it was emphasised that an “environmental/ecological” approach is required in solving the problems, and it was stated that “multi-stakeholder” action should be taken. It was observed that a “participatory” and “democratic” “political” stance was adopted for the development of “inclusive” policies. The importance of making “institutional” decisions on “legal” grounds before implementation was also emphasised. Finally, it was underlined that turning towards “technological/digital” solutions would mean catching up with the age.



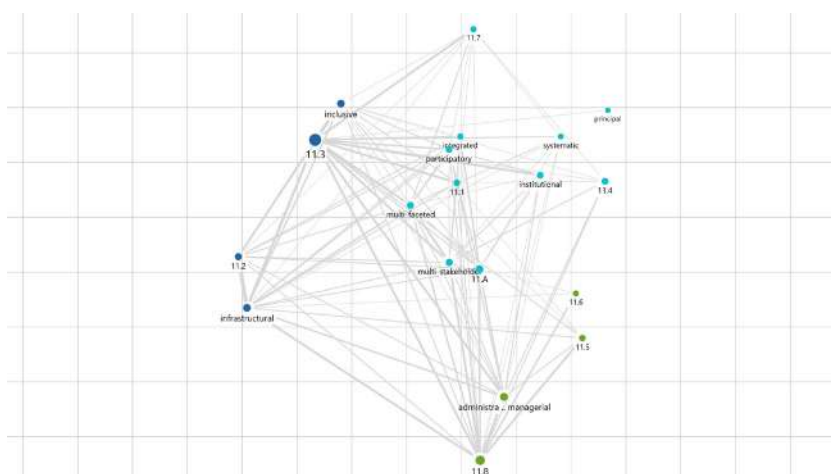


**Figure 6.** Code Cloud of the Solution Proposals Emerged in the Sessions.

**Source:** Compiled from research data.

An analysis of the MARUF19 report shows that the participants had 10 different perspectives on all the solution proposals in the report. When these perspectives are compared with the seven sub-targets under the title of Sustainable Cities and Communities, it can be seen from which perspectives the participants view the solution proposals (Figure 7). Accordingly, the participants have an “integrated”, “institutional”, “inclusive” and “multidimensional” perspective in the title of Safe and Affordable Housing. For the sub-target of Affordable and Sustainable Transport Systems, there is an “infrastructural”, “inclusive”, “multifaceted” and “multi-stakeholder” consensus among the forum participants. Regarding Inclusive and Sustainable Urbanisation, the participants emphasised an “inclusive” and “integrated” solution plan. In the sub-target of Protection of the World’s Cultural and Natural Heritage, it was emphasised that an “administrative/managerial” and “multi-stakeholder” strategy should be developed. In terms of Reducing the Adverse Effects of Natural Disasters, participants mostly emphasised “administrative/managerial” and “infrastructural” solutions. In the target of Reducing the Environmental Impact of Cities, the participants expressed their opinions on the basis of “multi-stakeholderism” and “infrastructure”. In the sub-target of Providing Access to Safe and Inclusive Green and Public Spaces, “systematic”, “participatory”, “integrated” and “inclusive” solutions were emphasised. For the sub-target of Strong National and Regional Development Plans, participants emphasised an “institutional”, “multi-stakeholder” and “multi-faceted” strategy. Finally, “administrative/managerial”, “multi-stakeholder” and “infrastructural” solutions were emphasised under the title of Implementing Policies for Inclusion, Resource Efficiency and Disaster Risk Reduction.

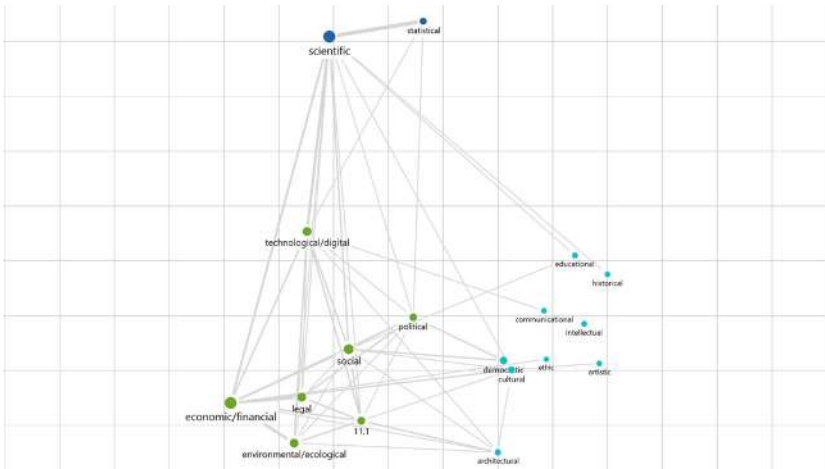




**Figure 7.** Relationship between Quadruple Helix Model Stakeholders and Participant Approaches.  
**Source:** Compiled from research data.

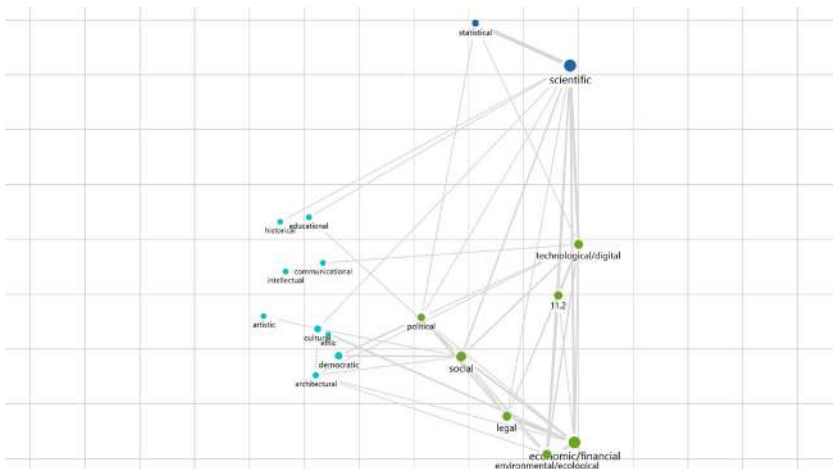
The 165 solution proposals in the MARUF19 report analysed in the study were analysed separately for each sub-target of SDG11 on Sustainable Cities and Communities. However, this sub-target was not included in the analyses since no solution proposal was found for the last sub-target, Supporting Least Developed Countries in Sustainable and Resilient Building. The analyses were made in terms of the approaches developed for the solution proposals. The approaches created using creative coding are as follows: “scientific”, “economic/financial”, “social”, “technological/digital”, “legal”, “democratic”, “political”, “cultural”, “statistical”, “architectural”, “philosophical”, “educational”, “communicative”, “artistic”, “historical” and “ethical”.

Of the 165 solution proposals developed in the MARUF19 report, 17 were mapped to the sub-target on Safe and Affordable Housing of SDG 11 on Sustainable Cities and Communities. This sub-target includes ensuring access to adequate, safe and affordable housing and basic services for all and upgrading slums by 2030. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 8). Accordingly, it is seen that the participants view the issue of Safe and Affordable Housing from a “social”, “legal” and “political” framework. It was underlined that the issue also has an “economic/financial” aspect and that solutions should be produced with an “environmental/ecological” approach. However, the participants emphasised “architectural” and “cultural” aspects.



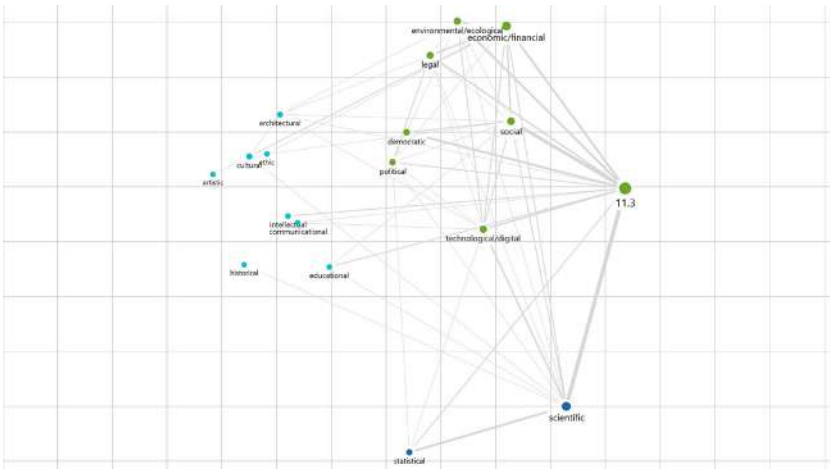
**Figure 8.** Participant Approaches to the Sub-target of Safe and Affordable Housing.  
**Source:** Compiled from research data.

Out of 165 solution proposals developed in the MARUF19 report, 20 are mapped to the sub-target on Affordable and Sustainable Transport Systems of SDG 11 on Sustainable Cities and Communities. This sub-target includes improving road safety and ensuring access to safe, affordable, accessible and sustainable transport systems for all by 2030, with particular attention to the needs of vulnerable people, women, children, persons with disabilities and the elderly. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 9). Accordingly, the participants approach the issue of Affordable and Sustainable Transport Systems primarily from an “environmental/ecological” perspective. This shows that the participants attach importance to the fact that transport and environmental problems should be addressed together. At the same time, the participants who looked at the issue from a “technological/digital” framework included their suggestions that public transport systems should be technologically diversified in the report. Underlining that the problem also has a “legal” and “economic/financial” side, the participants approached the solutions from a “social” perspective.



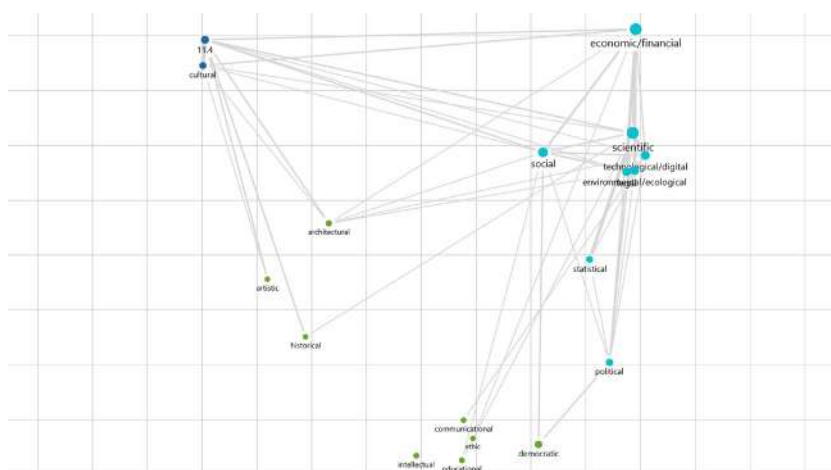
**Figure 9.** Participant Approaches to the Sub-target of Affordable and Sustainable Transport Systems.  
**Source:** Compiled from research data.

Of the 165 solution proposals developed in the MARUF19 report, 74 are mapped to the sub-target on Inclusive and Sustainable Urbanisation of SDG 11 on Sustainable Cities and Communities. This sub-target includes the promotion of inclusive and sustainable urbanisation in all countries by 2030 and strengthening the capacity to plan and manage participatory, integrated and sustainable human settlements. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 10). Accordingly, the participants underlined the need to look at the issue of Inclusive and Sustainable Urbanisation from a “scientific” perspective. In particular, they suggested finding solutions guided by “statistical” data. They stated that the issue is a “social” phenomenon and should be discussed on “political” grounds and that it is important that it should be carried out simultaneously with “democratic” participation processes. Emphasising that Inclusive and Sustainable Urbanisation also has an “economic/financial” side, the participants underlined that “architectural”, “cultural” and “ethical” aspects should also be given importance in the background. In addition, the participants, who approached the issue from a “technological/digital” framework suggested solutions for the smart city concept. Finally, they suggested that an “environmental/ecological” approach should be adopted and added that this is especially important in sustainability.



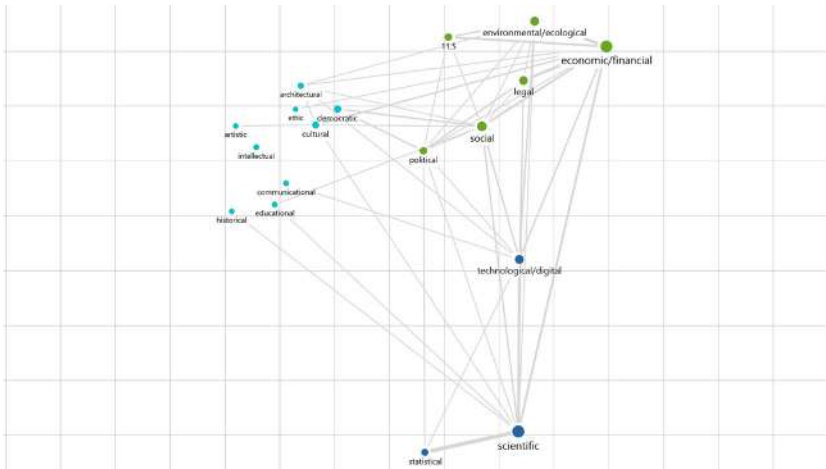
**Figure 10.** Participant Approaches to the Sub-target of Inclusive and Sustainable Urbanisation.  
**Source:** Compiled from research data.

Of the 165 solution proposals developed in the MARUF19 report, 18 were mapped to the sub-target on the Protection of the World’s Cultural and Natural Heritage of SDG 11 on Sustainable Cities and Communities. This sub-target includes increasing efforts to protect and safeguard the world’s cultural and natural heritage. An analysis of the proposed solutions developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 11). Accordingly, the participants firstly approached the Protection of the World’s Cultural and Natural Heritage from a “cultural” perspective. They stated that the issue has “historical” aspects as well as “artistic” and “architectural” aspects. Emphasising that “social” awareness plays an important role in the Protection of the World’s Cultural and Natural Heritage, the participants added that education and participatory “democracy” are important issues that will feed the increase in awareness. The participants stated that for the Protection of the World’s Cultural and Natural Heritage, it is necessary to act within an “economic/financial” planning and that there is a need for a “scientific” and “legal” basis for this.



**Figure 11.** Participant Approaches to the Sub-target of Protection of the World's Cultural and Natural Heritage.  
**Source:** Compiled from research data.

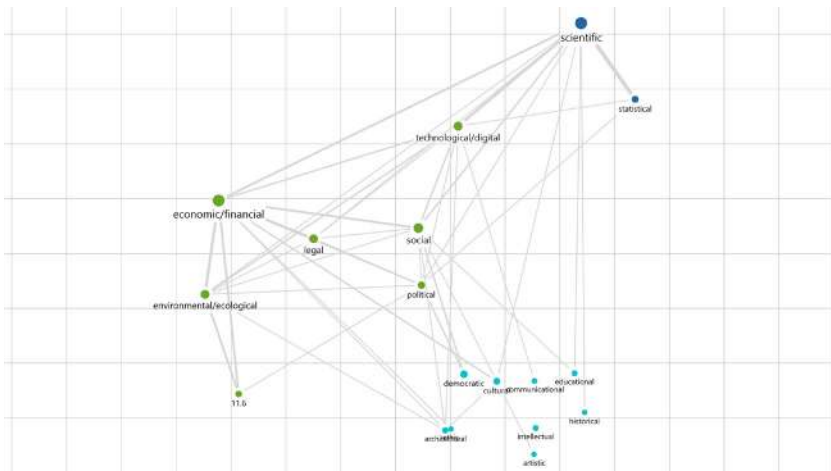
Out of 165 solutions proposals developed in the MARUF19 report, 15 of them are mapped to the sub-target on Reducing the Adverse Effects of Natural Disasters under SDG 11 on Sustainable Cities and Communities. This sub-target includes significantly reducing direct economic losses to global gross domestic product (GDP) due to disasters, including water-related disasters, and significantly reducing the number of deaths and people affected by disasters by 2030, based on the protection of the poor and vulnerable. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 12). Accordingly, the participants approached the issue of Reducing the Adverse Effects of Natural Disasters from an “environmental/ecological” perspective. It was also emphasised that the issue has an “architectural” context in relation to the need for durable structures before disasters and the destruction experienced as a result of disasters. It was also underlined that “multidimensional” and “multi-stakeholder” measures should be taken in terms of “economic/financial” aspects in order to Reduce the Adverse Effects of Natural Disasters and that “scientific” action should be taken while doing these in the background. The participants, who stated that there was a need for a particularly strong “legal” ground on the issue, also added that the issue was a “social” and “political” phenomenon.



**Figure 12.** Participant Approaches to the Sub-target of Reducing the Adverse Effects of Natural Disasters.

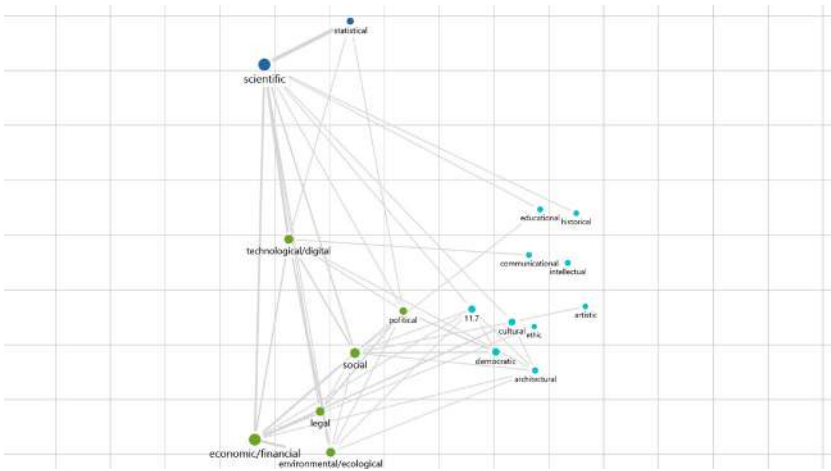
**Source:** Compiled from research data.

Out of 165 solutions proposals developed in the MARUF19 report, 10 are mapped to the sub-target on Reducing the Environmental Impact of Cities under SDG 11 on Sustainable Cities and Communities. This sub-target includes reducing the negative per capita environmental impacts of cities by 2030, with special attention to air quality, municipal waste management and other waste management. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 13). Accordingly, it was observed that the participants approached the issue of Reducing the Environmental Impact of Cities from an “environmental/ecological” framework. The participants, who are also aware that reducing these impacts will bring an “economic” cost, stated that “technological/digital” innovations should be applied as well as “scientific” while implementing solution proposals. It was emphasised that it is important to have a broad “social” consensus in reducing the environmental impacts of cities, and it was underlined that the “political” institution has an important role in this context.



**Figure 13.** Participant Approaches to the Sub-target of Reducing the Environmental Impact of Cities.  
**Source:** Compiled from research data.

Of the 165 solution proposals developed in the MARUF19 report, 13 are mapped to the sub-target on Providing Access to Safe and Inclusive Green and Public Spaces of SDG 11 on Sustainable Cities and Communities. This sub-target includes ensuring universal access to safe, inclusive and accessible green spaces and public spaces by 2030, especially for women, children, the elderly and persons with disabilities. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 14). Accordingly, participants stated that the most important issue in Providing Access to Safe and Inclusive Green and Public Spaces is to develop an “environmental/ecological” perspective. It was underlined that a broad “social” consensus should be achieved due to the additional “financial” burden that the issue will bring to central and local governments. It was also emphasised that the issue should be approached “scientifically” and “architectural” solutions should be creative. The participants suggested that these spaces could be designed as “cultural” and “artistic” spaces and added that the combination of green and public space could be used as an “intellectual” evaluation tool.

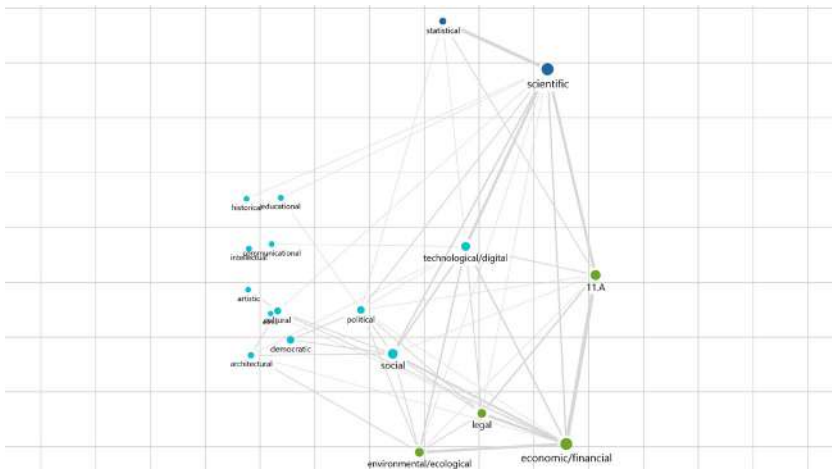


**Figure 14.** Participant Approaches to the Sub-target of Providing Access to Safe and Inclusive Green and Public Spaces.

**Source:** Compiled from research data.

Of the 165 solution proposals developed in the MARUF19 report, 29 were mapped to the sub-target on Strong National and Regional Development Planning of SDG 11 on Sustainable Cities and Communities. This sub-target includes the promotion of positive economic, social and environmental linkages between urban, peri-urban and rural areas by strengthening national and regional development planning. An analysis of the solutions proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 15). Accordingly, participants stated that Strong National and Regional Development Planning should be prepared from an “economic/financial” perspective. It was emphasised that there is a “legal” dimension to the issue in the background and that solutions should be approached within the framework of “social” needs and priorities. It was also mentioned that the existence of an “environmental/ecological” agenda is an indispensable issue for sustainable national and regional development planning. Emphasising that the issue is “scientific” as well as “economic/financial”, the participants suggested that solution proposals involving “technological/digital” innovations should be pursued. It was underlined that “statistical” data will be needed in this planning process, and it was emphasised that “education” is very important in the background.

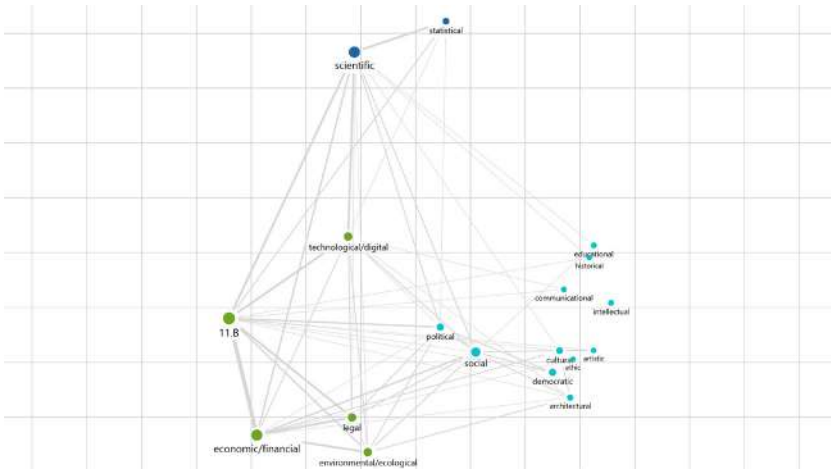




**Figure 15.** Participant Approaches to the Sub-target of Strong National and Regional Development Planning.

**Source:** Compiled from research data.

Of the 165 solution proposals developed in the MARUF19 report, 46 are mapped to the sub-target on Implementation of Policies for Inclusion, Resource Efficiency and Disaster Risk Reduction of SDG 11 on Sustainable Cities and Communities. This sub-target includes significantly increasing the number of cities and human settlements that adopt and implement integrated policies and plans for inclusion, resource efficiency, climate change adaptation and disaster resilience by 2030 and developing and implementing integrated disaster risk management at all levels in line with the Sendai Framework Action Plan for Disaster Risk Reduction 2015-2030. An analysis of the solution proposals developed in the report reveals the participatory approaches adopted to achieve these sub-targets (Figure 16). Accordingly, the participants stated that it is necessary to have an “economic/financial” perspective in the implementation of policies for inclusion, resource efficiency and disaster risk reduction. The participants underlined that “technological/digital” innovations can be effective especially in the implementation of policies for disaster risk reduction. Emphasising that the issue also has a “legal” aspect, the participants added that proceeding on the basis of a “social” consensus in the implementation process would contribute greatly to sustainability. Finally, the participants emphasised that the issue is “scientific” as well as economic and technological, and that scientificity is extremely important in the context of resource efficiency.



**Figure 16.** Participant Approaches to the Sub-target of Implementation of Policies for Inclusion, Resource Efficiency and Disaster Risk Reduction.

**Source:** Compiled from research data.

## 6. Discussion

In order to develop a rich understanding of the structure, participants and activities of MARUF19 from a quadruple helix perspective, the report text in all its elements was analysed in detail. The findings of the content analysis support the theoretical framework discussed and proposed. MARUF19 is a consensus space that creates an environment of cooperation between a large number of organisations, including universities, industrial organisations, municipalities and regional and local governments, forming the fourth stakeholder of the helix as an intermediary organisation. In the context of quadruple helix innovation, it responds to the need for intermediation to help remove the barriers of the quadruple helix (Howells, 2006; Mitton et al., 2007), to create opportunities to optimise collaborations and establish dialogues as open as possible (Bellgardt et al., 2014; Howells, 2006) and to defend the value of knowledge transfer (Miller et al., 2016). Furthermore, MARUF19 is an example of a consensus space, integrating various spheres of helices to foster innovation, offering consensus space, building and organising a collaborative environment (Champenois and Etzkowitz, 2018; Etzkowitz, 2008; Ranga and Etzkowitz, 2013), independent of any helix sphere and with unique characteristics (Champenois and Etzkowitz, 2018), connecting and uniting many different actors in a helix network and acting as a catalyst between actors (Champenois and Etzkowitz, 2018; Ranga and Etzkowitz, 2013). It creates the environment and opportunity for institutional growth, networking and the development of social capital (Yokakul and Zawdie, 2009) for the advancement of innovation. According to this information, the coming togeth-

er of different institutional sectors through MARUF19 as an intermediary organisation and engaging in discussions also provides a consensus space, accelerating the implementation of collaborative governance measures, including public consultation, feedback mechanisms and collaborative leadership models and practices (Ranga and Etzkowitz, 2013). Additionally, it paves the way for the emergence of new ideas through cross-feeding different perspectives, the transformation of stakeholders' roles and relationships, and their mutual commitment to innovation (Champenois and Etzkowitz, 2018; Etzkowitz, 2002; Etzkowitz, 2008; Ranga and Etzkowitz, 2013).

Secondly, MARUF19 builds and includes a quadruple helix model with its participants (university, industry, government and civil society). Organised with the motto of "Cities Developing Solutions", MARUF19 aims to search for solutions together with all stakeholders of the city by evaluating the global agenda and local needs and priorities together to create a basis for sharing knowledge, experience and opportunities among stakeholders, to evaluate different approaches to urban services and urban management together, and to create solidarity, cooperation and awareness among individuals and management mechanisms in the city in this process. In this context, the forum is a platform where knowledge, experience and opportunities are shared among the public, industrial organisations, non-governmental organisations, universities, local administrations and all other relevant stakeholders, focusing on "Cities Developing Solutions". The said institutional structure and objectives are confirmed by the organisation's activities and open the door to the quadruple helix model. The number and variety of sessions (31 sessions designed around 12 themes, three sessions focused on the Marmara Region, two Habitat special sessions and seven special sessions), the solution proposals and notes taken in the sessions and the report text emerging from this information draw attention.

Among the 250 speakers from 25 different countries, there were embassies abroad, local government associations, city networks, organisations and individuals who are experts in their fields. Thus, the forum had a remarkable international character not only with its content and agenda topics but also with its participants. In light of this information, it is seen that MARUF19 promises civil society as well as universities, industry and government and supports the co-creation process for future collaborations (Carayannis and Campbell, 2009, 2012; Carayannis and Grigoroudis, 2016; Carayannis and Rakhmatullin, 2014; Carayannis et al, 2017, 2018; Campbell et al., 2015), attaches importance to the knowledge society and knowledge democracy (Carayannis and Campbell, 2010, 2011, 2012, 2017) and thus contributes to co-creation and co-specialisation (Carayannis and Campbell, 2009, 2010, 2011;

Campbell et al., 2015). The fact that this quadruple innovation system recognises that sustainable development in the economy (knowledge economy) requires the co-evolution of both the knowledge economy, the knowledge society and the knowledge democracy (Carayannis and Campbell, 2017) is also taken into account in this research case.

Since the case in the study (MARUF19) is analysed in the context of Sustainable Cities and Communities, the sub-targets of this global goal were considered as a guiding framework. In this context, firstly, the concepts and themes from the forum sessions were investigated, followed by relationship analyses to better understand the relationship between the themes, solution proposals and quadruple helix stakeholders for the global goal. The network of relationships between the themes and the sub-targets of the global goal proves the organisation's ability to be sufficiently comprising and inclusive. Secondly, the participants consisted of civil society and industrial organisations, in particular universities and local governments, respectively. The interest of the central government was more limited. Thirdly, the themes that attracted the most interest in terms of participation rate were “urban technologies and innovation”, “public space”, “transport and mobility”, and “social inclusion”. This diversity in the leading themes proves the value of social innovations as well as technological innovations in the innovation system and their co-evolution for sustainability (Dubina et al., 2012). Indeed, various aspects of sustainability are interconnected and mutually influence each other (Piccarozzi, 2017). Social innovations include both economic and social outcomes (Bayuo et al., 2020).

Inclusive and Sustainable Urbanisation and Protection of the World's Cultural and Natural Heritage were the sub-targets with which the sessions were most closely aligned. Inclusive and Sustainable Urbanisation is currently a highly studied area for many regions from different perspectives, especially sustainable development (e.g. Abubakar and Aina, 2019; Laituri et al., 2021; Liang et al., 2022; Martínez-Córdoba et al., 2021; McGranahan et al., 2016; Zhang et al., 2021). Likewise, the issue of Protection of the World's Cultural and Natural Heritage also receives intense attention from various perspectives, such as tourism or climate change (e.g. Jang and Mennis, 2021; Job et al., 2017; Khalaf, 2020; Liljeblad and Oo, 2020; Shibasaki, 2018).

In the sub-targets, it was observed that the government and the university acted together more and gave special importance to the title of Inclusive and Sustainable Urbanisation. Significantly, the industrial sector focused on the sub-target on Safe and Affordable Housing. Furthermore, the common interest of the government, university and industrial sector was seen on Affordable and Sustainable Transport Systems, and the common interest of the gov-

ernment, university and civil society was seen on Reducing the Adverse Effects of Natural Disasters. The common interests of civil society and industry sector were also seen in the areas of Protection of the World's Cultural and Natural Heritage, Implementation of Policies for Inclusion, Resource Efficiency and Disaster Risk Reduction and Reduction of Environmental Impact of Cities. The only sub-targets where the four stakeholders met were Strong National and Regional Development Planning and Providing Access to Safe and Inclusive Green and Public Spaces. Looking at the themes; it was seen that there were participants from industry and universities in the themes of "housing and built environment" and "urban networks", and participants from universities and non-governmental organisations in the themes of "migration" and "resilience". Although the government stakeholder was predominant in the topic of "transport and mobility", there were also representatives from the industrial sector. In the themes of "social inclusion" and "governance", participants from government, universities and civil society were observed. The themes of "urban technologies and innovation", "urban infrastructure" and "public space" were embraced by industry, government and university. "Environment and climate change" and "local development" were the only themes common to all four stakeholders. According to these findings, since helix links are rarely equal and balanced (Etzkowitz, 2008), the same interaction cannot be expected for each sub-target and theme; however, the consensus and close interaction of all stakeholders for more sub-targets and themes will improve the innovation system. In addition, organisations seeking immediate and measurable results, e.g. industrial organisations, may prefer economic results over social and cultural activities. They can focus on technology and economy-oriented initiatives, relegating social and cultural considerations to a secondary position.

According to the solution proposals, it was revealed that the participants mostly approached the solution of the problems from an "economic/financial" perspective, emphasised "scientific" and focused on "social" rather than individual solutions. It was emphasised that the problems are generally "infrastructural" and that "administrative/managerial" solutions should be produced for this. In addition to this, it was emphasised that an "environmental/ecological" approach is required in solving the problems, and it was stated that "multi-stakeholder" action should be taken. It was observed that a "participatory" and "democratic" "political" stance was adopted for the development of "inclusive" policies. The importance of making "institutional" decisions on "legal" grounds before implementation was also emphasised. Finally, it was emphasised that turning towards "technological/digital" solutions would mean catching up with the age. According to these findings, it is seen that all these key elements in the approaches contain the basic features of the quadruple helix model. Furthermore, the

findings support the view (Macgregor et al., 2010) that high levels of maturity are not always necessary in the triple helix before moving to the Quadruple Helix Innovation Architecture (Q-HIA) and that the two essential conditions for such a structure are that innovation actors should be sufficiently connected to civil society and secondly, that these connections should be sufficiently focussed on innovation.

Finally, given the ability of forums to mediate and build consensus on the micro-foundations of the quadruple helix model, their function should be considered, especially at an early stage of the model's development. This structure creates an opportunity for all stakeholders: This new actor is accompanied by public support within the organisation; in the process, the isolation between institutions is eased, universities move out of their ivory towers, and new networks within and between institutions are born. Thus, the basis is built for the development of new helix structures among the helix actors. As a result, forums shape activities that transcend boundaries by creating and enhancing interactions and building consensus in the context of the quadruple helix model.

## 7. Conclusion

The fact that one of the 17 sustainable development goals set by the United Nations bears the title of Sustainable Cities and Communities shows that the importance of the issue is local as well as global, decentralised as well as centralised, human as well as physical. The fact that 2030 is set as the deadline reminds us how prioritised and even urgent this goal with 10 sub-targets is. The problems that will be created by the fact that more than half of the world's population will live in cities by that date will bring the issue of sustainability to the top of the agenda of national and international policymakers. Aside from the theoretical discussions, there is already an academic agenda at the national and international levels in the field of implementation. The date of 2023, when the 100th anniversary of the Republic of Türkiye is celebrated in our country, offers both a balance sheet of a hundred years of experience and a performance evaluation opportunity related to the global goals set by the United Nations.

The year 2023 is also a milestone in which Türkiye's Twelfth Development Plan was prepared, and the framework of the new plan to be implemented between 2024 and 2028 was determined. These multiple historical intersections make the practice of thinking together compulsory for the existing academic literature and the stakeholders involved in the field of implementation. The only condition for a meeting around the same table to address the issue of sustainability lies in providing the stakeholders with the potential and opportunities to think and act together. National and international multi-stakeholder meetings should bring

together academics and policy makers on the one hand, and representatives of industry and civil society organisations on the other. This discussion will provide guidance in analysing the current situation in the field of sustainable cities and communities, identifying problems and developing solutions, examining national and international cases, starting pilot applications and finally making and supervising permanent regulations.

As a model that prioritises and attaches importance to the unity and coordination of government, industry, university and civil society stakeholders, the quadruple helix is an extremely important guide for urban and regional sustainability. MARUF19, which is open to national and international participants for the identification of local and global problems, creation of solution proposals and discussion of projects for implementation, has created a democratic discussion ground with the contributions of participants representing the quadruple helix stakeholders. As the forum will be organised every two years, it will be one of the institutional structures that will shape the future and will become one of the good cases for the close geography in which Türkiye is located. The forum in question also sets an example for the work to be carried out under the heading of Sustainable Cities and Communities, which is among the Sustainable Development Goals of the United Nations. The fact that national and international participants are selected for the sessions and that local participants are given particular importance is also in line with the multifaceted and multi-stakeholder nature of the forum.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 19

### GREEN PRACTICES AND RESPONSIBLE CONSUMPTION BY THE HOTEL INDUSTRY IN TÜRKİYE: A QUALITATIVE STUDY ON HOTEL MANAGERS

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#### Abstract

Tourism has long been realized as an essential contributor to economic growth and development, generating jobs and income in many regions of the world. Recent developments in the field of sustainable tourism have emphasized the significant links between tourism and the achievement of the United Nations' Sustainable Development Goals. Thus, numerous studies have been carried out on sustainability and tourism. Despite the popularity of sustainability and tourism, more studies are needed to fully understand sustainability in the field of tourism and hospitality. Thus, this book chapter aims to determine hotels' green practices and their responsible consumption, called "hotels' eco-friendly behaviors". In this context, semi-structured interview forms were applied to the managers working in various departments of hotels, and the obtained data were analyzed by content analysis. As a result, four main components of hotels' green practices and their responsible consumption were revealed: recycling, energy-saving, training, and encouragement and preferring sustainable products. This book chapter substantially contributes to sustainable tourism literature by providing a deep understanding of hotels' green practices and responsible consumption. Moreover, this book chapter can increase the knowledge level of service providers about green practices.

**Keywords:** Sustainable tourism, hospitality industry, sustainable development, eco-friendly hotel practices



## 1. Introduction

Since the start of the Industrial Revolution, rapid economic and technological improvements have harmed the Earth. This situation has led to the emergence of concepts such as circular economy and sustainability. In addition to many fields, these concepts have frequently started to take place in the agenda of academics in tourism (Kesici, 2022).

Behaviors and attitudes of residents, tourists, and employees are essential for developing sustainable tourism in a destination. Residents should support the development of sustainable tourism (Lee, 2013), tourists should be responsible for consumption (Hu et al., 2021), and employees should exhibit eco-friendly behaviors (Ogretmenoglu et al., 2022; Ogretmenoglu et al., 2023a). Previous research on green practices and responsible consumption by the hotel industry is predominantly concerned with the consumers (tourists). However, studies on green practices and responsible consumption called “hotels’ eco-friendly behaviors” from the perspective of hotel managers are limited. Although this aspect is gaining considerable attention from tourism academics (Legrand et al., 2005; Sloan et al., 2013; Jones et al., 2014; Jones et al., 2016), knowledge or text on this issue in the relevant literature is scarce (Karatepe et al., 2021; Heenipellage et al., 2022; Darban et al., 2022; Aboramadan et al., 2022b). Thus, the present study is planned to fill this gap. In this context, this book chapter tried to determine hotel managers’ green practices and the responsible consumption of their services. To achieve the aim of this chapter, Istanbul was chosen, as it is one of the most prominent tourism destinations in the world, and the data was collected from hotel managers in Istanbul. Semi-structured interview forms were created in consultation with experts and based on the literature.

Content analysis, which is one of the qualitative analysis techniques, was carried out on the obtained data (Caliskan & Oktay, 2022). Nvivo software, frequently used in qualitative analysis, was used in content analysis. In line with the findings obtained, the findings were discussed, and recommendations for academics and service providers were presented.

## 2. Sustainability in Tourism and Sustainable Tourism

Natural resources are used unconsciously, and the balance of nature is disturbed. Therefore, the environment is damaged. Global warming has emerged as a result of industrialization and unconscious use of resources. The climate has changed, the ecological balance has deteriorated, and negative consequences such as air, water, and food pollution have emerged. The glaciers have melted, the ozone layer has been depleted, and environmental problems have affected every aspect of life. These adverse events have led to the damage of natural resources. To reduce and prevent these negative effects, the concept of sustainability has

emerged. Sustainability is an economic, environmental, and social concept that considers the future while meeting the needs of today (Pelit et al., 2015).

The 1982 World Nature Charter, which was approved by the IUCN (International Union for Conservation of Natural Life and Natural Resources), was the first agreement to embrace the concept of sustainability. The main focus of the concept of sustainability is to prevent environmental problems and to protect the ecological system by considering the balance of its protection and use. The main purpose is to prevent harm while using the ecosystem. Sustainability is the ability to use the ecosystem without being degraded without being consumed as a result of uninterrupted overuse (World Nature Charter, 1982). According to Middleton and Hawkins (1998), sustainability is the protection-use balance between people's natural, cultural, and social environments.

Sustainability includes use without compromising the needs of future generations. It is the protection of environmental quality together with the effective use of natural resources. The aim is to provide protection-use harmony between humans and the environment. A holistic approach is required to ensure sustainability. The establishment of a sustainable ecosystem and active participation are required. Participatory social systems should be established. A solution should be produced on the balance of protection and use of the ecological base. Collaboration with environmental information systems is required. In other words, the basis of the understanding of sustainability is the creation of a culture of sustainability. It is the adaptation of the mentality underlying human behavior to the environment. For this reason, sustainability is not a goal; it is a search for social security. It is a process (Our Common Future Report, 1987). Based on this, the main objectives of sustainability are as follows (Kinacı et al., 2011):

- Inclusive planning and strategy,
- Ecological protection,
- Protection of cultural heritage,
- Protective growth models,
- The balance between economic and natural resources, and
- The balance between international rights and possibilities.

Sustainable development and sustainable tourism are two concepts that have grown out of the concept of sustainability. The fundamental concepts and approaches of the sustainable development approach form the foundation of sustainable tourism (Sharpley, 2000). Furthermore, the United Nations (UN) report from 1987 provides the following definition of sustainable development: "It is the use of the needs of the present without compromising the ability of future generations to meet their own needs" (Our Common Future Report, 1987).

The role of tourism in the environment is also stated in the Manila Declaration of the World Tourism Organization (WTO). In this declaration, it is mentioned that the controlled use of tourism resources, the use and protection of the cultural, socio-economic, and historical areas of the region while meeting the tourism needs, by considering the protection-utilization balance. The importance of protecting natural and cultural resources on an international scale was mentioned. After the Manila Declaration, the WTO and the UN Environment Program jointly published a declaration. This declaration states: “The protection, development and improvement of the natural, cultural, social and economic environment is the basic condition for the development of tourism.” Thus, tourism will be able to contribute to the development of the cultural and physical environment and to the improvement of the quality of life (Manila Declaration, 1980).

WTO promoted sustainable tourism in the early 1980s; it is defined as “managing all resources in a way that meets social, economic, and aesthetic needs while establishing cultural integrity, necessary ecological processes, biodiversity, and life support systems” (Making Tourism More Sustainable, 2005).

The recommended criteria to achieve an understanding of sustainable tourism are as follows (Cakılcıoglu, 1996):

- Touristic regulation should be carried out according to supply: Carrying capacity should be considered in tourism. Decisions must be made based on supply. Appropriate infrastructure arrangements should be made. The supply-demand balance should be established correctly. Therefore, the supply potential should be considered while creating demand. Natural resources should be protected, and people suitable for carrying capacity should be hosted.
- Local people should be given priority: Tourism provides employment opportunities. However, certain difficulties may arise. Intense demand can lead to high prices. Therefore, small investors and local people should be supported in a competitive environment.
- Tourism should be spread over 12 months: If tourism is carried out in the short term with limited activities, it may harm the region. By ensuring that tourism is spread over 12 months, the understanding of maximum benefit and minimum harm should be considered.
- Transport infrastructure: A minimum level of safe transport standards should be provided.

- **Community involvement:** Tourism activities have many impacts on local people. A participatory approach should be adopted for the local people to get the maximum benefit from the processes. Otherwise, there may be negative behavior towards tourists.
- **Clean energy:** Renewable energy sources should be preferred. The use of solar, wind, and geothermal energy needs to be encouraged.
- **Local behavior:** Local behavior should be at the forefront instead of artificial tourist attractions. It will be interesting to present the daily behaviors and lives of the local people to the tourists.
- **Region-specific architecture:** It is beneficial to use local architecture. It also forms the identity of the region.
- **Protection of social identity:** Tourism includes the activities that should be carried out within the framework of the protection of the identity of the people of the region and socio-cultural understanding. In this respect, behaviors that will distort social identity should be avoided.
- **Tourism investments should be long-term, developing, and flexible:** Tourism investments should be flexible and long-term considering the potential of the region. Also, there should be steps that can be improved.

The UN stated that sustainable tourism has 12 main goals. These goals are listed as follows (Making Tourism More Sustainable, 2005):

- **Economic Applicability:** Tourism is a sector in a globally competitive environment. Therefore, tourism businesses and regions need to engage in economically viable activities to compete.
- **Local Welfare:** It is beneficial to carry out tourism to maximize the economic welfare of the local people. This is possible with the participation of local people.
- **Employment Quality:** Tourism activities also create many employment areas. This also reveals an increase in the labor force rate and quality.
- **Social Equality:** There should be an understanding of equal share in tourism activity. Social benefits should be considered.
- **Visitor Satisfaction:** Appropriate product or service presentation and processes must be implemented to ensure that all visitors are satisfied.

- **Local Control:** Local communities should take an active role in the processes with a participatory approach.
- **Local Welfare:** The quality of life of local people should be maintained and enhanced.
- **Cultural Richness:** In tourism, cultural richness comes together. In this respect, tourism activities should be carried out within the framework of respect.
- **Physical Integrity:** Tourism can contribute positively to environmental regulations. The landscape quality of the tourism region should be regulated, and protected and its sustainability should be ensured.
- **Biological Diversity:** Natural areas should be protected and should not be damaged by considering the protection-use balance.
- **Resource Efficiency:** Renewable resources should be preferred in tourism activities and an understanding of efficiency should be applied.
- **Environmental Cleanliness:** Environmental damage should be minimal in tourism activities and the environment should be protected.

### **3. Sustainable Development Goals and Sustainable Tourism**

Tourism is a versatile industry. It has many stakeholders at the micro and macro levels. Tourism includes small local businesses and large international businesses. From this point of view, it can be said that there is a serious potential that can contribute to sustainability (Koens and Thomas, 2015; Roberts and Tribe, 2008).

A sustainable tourism understanding can affect three dimensions of sustainable development. To achieve success in sustainable tourism, an effective management approach is required. All stakeholders should play a role in the processes (Bramwell & Lane, 2011). Management should be able to integrate economic, social, and environmental factors into the processes for success in a sustainable approach (Jitmaneeroj, 2016).

Management deals with all possible problems and agendas at the organizational level, determines existing and alternative methods, and has the power to make decisions (Hall, 2011). Institutional understanding is required for sustainability. Research & development activities, capacity building, and human resources are also included in this process. Management exists not only in the business dimension but also in the government dimension. In addition, local people and local stakeholders should be able to participate in tourism planning processes. All stakeholders, including private-public cooperation, stakeholder institutions, international

organizations, and local-national decision-makers, have an influence level in tourism management (Hall, 2011). Local governments, private businesses, non-governmental organizations, local people, and tourists are important stakeholders in sustainable tourism (Torres-Delgado and Palomeque, 2014).

Tourists are among the most important stakeholders. WTO has placed tourists at the center of the concept of sustainable tourism. Sustainable tourism is the use of the existing resources of the region and their transfer to future generations. It is a structure that protects the socio-cultural structure, environmental structure, biodiversity, and ecological processes. It is the effective management of all resources to meet tourism needs (Rasoolimanesh et al., 2020).

Miller (2001) mentioned that the support of local people is important for sustainable tourism. Similarly, Twining-Ward and Butler (2002) mentioned the necessity of cooperation with local people for sustainable tourism. Considering the importance of the private sector in tourism, the business world is also a critical stakeholder (Byrd, 2007). WTO and United Nations Development Programme (UNDP) argue that business plays a critical role in sustainable development. UNDP Director Achim Steiner also said: “The role of the private sector and access to finance is very important for sustainable tourism. Long-term competitiveness depends on the success of the private sector and its willingness to invest in new markets and services” (Rasoolimanesh et al., 2020).

Tourism is one of the fastest-growing sectors in the world. Economic growth and development can be supported at all levels of tourism. Employment opportunities can be created. There are many opportunities to generate income. Thanks to tourism, local production and consumption can be supported by the participation of local people in the processes. Agricultural productivity can be increased. Thus, the welfare level of the local people can be increased. Climate change processes can be supported. The accommodation and transportation sectors may be suitable sectors for energy conservation and renewable energy use (Jones et al., 2017).

Environmental problems in the tourism sector are discussed when considering sustainable tourism. Most of these are related to energy use, waste emissions, and water consumption. Reducing costs is another issue. Labor training, health, and safety activities can also be supportive of the understanding of sustainability. With these steps in the tourism and hospitality sector, costs can be reduced, risks can be reduced, and new products or processes can be created (Azapagic, 2003).

Sustainable tourism is an approach based on sustainable development goals. Tourism contributes directly or indirectly to sustainable development goals. Each of the 17 goals is in-

cluded in this. The tourism sector has important effects on production, consumption, economic growth, biodiversity, conservation, and sustainable use of marine resources (Rasoolimanesh et al., 2020).

In summary, tourism contributes to the achievement of the UN's Sustainable Development Goals (SDGs). Here, the authors of this book chapter will delve into how tourism can contribute to the achievement of several SDGs in more detail.

**No Poverty:** One of the sustainable development goals is the eradication of poverty. Nearly half of the world's population is in poverty. Thousands of people die every day because of a lack of clean water and food. This problem can be solved by acting together. By acting together, diseases can be eradicated, and a fairer world can be created. Thus, this problem can be eliminated. In this context, there are seven main targets set to be achieved by 2030. These are the elimination of extreme poverty, implementation of social protection systems, 50% reduction in poverty, equal rights to basic services, maximum use of resources, building resilience to environmental, economic, and social disasters, and pro-poor and gender-responsive development to implement substantial policies to end poverty adopting strategies. Although the process has slowed down with the COVID-19 pandemic, the parameters show that poverty can be reduced by 2030 (The 17 Goals, 2023). Türkiye is in a good position to eradicate poverty. The rate of people earning less than \$3.2 per day is 0.6% (Sustainable Development Report, 2022).

Tourism has been recognized as a practical tool for decreasing poverty by providing employment opportunities, fostering economic growth and development, and helping the conservation of natural and cultural heritage (Scheyvens, 2007).

**Zero Hunger:** Hunger is one of the leading causes of death in the world. Millions of people are malnourished due to unequal access and inefficient use of the world's resources. If sustainable agriculture is promoted by using modern technology, the population of the world can be fed, and the problem of hunger can be eliminated. In this context, there are eight main targets set to be achieved by 2030. These are ending all forms of malnutrition, universal access to safe and nutritious food, removing restrictions on agribusiness, sustainable food production, resilient farming practices, increasing productivity and incomes of small-scale food producers, investing in rural infrastructure and agricultural research, maintaining genetic diversity in food production, and export support and timely access to information on food trade markets (The 17 Goals, 2023). The rates in Türkiye show that the prevalence of malnutrition is 2.5%. It is also at a good point in terms of grain yield (Sustainable Development Report, 2022).

Zero Hunger aims to bring an end to hunger worldwide by ensuring everyone has access to food. Tourism plays an important role in achieving this goal by promoting local food products and improving access to food for host communities. This, in turn, can provide another source of income for residents, allowing them to enhance their access to food and meet their primary needs (Degarege & Lovelock, 2021).

Good Health and Well-being: Child mortality has halved in the last 15 years. This development is an indicator of being successful in the fight against diseases. However, significant resources are spent on the treatment of diseases that are easy to prevent. With the goal of better health for all, preventive measures, healthy lifestyles, and modern, efficient healthcare services need to be promoted. In this context, there are nine targets set to be achieved by 2030. These are reducing maternal mortality, ending all preventable deaths under the age of 5, combating communicable diseases, reducing deaths from noncommunicable diseases and strengthening mental health, preventing and treating substance abuse, universal access to family planning and education, universal access to health coverage, and reducing morbidity and mortality from pollution and hazardous chemicals (The 17 Goals, 2023). Türkiye is doing well in maternal, newborn, and under-5 deaths (Sustainable Development Report, 2022).

Tourism promotes physical activities, such as hiking or adventure sports, that have positive health outcomes (Winter et al., 2019). Also, medical or wellness tourism promotes relaxation and well-being (Atsız et al., 2023).

Quality Education: Education reveals intelligence and increases imagination. It is the main foundation of prosperity. It opens the door to a world of opportunities for a progressive and healthy society. Learning and education benefit everyone and should be accessible. In this context, there are nine targets set to be achieved by 2030. These are equal access to quality pre-primary education, free primary and secondary education, increasing the number of qualified people for financial skills, affordable technical, vocational, and higher education, universal literacy, education for sustainable development, abolition of all privileges in education, global citizenship, and inclusive and safe educational environment are higher education scholarships for developing countries (The 17 Goals, 2023). Türkiye is in a very good situation, especially in terms of literacy (Sustainable Development Report, 2022).

Quality education and tourism are closely interrelated. Tourism education and training programs provide the skills and knowledge for local people (Malihah & Setiyorini, 2014).

Gender Equality: Gender bias undermines social structure. This is not just about human rights. It is the negative impact of the human potential of the world. Women should have



equal rights. The principle of equality for women should be adopted. Economic, social, and political equality is in the interest of all citizens of the world. By acting together, prejudices can be eliminated. Everyone can work with equal rights and respect. With this approach, this problem can be eliminated. In this context, there are nine targets set to be achieved by 2030. These are ending all violence against women and girls, ending discrimination against women and girls, providing unpaid care, ending forced marriages, universal access to sexual health and rights, empowering women through promoting technology, ensuring women's full participation in political, economic, and public life, and developing applicable policies for gender equality (The 17 Goals, 2023). Türkiye is not doing well in terms of women's labor force participation rate and the rate of women in the national parliament (Sustainable Development Report, 2022).

Sustainable tourism is closely related to gender quality. Thanks to tourism, women are more involved in business life (Cicek et al., 2017).

**Clean Water and Sanitation:** One in three people in the world has to live without sanitation. This causes many diseases and deaths. Progress has been made in accessing clean drinking water, but a lack of sanitation slows these advances. Hygiene practices should be taught, affordable equipment should be provided, and preventive actions should be taken. In this context, there are eight targets set to be achieved by 2030. These are adequate and equitable sanitation for all, safe and affordable drinking water, increasing water use efficiency, improving water quality and safety, protecting and restoring aquatic ecosystems, expanding water and hygienic support in developing countries, implementing integrated water resources management, and water and sanitation to support local participation in management (The 17 Goals, 2023). Türkiye is in a good position in terms of the population using basic sanitation services and basic drinking water services (Sustainable Development Report, 2022).

As infrastructure investments are made thanks to tourism development, problems such as lack of clean water are prevented in that realm (Frone & Frone, 2013).

**Affordable and Clean Energy:** Renewable energies are more reliable. It is also cheaper and more efficient. The current dependence on fossil fuels is unsustainable and harmful to the earth, so the way of producing and consuming energy must be changed. This is crucial to implementing new energy solutions as quickly as possible and tackling climate change. In this context, there are five targets set to be achieved by 2030. These are a global increase in the percentage of renewable energy, universal access to modern energy, improvement in energy efficiency, promoting technology and investment, clean energy research, and expanding and

increasing energy services for developing countries (The 17 Goals, 2023). Türkiye is doing well in terms of population with access to electricity, clean fuels, and technology for cooking (Sustainable Development Report, 2022).

Tourism is also very supportive of clean energy. Sustainable tourism practices further encourage clean energy generation and management (Moslehpour et al., 2022).

**Decent Work and Economic Growth:** Economic growth should be a stimulating force for the whole world. The environment must be protected while achieving financial progress. Workers' rights must be protected. Child labor and modern slavery must end. Everyone should be offered the opportunity to be innovative and entrepreneurial. Access to financial services should be facilitated, and job creation should be encouraged. In this context, there are nine targets set to be achieved by 2030. These are achieving higher levels of economic productivity, sustainable economic growth, increasing resource efficiency in consumption and production, promoting policies to create jobs and support businesses, promoting youth employment, education and training, ending modern slavery, human trafficking and ending child labor, protecting employee rights and promoting a safe working environment, full employment, and equal paid decent work, and promoting beneficial and sustainable tourism (The 17 Goals, 2023). Türkiye is doing well in fatal work-related accidents (Sustainable Development Report, 2022).

Sustainable tourism practices make decent work opportunities for locals and can enhance their access to decent work (Ohridska-Olson & Ivanov, 2010).

**Industry, Innovation, and Infrastructure:** A flexible and functioning infrastructure is essential for a successful community. Upgrading infrastructure is essential for social development. For this reason, sustainable and innovative technologies should be encouraged. Universal and equal access to finance and information should be ensured. Thus, social welfare can be achieved, and employment and more stable societies can be created. In this context, there are eight targets set to be achieved by 2030. These are promoting inclusive and sustainable industrialization, developing sustainable, resilient, and inclusive infrastructures, developing all sectors and infrastructures for sustainability, increasing access to financial services and markets, facilitating sustainable infrastructure development for developing countries, supporting technology development and industrial diversification, developing R&D activities and upgrading industrial technologies, and to ensure universal access to information and communication technologies (The 17 Goals, 2023). Türkiye Logistics Performance Index: The quality of trade and infrastructure related to transportation are good (Sustainable Development Report, 2022).

Sustainable tourism infrastructure, such as green buildings, public transport, and renewable energy facilities help to sustainable development (Banga et al., 2022).

**Reduced Inequality:** The vast majority of the world's wealth is held by a very small group of people. This causes financial and social discrimination. Everyone should have access to equality and prosperity for the development of nations. In this way, the whole world will be able to prosper. In this context, there are nine targets set to be achieved by 2030. These are strengthening the social, political, and economic participation of all, reducing income inequality, adopting financial and social policies that promote equality, ensuring equality of opportunity and ending discrimination, having developing countries more represented in financial institutions, responsible and well-managed immigration policies, special and differential treatment for developing countries, regulating and improving global financial markets and institutions, and promoting development aid and investment in underdeveloped countries (The 17 Goals, 2023). Türkiye is not in good condition with the Gini coefficient and Palma ratio (Sustainable Development Report, 2022).

The tourism industry can reduce income inequalities (Nguyen et al., 2021). Moreover, raising awareness of responsible tourism practices can help to reduce inequalities (Frey & George, 2010).

**Sustainable Cities and Communities:** There is a continuous increase in the world population. Sustainable and modern cities must be built to accommodate everyone. Safe and smart cities are needed for everyone to survive and thrive. In this context, there are nine targets set to be achieved by 2030. These are appropriate and sustainable transportation systems, safe and affordable housing, protection of the world's cultural and natural heritage, inclusive and sustainable urbanism, reducing the environmental impact of cities, mitigating the negative effects of natural disasters, strong national and regional development planning implementation of policies for scope, resource efficiency, providing access to safe and inclusive green and public spaces, and disaster risk reduction (The 17 Goals, 2023). Türkiye is in good standing with access to improved water resources (Sustainable Development Report, 2022).

Sustainable tourism practices, such as reducing carbon emissions, encouraging walking, and cycling as transport alternatives, and waste reduction, positively affect urban sustainability (Joppe & Dodds, 1998).

**Responsible Consumption and Production:** There are abundant natural resources in the world, but they should be used and consumed responsibly. It must be learned how to use and produce them in sustainable ways in order to reverse the damage to the world. In this context,

there are nine targets set to be achieved by 2030. These are ensuring sustainable management and use of natural resources, implementing a 10-year sustainable consumption and production framework, ensuring responsible management of chemicals and waste, halving global food waste per capita, promoting sustainable practices and reporting by companies, significantly reducing waste generation, sustainable lifestyles should be supported, sustainable public procurement practices should be encouraged, and the scientific and technological capacities of developing countries for sustainable consumption and production should be supported (The 17 Goals, 2023). Türkiye is doing well in terms of production-based nitrogen emissions and nitrogen emissions from imports (Sustainable Development Report, 2022).

Sustainable tourism can contribute to the decrease of waste and the implementation of eco-friendly behaviors (Lee, 2001).

Climate Action: Climate change is a real threat to the entire world. Its effects are already visible and could lead to serious consequences if action is not taken. The world can be protected by adhering to innovation, education, and climate commitments. These changes will present great opportunities for infrastructure improvement, new jobs, and promoting greater societal well-being. In this context, there are nine targets set to be achieved by 2030. These are to integrate climate change measures with policy and planning, to strengthen resilience and adaptation capacity to climate-related disasters, to implement the UN Framework Convention on Climate Change, to build knowledge and capacity to meet climate change, and to promote mechanisms to increase planning and management capacity (The 17 Goals, 2023). Türkiye is improving in terms of CO<sub>2</sub> emissions in imports (Sustainable Development Report, 2022).

The tourism industry helps to reduce carbon emissions by encouraging alternative and sustainable transportation ways, including biking, walking, and eco-friendly vehicle alternatives (Buluk & Esitti, 2019).

Life Below Water: Healthy oceans and seas are essential for the world. Water covers 70 percent of the planet and is needed for food and energy. However, great damage has been done to these valuable resources. They must be protected by eliminating pollution and overfishing, and all marine life in the world must be responsibly managed and protected immediately. In this context, there are nine targets set to be achieved by 2030. These are protecting and improving ecosystems, reducing marine pollution, sustainable fishing, reducing ocean acidification, ending incentives that contribute to overfishing, protecting coastal and marine areas, increasing scientific knowledge, research, and technology for ocean health, increasing the economic benefits of the sustainable use of marine resources, and supporting small-scale

fishermen (The 17 Goals, 2023). Türkiye is in good standing with the threats to marine biodiversity embodied in imports (Sustainable Development Report, 2022).

**Life on Land:** Life on land is the basis of the planet. All living things are part of the ecosystem. Serious damage has been done through the loss of natural habitats, deforestation, and land degradation. Ecosystems must be protected, sustainable use must be ensured, and biodiversity must be protected. These are the keys to life. In this context, there are nine targets set to be achieved by 2030. These are halting deforestation and afforestation, protecting and restoring terrestrial and freshwater ecosystems, protecting mountain ecosystems, ending desertification and restoring degraded lands, promoting access to genetic resources and fair sharing of benefits, eliminating poaching and poaching of protected species, preventing invasive alien species in terrestrial and aquatic ecosystems, protecting biodiversity and wildlife, and integrating ecosystem and biodiversity into government planning (The 17 Goals, 2023). Türkiye is doing well in the permanent deforestation rate (Sustainable Development Report, 2022).

Sustainable tourism practices encourage the protection of marine and terrestrial ecosystems. Therefore, tourism is an important factor in achieving sustainable development goals (Nirmal & Jacob, 2022).

**Peace and Justice Strong Institutions:** A strong morality and compassion are necessary for a democratic society. However, injustice, persecution, and harassment are still common. This situation damages the fabric of society. It must have global social standards of justice, strong institutions, and a commitment to peace. In this context, there are nine targets set to be achieved by 2030. These are protecting against abuse, exploitation, and trafficking of children, reducing violence everywhere, preventing the illegal flow of finance and arms, promoting the rule of law and ensuring equal access to justice, significantly reducing corruption and bribery, promoting responsive, inclusive, and representative decision-making, strengthening participation in global governance, developing effective, accountable, and transparent institutions, and ensuring universal legal identity (The 17 Goals, 2023). Türkiye is doing well on unconvicted detainees and property rights (Sustainable Development Report, 2022).

Support for residents should provide equitable distribution of benefits for all, regardless of ethnicity or social status. Moreover, supporting residents' development helps to bring about stability and promote peace (Evren et al., 2019).

**Partnerships to achieve the Goal:** Global goals can be achieved with an understanding of unity. Especially for developing countries, international support and investments are needed.

Collaboration is necessary for a better world. In this context, there are nine targets set to be achieved by 2030. These are fully implementing official development assistance commitments, strengthening local resource mobilization to build local capacity, helping developing countries achieve long-term debt sustainability, providing financial resources for developing countries, investing in the least-developed countries, and providing access to science, technology, and innovation knowledge sharing and cooperation for developing countries, strengthening science, technology and innovation capacity for least developed countries, promoting sustainable technologies in developing countries, and increasing the capacity of sustainable development goals in developing countries (The 17 Goals, 2023). Türkiye is doing well in some indicators. Other countries are doing well in terms of government revenue excluding grants (percent of GDP), profits of multinational companies (billion USD), and doing well in the Statistical Performance Index (Sustainable Development Report, 2022).

Collaboration between the tourism industry, government, and residents can promote sustainable development and the highest benefits for all stakeholders (Yukseket al., 2019).

Sustainable tourism literature has emphasized the contribution of tourism to its sustainability. Understanding sustainability is a situation that tourism enterprises can overcome with help. A process and collaboration are required. Cultural heritage and nature must be protected (Agbabiaka et al., 2021; Spring, 2019). In order to take successful steps in sustainability, management and planning activities must be carried out within this framework. Legal aspects should support the issue. Infrastructure should be provided. Be aware of environmental challenges (Chen, 2016; Makian & Hanifezadeh, 2021). Awareness of environmental challenges, sustainable tourism policies should be created by considering the harmful effects of climate change (Onafowora & Owoye, 2020). Destinations should be protected within the framework of the sustainability principle, and social awareness should be created (Chatterjee & Dupre, 2019; Pamukçu & Çalışkan, 2020). Tourists should also be aware of this issue (Sarac et al., 2019). Uçgun and Narcı (2022) suggested that tourists' age and education level contribute positively to sustainability awareness and, therefore, to sustainable tourism.

The green behavior literature generally is associated with creativity and innovation (e.g., Gürlek & Köseoğlu, 2021; Arici & Uysal, 2022), human resource management (e.g., Luu, 2019; Aboramadan et al., 2022a; Tanova & Bayighomog, 2022), brand equity (Ishaq et al., 2021) and leadership practices (Jang et al., 2017). Employees are important precursors in the sustainability behaviors of hotel businesses (e.g., Aboramadan & Karatepe, 2021; Aboramadan et al., 2021). In this context, hotel businesses should support their employees (Lamm et al., 2015; Karatepe et al., 2022).

Tourists can prefer pro-environmental and responsible consumption steps (e.g., Kim et al., 2020; Errmann et al., 2021; Cui et al., 2020). Hotel businesses should also direct tourists to responsible consumption and take steps. Some steps hotels take for responsible consumption and production are as follows: smart showers to conserve water, using electric shuttles to ensure carbon-free transportation, the preference for filtered drinking water to reduce plastic bottles, and pro-recycling processes (Hotel ICON, 2022; Peng et al., 2020). For example, Shangri-la Hotel has made the hotel's water bottling facilities and other sustainable materials available (Luxury Hotels and Resorts, 2022).

In conclusion, tourism can play a crucial role in achieving the SDGs, especially when sustainable tourism practices are embraced. To maximize tourism's positive contributions, the industry needs to recognize and act upon the links between tourism and sustainable development (Rasoolimanesh et al., 2020). Although the incentives for pro-environmental hotel selection have been examined in the literature (e.g., Wan & Poon, 2014; Dolnicar et al., 2017; Han et al., 2019; Cui et al., 2020; Kim et al., 2020; Foroughi et al., 2022), it is useful to examine the responsible behavior of hotels (Karatepe et al., 2021; Heenipellage et al., 2022). Thus, conducting a study examining responsible consumption and environmentally friendly practices in hotels can help increase the knowledge of the field.

#### **4. Methodology**

In this study, which adopts a qualitative approach, data were obtained from hotel managers with a semi-structured interview form. Qualitative research has been frequently used in the field of tourism and hotel management recently (e.g., Atsız et al., 2023; Cheng & Edwards, 2019; Lei & Law, 2015; Ogretmenoglu et al., 2023b). Although there are many types of analysis in the qualitative approach, one of the most popular is content analysis (Hermann, 2008; Elo & Kyngäs, 2008).

The authors of this book chapter followed three steps for content analysis. The first step was to define the research population, select the sample, and identify the sources of the content (Atsız & Cifci, 2021). In this direction, the sample of the research in this study was determined as hotel managers in Istanbul. There are also some reasons why the sample was determined as Istanbul. First, it is one of the most popular destinations in terms of tourism (Genc & Turkey, 2022). Second, the sample is more accessible to the authors of this book chapter because they reside in Istanbul.

The second step was to code the obtained data. Various methods are used to obtain data for content analysis. The most popular of these is the technique of obtaining data through

interviews (Atsız & Cıfci, 2021). In addition, the coding process can be done manually or using software tools such as NVivo, ATLAS.ti, or Maxqda, etc. (Oliveira et al., 2013). In this study, the authors obtained the data with semi-structured interview forms and analyzed these data with Nvivo. The final step is the interpretation of the results. Accordingly, the authors of this study compared their findings with the previous literature and interpreted them in the conclusion and discussion section.

Interview questions were created by literature review, and these interview questions were submitted for the approval of academics who are experts in sustainable tourism.

## 5. Results

### 5.1. Profiles of Participants

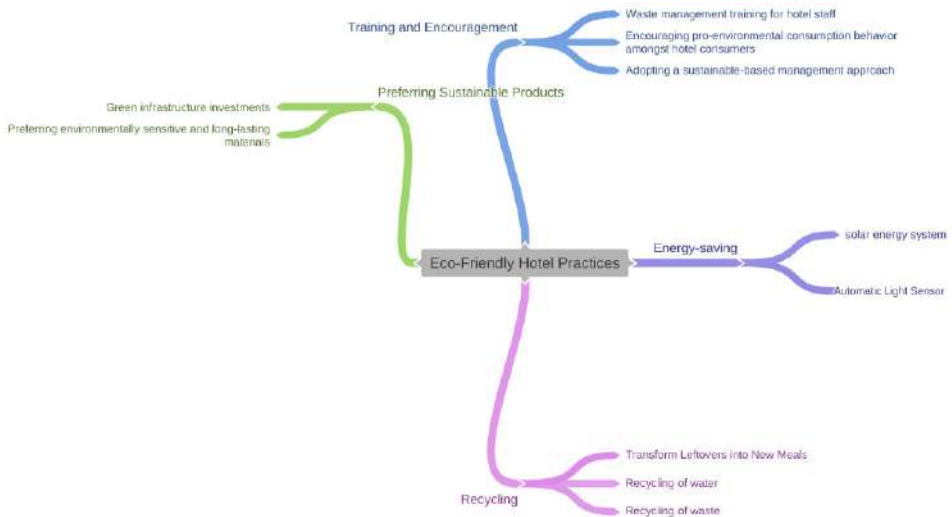
Table 1 demonstrates the profile of the participants. Regarding participant profiles, out of 6 participants, 2 were females; their ages ranged between 25 and 54. Three of them were single, and most of them had graduated from a university. In addition, these participants work as managers in different departments of different hotels. Some are food and beverage managers, some are front office managers, and some are kitchen managers.

<b>Table 1. Profile of participants</b>				
	<b>Gender</b>	<b>Age</b>	<b>Marital Status</b>	<b>Highest Qualification</b>
<b>P1</b>	Male	25	Single	Undergraduate Degree
<b>P2</b>	Female	35	Married	Undergraduate Degree
<b>P3</b>	Female	Unknown	Single	High School
<b>P4</b>	Male	48	Single	Undergraduate Degree
<b>P5</b>	Male	32	Married	Undergraduate Degree
<b>P6</b>	Male	54	Married	High School

### 5.2. Findings of Content Analysis

Four components of eco-friendly hotel practices were determined through content analysis (see Figure 1). Visualization was done with coggle because it provides an aesthetic vision.





**Figure 1.** Components of eco-friendly hotels' practices

**Recycling:** As a result of the content analysis, the first dimension that emerged in this study is recycling. Recycling is an effortless and practical way to contribute to sustainable goals and reduce hotels' impact on the environment. Recycling includes collecting and sorting waste materials such as paper, plastic bottles, and other metals. Recycling assists in protecting energy and conserving natural resources (Singh et al., 2014). In parallel with the above information, the participants stated that they send water bottles and waste to recycling. Moreover, they transform leftovers into new meals (for example, new Rullo cake using leftover cake).

**Energy-saving:** The second dimension obtained from the content analysis is energy-saving. Hotels consume a lot of energy for heating, cooling, lighting, and water use to provide a comfortable and welcoming atmosphere for visitors. However, hotel owners and managers are shifting toward energy-saving strategies as concern over climate change and the need to cut energy usage rises (Zografakis et al., 2011). In this study, the participants stated that they benefited from solar energy systems. Moreover, they stated that they also benefited from automatic sensor lights to save energy.

**Training and Encouragement:** In this study, similar to the literature (Nisar et al., 2021), it was revealed that staff training is very important in pro-environmental hotel practices. In hotels, staff training is essential for energy-saving actions. Energy usage can be considerably reduced by training staff to turn off lights and equipment when they're not in use (Abuelhassan & Elsayed, 2020). In addition, customers are very important in pro-environmental hotel practices (Trang et al., 2019).

**Preferring Sustainable Products:** The fourth dimension obtained as a result of the content analysis is using sustainable products. Sustainable products are those that do not harm the environment during production, use, or disposal process. There are many advantages to using sustainable products in hotels. By minimizing waste and avoiding the use of hazardous chemicals, for instance, sustainable products can significantly lower the carbon footprint of hotels. Additionally, environmentally friendly products can lower energy and water usage, lowering maintenance costs and reducing reliance on non-renewable resources (Yusof & Jamaludin, 2013).

## 6. Conclusion and Suggestions

This study aimed to investigate hotels' green practices and their responsible consumption. In this context, semi-structured interview forms were conducted with the managers working in various departments of the hotels, and the obtained data were themed by content analysis. As a result, four main components of hotels' green practices and their responsible consumption were revealed: recycling, energy-saving, training and encouragement, and preferring sustainable products.

Recycling is a vital component of sustainable living and has many advantages for both the economy and the environment. Recycling prevents waste, protects natural resources, and creates wealth. Hotels can help protect the environment for present and future generations by recycling (Wang, 2012).

Hotels must conserve energy if they want to lessen their environmental impact and increase their marketability. Utilizing energy-saving techniques can also assist hotels in lowering their energy usage, which can result in significant cost savings. Hotels can significantly reduce energy consumption and contribute to a more sustainable future by using energy-efficient lighting, heating, and cooling systems, reducing water consumption, integrating energy management systems, and training staff (Yusof & Jamaludin, 2013).

Hotels must choose sustainable products to reduce their impact on the environment, enhance the guest experience, and reduce expenditures. Hotels that favor sustainable products can differentiate themselves from the competition and help create a green future. Hotels may lessen their environmental effect and pave the way for a more sustainable future by utilizing eco-friendly cleaning supplies, sustainable linens and towels, eco-friendly furnishings, local and organic food, and sustainable amenities (Yusof & Jamaludin, 2013).

This study has some theoretical contributions. First, this study tries to expand the sustainable tourism literature by identifying eco-friendly practices in hotels. Second, this study provides evidence from a developing country. Future studies can make comparisons using the findings of this study.

## 6.1. Suggestions for Hotel Managers

Based on the findings of this study, the following suggestions can be made for hotel managers:

- Hotels can use low-flow faucets, showerheads, and toilets; this can save a considerable amount of water and energy usage.
- Hotels can use non-toxic and biodegradable cleaning products which are not harmful to the environment.
- Hotels can prefer eco-friendly furnishings, such as reclaimed wood, recycled plastic furniture, or second-hand furniture.
- To keep employees up to date on the most recent pro-environmental practices and policies, regular training and education are crucial. Additionally, hotel management can honor and reward staff employees who exhibit eco-friendly behaviors, such as turning off lights and equipment when not in use or properly using recycling bins.
- Hotel management can set environmental goals such as energy consumption reduction goals for hotel staff to work towards. These goals can form part of performance targets for hotel staff.
- Monitoring and evaluation are important in providing staff adherence to the hotel's eco-friendly policies and procedures. This can be done using measurement and monitoring tools and regular performance evaluations.
- Hotel managers can be role models for hotel staff. Hotel managers can demonstrate how to use energy efficiently, reduce waste, and follow environmental practices.

## 6.2. Limitations and Suggestions for Future Research

This study is not exempt from some limitations. This qualitative work was conducted with only six interviews. The interview numbers are low since limited managers volunteered to join the study. Some hotel department managers did not make an interview with the authors because they were so busy. Future work can overcome this issue by interviewing more managers. The nature of such studies cannot generalize the results for the overall population. Thus, these results should be confirmed by using quantitative methods (e.g., surveys) on a large sample (Atsız & Cifci, 2022).

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 20

# COMBATING CLIMATE CHANGE IN TÜRKİYE: INTEGRATION OF MARKET-BASED INSTRUMENTS TO THE ENVIRONMENTAL POLICY

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### Abstract

Climate change is regarded as humanity's "code red" warning, posing a significant threat to the planet and negatively impacting various aspects of life. The international community has recognised the urgency of addressing this issue since the 1970s, as evident in the Sustainable Development Goals (SDGs), particularly SDG 13, which emphasises integrating climate change measures into national policies and strategies. Türkiye faces significant impacts from climate change, including droughts, floods, and extreme weather events that strain its natural resources. Despite some efforts in regulations and action plans, the country's greenhouse gas emissions have more than doubled since 1990, driven by rapid industrialisation, urbanisation, and population growth, raising concerns. This chapter aims to discuss the necessary steps within the framework of environmental policy measures in Türkiye to address the urgent action mentioned in the goal. Implementing market-based instruments in Türkiye is being evaluated in line with this objective. The key priority areas for Türkiye's environmental policy and market-based instruments should target the electricity, industry, and transport sectors, major contributors to greenhouse gas emissions. Mitigating emissions requires increasing renewable energy in the electricity sector, improving industrial efficiency, and promoting sustainable transportation practices.

**Keywords:** Climate Change, Environmental Policy, Emission Trading Scheme, Carbon Tax, SDG13, Türkiye

## 1. Introduction

Climate change refers to long-term alterations in temperatures and weather patterns. These alterations may occur naturally due to fluctuations in solar activity or significant volcanic eruptions. However, in the 1800s, human activities emerged as the principal cause of climate change, primarily attributable to the combustion of fossil fuels such as coal, oil, and gas. Climate change leads to various destructive outcomes, including but not limited to intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms, and declining biodiversity. According to the sixth assessment report of the IPCC (2021), the sea level is expected to rise 30-60 cm by 2100 under different scenarios. Drought is estimated to displace 700 million people by 2030. As sea levels continue to rise, communities will be compelled to relocate, and prolonged droughts will pose a risk of famine. Consequently, there is an anticipated increase in the number of “*climate refugees*” in the near future.

Climate change can be regarded as humanity’s unmistakable “*code red*” warning. Because of its particular importance, it has been near the top of the global agenda since the 70s. The Kyoto Protocol in 1997, which set binding emission reduction targets to the Parties, is a milestone for the worldwide effort to combat climate change. The Paris Agreement, which entered into force in 2016, is another landmark since it is the first legally binding international treaty to limit global warming to below 2 degrees Celsius compared to pre-industrial levels. The agreement requires each Party to prepare nationally determined contributions it intends to achieve. The 2030 Agenda for Sustainable Development, embraced by the United Nations in 2015, places the 17 Sustainable Development Goals (SDGs) at its core. It emphasises the need for immediate and collective efforts from all nations to eradicate poverty, enhance health-care and education, mitigate inequality, and promote economic progress. Simultaneously, it addresses the urgency of combating climate change and preserving our oceans and forests.

Among the 17 SDGs, SDG 13, namely **Climate Action**, specifically focuses on the imperative of promptly addressing climate change and its consequences. The second target of SDG 13 highlights the significance of integrating climate change measures into national policies, strategies, and planning. The vast environmental economics literature categorises the endeavours to incorporate climate change measures into environmental policy as market-based and non-market-based instruments. The former aims to modify the economic incentive structure to influence actors’ behaviour, while the latter imposes specific obligations or implements non-monetary incentives to induce behavioural change. Since the Kyoto Protocol, market-based instruments such as indirect taxation, targeted subsidies or emission trading

schemes (ETS hereafter) have become popular since they provide a flexible and cost-effective means for reaching given policy objectives.

This chapter aims to discuss the necessary steps within the framework of environmental policy measures in Türkiye to address the urgent action mentioned in the goal. Implementing market-based instruments in Türkiye is being evaluated in line with this objective. This chapter focuses on addressing the following questions:

- What is the position of Türkiye on climate change and SDG13.2?
- How should market-based instruments be integrated into environmental policy in Türkiye in order to fulfil SDG13.2?

The rest of the paper is organised as follows: in Section 2, some statistical facts are supplied to properly locate Türkiye in global greenhouse gas emissions. Within the same part, it also summarises Türkiye's distances to SDG13 targets. Section 3 briefly summarises two main market-based environmental policy instruments: tax and ETS. Following this textbook information, Türkiye's approach to environmental policies within the scope of market-based instruments is evaluated in terms of regulations made and actions that should be taken urgently. Section 4 includes the conclusion and recommendations.

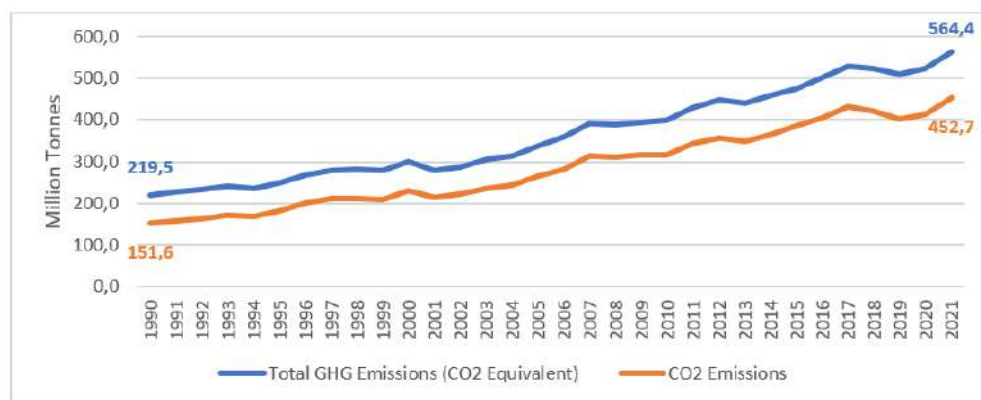
## 2. Türkiye's Position in Climate Change and SDG 13

Türkiye, located in the Mediterranean basin, is among the nations severely impacted by the consequences of climate change. The emergence of recent droughts, floods, and extreme weather events serves as crucial evidence of this, exerting substantial pressure on forest, water and land resources.

While the Kyoto Protocol was ratified in 2009, Türkiye stood alone as the sole country listed in Annex I that did not assume responsibility for digitised emission reduction under the Protocol (Ayhan, 2013). The Paris Agreement was signed in 2016 (with no ratification yet), which undertakes “*up to 21% reduction in Greenhouse Gas (GHG) emissions from the Business as Usual (BAU) level by 2030*” in its Intended Nationally Determined Contribution (INDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC). According to the second Voluntary National Review (VNR) Report (2019), being responsible for 0.7% of total global GHG emissions, Türkiye declared the need to use international assistance for improving finance, know-how, technology and capacity, including the Green Climate Fund, to achieve the mitigation target outlined in its INDC. The report highlights Türkiye's approach to climate change, emphasising its status as a developing country in the upper

middle-income group and listed in “Annex I” by the UNFCCC, acknowledging its unique circumstances also postulated in the Kyoto Protocol. Based on the “*common but differentiated responsibilities*” principle, Turkish authorities allege that Türkiye had no historical responsibility for GHG emissions, given its per capita ratio of 3.88 tCO<sub>2</sub>e, which accounts for less than 1% of the global total. In comparison, the average GHG emissions of Annex I countries stood at 14.37 tCO<sub>2</sub>e per capita (The Republic of Türkiye, Ministry of Foreign Affairs website).

The statements made by Turkish authorities regarding total or per capita emission levels are indeed accurate, but they present only one aspect of the situation. According to the World Development Indicators (WDI), Türkiye’s contribution to global GHG emissions was merely 1.01% in 2019, with 488.5 million tonnes of CO<sub>2</sub> equivalent. However, it is essential to consider the swift changes in GHG emissions carefully. Substantial population growth (almost 50% increase since 1990) and rapid industrialisation and urbanisation have seen Türkiye’s energy demand increase indispensably. Accordingly, GHG emissions in Türkiye have surged by over 2.5 times since 1990. Similar to global patterns, CO<sub>2</sub> comprises the largest share among GHGs<sup>1</sup>, accounting for 80% in 2021. Unfortunately, the change in CO<sub>2</sub> emissions between 1990 and 2021 is even more concerning as it nearly tripled, escalating from 151.6 to 452.6 million tonnes (See Figure 1).

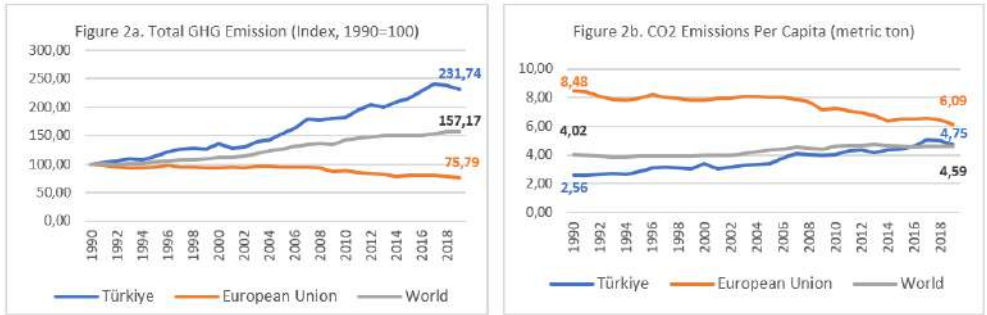


**Figure 1.** Greenhouse Gas Emission Trend in Türkiye (1990-2021)

**Source:** TurkStat (2023), Greenhouse Gas Emissions.

<sup>1</sup> Greenhouse gases (GHGs) absorb infrared radiation sent by sunlight and trap its heat in the atmosphere, creating a greenhouse effect that results in global warming and climate change. Major GHGs that are counted in international inventories are Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>), Nitrous oxide (N<sub>2</sub>O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF<sub>6</sub>), Nitrogen trifluoride (NF<sub>3</sub>).

The picture becomes more apparent when we compare the changes in GHG emissions in the world, the European Union (EU) and Türkiye. Utilising the most comprehensive available data from the World Development Indicators (WDI), it is evident that Türkiye’s GHG emissions have more than doubled since 1990, while global emissions increased by 1.5 times and even decreased by 25% within the EU (Figure 2a). Considering per capita CO<sub>2</sub> emissions, a similar pattern emerges. Between 1990 and 2019, Türkiye experienced an almost twofold increase in per capita CO<sub>2</sub> emissions, contrasting with a slight increase globally and a decreasing trend within the EU. It is crucial to emphasise that Türkiye’s per capita CO<sub>2</sub> emissions surpassed the global average in 2016 and have maintained this position since then (Figure 2b).



**Figure 2.** Greenhouse Gas Emissions Trends  
**Source:** TurkStat (2023), Greenhouse Gas Emissions & World Development Indicators

The final part of this subsection will discuss the performance of Türkiye in relation to the SDGs. The OECD report “Measuring Distance to the SDG Targets” (2022) provides OECD countries with a high-level overview of strengths and weaknesses in performance across the SDGs by representing how countries differ from Voluntary National Reviews (VNRs) or other reporting processes and is a good choice for the evaluation. The report adopts a geometric growth model for assessing the direction and pace of recent changes in the context of the SDGs. It models the likelihood of achieving a specific level using Monte Carlo simulations.

The upper part of Table 1 below represents Türkiye’s distances to SDG13. A country’s distance to the target is measured as the “standardised difference” between a country’s current position and the target end value. The country profile of the OECD report (2022) states that Türkiye appears close to meeting targets on education for sustainable development (13.3). Indeed, the lowest distance was recorded in target 13.3. However, it is asserted that there is no progress or moving away from target 13.2, which is the main topic of this paper. As explained in Section 3.2, Türkiye has made some efforts to re-design its environmental policy to integrate climate change measures. However, these efforts, unfortunately, have not been



fruitful yet. Türkiye VNR (2019) informs that the economic losses caused by floods due to climate change are second only to the economic losses resulting from seismic disasters and states that disaster policies will be prioritised to build resilience to climate-related risks. Not surprisingly, the highest distance is recorded in target 13.1, so it is crucial to strengthen the adaptation capacity, especially of those vulnerable to adverse effects of climate change.

OECD (2022) also emphasises the lack of data, particularly for the planet category (including SDG 13), that hinders monitoring changes over time. The Turkish Statistical Institute remarks on its website that among eight indicators of SDG13, only two were reported online, five indicators were still explored, and the remaining was a non-statistical indicator.

Table 1. Türkiye’s distances to SDG 13 and recent trends				
SDG global target	Türkiye’s Distance to target (s.u.*)	Trend Assessment	OECD Average distance (s.u.*)	OECD Trend Assessment
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	0.92	n.a.	0.73	n.a.
13.2 Integrate climate change measures into national policies, strategies and planning	0.65	No progress or moving away from the SDG target	1.15	Progress has been made, but is insufficient to meet the target
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	0.46	n.a.	1.04	n.a.
Performance of Türkiye on indicators for SDG 13	Current value	Assessment	Trend	
CO <sub>2</sub> emissions from fossil fuel combustion and cement production (tCO <sub>2</sub> /capita)	5.3 (2021)	Major challenges remain	Stagnating	
CO <sub>2</sub> emissions embodied in imports (tCO <sub>2</sub> /capita)	0.6 (2018)	Challenges remain	On track or maintaining SDG achievement	
CO <sub>2</sub> emissions embodied in fossil fuel exports (kg/capita)	1.3 (2021)	SDG achieved	Trend information unavailable.	
Carbon Pricing Score at EUR60/tCO <sub>2</sub> (% , worst 0–100 best)	23.6 (2018)	Major challenges remain	Stagnating	
(*) The standardised measurement unit (s.u.) is the standard deviation observed among OECD countries in the reference year. Source: OECD (2022) & UN Sustainable Development Report (2023)				

The lower part of Table 1 represents the performance of Türkiye on indicators defined in the Sustainable Development Report. Unlike the Sustainable Development goal indicators, these only focus on target 13.2. It could be propounded that integrating climate change mea-

asures into national policies, strategies, and planning is at the heart of climate action. According to the latest Sustainable Development Report (2023), the statistical performance index of Türkiye is 87%, and the missing data is only 2%. The significant challenges specified in the report that Türkiye faces were CO<sub>2</sub> emissions from fossil fuel combustion and cement production and Carbon Pricing Score.

The indicator “CO<sub>2</sub> emissions from fossil fuel combustion and cement production” measures emissions from the combustion and oxidation of fossil fuels and cement production by excluding emissions from fuels used for international aviation and maritime transport. Based on Turkstat data, Türkiye fulfilled 64% of its electricity production using fossil fuels in 2021. 31% of this ratio belongs to coal. Moreover, despite its substantial renewable energy potential, the proportion of fossil fuels in energy production witnessed a 4.6-point increase from 1990 to 2021. VNR (2019) states that the share of renewable energy in Türkiye’s electricity production is aimed to be increased to a 30% level by 2023. The share of renewable energy in electricity generation was recorded as 35.8% in 2021 by Turkstat data, casting doubts on the accuracy of setting targets.

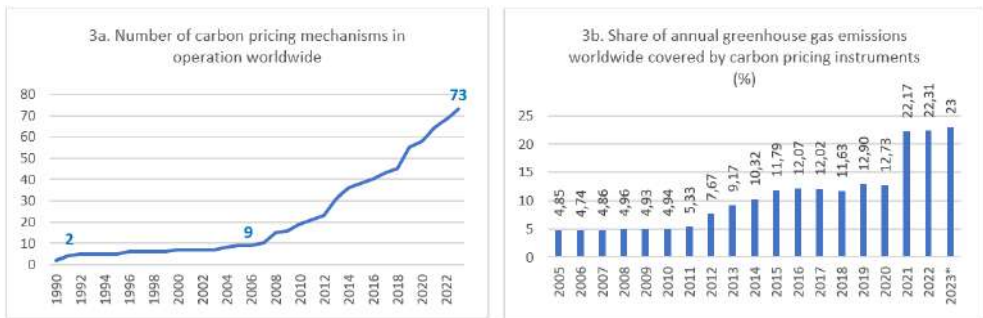
The Carbon Pricing Score (CPS) measures the extent to which countries have attained the goal of pricing all energy-related carbon emissions at specific benchmark values for carbon costs. The more progress a country has made towards a specified benchmark value, the higher the CPS. In Türkiye, neither a specific carbon tax nor a mandatory carbon market is implied. So, the value in the indicator is derived only from the voluntary carbon market. According to data provided by MidSEFF, Türkiye is the third-largest host country in terms of registered projects (288 as of 2020) and represents the largest seller of voluntary carbon credits in the region. Despite its low score in CPS, the achievements recorded in voluntary carbon markets give positive signals that an ETS should be at the centre of the environmental policy in Türkiye.

### **3. Integration of Market-Based Instruments into the Environmental Policy in Türkiye**

#### **3.1. Market-Based Instruments**

The environmental economics literature categorises the endeavours to incorporate climate change measures into environmental policy as market-based and non-market-based instruments. The former aims to modify the economic incentive structure to influence actors’ behaviour, while the latter imposes specific obligations or implements non-monetary incentives to induce behavioural change. There is a growing consensus among economists that

market-based instruments, such as green taxes and emission trading schemes, offer a more cost-effective means of achieving the objective of reducing GHG emissions compared to non-market-based instruments (also known as command-and-control policies) when determining the optimal policy option to combat climate change. Figure 3 illustrates the rising enthusiasm for market-based instruments. The adoption of carbon pricing mechanisms has notably surged since 1990, when Finland pioneered the world's first carbon tax. In 2005, merely nine carbon pricing mechanisms were in effect globally; however, this figure grew to 73 in 2023 (Figure 3a). Approximately 23 per cent of global greenhouse gas emissions are now encompassed by carbon pricing instruments, like carbon taxes and emissions trading systems (Figure 3b).



**Figure 3. Growing Interest in the Market-Based Instruments**  
(\*) As of April 1, 2023

**Source:** 3a. World Bank. (May 31, 2023). Number of carbon pricing mechanisms in operation worldwide from 1990 to 2023 [Graph]. In Statista. Retrieved July 31, 2023, from <https://www.statista.com/statistics/483565/planned-and-implemented-carbon-pricing-instruments-worldwide/> 3b. World Bank. (March 31, 2023). Share of annual greenhouse gas emissions worldwide covered by carbon pricing instruments from 2005 to 2023 [Graph]. In Statista. Retrieved July 31, 2023, from <https://www.statista.com/statistics/1327043/global-ghg-emissions-covered-by-carbon-instruments/>

OECD (2001) defines an environmental tax as “if the tax base is a physical unit (or a proxy for it) of something which has a proven specific negative impact on the environment when used or released.” Environmental taxes intend to fill the gap between the private and social costs of production and consumption by internalising the externalities. The environmental taxes based on the chosen tax base can be divided into three groups: (i) taxes levied on end products that generate pollution, like automobiles, (ii) taxes imposed on goods commonly used as inputs in polluting activities, such as fuel, and (iii) taxes imposed on pollutants present in inputs, such as CO<sub>2</sub> found in the combustion of fuel. Environmental taxes can have two favourable impacts: fiscal, i.e., they raise budget revenue and, as expected, environmental. These two impacts are inversely related, and the elasticity of supply and demand determines which impact will dominate. In strictly targeted taxes, since demand will be relatively more

elastic (mostly because of the substitutability), the environmental impact is expected to be more significant than the broadly targeted taxes. Environmental taxes can have regressive effects, disproportionately affecting low-income households compared to wealthier ones. This impact becomes even more severe when the taxed good is considered a necessity item with limited alternative options.

In an emission trading scheme (ETS), the public authority establishes a market where the environment is treated as a waste sink or issues pollution allowances that grant companies the ability to trade the rights to emit pollutants within acceptable limits. The allowances can be traded as any other commodity in the market. This mechanism aims to guarantee that a particular level of pollution is achieved at the lowest possible cost to society while also ensuring that the environment is only impacted within its capacity to tolerate such effects. The purpose of this instrument is twofold: to ensure that a predetermined level of pollution is achieved at the lowest possible cost to society and to ensure that the environment is not subjected to more pollution than it can withstand. The governing authority allocates a fixed quantity of permits, each representing authorisation to release a specific amount of pollutants.

Gulbrandsen et al. (2019) propose eight features to design an *effective* (brings about a higher and more stable carbon price, with subsequent reductions in emissions) and *efficient* (achieves such reductions at minimal, or at least lower, costs) ETS for the GHG emissions: (i) **Type of system:** While the *cap-and-trade system* is based on the distribution of predetermined (the cap) allowances, the *baseline-and-credit system* does not have a predetermined ceiling and distributes allowances ex-post. (ii) **Ambition level:** The level of the cap is not only the primary indicator of the scarcity of allowances created but also determines the carbon price and the incentive effects of the ETS. (iii) **Sectors, gases, and emissions covered.** (iv) **Allocation mechanism:** Public authority may distribute the allowances via auctioning, free of charge (grandfathering), or by specifying some type of benchmarking. (v) **External offsetting and linking:** It includes whether the system allows for linking up to the external outreach to similar (national/international) systems. (vi) **Monitoring, reporting and verification (MRV) and enforcement:** It refers to the rules and institutions for MRV tasks and the case of non-compliance. (vii) **Price or quantity-focused management mechanisms:** It concerns the rules (or possible institutions established) to stabilise the carbon price. (viii) **Revenue earmarking:** If allowances are distributed via auctioning, earmarking the auctioning revenues for which activities or sectors must be determined.

### 3.2. Türkiye’s Approach to Market-Based Instruments

Türkiye first introduced the concept of sustainable development into the 7th Development Plan in 1996, following the 1992 Rio Conference, and, during the past quarter century, consistently emphasised its commitment to work for a sustainable world. In the relevant section of the Plan, it was stated that *“Economic instruments will be used to integrate environmental policies with economic and social policies. In the management of environment, an appropriate combination of instructive and incentive measures will be used”* (p.204). It can be seen as the first official reference to economic instruments of the environmental policy in Türkiye. However, the following plan (8<sup>th</sup> Development Plan) regretfully admitted that *“Environment policies could not be integrated with economic and social policies while economic means could not be sufficiently used”* (p.212). Afterwards, in each of the following plans, the scope and content for the environmental issues steadily increased, the importance of the environmental problems was accepted, and legal regulations and policy recommendations were made regularly. Anyway, as Özekan (2020) and Gökçe et al. (2021) clearly stated, the good intentions in the development plans are hardly realised. Table 2 below represents the legal documents that regulate or make projections about GHG emissions in Türkiye.

Table 2. Regulations in place relevant to the Market-Based Instruments in Türkiye		
Document, Regulation and Projects	Detail	Date
İstanbul International Finance Centre Strategy and Action Plan	Action 33: Establishment of the carbon market in Turkey (2012-2015)	2009
Communiqué on GHG Emission Reduction Projects Registry	Article 1: This communiqué regulates the procedures and principles regarding registration of the projects, which are developed to limit, reduce GHGs and increase carbon sink areas to combat climate change.	2011
Climate Change Action Plan	Action Y4.1: Effective negotiations for Turkey’s favourable participation in the existing regional and global carbon markets until 2013.	2012
	Action Y4.2: By 2015, work towards the establishment of a carbon market in Turkey	
Türkiye Climate Change Adaptation Strategy and Action Plan	‘It has been planned through these activities to determine the economic values of protective and environmental services [...] to evaluate more rationally the economic value of carbon captured by the forests through its offer to the markets.’ (p.40)	2012
Energy Efficiency Strategy Document	SA-07/SH-05: To create additional sustainable finance (of public resources) for energy efficiency and renewable energy projects, capacity building for developing infrastructure of the carbon market. Carbon stock exchange in Turkey will be completed within 18 months of the date of issue of this document.	2012

**Table 2.** Continued

Regulation on Monitoring GHG Emissions	<b>Article 1:</b> This regulation embodies the procedures and principles regarding monitoring, reporting, and verification of GHG emissions that are born from the actions defined in Annex 1 of the regulation. The regulation covers the following GHGs: CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs, SF <sub>6</sub> .	2012 (revised in 2014)
Communiqué on Voluntary Carbon Market Project Registry	<b>Article 1:</b> The purpose of this Communiqué is to regulate the procedures and principles regarding the registration of projects that provide greenhouse gas emission reductions and are developed to obtain carbon certificates.	2014
Communiqué on Verification of GHG Emission Reports and Authorisation of Verifying Institutions	<b>Article 1:</b> This communiqué defines features of the verifying institutions that audit GHG emission reports in the framework of the Regulation on Monitoring, Reporting and Verification (MRV) of GHG Emissions.	2015
Communiqué on Verification of GHG Emission Reports and Accreditation of Verifying Institutions	<b>Article 1:</b> The purpose of this Communiqué is to determine the procedures and principles regarding the verification of GHG reports and the qualifications and accreditation procedures of the verification bodies that will carry out these procedures.	2017
Regulation on Fluorinated Greenhouse Gases	<b>Article 1:</b> The purpose of this regulation is to control emissions from fluorinated GHGs and to regulate the procedures and principles regarding the use of fluorinated greenhouse gases listed in the Kyoto Protocol to the UNFCCC, to which Turkey is a party, and products or equipment containing fluorinated greenhouse gases.	2018 (Revised in 2022)
Regulation on the Monitoring of Greenhouse Gas Emissions from Aviation Activities	<b>Article 1:</b> The purpose of this Communiqué is to determine the procedures and principles regarding the verification of GHG reports and the qualifications and accreditation procedures of the verification bodies that will carry out these procedures.	2022
<b>Source:</b> Based on Turhan and Gündoğan (2019, p. 520), revised and updated by the author.		

The one and only environmental tax implemented in Türkiye is the “environmental cleaning tax”, which is imposed on households, workplaces, and other buildings based on water consumption. In the energy sector, certain taxation measures are designed to support Türkiye’s energy objectives rather than strictly for environmental purposes. Many of these energy taxes are collected through the special consumption tax<sup>2</sup> (SCT). Some renewable energy sources, such as bioethanol in gasoline and biodiesel, receive exemptions from the SCT. Furthermore, renewable power generators are eligible for various license exemptions and fee reductions (IEA, 2021).

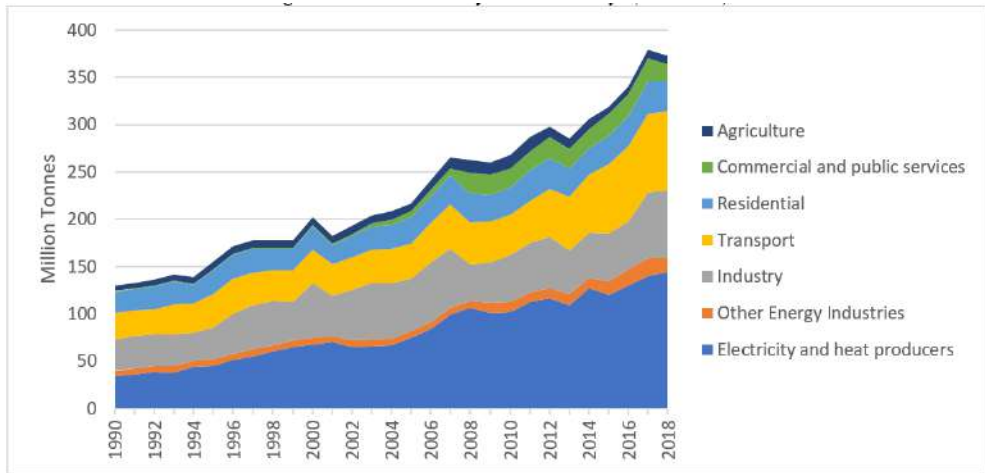
Türkiye does not have a carbon tax and does not operate a mandatory ETS for CO<sub>2</sub> or any other GHG. However, within the last decade, some efforts at the Ministerial level to establish

2 In Turkish: Özel Tüketim Vergisi (ÖTV)

a carbon market in Türkiye have been remarkable. In their critical study, Turhan and Gündoğan (2019) claim that the adoption of the monitoring, reporting, and verification (MRV) regulation through a ministerial communiqué in 2015 (see Table 2) was a clear signal that Türkiye was preparing to put emissions trading to the centre of its climate policies. Indeed, Türkiye initiated in 2013 the “Partnership of Market Readiness (PMR)” project carried out with funding from the World Bank. The technical assistance project, which lasted approximately seven years, examined the impact of carbon pricing mechanisms on the economy, budget and sectors in the light of analytical assessments and suggested that the most appropriate market-based mechanism for Türkiye’s policy priorities and local context would be the ETS. Carbon pricing and ETS were also discussed at Türkiye’s first Climate Council, organised by the Ministry of Environment, Climate and Urbanization in 2022. Establishing an ETS in Türkiye, pilot implementation of ETS in 2024, and transforming existing taxes into carbon taxes are among the recommendations taken at the Council.

Moreover, the “Carbon Market Implementation Partnership-PMI” project was launched with the World Bank in 2022, and a Gap Analysis Report was prepared to identify gaps and needs. In line with the PMR’s Roadmap (Neelis et al., 2016), which proposes that “*although the existing environmental law does already make a reference to carbon markets, new primary legislation would be needed to establish an ETS in Türkiye*” (p.8), a draft of the Climate Change Law was leaked to the media at the end of 2022. The draft clearly defines an ETS for Türkiye. However, after that, the draft was most likely shelved due to the change in the political atmosphere and elections in the country.

Based on the GHG statistics and trends in Türkiye, it is obvious there is an urgent need for action. With the support of the growing literature and global popularity, it can be proposed that market-based instruments should be the head of environmental policy. The first step in this aim is to specify a set of priority sector and market-based instrument combinations. In the PMR Assessment Report (Johnson et al., 2017), five potential sectors were determined for the implication of market-based instruments by considering their emissions size, growth, the relevance of other policies and abatement potential to derive a qualitative prioritisation. These sectors are (i) Electricity, (ii) Industry, (iii) Waste, (iv) Transport and (v) Buildings. Figure 3 below represents the distribution and trend of CO<sub>2</sub> emissions in Türkiye by sector. As we can see from the figure, priority areas in Türkiye for the environmental policy and especially market-based instruments should be electricity, industry and transport.



**Figure 4.** CO<sub>2</sub> emissions by Sector in Türkiye (1990-2018)

Source: International Energy Agency Statistics

Electricity generation is the largest single sector in terms of emissions, and it also has high growth in emissions. In 2018, the sector was responsible for 38% of CO<sub>2</sub> emissions, and the growth rate was 323.53% between 1990 and 2018. Because the liberalisation process in the electricity market has continued since 1982 (Dinçel, 2021), it could be suitable for market-based instruments. The country's high potential for further renewable development must also be emphasized.

The industry is a significant sector in terms of emissions, with a share of 19.30% in 2018. However, the sector's growth rate was 118% between 1990 and 2018. The PMR Assessment Report (Johnson et al., 2017) states that emissions and opportunities for abatement may vary by industrial sector. Still, high policy priority on efficiency and clean production improvements is inevitable.

The transport sector is also notable for its extensive and also fast-growing emissions. Its share in CO<sub>2</sub> emissions in 2018 was 22.25% and almost tripled between 1990 and 2018 (an increase of 196.43%). In line with global data, the highest share of CO<sub>2</sub> emissions from the transport sector belongs to road transport. According to IEA data, as of 2018, 67 million tons (81%) of the 83 million tons of CO<sub>2</sub> emitted by the transportation sector was caused by road transportation. As mentioned earlier, there are some significant fuel tax policies that can affect the industry. However, these taxes were not designed as environmental taxes, so the sector must be prioritised.



## 4. Conclusion

The issue of climate change is of utmost importance and has been a prominent concern on the global agenda for decades since it poses a significant threat to the planet and impacts various aspects of life. The combustion of fossil fuels and human activities have emerged as the primary causes of climate change, leading to various destructive outcomes such as droughts, water scarcity, rising sea levels, and declining biodiversity. The global community recognises the urgency of addressing climate change, which has been a priority on the international agenda since the 70s. The Sustainable Development Goals (SDGs), with SDG 13 specifically focusing on Climate Action, emphasise the need for integrating climate change measures into national policies and strategies.

Türkiye is significantly impacted by the consequences of climate change, facing challenges such as droughts, floods, and extreme weather events that put immense pressure on its natural resources and emphasise its commitment to sustainable development and climate action on all occasions. The country's carbon emissions have more than doubled since 1990, driven by rapid industrialisation, urbanisation, and population growth. While it has made some efforts regarding regulations and action plans, the rapid growth in greenhouse gas emissions is a cause for concern.

To address the urgent action required for climate change and fulfil Sustainable Development Goal 13.2 (integrating climate change measures into national policies), Türkiye must put on its agenda applying market-based instruments in its environmental policies. Market-based instruments, such as carbon taxes and emission trading schemes (ETS), are effective and cost-efficient tools for reducing emissions in many countries. Türkiye has shown interest in establishing an ETS and has explored the possibility of implementing carbon pricing mechanisms. However, concrete steps and legislation are yet to be realised.

The priority areas for Türkiye's environmental policy and market-based instruments should focus on the electricity, industry, and transport sectors, which contribute significantly to greenhouse gas emissions. Increasing the share of renewable energy sources in the electricity sector, improving industrial efficiency, and promoting sustainable transportation practices are crucial steps to mitigate emissions. Combating climate change is a global imperative, and Türkiye must take urgent and decisive actions to align its environmental policies with the goals of SDG 13. By enacting necessary legislation and embracing market-based instruments, Türkiye can contribute significantly to the global fight against climate change and safeguard its future and that of the planet. Strengthening climate action, enhancing monitoring and reporting of emissions, and accelerating the transition to cleaner energy sources should be top priorities for the country.

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## CHAPTER 21

### THE ROLE OF GREEN BONDS IN ACHIEVING SDG 13: THE CASE OF TÜRKİYE

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#### Abstract

Within the target of transforming the world into a better place, the Sustainable Development Goals (SDGs) also aim to reduce greenhouse gas emissions and adapt to the negative effects of climate change with the 13th Goal. One of the financial tools used to finance such initiatives is the use of green bonds, which is a debt instrument that raises funds for green projects. These instruments are accepted as new in financial circles. In contrast to green credits that get involved in direct financing, the revenues from these bonds are usually used to fund low-carbon projects as well as ecologically beneficial projects. Institutions such as municipalities, companies, government agencies, and supranational organizations usually prefer to issue green bonds instead of normal bonds as this is accepted as the signaling device of commitment to the environment by various stakeholders like managers, shareholders, clients, and society. After ratifying the Paris Climate Agreement in 2021, Türkiye has started to prepare a long-term climate action plan, including regulations for green bonds. In this plan, the Capital Markets Board issued the Green Debt Instruments and Green Lease Certificate Guide in 2022. This study explores the standards and features of green bonds, delving into their origin and presenting relevant statistics. Additionally, it investigates global and Turkish green financing arrangements, including alternative investment instruments such as green sukuk.

**Keywords:** Green bonds, green financing, sustainability

## 1. Introduction

One of the goals of sustainable development (SDGs) by the United Nations, the 13th goal is to reduce greenhouse gas emissions and adapt to the negative effects of climate change with the target of transforming the world into a better place (United Nations, 2023). The targets of this goal include strengthening the “resilience” and “adaptive capacity” to climate-related dangers and natural catastrophes throughout the world, together with increasing training, awareness, and institutional capacity. Integration of these targets into the national policies and preparation plans and strategies and educating humanity to help keep climate change at a reasonable level. Also, mobilizing sources for taking necessary actions and operating the Green Climate Fund most efficiently are among the targets of the climate goal (United Nations, 2016).

The financial industry is increasingly regarded as critical to hastening the transition to sustainability and carbon neutrality. One factor is the need to mobilize enormous sums of private money to satisfy the investment requirements for meeting the Paris Agreement’s climate objectives and the United Nations SDGs (Maltais and Nykvist, 2020). However, still, there are obstacles in front of the “green infrastructure” and, consequently, “green bonds” in the financial world. The institutional investment still has not reached the levels desired. The reasons for institutional investors’ reluctance to participate directly in green infrastructure range from legal and legislative uncertainties in the energy and environment to hazards particular to new technology-related projects, making it difficult for rating agencies to provide adequate investment-grading scales. Capital is significantly dispersed across the clean energy project cycle, with smaller-scale agreements or energy efficiency initiatives lacking aggregation methods. These challenges are exacerbated by a scarcity of suitable investment vehicles (such as green bonds or funds) that provide the liquidity and risk/return profile required by institutional investors. Furthermore, pension fund trustees, who are not environmental experts and are frequently non-financial professionals, are apprehensive about increasing their exposure to emerging clean technology (Della Croce and Yermo, 2013).

Within the scope of combating climate change, the United Nations Framework Convention on Climate Change (UNFCCC), which Türkiye also joined on May 24, 2004, is the first and most important step taken in the international arena. In this context, the Paris Agreement was adopted at the UNFCCC 21st Conference of the Parties held in Paris in 2015. Türkiye signed the Paris Agreement with the representatives of 175 countries at the High-Level Signing Ceremony held in New York on April 22, 2016. The agreement was approved on October 6, 2021, and entered into force in Türkiye on November 10, 2021. At the same time, Türkiye’s 2053 net-zero emission target was announced (TC Ticaret Bakanlığı, 2023).

One of the financial tools used to finance such initiatives and raise funds to prevent catastrophes is the use of green bonds, which is a debt instrument to raise funds for green projects. These instruments are accepted as new in financial circles in contrast to green credits that get involved in direct financing, and revenues from these bonds are usually used to fund low-carbon projects as well as ecologically beneficial projects. Institutions such as municipalities, companies, government agencies, and supranational organizations usually prefer to issue green bonds instead of normal bonds as this is accepted as the signaling device of commitment to the environment by various stakeholders like managers, shareholders, clients, and society (Khurram et al., 2023).

This chapter aims to identify the relation and importance of green bonds in reaching the 13<sup>th</sup> goal of the United Nations SDGs, which is to reduce greenhouse emissions and adapt to their negative effects. For this purpose, the history of green bonds with their rules and regulations is given in the following sections. Section two gives the European Deal details, which summarizes the European look at the green bonds, and the third section about the United Nations SDGs and the thematic bonds gives details of the sustainable goals and thematic bonds. After the importance as a financial tool is summarized in the Fourth Section, green bonds are analyzed as green finance tools, and different green bonds are investigated with their categories and standards in the sub-sections of the fourth section. Section five summarizes the performance of green bonds historically in volumes with the help of graphics, and the countries with the highest volumes of green bonds are also illustrated. Section six gives a detailed history of green transformation and green bonds in the banking sector in Türkiye, together with the alternative Islamic product green sukuk. In the seventh section of the study, sustainability and the green bonds traded in Borsa Istanbul are given in detail, and the eighth and last section concludes the chapter.

## **2. The European Green Deal**

In December 2019, the European Commission introduced the European Green Deal, an ambitious policy package aimed at taking the European Union economy to a more sustainable and greener level. The overall objectives of the Consensus, which is considered a bold step to combat the climate crisis that the whole world is facing, can be summarized as reducing net greenhouse gas emissions to zero by 2050, becoming the first climate-neutral continent, and turning the transition to a green economy into an economic and industrial opportunity for Europe. In addition to policy packages, the Green Deal consists of various financial supports for research on environmentally friendly technologies. The Agreement's aims are, in principle, to reduce net greenhouse gas emissions to zero by 2050, separating resource usage

from economic growth, and that no location or group of people should be exempt from these regulations or fall behind (Keleş, 2021).

The European Green Deal is viewed as both a reaction to climate change and a new growth strategy to reshape the European Union economy into a sustainable economic model as well as achieve goal 13 of the sustainable development goals. With this new growth strategy, the European Union declares that there won't be any net greenhouse gas emissions in 2050 and that economic development will be decoupled from resource use. The goal is to create a developed, resource-efficient, and competitive society with a growing economy. By reducing environmental threats, the European Union aims to conserve its natural resources and safeguard its inhabitants' health and well-being. It also emphasizes how equitable and inclusive this transition is (Baydemir, 2021).

To guide sustainable projects and activities of investments under the European Green Deal, the European Union is expanding a list of growth-sustainable economic structures and a demonstration system called European Union taxonomy, which helps them identify which economic growth movements are sustainable as their changes. This potential was published in the European Union Taxonomy Regulation, the Official Journal of the European Union, on 22 June 2020 and entered into force on 12 July 2020 (Değerli, 2002). A framework for categorizing "green" or "sustainable" economic activities carried out in the European Union is described in the European Union taxonomy legislation. Green, sustainable, or environmentally friendly economic activity was not previously clearly defined. A precise definition of whether a business or industry is running sustainably or ecologically friendly is provided by the European Union taxonomy rule, which establishes a defined framework for the idea of sustainability. These businesses stand out favorably when compared to their rivals and ought to gain from more investments. By rewarding and promoting environmentally friendly company practices and technology, the Act serves this purpose (European Union, 2020).

### **3. Sustainable Development Goals and Thematic Bonds**

The United Nations SDGs, ocean conservation, education, housing, and other relevant initiatives and activities may all be funded with the help of thematic bonds, which are fixed-income securities that are issued in the capital markets. Bonds having a sustainability component do not specify a specific use for the profits. Instead, the issuer undertakes to follow several sustainability-related guidelines and deadlines (ICMA 2021). Green (G), social (S), sustainability (S), and sustainability-linked labeled bonds (S or +) are examples of sustainable financing products used in the literature. Green, social, sustainability, and sustainability-lin-

ked labeled bonds are examples of such sustainable financing products for this study. Gender bonds are seen as a subclass of social bonds, whereas blue bonds are a subdivision of green relationships. The terms GSS, GSS+, environmental, social, and governance (ESG), or sustainable bonds are other names for thematic bonds. Proceeds from sustainability bonds are used to fund both environmental and charitable endeavors. Since funds obtained through these securities are reserved for certain initiatives that are intended to produce the desired effects, green, social, and sustainability bonds are sometimes referred to as use-of-proceeds bonds (Kothari and Agarwal, 2023).

To increase long-term investments in sustainable economic activities and projects, sustainable finance refers to the process of taking ESG issues into account when making investment choices in the financial sector. In addition to the environment more generally, such as the preservation of biodiversity, pollution avoidance, and the circular economy, environmental issues may also involve the mitigation and adaptation of climate change. Social concerns might include human rights problems as well as inequality, inclusivity, labor relations, and investments in people, their talents, and communities. A key factor in ensuring the incorporation of social and environmental factors in the decision-making process is the governance of public and commercial organizations, which includes management structures, employee relations, and CEO compensation (European Commission, 2023).

The term “sustainable finance” is wider since it includes the application of ESG factors to financing choices. Allocating money to the most productive uses is the major responsibility of the financial system. Finance can take the lead in providing capital to sustainable businesses and projects, accelerating the shift to a more circular and low-carbon economy. Examining how money (investment and lending) interacts with social, political, and environmental concerns is part of sustainable finance. Finance may help in the allocation function by providing strategic advice on how to balance competing sustainable goals. Additionally, investors have power over the companies in which they make investments. Long-term investors can influence corporations to adopt sustainable business practices in this way. Last but not least, finance is skilled at valuing risk and may thus assist in coping with the inherent uncertainty surrounding environmental challenges, such as the effect of carbon emissions on climate change (Schoenmaker and Schramade, 2019).

The earnings from sustainability bonds fund a mix of environmental and charitable endeavors. Green, social, and sustainability bonds are sometimes referred to as “use-of-proceeds bonds” since the funds produced through these instruments are reserved for certain initiatives that are intended to produce the desired effects. Proceeds from green bonds are intended to



fund initiatives and endeavors that are anticipated to have a favorable environmental impact. Ocean and marine conservation initiatives are funded via blue bonds. Social bonds assist issuers in addressing societal inequities by raising money for initiatives with favorable social benefits anticipated. Social project categories include access to basic infrastructure “(clean drinking water, energy, and sanitation)”, affordable housing, employment creation, and food security. Gender bonds are only concerned with gender equality (Hussain, 2022)

One of the fundamental tenets of sustainable development is living within the bounds of the environment. Climate change is one result of doing nothing about it. Sustainable development, however, has a far larger focus than merely the environment. It also involves ensuring a powerful, wholesome, and equitable society. This entails addressing the many needs of every individual in present-day and future-day communities, fostering individual welfare, social inclusion, and cohesiveness, and fostering equality of opportunity (Sustainable Development Commission, 2023). Sustainability and finance both consider the future. Over the past few decades, the concept of sustainable finance has gone through many stages, with the emphasis steadily shifting from immediate profit to long-term value generation. A significant advance in tackling social and environmental concerns is the shift from risk to opportunity. While financial institutions began to steer clear of unsustainable businesses due to risk, leaders are increasingly investing in sustainable businesses and initiatives (Schoenmaker and Schramade, 2019).

#### **4. Green Bonds and Their Importance**

The first green bond was issued by the World Bank in 2008 in partnership with the Swedish Bank. The total issuance in the sustainable bond market, which broke a record of USD 1 trillion in 2021, decreased to USD 863.4 billion in 2022. This decline, which is also seen in the conventional bond market, did not change the share of sustainable bond issues in total, and this ratio remained at the level of 5% in 2022. Green bonds, which continue to dominate the sustainable issuance market, had a share of 56%, with USD 487.1 billion in 2022. Sustainable, social, and sustainability-related issues had a share of 19%, 15%, and 9%, respectively, while the share of transformation-themed bonds in the transition to a low-carbon economy remained below 1% (TSKB, 2022).

Late 2007 was the starting point of the “green bond” adventure when Swedish pension fund managers from the Swedish Bank (SEB) called the World Bank to discuss and asked for help on how to issue a bond to support climate change. By issuing this initial “green bond,” the World Bank started a new era for investors to fund climate projects or wanted to invest to

invest in climate-friendly initiatives. The World Bank green bond increased awareness about the difficulties of climate change while also demonstrating the possibilities for investors to assist climate solutions via safe investments while still earning financial benefits. However, the concept of a bond that is dedicated to a specific kind of project has not been tested before. The green bond was a historic event that radically altered the way investors, development specialists, lawmakers, and scientists collaborated (World Bank, 2019). Soon after, the first green bonds issued by the World Bank were issued by the IFC in 2010. As of 30 June 2022, the IFC had issued a total of USD 10.5 billion in green bonds, making it one of the major green bond issuers (Kothari and Agarwal, 2023).

The legislative and regulatory environment, market circumstances, and financing trends all have an impact on how quickly green bond markets evolve and develop. The developing green bond market also confronts some unique difficulties and hindrances to ongoing development and expansion. There are several of these issues, including underdeveloped domestic bond markets, a dearth of bankable and standardized green projects, a lack of widely acknowledged green standards and definitions, issuers' perspectives on costs vs. benefits, and a general scale mismatch between projects, bonds, and institutional investors (OECD, 2015). There is a growing literature on green bonds as the number of investments in these instruments increases. investors are willing to give up financial benefits to invest in environmentally friendly or socially responsible assets. However, when Larcker and Watts (2020) analyzed green municipal bonds in the US and compared them with non-green bonds, they found no distinction between the two types of bonds, concluding that US municipal bondholders are hesitant to sacrifice real wealth in exchange for societal advantages when they invest in sustainable assets conversely to several recent theoretical and experimental research (Larcker and Watts, 2020).

Despite these challenges, green bonds increase awareness and consciousness about climate change concerns and highlight the chance for institutional investors to support climate-friendly investments through liquid securities while retaining financial gains. Green bonds also emphasize the social value of fixed-income investments and the need for more transparency. They have also altered investor behaviors. In ten years, investors started to publish their identity and offer quotations when they purchase green or other labeled bonds, and they are much more conscious about their capacity and power to support initiatives through their investments. As a result, social bonds, blue bonds, and other bonds that raise funds for specific development purposes have emerged. All adhere to the green bond concept, with an emphasis on impact reporting. The growing interest among investors in their investments' social and environmental impact signals a fundamental shift in the bond market. Investors recognize their

ability to support programs that are important to their stakeholders without sacrificing profits. They also want statistics on how they are tackling ESG issues, especially as they increasingly recognize that by producing social value, they are also lowering the risk to their investments. In general, an issuer with solid sustainability standards will be a more effective investment. Issuers are reacting and interacting with investors to demonstrate how their bonds provide chances for both financial and social benefits (World Bank, 2019).

#### **4.1. Green Bonds as a Tool for Green Finance**

A green bond can be distinguished from a standard bond by its designation, which denotes a promise to utilize all money obtained to finance or refinance “green” projects, assets, or business operations. Green projects are initiatives that advance ecologically friendly practices. A way to raise money for green ventures is through green bonds. They provide investors the chance to explicitly choose and consciously fund green enterprises. To raise money for green initiatives, green bonds can be used to draw in new investors (European Commission, 2016).

The four major categories of green bonds are as follows (ICMA, 2021);

1. **“Standard Green Use of Proceeds Bond”** – These are unsecured debt commitments that only provide the issuer complete recourse if investors aren’t paid back as agreed.
2. **“Green Revenue Bond”** – These are debt contracts with no recourse to the issuer, where the bond’s credit exposure is to the cash flows of committed fees, taxes, and income sources, and where the profits are used for connected or unrelated green projects.
3. **“Green Project Bond”** – The project bonds are for one or more green projects, and the investor is directly exposed to the project’s risk, with or without the possibility of suing the issuer.
4. **“Secured Green Bond”** – These are secured bonds, the net proceeds of which may be applied to the financing or refinancing of the particular Green Project that serves as the security for the bond (“Secured Green Collateral Bond”) or other Green Projects of the issuer, sponsor, or originator that may or may not be serving as a security for the bond (“Secured Green Standard Bond”). These are often secured instruments, such as covered bonds, securitizations, asset-backed commercial paper, secured notes, etc., where the assets’ cash flows can be used as a source of repayment or where the assets act as security for the bonds before other claims.

The primary participants in the bond market can be divided into issuers (organizations with green projects that require financing or refunding), underwriters (financial bodies organizing the issuance of the green bonds), external reviewers (confirming the “greenness” of the underlying projects), intermediaries (like stock exchanges), and investors (especially the ones with a requirement to purchase green assets). Due to their dedication to green transparency, issuers of green bonds may see improved risk mitigation procedures. However, bond investors, particularly long-term responsible investors, have greater possibilities of proactively interacting with issuers on ESG aspects relevant to the projects they are funding. In addition to bank lending and equity financing, the green bond market can offer long-term funding for green projects in areas where the availability of long-term bank loans may be constrained. Given the worldwide commitment to transition to a low-carbon economy, it is anticipated that the green bond market will expand and draw more diversified issuers and investors (European Commission, 2016).

## 4.2. Green Bond Standards

Corporate Finance Institution (CFI) defines the green bond as a type of financial security that is issued by a company to finance or refinance initiatives that have a beneficial impact on the environment and/or the climate. A climate bond is another name given for a green bond. The projects that mostly receive financing from green bonds are (CFI Team, 2021):

- energy-saving initiatives
- green energy initiatives
- programs aimed at preventing and reducing pollution
- projects involving natural resources and land management
- green transportation initiatives
- water and waste management initiatives
- green construction initiatives

The International Capital Market Association (ICMA) issued Green Bond Principles (GBPs) in June 2021. The GBPs are a set of voluntary process standards that encourage openness and disclosure and support integrity in the growth of the green bond market by outlining the procedure for issuing green bonds. The GBPs are designed for widespread market use, serving as a guide for issuers on the essential elements of launching a reliable Green Bond, a resource for investors to evaluate the environmental impact of their Green Bond investments, and a tool for underwriters to assist in facilitating transactions that protect the market’s integrity. The Social Bond Principles (SBPs), the Sustainability Bond Guidelines (SBGs), and the Sustainability-Linked Bond Principles (SLBPs) are all published under the jurisdiction of the same principles, as

are the GBPs. The mission and vision of the principles, which are a set of voluntary frameworks, aim to promote the role of global debt capital markets in financing progress toward environmental and social sustainability (ICMA, 2021). Following the voluntary GBPs established by the ICMA, the IFC has issued its own Green Bonds Framework as well as a step-by-step manual for issuing a green bond, the Green Bond Handbook. The main underlying premise for identifying the eligibility of a project is the existence of evident environmental benefits, even if the GBPs give an indicative (not full) list of eligible Green Projects. The following is a list of possible categories for Green Projects that are GBP-eligible (Kothari and Agarwal, 2023).

The European Commission, a key proponent of green bonds, has developed the European Green Bond Standard (EUGBS), which should establish strict sustainability rules to safeguard investors and become the “gold standard” for how businesses and governmental entities can raise green bonds. Any issuer of green bonds, including those from outside of the European Union, is eligible to participate in the EUGBS. The fundamental requirements are that the money must be completely and transparently awarded to projects that adhere to the European Union taxonomy and are subject to external scrutiny by recognized third parties. The EUGBS will initially be a voluntary standard, but it may eventually become a requirement for issuers (UBS, 2022).



**Figure 1.** Possible Categories for Green Projects that are GBP-Eligible

Source: Kothari and Agarwal, 2023

The key features of the EUGBS are shown above (Figure 1) are listed and explained below (European Commission, 2021):

**“Inclusive”:** All issuers in the European Union and outside the European Union, including corporations, sovereigns, financial institutions, and producers of covered bonds and asset-ba-

cked securities, will be eligible to participate. There will be a certain constrained amount of freedom for sovereign issuers.

**“Voluntary”:** It will be a voluntary standard outlining universal conditions for any bond issuers who want to refer to their bond as a “European green bond” or “EUGBS”.

**“Aligned with the European Union Taxonomy”:** By the time the bond matures, issuers must have committed 100% of the cash (proceeds) raised by the bond to commercial activities that comply with EU Taxonomy criteria.

**Supporting issuers in transition:** Long-term initiatives (lasting up to 10 years) that match economic activities with the European Union Taxonomy can be financed using European green bonds.

**“External review”:** An outside examiner will examine European green bonds to make sure they abide by the EUGBS Regulation, particularly concerning the financed projects’ taxonomy alignment. The European Securities and Markets Authority (ESMA) will require continuing compliance with the registration requirements for external reviewers to register them.

**“Grandfathering”:** If the EU Taxonomy Technical Screening Criteria (TSCs) change after the bond is issued, issuers have an additional five years to employ the previous standards.

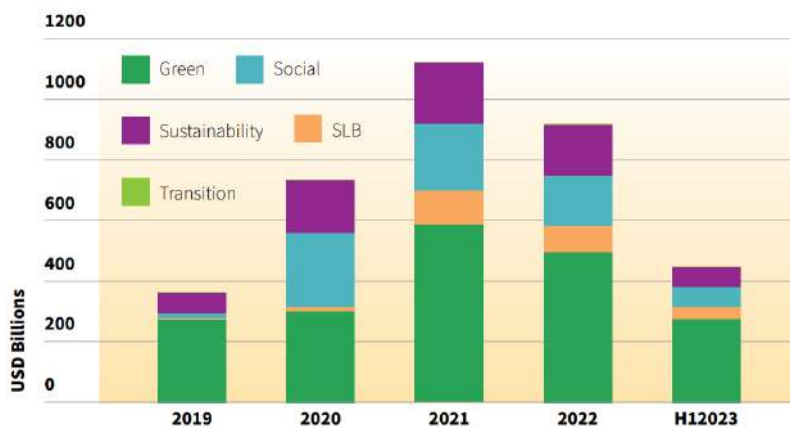
All issuers, both inside and outside the EU, including businesses, governments, financial institutions, and those that produce covered bonds and asset-backed securities, will have access to EUGBS. The freedom granted to sovereign issuers will be precise and limited. The standard, which will be voluntary, would provide uniform requirements for any bond issuers who wish to call their bond a “European green bond” or “EUGBS.”

## 5. Green Bond Volumes in the World

After the World Bank first issued the “green bond” labeled bonds to institutional investors in 2008, the use of sustainable debt instruments, especially thematic bonds and loans, is increasing day by day. According to some research institutions, the global green bond market exceeded USD 700 billion in 2020. Income from this market was used mostly in the energy sector, low-carbon buildings, and transportation sectors, respectively. By 2021, the green bond markets grew even more and the global green bond market exceeded USD 1 trillion. This amount represents a 20-fold increase compared to 2015 and represents 1% of the global debt markets (Şimşek and Tunalı, 2022). In addition to green bonds, the issuance of social bonds, sustainable bonds, sustainability-linked bonds, and transitional bonds markets have been on an increasing trend since 2019 (Climate Bonds Initiative, 2023a).

Debt held by GSS+ exceeded USD 4 trillion. The Climate Bonds Initiative (Climate Bonds) has accumulated USD 4.2 trillion in green, social, sustainability, transition, and sustainability-linked (GSS+) debt by the end of the first half of 2023 (H1 2023), under its screening methodology (aligned). This sum comprised USD 448 billion of aligned GSS+ debt that was recorded in H1 2023, a 15% year-over-year (YoY) decrease from the first half of 2022 (H1 2022). 62% of alignment volume was made out of green bonds, with USD 278.8 billion registered in H1. Debt related to sustainability and social issues came in second and contributed 15% and 14%, respectively. The most active month was February, with a total aligned GSS+ volume of USD 81 billion. With 47% of the H1 volume (USD 210.9 billion) of aligned GSS+ trades, EUR was the main currency. The EUR led the currency chart for the sixth year running.

By the end of 2022, the volume of GSS+ bonds issued on a global scale reached USD 3.7 trillion. In 2022 alone, USD487.1 billion of green bonds were issued, with sustainability bonds contributing USD166.4 billion, social bonds totaling USD 130.2 billion, sustainability-related bonds USD 76.3 billion, and transitional bonds USD 3.5 billion (Climate Bonds Initiative, 2023a).

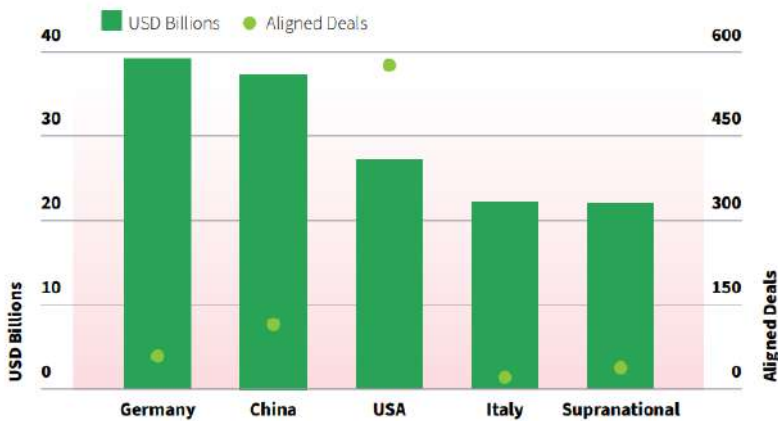


**Figure 2.** Cumulative Volume of the Thematic Bonds (GSS+)  
**Source:** Climate Bonds Initiative (2023a)

In Figure 2, it can be seen that by H1 2023, GSS+ volume has been around USD 4.2 trillion in volume. With these numbers, green bond issuance surpasses that of fossil fuels. According to Bloomberg, in H1 2023, acquisitions promoting low-carbon energy outnumbered those coming from fossil fuel businesses. While this was going on, 58% (USD 263.6 billion) of the aligned volume reported by Climate Bonds in H1 2023 was set aside for re-

newable energy Use of Proceeds (UoPs) deals. These UoPs are proceeding from instruments that are devoted to certain initiatives, investments, activities, or expenditures that meet the requirements for the Climate Bonds sector. Access to low-carbon energy is a key decarbonization lever for organizations functioning in practically all industries. Given their high energy demands and consumption, steel and cement manufacturing processes, electric cars, energy-efficient buildings, and even energy-efficient structures depend on the availability of low-carbon energy as part of the entity-level plan to reach net zero. As a result, the fact that green partnerships with Low Carbon Energy UoP surpassed those with fossil fuel businesses is a significant milestone, indicating that finance for the growth of clean energy is increasing (Climate Bonds Initiative, 2023a).

In Figure 3, Climate Bonds reported aligned volume with the green label of USD 278.8 billion in H1 2023, a modest decrease of 4% from the USD 290 billion reported in H1 2022. The greatest green bond volume producers were Germany and China, with 14% (USD 39.2 billion) and 13% (USD 37.4 billion) of the market share, respectively. China's overall volume decreased, but its green-labeled issuance continued to expand, making it the second-largest supplier of green volumes. With USD 51.2 billion, March was the biggest month for aligned green volumes. 18% (or USD 52.4 billion) of the aligned green volume was accounted for by sovereigns. With USD 15 billion split across two new offers and three reopenings, Germany priced the greatest volume of green sovereigns. Italy and the United Kingdom came next, with purchases totaling USD 13.8 billion and USD 9.8 billion, respectively. With a share of 73% (USD 38 billion), EUR was the favored currency for aligned sovereign green bonds.



**Figure 3.** Highest Green Bond Volumes and Their Aligned Deals  
**Source:** Climate Bonds Initiative (2023a)



## **6. Green Bonds in Türkiye**

After ratifying the Paris Climate Agreement in 2021, Türkiye started to prepare a long-term climate action plan, including regulations for green bonds. Increasing the share that Türkiye will receive from international green finance and green investments and strengthening the ecosystem that will enable the development of green finance in our country in this direction is important to support the development of a sustainable, resource-efficient, and green economy.

The speed at which green bond markets develop and mature hinges on many variables, including policy and regulatory factors, market conditions, and financing trends. Additionally, the evolving green bond market faces a range of specific challenges and barriers to its further evolution and growth. These include underdeveloped domestic bond markets, insufficient pipelines of bankable and standardized green projects, a lack of commonly accepted green standards and definitions, issuer's views on costs vs. benefits, and a general scale mismatch between projects, bonds, and institutional investors.

### **6.1. Green Transformation in Türkiye**

The fact that the impacts of climate change are severe all over the world has increased the importance of the transition to a green economy within the framework of the concept of sustainability. With approaches such as the European Green Consensus announced by the European Union at the end of 2019, the weight of climate change in global economic policies is increasing under the leadership of developed countries. This situation brings with it the necessity of green transformation in industry and economy in general according to the new policies to be implemented by countries, especially within the European Union, which is our main export market. The process of integration with global value chains and attracting more international investment during the program period was shaped by taking into account the targets and actions included in the Green Reconciliation Action Plan within the framework of this new understanding. New approaches supporting the green transformation and transition to the circular economy in the fields of industry, trade, transportation, environment, and energy will be implemented within the framework of support and credit incentive mechanisms, taking into account foreign financing opportunities. The competitiveness of exports will be increased in line with climate change policies in the field of international trade by supporting investments that increase efficiency and limit the increase in greenhouse gas emissions, especially in recycling technologies. By completing the Green Organized Industrial Zones and green industrial zone certification system, the creation of environmentally sensitive, sustainable industrial and circular economy areas will be accelerated.

The Ministry of Treasury and Finance published a document named the “Sustainable Finance Framework Document” on the ministry website on 12 November 2021 in the Presidential Circular published in the Official Gazette dated 16 July 2021 and numbered 31543 (The Ministry of Treasury and Finance, 2021). The Circular allows the Ministry of Treasury and Finance to carry out borrowing transactions in the form of green, social, or sustainable bonds or lease certificates in the international ESG debt instruments market on behalf of Türkiye. A possible green bond issuance to be made by the Ministry of Treasury and Finance in the international ESG market is important in terms of financing Türkiye’s medium and long-term development goals and supporting sustainable economic growth. It will also contribute significantly to the fulfillment of the United Nations SDG commitments and compliance with the European Green Agreement (T.C. Ticaret Bakanlığı, 2022).

The execution of the goals and measures outlined in the Green Deal Action Plan is prioritized in the 2022–2024 Medium Term Program (MTP), which includes a section on the “Green Transition”. Supporting investments that increase efficiency and aim to limit the increase in greenhouse gas emissions, especially in recycling technologies, supporting research and development to accelerate the green transition, finishing the green industrial zone certification system and green organized industrial zones, and developing the regulatory framework of the financial sector to facilitate the green transformation of the sector are the main objectives of the green transformation section, which includes seven policies and actions. The program also supports investments in manufacturing that consider the environment, expanding zero waste practices to include homes, and encouraging green bonds and sukuk issuances through the development of a handbook following international standards (T.R. Ministry of Treasury and Finance, 2021).

The Medium-Term Program for the 2023 - 2025 period was published in the Official Gazette dated 04 September 2022 and numbered 31943 (Orta Vadeli Program, 2022), and the Central Government Budget Law Draft for 2023 was submitted to the Presidency of the Turkish Grand National Assembly on 17 October 2022. After the Parliament discussions, the Central Government Budget Law was accepted on 16 December 2022 with decision number 6003 and entered into force by being published in the Official Gazette dated 31 December 2022. (2023 Yılı Merkezi Yönetim Bütçe Kanunu, 2022). In the announcements made to the public by the Ministry of Treasury and Finance within the scope of the 2023 Borrowing Strategy, it is written that the Treasury Financing Program was prepared based on the Medium-Term Program and Central Government Budget projections and that conventional bonds, lease certificates, green bonds, social bonds and/or sustainable bonds in various maturities

can be issued depending on market conditions to obtain financing from international capital markets (T.C. Hazine ve Maliye Bakanlığı, 2022).

“Green Finance and Carbon Pricing” was one of the seven commissions established to form the basis for our national climate studies on climate change at Türkiye’s first Climate Council held in Konya between 21-25 February 2022. “Green Finance” was also discussed under the “Green Financing and Carbon Pricing” main commission. Representatives of all public and private sectors, universities, and non-governmental organizations related to the subject from all over Türkiye came together and worked extensively; online meetings, commission meetings, roundtable meetings, and general assembly meetings were held. As a result of all opinions and evaluations, eleven recommendations were reported to make studies, take decisions, and prepare and implement regulations about “Green Finance” including, green taxonomy, green financing instruments, markets for green and sustainable bonds, lease certificates, and other instruments (T.C. Çevre, Şehircilik ve İklim Değişikliği Başkanlığı, 2022).

## **6.2. Sustainable Banking and Green Bonds Issued in Türkiye**

Following the United Nations SDGs, which aim to find solutions to global problems and contribute to the Climate Action, Accessible, and Clean Energy SDGs, Türkiye’s financial institutions are also trying to contribute to the sustainability journey by issuing financial green instruments. They are also contributing to the updates of the Global Compact Türkiye Sustainable Finance Statement, which we signed in 2017, for the same purpose. This section of the study aims to give some examples of the green bonds issued by the Turkish Financial Institutions as well as the Turkish Treasury.

The banking sector is among the first sectors that implemented sustainability and sustainable finance practices among financial institutions. Access to finance is of vital importance in projects and investments to be implemented both in the fight against climate change and in adapting to the variable conditions brought about by climate change (Türkiye Bankalar Birliği, 2022). In the field of green financing, the Turkish banking sector provides substantial financing, especially in renewable energy, which is critical in the fight against climate change. When we consider September 2021 figures, the total cash financing balance provided to renewable energy reached TL 200 billion (USD 22.6 billion). The said amount corresponds to 4.9% of the total loans of the Turkish banking sector and 2.8% of the total assets (Bankacılık Düzenleme ve Denetleme Kurumu, 2022a).

The first issuance considered as green security following internationally accepted standards was the green bond issuance with a maturity of 5 years and amounting to USD 300 million, carried

out by the Türkiye Sınai Kalkınma Bankası (Industrial Development Bank of Türkiye) in 2016. This was followed by the issuance of sustainable subordinated bonds with a 10-year maturity and USD 300 million issued by the same Bank in 2017. One of the applications that has attracted attention in the recent period is the mortgage-backed securities issued to finance environmentally friendly and energy-efficient housing (Bankacılık Düzenleme ve Denetleme Kurumu, 2018).

The first green bond to be used in renewable energy projects, with a maturity of 5 years, worth 50 million dollars, issued in January 2020, was issued by Yapı Kredi Bankası, one of the leading commercial banks of Türkiye. Yapı Kredi Bankası announced that this issue also contributes to Türkiye's strategy of transition to a low-carbon economy, as well as Accessible and Clean energy (7) and Climate Action (13) targets of the United Nations SDGs. Being aware of the responsibility in the fight against climate change, Yapı Kredi Bankası announces that they monitor the environmental and social impacts arising from operational and lending activities and update their policies when necessary (Yapı Kredi Bankası, 2020a).

Furthermore, Yapı Kredi Bankası also announced that the Bank is among the leading banks in many prestigious sustainability indices such as the Financial Times Stock Exchange Group (FTSE), the FTSE4Good Emerging Markets Index, which evaluates the environmental, social, and corporate governance performance of companies, and the Borsa Istanbul Sustainability Index, with the work in the field of sustainability. In the upcoming period, Yapı Kredi Bankası is enthusiastic to continue to work with the understanding of sustainability and continue to offer services that correctly respond to the needs of society and the stakeholders. With this issue, Yapı Kredi Bankası was awarded the MTN Awards 2020 "Deal of the Year" in the category in the Socially Responsible Investment: Green, Social, Sustainable category (Yapı Kredi Bankası, 2020b).

In this scope, the Ministry of Treasury and Finance made its first green borrowing through Bank of America, ING, JP Morgan, and Standard Chartered, which it authorized on April 5, 2023. Within the framework of the USD-denominated green bond purchase order with a maturity of 2030, a nominal amount of USD 2.50 billion was sold, and the transfer of the funds to Treasury accounts was completed on April 13, 2023. The coupon rate of the 7-year green bond was determined as 9.15%, and the return for investors was 9.30%. In the tender, more than 3 times the amount to be sold was received from approximately 200 accounts. The investor distribution was as follows: 31 percent from England, 19 percent from Türkiye, 18 percent from the USA, 16 percent from the Middle East, 15 percent from other European countries, and 1 percent from other countries. This green bond was issued as the first ESG bond issuance by the Undersecretariat of Treasury in international capital markets (T.R. Mi-

nistry of Treasury and Finance, 2023). In Table 1, the share of the green bonds, details about them, and the price can be found.

Table 1. International Bond Issuances in 2023							
Issue Date	Currency	Size	Maturity Date	Coupon Rate (%)	Price (%)	Yield to Investor (%)	Yield to Investor (Spread)
19.01.2023	USD	2.75 billion	19.01.2023	9.375	97.638	9.750	UST + 619.2 bps
14.03.2023	USD	2.25 billion	14.03.2023	9.375	99.438	9.500	UST + 516.7 bps
13.04.2023	USD	2.50 billion	13.04.2023	9.175	99.117	9.300	UST + 596.8 bps
Source: T.R. Ministry of Treasury and Finance (2023)							

As we mentioned above, the general strategy and steps of green transformation in our country were determined by the “Green Reconciliation Action Plan” published in July 2021. In the said Action Plan, the task of preparing the “Sustainable Banking Strategy Document” was given to the Banking Regulation and Supervision Agency. The main purpose of this document is to determine the general strategies and policies necessary for the Turkish banking sector to establish a sustainable banking infrastructure in the future. In this context, during the preparation of the strategy document, close cooperation was made with the related parties, especially with the banks that are members of the Banks Association of Türkiye and the Participation Banks Association of Türkiye, and great importance was attached to receiving the contribution of sector representatives (Bankacılık Düzenleme ve Denetleme Kurumu, 2022).

The Sustainable Banking Strategy Document primarily focuses on the establishment of a sustainable banking infrastructure and includes approaches regarding the procedures and principles that our banks will take as a basis in their sustainability activities within the framework of international standards and practices. In other words, the strategy of the possible sustainable banking regulatory framework is determined first. Second, the Strategy Paper sets out general approaches to managing sustainability risks. For this purpose, the basic principles for the quantification, measurement, and analysis of the “climate-related financial risks” of the Turkish banking sector, which are classified as physical risks, transition risks, and reputational risks, are determined in the document. The policies outlined in the Strategy Document aim to develop sustainable banking activities while preserving the financial soundness of the sector. We expect that the steps to be taken in this context will also contribute to the provision of cost-effective resources from international markets for the green transformation of the real sector (Bankacılık Düzenleme ve Denetleme Kurumu, 2022a).

The Banks Association of Türkiye summarized the recent studies and developments in the past few years which have been carried out with a focus on sustainability in the field of finance and banking in Türkiye (Türkiye Bankalar Birliği, 2022).

On 2 October 2020, CMB amended the Corporate Governance Communiqué and announced the Sustainability Principles Compliance Framework. The Capital Markets Board's Communiqué No. II-17.1.a on the Amendment of the Corporate Governance Communiqué No. II-17.1, which was published in the Official Gazette on October 2, 2020, and made public via a press release by the Capital Markets Board, marked the implementation of the Compliance Framework. This step aims to improve sustainability efforts for sustainability reporting, and disclosure among publicly held companies. The Outline is effective as of the 2020 Annual Reports, published in 2021. Companies are expected to integrate, follow, and disclose on a voluntary, "comply or explain" basis. In other words, the companies are under obligation to report and disclose whether they comply with these principles or the reasons for failure to comply. The Framework contains the basic principles that publicly held companies should build with determining sustainability priorities, strategy for risks, opportunities, governance structures, policies regarding climate, energy, employee and human rights, and following certain key performance indicators (Kurumsal Yönetim Tebliği (II-17.1)'nde Değişiklik, 2020). (Kurumsal Yönetim Tebliği, 2014). Corporate governance is a set of laws, rules, and pertinent voluntary private sector practices that enable an organization to attract capital and talent, be run effectively, and thereby provide stability by generating long-term financial gains for its shareholders, without jeopardizing beneficiaries' and the public's interests where four guiding principles are listed as "accounting, transparency, fairness, and responsibility". The set of tools enabling to run the entity more efficiently also leads to aspects where sensitivity and awareness arise in environment, ethics, strategy in the corporation, compensation, and efficient management of risk (Conmy, 2023).

In June 2022, the CMB published a template to standardize corporate sustainability reporting based on the abovementioned CMB Framework for companies. Moreover, the CMB is cooperating with the Public Auditing Accounting Standards Board to integrate the ISSB standards for companies with certain thresholds.

### **6.3. Green Sukuk**

Green Sukuk are investments in renewable energy and other environmental assets that comply with Shari'ah (Islamic Law). They address Shari'ah's concern for environmental preservation. The money raised is put to use in financing new buildings, paying off exis-

ting construction debt, or paying back a government-issued green subsidy. They could entail securitizing future cash flows from ring-fenced projects or assets that must meet certain requirements. While the Gulf nations' solar energy plans provide several chances for Green Sukuk, they also have enormous potential for renewable energy for sustainable development and substantial investment needs to defend themselves from the effects of climate change (Climate Bonds Initiative, 2023b).

Green sukuk revenues can be used to finance environmental initiatives similarly to green bonds. However, unlike green bonds, green sukuk is a Shari'ah-compliant financial product. There are two labels on green sukuk: "Islamic" and "Green". The designation "Islamic" denotes that sukuk, an interest-free bond that yields rewards to investors, is founded on the principles of Shari'ah. Investors get a predetermined portion of the profits created by the pool of underlying assets, which investors partially own, as opposed to interest (Azhgaliyeva, 2021).

One of the benefits of Green Sukuk is the chance to bridge the gap between traditional finance and Islamic finance. Green Sukuk can appeal to both traditional investors with environmental priorities and Islamic investors with Shari'ah sensitivities. In this sense, green sukuk also supports diversification in the investor base and funds. It has been a gateway for investors who do not want to buy or issue bonds. Green Sukuk is open to all traditional and green investors. In this respect, there is more investor potential than green bonds. It is very suitable for investors who want to invest following Shari'ah or environmentally friendly principles. It is also a positive step for Islamic finance to create a new asset class (Menteşe, 2021).

Turkish green bond issuances have grown over time, although they are still modest when compared to global levels. The impact of green bond issuances on corporate stock returns is investigated in Dumlu and Keleş's study, in which they find that stock returns of the green bond issuing companies have positive and significant returns on the first day of the green bond issue (Dumlu and Keleş, 2023).

In Türkiye, however, it is projected that there is a need for an investment of USD 135 billion by 2030 and that USD 107 billion of this amount should be financed (Shura, 2021). Considering that these investments will be financed mainly by debt, the importance of debt instruments becomes clear (Dumlu and Keleş, 2023). Green bonds and Green Sukuk together can reach a much larger investor universe by using debt instruments used in financing all the sustainable projects that are planned.

## 7. Borsa İstanbul and Green Finance

Positioning itself as the single financial exchange in Türkiye, Borsa İstanbul is actively taking important roles in green finance and green transformation issues. Stock exchanges, nevertheless, need the right equipment, knowledge, and instructions to achieve this. Strategic green finance procedures are being established and conducted by stock exchanges. These include audits, research into global standards of excellence, market involvement and training initiatives, and assistance for policy discussion. Still, to do this, an exchange must either join a conversation currently taking place in the market they serve or start a conversation about how the financial center they work in may engage in green finance. Exchanges are urged to develop their sustainable finance roadmaps and participate in national policy discussions to assist green financing (United Nations, 2017). Stock exchanges are particularly positioned to set standards, direct both issuers and investors and facilitate the development required for green finance since they act as intermediaries between issuers and investors.

Stock exchanges are establishing and convening strategic green finance processes. These include stock-taking exercises, examination of international best practices, market engagement, and education efforts, and supporting policy dialogue. To start this, however, an exchange must first either engage in a dialogue already underway in their market or initiate a dialogue on how the financial center they work in can engage in green finance. Exchanges are encouraged to set out their roadmaps for sustainable finance, as well as engage in national policy processes to support green finance.

On 24 February 2022, the Capital Markets Board published the Guidelines on Green Debt Instruments, Sustainable Debt Instruments, Green Sukuk, and Sustainable Sukuk (lease certificates) based on ICMA GBPs. The Guidelines aim to clarify the regulatory framework, enhance public disclosure requirements, and contribute to the growth and credibility of sustainable bond issuances in and from Türkiye (Sermaye Piyasası Kurulu, 2022a).

CMB Guidelines are setting a basic green/sustainable project classification for the green debt instruments and green lease certificates (Sermaye Piyasası Kurulu, 2022b). In the CMB Green Bond Guidelines, the green projects taxonomy is given for the issuers of the mentioned instruments. Issuers may use the funds received from these instruments on eligible green project types, including:

- renewable energy,
- energy efficiency,
- pollution prevention and control,



- environmentally sustainable management of living natural resources and land use,
- conservation of terrestrial and aquatic biodiversity,
- clean transport,
- sustainable water and wastewater management,
- climate change adaptation,
- eco-efficient and/or adapted products, production technologies and processes, and
- green buildings.

To incentivize the financing of investments with a positive environmental/sustainable impact, the fees charged by the CMB, Borsa İstanbul, and Central Registry Agency (MKK) for the issuance of instruments under the Guidelines will be implemented at a 50% discount.

With regards to green finance, Borsa İstanbul is one of the first five exchanges that signed the foundation document of the United Nations Sustainable Stock Exchanges (SSE) in 2012. SSE launched the sustainable derivatives exchanges initiative in 2021 to spread sustainability-related work among derivatives exchanges. Borsa İstanbul is one of the founders of this international initiative as well. Borsa İstanbul serves on the Board of Directors of the World Federation of Exchanges and is also in the Federation's sustainability working group. Borsa İstanbul is also the founder of the Federation of Euro-Asian Stock Exchanges (FEAS) and carried out the General Secretary role between 1995 and 2017, where substantial efforts were undertaken involving sustainability.

Borsa İstanbul encourages listed companies to adopt sustainability as a strategic priority and provides insights through training, conferences, workshops, and awareness-raising events. Borsa İstanbul also released several guidances for the companies and the investors in the scope of green finance. In 2020, Borsa İstanbul updated the Sustainability Reporting Guide for Companies, which was first released in 2014. The Sustainability Guide, which was developed with the perspective of “Surviving in the Future,” targets directing businesses to gain more from international investment flows.

The Sustainability Guide, prepared with the theme of “Surviving in the Future”, aims to help companies to benefit more from global investment flows. The guideline includes, among others, a detailed reference to United Nations SDGs to be realized by 2030, sustainable investments and methods, integration of sustainability into business activities and its benefits, international reporting frameworks and basic principles of report preparation, and examples of environmental and social performance indicators (Borsa İstanbul, 2020). The Borsa İstanbul Sustainability Guide for Companies reveals environmental, social, and corporate

governance issues that have to be taken into consideration by companies and related reporting requirements with examples. The guideline provides a critical tool for companies to fulfill the investor's expectation of action and information on ESG and to position themselves correctly to attract more international investments.

In 2022, Borsa İstanbul prepared and published an Integrated Reporting Guide for Companies, acknowledging that guidance and good examples are crucial driving forces in sustainability. The same year, Borsa İstanbul also released a Climate Reporting Guide, encouraging listed companies to report their climate-related information. (Borsa İstanbul, 2022a, Borsa İstanbul, 2022b).

When sustainability is considered, structuring a legal framework and creating a legal framework is not enough for a revolution. The legislation and the practical applications for this framework have to be shared and discussed with the people, especially in terms of practicing the legal framework. For this purpose, Borsa İstanbul has started a training program for the staff of companies traded in the Borsa Istanbul Markets. Before 2023, more than 450 people took part in seminars given by the personnel. The seminars were performed online to have a higher and wider contribution. Borsa Istanbul provides these online courses for free to contribute to increasing awareness of sustainability and promote its Sustainability indices for the listed companies. Furthermore, participants or the staff who are in charge of the sustainability of the companies listed in Borsa Istanbul can access the documents of all the legislation and training programs from the related internet site (Borsa İstanbul, 2023).

The Integrated Reporting Network (ERTA) in Türkiye was established with the opening bell ceremony held in Borsa İstanbul at the beginning of 2017. The same year, a cooperation agreement was signed between Borsa İstanbul, ERTA, and the International Integrated Reporting Council (IIRC). Since then, Borsa İstanbul organized bell ceremonies, experience-sharing platforms, and conferences to promote integrated reporting (Borsa İstanbul, 2017). Since 2017, 38 companies, including Borsa İstanbul started to prepare integrated reports that include financial and sustainability perspectives.

## **8. Conclusion**

Türkiye ratified the Paris Agreement in October 2021 and declared a net-zero commitment to greenhouse gas emissions by 2053. In July 2021, Türkiye published the Green Deal Action Plan to harmonize with the European Union Green Deal's actual and planned policy changes by adopting compliant roadmaps for foreign trade and relevant policy areas. The amount of green finance instruments, especially green bonds, is rising in the world. Using this opportu-

nity, Türkiye is following several sustainable finance initiatives aiming to support the green transition of the economy and the United Nations SDGs. The financial initiatives are mostly organized by the Banks Association of Türkiye, Capital Markets Board, and Borsa İstanbul. However, the need for financial sources for the Green Deal Action Plan is huge, and it is difficult to finance projects in this scope. Türkiye can use Capital Markets more effectively through green bonds and especially green sukuk instruments and become a leading green finance center with the potential of huge numbers of investors in the capital markets.

To reduce greenhouse gas emissions and adapt to the negative effects of climate change with the target of transforming the world into a better place and, therefore, achieving United Nations SDG number 13, green bonds are serving as one of the most important tools to maintain the necessary monetary desideratum for the financial and social institutions. This chapter aims to give details about the green bonds, studies, and legislation to improve their power in green finance, and details of what has been done so far in the world and Türkiye. Also, the basic and detailed studies in Türkiye, which is a relatively new country joining the Paris Agreement, need to improve the green bonds market for financing more projects and reach its targets more quickly. The execution of the goals and measures outlined in the Green Deal Action Plan and issuing a detailed green taxonomy are the most privileged areas for reaching these goals for Türkiye.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







## CHAPTER 22

### TOWARDS A SUSTAINABLE BLUE ECONOMY IN TÜRKİYE: AN OVERVIEW OF KEY SECTORS AND SDG 14 TARGETS

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#### **Abstract**

The Blue Economy is an approach that promotes the sustainable management and utilization of marine and ocean resources. Sustainable Development Goals (SDG) 14 includes many targets that can be summarised as “Sustainable Use of Marine and Ocean Resources”. In this study, the general framework of the Blue Economy is drawn, and the steps taken by Türkiye to realize this goal are examined. Considering its long coastline, rich marine biodiversity and maritime potential, SDG 14 is important for Türkiye. Marine tourism, fisheries and aquaculture, and maritime transport sectors are the leading areas of the Blue Economy in Türkiye. In addition to the significant economic benefits to be realized in these sectors, Türkiye’s Blue Economy strategy also faces challenges in protecting the marine environment and ensuring sustainability. These challenges include marine pollution, overfishing, technological gaps, and diplomatic and legal barriers. Moreover, given the targets and indicators of SDG 14, Türkiye needs to strengthen its policies and efforts, particularly in protecting marine and ocean resources, promoting sustainable fisheries, conserving marine biodiversity, and investing in marine technologies.

**Keywords:** Blue Economy, Sustainable Fishing, Marina Biodiversity, Marine Pollution, Blue Tourism, Maritime Transport

## 1. Introduction

Traditional economic systems, called the **brown economy**, include economic activities that depend on fossil fuels for production and have environmentally destructive consequences. This approach is recognized as responsible for climate change. Nowadays, as an alternative to the brown economy, many research and policies focus on economic activities that use clean energy sources, reduce waste production, increase the importance of recycling and economic growth without creating environmental destruction to minimize carbon emissions, and reduce resource consumption, are called the **green economy**. Although the green economy approach has a critical role in combating climate change, considering that oceans cover a large part of our planet, researchers need to expand their perspective on sustainable development from green to blue to explore the sustainable economic potential of seas and oceans (Patil et al., 2016).

Oceans, which constitute 72% of the planet and 95% of the biosphere, are recognized as the origin of life. Oceans undertake the most critical tasks on our planet, such as oxygen production, absorption of carbon emissions, recycling of nutrients, and the regulation of the climate. Apart from their role in the planet's life cycle, oceans also have an essential status in terms of economic activities. The most important of these is that logistics activities related to approximately 80 percent of global trade are provided over the sea and oceans. For countries on the coastline, the tourism industry can significantly contribute to national income through coastal tourism. At the same time, oceans offer a significant renewable energy potential through wind, wave, tidal, thermal, and biomass resources. Fisheries and aquaculture are both important livelihoods and vital sources of food. In addition, deep-sea mining and marine biotechnology are other sectors that utilize the oceans. Considering the crucial role of oceans in the planetary life cycle and their abundance in economic activities, it can be argued that the Blue Economy approach is vital to sustainability (Choudhary et al., 2021).

The Blue Economy, one of the 17 Sustainable Development Goals (SDG) established by the United Nations to promote sustainable development worldwide and address social, economic, and environmental issues, represents SDG 14, expressed as “*conserve and sustainably use the oceans, seas, and marine resources for sustainable development*”. In this chapter, the Blue Economy approach within the framework of SDG 14 will be discussed from the perspective of Türkiye, a country surrounded by seas on three sides, and policy recommendations will be presented.

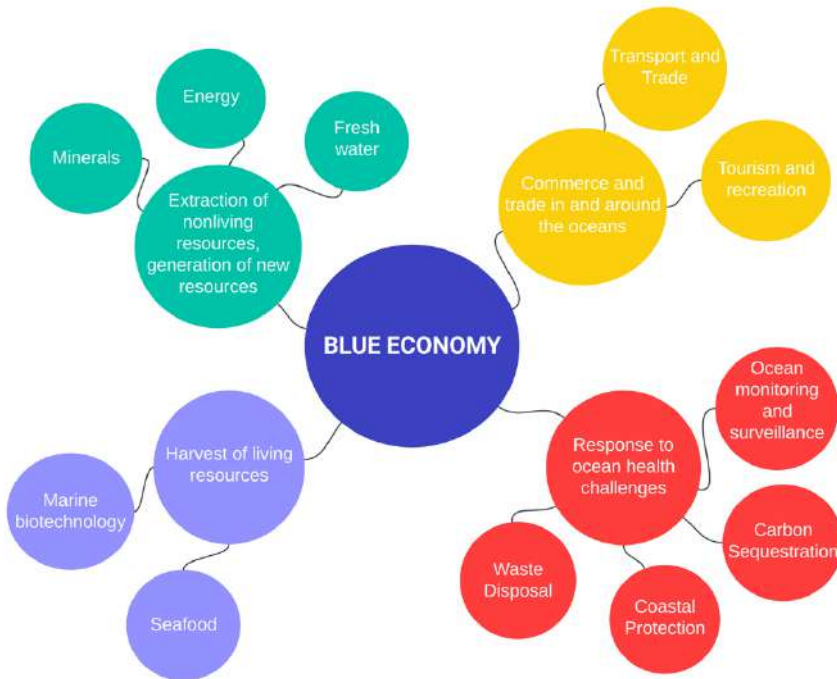
The second part of this study discusses the general framework of the Blue Economy and the SDG 14 targets. Section 3 analyzes Türkiye's Blue Economy potential, while Section 4

discusses the challenges that the country will face regarding the Blue Economy. Section 5 examines the country's situation concerning SDG 14 targets and indicators. Finally, Section 6 provides an overall assessment and policy recommendations for Türkiye.

## 2. Concept of the Blue Economy

The concept of the Blue Economy was first used in the book “The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs” published by G. Pauli in 2010, and then it was discussed at the Rio+20 United Nations Conference on Sustainable Development held in Rio de Janeiro in 2012. This concept is a sustainable development strategy that puts the sea and oceans at its center. The Blue Economy, which refers to SDG 14, is an approach that aims to use and manage marine and ocean resources sustainably (Silver et al., 2015).

The Blue Economy's components, which address both the economic potential and environmental sustainability of seas and oceans, are presented in Figure 1 (World Bank, 2016).



**Figure 1.** Components of Blue Economy

**Source:** World Bank (2016), Blue Economy Development Framework: Growing the Blue Economy to Combat Poverty and Accelerate Prosperity, Oceans 2030: Financing the Blue Economy for Sustainable Development.

According to Figure 1, the Blue Economy has four main components. The first is harvesting living resources, namely seafood and marine biotechnology. Seafood covers the fishing and aquaculture industries, while marine biotechnology is used in the pharmaceutical and chemical industries. The second component covers non-living resources and includes renewable energy production, deep-sea mining to extract minerals, and clean water from freshwater resources. The third component covers tourism and logistics activities, while the fourth and final component concerns ocean health. When considering all components, the Blue Economy refers to the comprehensive management of marine and ocean resources while also keeping in mind the economic, environmental, social, and cultural dimensions. This approach reflects the basic principles of sustainable development and aims to leave healthy marine ecosystems and rich resources for future generations (World Bank, 2016).

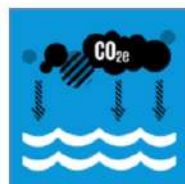


#### **Target 14.1: Reduce Pollution in the Seas and Oceans**

This target aims to reduce various types of sea pollution. It aims to avoid pollution from plastic waste, chemical pollutants, and other waste materials affecting our seas, to protect the health of marine ecosystems, and to minimize the risks that threaten human health.

#### **Target 14.2: Protecting and Restoring of Marine and Coastal Ecosystems**

This target aims to conserve biodiversity and ecosystem services by protecting marine and coastal ecosystems. Measures to attain this goal include reducing pollution, controlling marine litter, protecting coastal zones, and rehabilitating reefs.



#### **Target 14.3: Reducing Ocean Acidification and its Impacts**

This target aims to protect and ensure the sustainability of marine life and ecosystems exposed to increasing acidity levels in the world's oceans. It aims to protect the oceans by reducing carbon dioxide emissions and preventing ocean acidification.

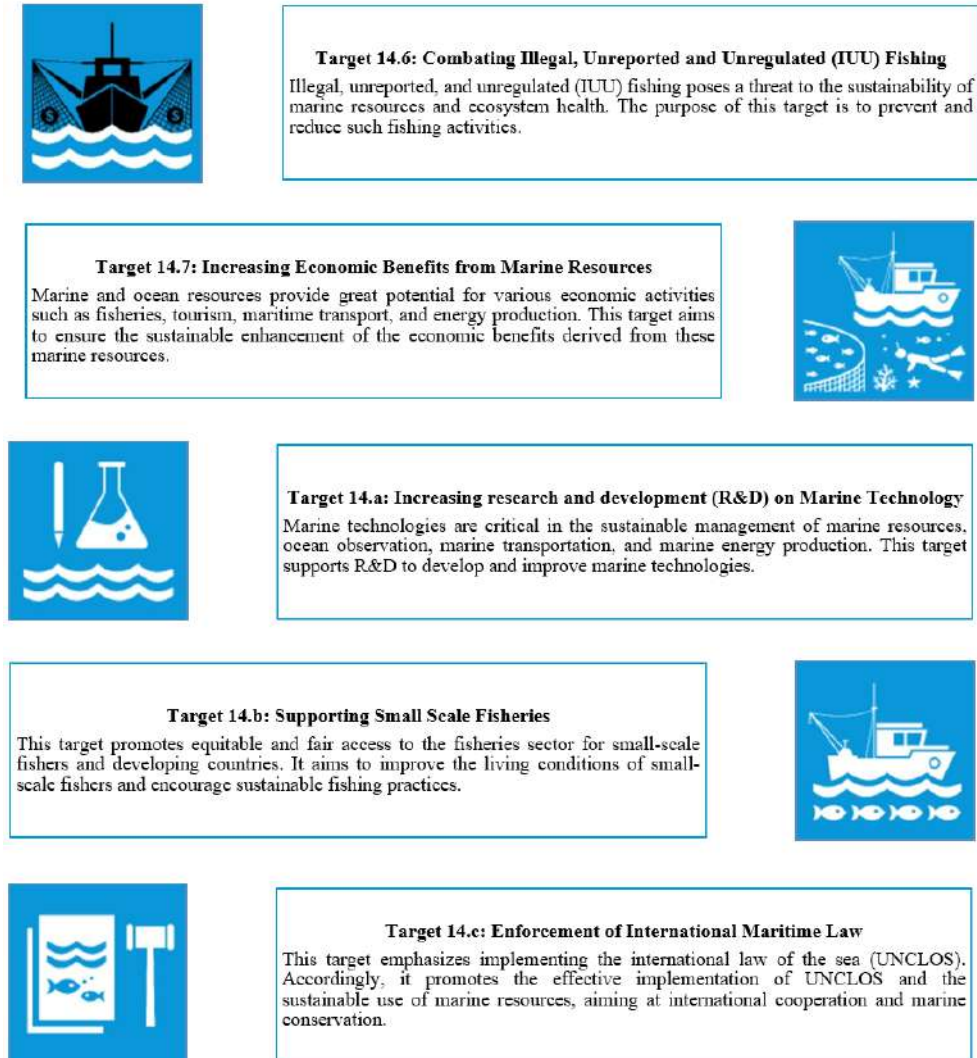
#### **Target 14.4: Sustainable Fishing Management:**

This target aims to manage marine resources sustainably. This involves implementing measures to prevent overfishing, safeguard marine biodiversity, and preserve the health of marine ecosystems.



#### **Target 14.5: Conservation of Marine and Coastal Ecosystems**

This target aims to conserve biodiversity and ensure the sustainability of ecosystems in marine and coastal areas. This includes protecting marine and coastal ecosystems from destructive human activities, pollution, overfishing, and other threats.



**Figure 2.** Targets of SDG 14 – Blue Economy

**Source:** United Nations (2015), Draft outcome document of the United Nations summit for the adoption of the post-2015 development agenda. Draft resolution submitted by the President of the General Assembly, Sixty-ninth session, Agenda items 13 (a) and 115, A/69/L.85.

Figure 2 shows the targets of SDG 14. Accordingly, the main targets of the United Nations sSDG regarding the Blue Economy approach can be summarised as follows (World Bank & UN-DESA: 2017):

- Prevention of marine pollution,
- Sustainable management of the sea and coasts,
- Minimizing the effects of ocean acidification,
- End destructive fishing practices,
- Prohibition of excessive and illegal hunting,
- Eliminate subsidies that support overfishing and illegal hunting,
- Ensuring access to marine resources and markets for small-scale fishers,
- Regulation of fishing conditions for a sustainable yield,
- Protection of coastal and marine areas

In summary, the Blue Economy concept in SDG 14 represents a global commitment to manage and protect the oceans and seas in an economically, environmentally, and socially sustainable manner. Successful implementation of these goals will provide many important gains for today's societies, such as sustainable economic growth, employment opportunities, food security, renewable energy production, sustaining biodiversity, reducing marine pollution, increasing the well-being of coastal communities, while ensuring that future generations inherit a healthy marine ecosystem through the protection of marine and ocean resources.

### **3. Literature Review**

There are many studies examining the Blue Economy approach. Most of these studies focus on fishing activities, marine biodiversity conservation, and marine pollution. Although the United Nations publishes SDG 14 indicators, data on these indicators is insufficient for most countries. There is no generally accepted methodology for assessing the Blue Economy approach. Therefore, each study in the literature has addressed specific aspects of the Blue Economy.

Keen, Schwarz, and Wini-Simeon (2018) examined the effectiveness of policies for the Blue Economy approach in the Solomon Islands, home to some of the richest coral reefs in the world. The study's findings, which the researchers conducted in three different case studies, showed that infrastructure investments are insufficient and institutional arrangements must be developed. They stated that national commitment, cultural adaptation, and capacity are important for the effective implementation of Blue Economy policies.

Regarding the opportunities of the Blue Economy in Bangladesh, Hussain et al. (2017) highlighted that the potential of the country's marine resources could not be exploited due to

the need for management measures. In particular, they found no enforcement mechanism to prevent juvenile marine fish fishing, later dumped into the sea as garbage. This increases marine pollution and harms marine fish biodiversity in Bangladesh. Another critical component of Blue Economy strategies is preventing overfishing. Researchers found that overfishing in the region can damage fish stocks and is one of the most significant barriers to sustainable fishing practices.

Analyzing the success of the Blue Economy approach in Hainan Island, China, Fang et al. (2021) calculated the degree of sustainable development of the island. They indicated that the island's sustainable development rating had increased since 2003. Additionally, they stated that the island's potential would increase thanks to the Hainan Free Trade Port policy. Still, traditional production methods, especially aquaculture and land reclamation, should be restricted due to their negative environmental impact.

Scharin et al. (2016), who examined the processes for sustainable management of the seas in the Baltic Sea, stated that a holistic perspective is needed to ensure effective management in complex marine ecosystems. Accordingly, they concluded that managing marine ecosystems with a holistic approach instead of considering sectors separately in the Blue Economy would promote sustainable marine resource management by combining ecological, social, and economic benefits.

Gülseven (2020), who aimed to measure the achievements of the Blue Economy approach for the United Arab Emirates in the Persian Gulf, underlined the adoption of a common policy with the neighboring countries of Iran, Iraq, Kuwait, Saudi Arabia, Bahrain, and Qatar, especially for the protection of the marine ecosystem in common areas. Although almost half of the sea regions of the UAE are protected, measures to address marine pollution from industrial production on the Gulf Coast are insufficient.

Examining Blue Economy strategies in Australia, Voyer et al. (2017) identified the need to develop support mechanisms that encourage innovation and growth of environmentally sensitive maritime industries. They also stated that maritime security is a critical element and needs to be addressed in more detail.

Tsiouvalas, Stoeva, and Raspotnik (2022) examined the Blue Economy model of Alaska and Northern Norway in the context of socio-ecological interactions in the fishing and aquaculture sectors. The authors examined the success of the blue economy approach in the region regarding economic value, social impact, and environmental sustainability due to the inadequate definition of the Blue Economy concept. Within the framework of these phenomena, they determined that



the sustainability of the fisheries and aquaculture sectors in these two regions was effectively achieved in terms of the harvesting and processing of seafood. However, due to the uncertainty of the effects of climate change on marine biodiversity in the region, they stated that annual harvest levels should be determined, and decision-making processes should be improved.

Barquet et al. (2023) addressed Blue Economy opportunities and barriers in Sweden and stated that significant progress had been made in the country's blue energy and hydro fields. They stated that efforts were under way to diversify production and consumption in the fisheries and aquaculture sectors, expand offshore energy areas, and develop alternative fuels. However, the authors noted that the current arrangements for the use and management of the marine regions in Sweden needed to be adapted to encompass society, the environment, and biodiversity, as well as economic growth.

Addressing Blue Economy policies in the Caribbean, Rustomjee (2016) argued that a global fund covering the Caribbean and other small island states is needed to support the region's transition to a Blue Economy. Many small island states need more technologies to implement Blue Economy policies. Cooperation arrangements are necessary to ensure technology transfer to these countries. Infrastructure investments are required in these sectors to effectively implement the Blue Economy approach in industries such as marine tourism, coastal and maritime transportation, and fisheries. However, Rustomjee underlined that these states have limited access to funds to finance infrastructure for these purposes.

Kwiatkowski and Zaucha (2023), aiming to measure the success of the Blue Economy in Poland, found that seven primary industries showed significant growth, notably fishing, ship-building, coastal tourism, and gastronomy. Between 2010 and 2017, Poland's Blue Economy increased from EUR 2.6 billion to EUR 3.6 billion. At the same time, the Blue Economy's growth rate was higher than the growth rate of the country's overall economy.

#### **4. Blue Economy Potential of Türkiye**

Türkiye has excellent potential in the field of Blue Economy with its vast and diverse marine resources. A long coastline, rich marine biodiversity, and access to maritime regions enhance the country's ability to utilize marine areas and sustain economic growth. At the same time, its strategic location at the intersection of world trade routes between the Marmara Sea, the Mediterranean, the Aegean Sea, and the Black Sea is vital for maritime transportation. This provides Türkiye's ports and maritime transportation with easy access to international trade. In this context, Türkiye's Blue Economy strategy offers significant opportunities to facilitate maritime transport and increase trade volume (Develi, 2021).

Türkiye has significant potential for fisheries and aquaculture thanks to its strategic location with seas on three sides of the country. Adopting sustainable fishing practices in the seas contributes to the nutrition of the local population and increases export revenues. However, the potential of the marine ecosystem can be threatened by overfishing and unbalanced utilization. In this context, the Blue Economy strategy is critical for the sustainable management of marine fisheries and the transferability of marine resources to future generations (IME-AK-WTO, 2022).

Türkiye's coasts, beaches, and historical regions indicate a great potential for marine tourism. Marine tourism contributes to economic growth by attracting both domestic and foreign tourists. At the same time, there is significant potential for renewable energy sources such as wind, tidal, and sea currents. The development of studies to utilize sustainable energy sources is essential in meeting the energy needs and ensuring environmental sustainability in Türkiye, which relies on foreign energy and widely uses fossil fuels (Sağlam & Uyar, 2005; Kozan et al., 2014).

Türkiye's focus on the Blue Economy has the potential to support economic growth by utilizing marine resources sustainably. However, the success of the Blue Economy strategy should not only be limited to economic growth targets but should also be ensured by considering environmental sustainability. In this framework, Türkiye must adopt and develop effective policies and practices for the sustainable management and conservation of marine resources.

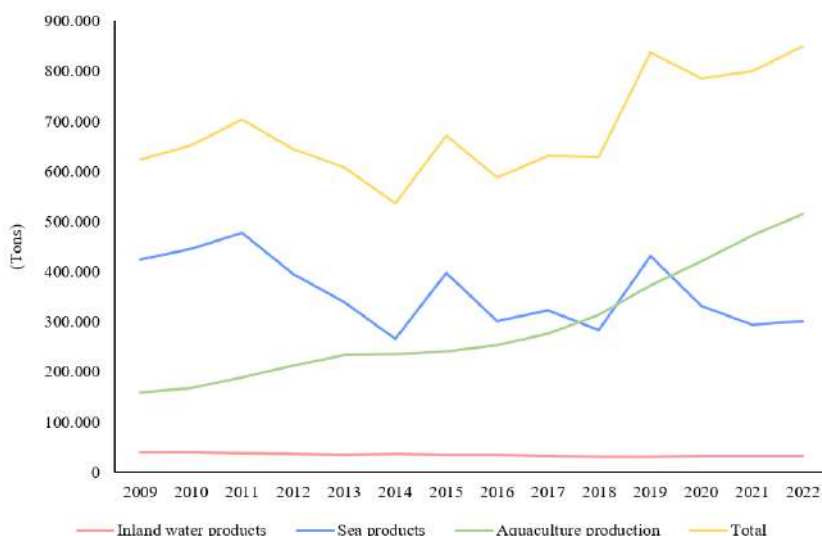
Türkiye's participation in sustainable marine resource management, adoption of advanced technological innovations, and international cooperation have the potential to gain an influential and leading position within the Blue Economy approach. Sectors such as maritime transport, fisheries, aquaculture, and marine tourism are the main areas that constitute Türkiye's Blue Economy potential. The current situation and potential of these sectors are evaluated below.

#### **4.1. Fisheries and Aquaculture**

With its vast and diverse water resources, Türkiye has great potential in fisheries and aquaculture. The country's geographical location and diverse aquatic ecosystems offer a favorable environment for developing the fisheries sector and sustainable aquaculture production. Türkiye has various hydrographic zones, such as the Marmara Sea, Aegean Sea, Mediterranean Sea, Black Sea, and inland waters, allowing for the cultivation and fishing of different species.

Fisheries and aquaculture are traditional and economically important sectors in Türkiye. Coastal and offshore fishing activities play a significant role in terms of both the livelihood of local people and export revenues. Especially the fishing and marketing of species such as anchovies, horse mackerel, whiting, sea bass, and sea bream are among the examples reflecting Türkiye's fisheries potential. Aquaculture has an increasing importance, especially in recent years. Aquaculture products such as fish, mussels, and oysters are cultivated in sea cages and inland waters. Developments in this field support the fisheries sector by increasing the country's aquaculture production capacity and diversifying seafood exports (TurkStat, 2022).

Figure 3 presents statistics on Türkiye's marine, aquaculture, and inland water products.

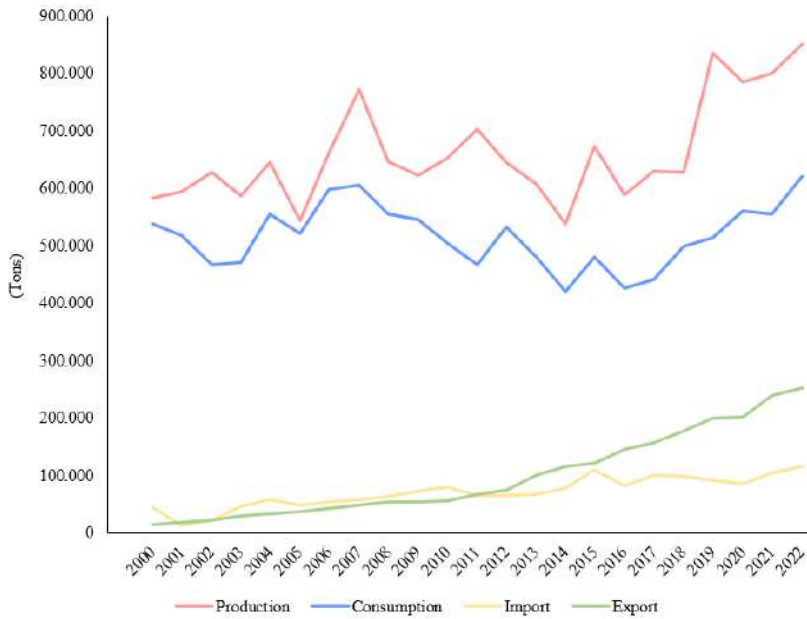


**Figure 3.** Quantities of Sea, Aquaculture, and Inland Water Products (Tons)

**Source:** TurkStat (2022), Fishery Statistics

There are 550 fish species in Türkiye's seas and about 380 fish species in inland waters. Approximately 100 of these species are fished for commercial purposes. An average of 680 tons of fish and aquaculture products are harvested annually, as shown in Figure 3. However, Türkiye's seafood catch has been below the average in recent years. Despite this, aquaculture production has shown an increasing trend every year and exceeded the amount of seafood in 2018 and onwards. This trend emphasizes the importance of Türkiye's marine and inland water resources for the Blue Economy.

Marine and aquaculture products caught in Türkiye meet the demand of both the local population and international markets. Figure 4 shows the production, consumption, import, and export amounts of fisheries and aquaculture products in Türkiye.



**Figure 4.** Fisheries and Aquaculture Production, Consumption, Import, and Export Quantities (Tons)  
**Source:** TurkStat (2022), Fishery Statistics

According to Figure 4, although most of Türkiye's fisheries and aquaculture production is intended for local consumption, recent significant increases in production have increased Türkiye's competitiveness in international markets. The production of 585,376 tonnes in 2000 increased yearly, reaching 849,808 tonnes in 2022. 39.4% of the production amount realized in 2022 consists of fishing products and 60.6% of aquaculture products. Parallel to the increase in production in the fisheries and aquaculture sector, exports have also increased rapidly. The export amount, only 14,533 tonnes in 2000, reached 66,738 tonnes in 2011. By 2022, 251,416 tonnes of fisheries and aquaculture products, 30% of the production amount, were exported.

According to TurkStat (2022) data, while its exports were 28.7 million dollars in 2000, it reached 744.9 million dollars in 2011 and 27.4 billion dollars in 2022. Imports, which were 22.6 million dollars in 2000, reached 200.3 million dollars in 2011 and 5.2 billion dollars in 2022. This situation indicates that Türkiye's exports of fisheries and aquaculture products are growing faster than imports and have a significant potential in terms of foreign trade surplus. These data reflect the change in the foreign trade dynamics of Türkiye's fisheries and aquaculture sector. The export has gained considerable momentum, as shown by the statistics for 2000-2022. These data clearly emphasize the economic growth potential of Türkiye's fisheries and aquaculture sector and its competitiveness in international trade.

## 4.2. Coastal and Sea Tourism

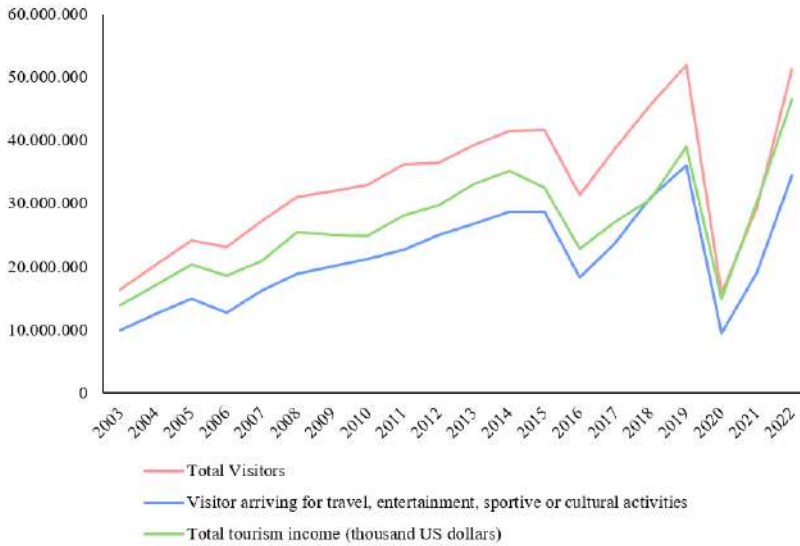
Located in a geography with rich marine and coastal resources, Türkiye has a remarkable position in the tourism sector, a critical aspect of the Blue Economy. The Blue Economy is an approach that promotes economic growth, creates employment, and increases social welfare through sustainable and effective management of marine and water resources. Türkiye's tourism sector is vital to this economic approach and central to the country's Blue Economy strategy.

Marine tourism is an important element of Türkiye's tourism sector with its long coastline, beaches, turquoise waters, and historical sites. While sea, sand, and sun tourism make Türkiye an attractive destination for domestic and foreign tourists throughout the year, activities such as water sports, diving, and yachting contribute to the sector's diversification. While coastal regions support many sub-sectors, such as hotel management, restaurants, and the entertainment sector, they also contribute to economic growth with their potential to create employment.

Marine tourism in Türkiye includes many places such as seacoasts, beaches and islands, and activities such as sea sports, yachting, and underwater tourism. According to the blue tourism inventory, there are 12 cruise/passenger ports in Türkiye, 83 marinas, 41 of which are certified by the Ministry of Culture and Tourism, and 42 of which are not. According to the inventory of marine tourism vessels, there are 1571 yachts, 220 bareboats, 2155 dayboats, 46 floating restaurants, 263 diving facilities, 697 surface facilities, about 1000 inland excursion boats, and 2 diving marine tourism vessels (WTO, 2019).

In Türkiye, marine tourism revenues constitute approximately 20% of total tourism revenues. In 2002, maritime tourism revenues were 1.9 billion dollars and reached 7.2 billion dollars in 2019. An important source of income in maritime tourism is the touristic activities carried out by cruise ships. This is because the per capita expenditures of tourists arriving on cruise ships are quite high compared to other tourists. In this respect, Türkiye has become a popular destination for cruise tourism, especially due to its Marmara, Mediterranean, and Aegean Sea coastline and its historical richness. While the number of cruise tourists traveling to Türkiye was only 581 thousand, it peaked in 2013 and reached 2.2 million people. However, due to the threat of terrorism and the economic crisis in 2014 and afterward, cruise companies changed their route from the Eastern Mediterranean to the Far East. Especially in 2020, due to the Covid-19 pandemic, the number of cruise ships was 5, and the number of cruise tourists was 1,824 people, reaching very low levels. In 2022, 991 cruise ships visited the country,

and more than 1 million cruise tourists were hosted. This shows that there has been a revival in the sector. Figure 5 presents the total number of visitors entering Türkiye, the number of visitors coming for traveling, leisure, sportive, or cultural activities, and total tourism revenue.



**Figure 5.** Visitor and Tourism Income Statistics  
**Source:** TurkStat (2023), Departing Visitors Survey

According to Figure 5, an average of 60-65% of visitors entering Türkiye each year in the past 20 years came for travel, leisure, sports, or cultural activities. Between 2003 and 2011, tourism revenue averaged USD 21.5 billion annually between 2011 and 2022, while it averaged USD 31.1 billion. This increase reflects the growth in Türkiye's tourism sector and the contribution of tourism revenues to the economy. Moreover, according to the World Bank (2020), international tourism revenues account for about 15 percent of Türkiye's total exports. This shows that Türkiye's tourism sector positively impacts the country's foreign trade balance. Tourism revenues provide foreign exchange inflows and contribute to local economies, positively impacting job creation and infrastructure development.

### 4.3. Maritime Transport

Maritime transport is integral to the global trade and transport network and significantly contributes to the world economy. Transporting people, goods, or other cargoes over sea routes is defined as maritime transport. Maritime transport has a lower carbon footprint than other logistics methods such as air and road. At the same time, maritime transport allows using

renewable energy sources such as wind or solar energy. Considering that about 80% of world trade is carried out by sea, these advantages show that maritime transport is important in the Blue Economy approach.

Türkiye has an important role in maritime transport thanks to its strategic location. The country’s wide and strategic access to the seas makes it one of the key points of international trade and logistics. At the same time, Türkiye’s proximity to European and Asian continents enables fast and efficient maritime transport. Türkiye is located geographically where narrow passages such as the Bosphorus and the Dardanelles are critically important. These straits are the main arteries directing maritime traffic from the Black Sea to the Mediterranean Sea. Therefore, the security and effective management of these passages are of vital importance for the sustainability and safety of maritime transport.

Table 1 shows the distribution rates of international trade volume by transport type.

<b>Table 1.</b> International Trade in Goods by Mode of Transport (%)					
	<b>Maritime Transportation</b>	<b>Road Transportation</b>	<b>Rail Transportation</b>	<b>Air Transportation</b>	<b>Others</b>
<b>2012</b>	87.0	10.6	0.6	0.4	1.4
<b>2013</b>	86.4	11.4	0.5	0.4	1.3
<b>2014</b>	86.2	11.2	0.4	0.5	1.7
<b>2015</b>	87.7	10.7	0.5	0.4	0.7
<b>2016</b>	88.0	10.8	0.5	0.3	0.4
<b>2017</b>	88.5	10.3	0.4	0.3	0.5
<b>2018</b>	88.7	10.3	0.4	0.4	0.2
<b>2019</b>	88.6	10.3	0.4	0.4	0.3
<b>2020</b>	88.8	9.4	0.6	0.2	1.1
<b>2021</b>	87.5	10.7	0.7	0.2	0.9
<b>2022</b>	86.8	11.5	0.7	0.6	0.6
<b>Source:</b> TurkStat (2023), Foreign Trade Statistics					

According to the statistics in Table 1, maritime transport had the highest share in the transport of goods in international trade in Türkiye between 2012 and 2022. The fact that 87 percent of import and export goods are transported by maritime transport each year reflects the critical importance of Türkiye’s Blue Economy. When analyzed based on the value of goods transported, maritime transport had the largest share of exports and imports in Türkiye in the same period. In 2012, an analysis of logistics types (road, air, and maritime transport) revealed that imports and exports accounted for 95.3% and 75.8% of maritime transport, respectively. By 2022, the share of maritime transport was 92.2% in imports and 80.1% in exports. When

ranking the value of goods exported by maritime transport in Türkiye, the top five countries are the United States, the United Kingdom, Italy, Germany, and Spain. As for importing countries, the top five countries ranked by the value of goods transported are China, the Russian Federation, Germany, the United States, and India (TurkStat, 2022; UTIKAD, 2022).

According to DGM (2023) statistics, while the amount of cargo handled in Türkiye's ports was 363.3 million tonnes in 2011, it reached 542.6 million tonnes in 2022. Of the 542.6 million tonnes of cargo handled in ports in 2022, 171.2 million tonnes of liquid bulk cargo, 165.2 million tonnes of solid bulk cargo, 130.2 million tonnes of containers, 64.5 million tonnes of general cargo, and 11.3 million tonnes of vehicles. At the same time, 150.1 million tonnes of the total cargo handled at the ports in 2022 were export goods, while 243.9 million tonnes were import goods.

## 5. Challenges of the Blue Economy in Türkiye

The Blue Economy is an approach that aims to manage and utilize marine and water resources sustainably. This approach promotes eco-friendly growth in fishing and aquaculture, oceanic tourism, marine transportation, and deep-sea mining industries. In addition to the significant economic benefits that Türkiye will derive from the seas with the Blue Economy strategy, there are also challenges that Türkiye will face to protect the marine environment and ensure sustainability. These are marine pollution, overfishing, lack of technological infrastructure, and diplomatic and legal difficulties.

**Marine pollution** is an important threat to Türkiye's rich marine resources and ecosystems. Various pollutants caused by industrial wastes, domestic sewage, ship traffic, and agricultural activities are mixed into marine waters and adversely affect marine life. This pollution not only reduces marine organisms' habitats but also threatens human health through seafood consumption. Marine pollution also leads to the deterioration of marine tourism and ecosystem balance, combining economic and environmental problems. Therefore, effective waste management, environmental awareness, and the adoption of sustainable practices in Türkiye are essential in addressing the issue of marine pollution (Akın & Akın, 2007; Köseoğlu et al., 2016).

While Türkiye's progress towards a Blue Economy requires the balanced and sustainable utilization of marine resources, overfishing is a critical obstacle that makes it difficult to achieve this goal. Overfishing fish and other marine species in our seas leads to rapid population decline and even endangers some species. One of the main reasons for this problem is the high fish consumption that comes with increasing population and economic demand. In addition,



developing technology and more effective fishing methods increase the fishing pressure. Overfishing threatens the stability of ecosystems by disrupting the balance between species in marine ecosystems, collapsing the food chain, and reducing biodiversity. In the long term, this situation may also adversely affect the fisheries sector and lead to loss of income. In order to overcome the problem of overfishing, it is important to adopt sustainable fishing methods, enforce fishing bans and restrictions, tighten inspections and raise public awareness. Only in this way will it be possible to protect the future health and economic value of the seas (Yılmaz, 2021).

The adequacy of technological infrastructure is a critical element in Blue Economy strategies. Modern and innovative technologies should be used for effective management and sustainable use of the seas. The effective management and sustainable use of the seas requires the use of modern and innovative technologies. Lack of technological infrastructure negatively impacts the monitoring, management, control, and protection of marine resources. There is also a need for advanced technological infrastructure in areas such as monitoring marine pollution and migratory movements of marine species. Türkiye must invest in marine technologies and support R&D activities to sustain its aquatic economic activities and protect marine resources. Encouraging local technology production to manage Blue Economy strategies effectively will contribute to economic growth and help protect marine ecosystems (Çoban & Ölmez, 2016).

One of the challenges that countries with high maritime potential, such as Türkiye, may face is diplomatic and legal obstacles. Sustainable management of marine resources and protection of marine ecosystems requires international cooperation and legal arrangements as they have impacts beyond national borders. In this context, diplomatic and legal challenges arising from utilizing and sharing marine natural resources play an important role. Activities in marine segments such as fisheries, maritime transport, energy production, and deep-sea mining may occur in international waters and shared marine areas. This can lead to disputes between neighboring countries over the use and sharing of maritime space. Protracted negotiations and legal conflicts may arise between countries on issues such as determining maritime boundaries and sharing submarine natural resources. At the same time, uncertainties and gaps in international law on maritime resources can also pose obstacles to diplomacy and cooperation. The inadequacy of international legal arrangements on issues such as maritime boundaries, ownership of submarine resources, and the right of transit may lead to conflicting interests of different countries (Voyer et al., 2018). In realizing its Blue Economy vision, Türkiye needs to increase cooperation with neighboring countries and support international legal arrangements for the sustainability of maritime activities.

While the cooperation of public, private, academic, and non-governmental organizations is crucial to overcoming the challenges of the Blue Economy, public awareness and education also play a vital role. In order to achieve the goals of sustainable use of marine resources and conservation of marine ecosystems, these stakeholders need to come together to produce strategic and coordinated solutions. Public institutions can strengthen oversight mechanisms and promote sustainable marine policies by establishing regulations. The private sector can pioneer environmentally friendly practices by developing innovative solutions and technologies. Academic institutions can support these processes with scientific research and expertise. However, cooperation between these stakeholders would be incomplete without raising public awareness and disseminating educational activities. Civil society organizations can raise public awareness and encourage public participation on the value of marine resources and the importance of their conservation and sustainable use. At the same time, they can increase the sensitivity of future generations to the seas and the environment through educational activities. A conscious and active role of society in these issues stands out as a critical element for the transition to a Blue Economy to be permanent and sustainable (Winther et al., 2020).

## **6. Assessment of SDG 14 Targets and Indicators for Türkiye**

As part of global sustainability efforts, the 14th goal in the United Nations SDG framework, “Life Below Water”, covers ten targets. These targets are explained in Chapter 2. There are indicators for each target to assess whether SDG 14 is being effectively implemented. These indicators focus on the ten targets as specific and measurable parts of the main goal of SDG 14. Accordingly, each indicator provides a more detailed view, focusing on a specific issue or aspect of marine ecosystems (UNDP, 2016).

There are two indicators to measure the success of the target “Reduce Pollution in the Seas and Oceans” expressed as Target 14.1. These are the Coastal Eutrophication Index and Plastic Residue Density. The Coastal Eutrophication Index measures the degree to which aquatic ecosystems in coastal areas are exposed to eutrophication. Eutrophication refers to the problems that occur in aquatic ecosystems due to excessive accumulation of nutrients in water. This indicator is used to determine and protect the health and balance of aquatic ecosystems. The second indicator, Plastic Residue Density, aims to measure the density of plastic waste in marine and coastal areas. While plastic waste causes serious damage to marine ecosystems, this indicator is important to understand the extent of marine pollution. The measured data demonstrates the severity of the threat posed by plastic waste on coastal areas and marine coasts (Ferreria et al., 2010).

An “Integrated Marine Pollution Monitoring Study” is being carried out by the Ministry of Environment, Urbanisation, and Climate Change in coordination with TUBITAK-MAM to assess the nutrient status of coastal and marine waters in Türkiye for 2014-2019. According to the findings of this study, it was determined that the risk of eutrophication in the Marmara Sea is high in winter months, but this risk is not present in summer months (MoEnvU MoEnvU & TUBITAK-MAM, 2021d). In the Aegean Sea, it was determined that there was no eutrophication risk in general except for the regions under the influence of the Izmir Inner Gulf. However, there was eutrophication risk in the region under the influence of the Gediz River and Izmir Middle Gulf in the winter months of 2019 and the region under the influence of the Evros River in the winter period of 2018 (MoEnvU & TUBITAK-MAM, 2021b). According to the assessment of the Mediterranean Sea, it was determined that there is a tendency towards eutrophic conditions in Mersin and İskenderun Bays due to terrestrial pressures. From the west of Mersin Bay to Marmaris, it was observed that the ecological water quality increased and the eutrophication tendency decreased (MoEnvU MoEnvU & TUBITAK-MAM, 2021a). In the Black Sea, it was determined that there was no eutrophication risk in coastal and open surface waters in summer seasons during the 2014-2019 period. However, eutrophication risk is high in the areas affected by the Sakarya River, Samsun Discharge, and Fatsa. It was determined that the eutrophication risk increased in winter periods compared to the summer period, especially in the entrance of the Bosphorus, Sakarya River, Ereğli, Zonguldak, Samsun discharge, Yeşilırmak, Fatsa and some areas in Trabzon (ÇŞİDB & TUBİTAK-MAM, 2021c).

Although no data set or specific study directly addresses the plastic density in Türkiye’s marine and coastal areas, Meijer et al. (2021) calculated the probability of leakage of municipal plastic waste (MPW) produced in the river basin into aquatic environments. According to this study, 68 million metric tonnes of municipal plastic waste (MPW) are generated globally every year, of which 1.7 million metric tonnes are generated in Türkiye. Approximately 1.5% of the globally generated MPW reaches the ocean within a year. Thus, the amount of MPW leaking into the ocean globally in a year is approximately 1 million metric tonnes, and approximately 0.9% (14 thousand metric tonnes) of the global MPW leaking into the ocean reaches the oceans from the coasts and rivers of Türkiye. Globally, 31,904 rivers contribute 100 percent of MPW leakage to the ocean, while 1,656 rivers contribute 80 percent. Türkiye has 659 rivers that contribute 100 percent to MPW leakage to the ocean and 29 rivers that contribute 80 percent. Furthermore, Türkiye ranks 12th in the ranking of the highest plastic emissions to the oceans. These findings indicate that Türkiye needs to take serious measures regarding plastic leakage into the seas and oceans.

Target 14.2, “Protecting and Restoring of Marine and Coastal Ecosystems”, aims to protect and manage marine and coastal ecosystems sustainably, ensuring the continuity of healthy seas and the benefits that people derive from these ecosystems. To measure the success of this target, it is analyzed whether an ecosystem-based approach is used for marine and coastal ecosystems. The ecosystem-based approach emphasizes the conservation and sustainable management of marine and coastal ecosystems from a holistic perspective. This approach aims to maintain the balance between humans and nature by preserving the functionality and resilience of natural ecosystems. UNEP (2021) states that these approaches are implemented in only 18 countries. Türkiye is not among these countries. These findings indicate that studies should be carried out to manage Türkiye’s conservation and restoration efforts for seas and coasts within the framework of an ecosystem-based approach.

Target 14.3, “Reducing Ocean Acidification and Its Impacts”, aims to protect marine biodiversity and ecosystem functions, make maritime and fisheries activities sustainable, and increase carbon absorption by controlling ocean acidification. Ocean acidification means that seawater becomes acidic due to the absorption of excess carbon dioxide (CO<sub>2</sub>) from the atmosphere into the oceans. This harms marine organisms and ecosystems and alters seawater chemistry, particularly critical for organisms containing calcium carbonate. In this context, the goal of reducing ocean acidification plays a vital role in combating climate change and sustainable marine resource management. In order to assess the success of this goal, it is necessary to analyze the average level of marine acidity measured at specific stations. However, an action plan on what the acidification level of the oceans should be and specific actions to limit acidification has not been established. Therefore, this indicator cannot be assessed (Scott, 2018). However, it is known that the acidification level of the oceans has increased by 30% since the Industrial Revolution, and the surface pH of the oceans has decreased to 8.1. Altuğ et al. (2020), in their study of marine ecosystems in Türkiye, reported that the average pH value was 8.16 in the Mediterranean and Aegean Sea, 8.19 in the north of the Aegean Sea, 8.25 in the Dardanelles, 8.24 in the Bosphorus, 8.29 in the north of the Marmara Sea and 8.3 in the south of the Marmara Sea. Especially in the north of the Aegean Sea, it can be said that the pH level is low compared to other regions. Since the cause of ocean acidification is CO<sub>2</sub> absorbed in the oceans, it can be said that the most important strategy toward this goal is to reduce CO<sub>2</sub> emissions.

Target 14.4 “Sustainable Fisheries Management” aims to determine whether fisheries stocks are sustainably harvested. This indicator aims to measure the status of fishery stocks subject to overfishing. Fish stocks whose abundance level is at or above the level that provi-

des maximum sustainable yield are considered sustainable. When analyzed on a global scale, sustainable fishery resources decreased from 91.4% in 1978 to 72.7% in 2000. By 2019, the rate of sustainable fisheries resources globally reached its historically lowest level of 64.6%. Data on this indicator for Türkiye are only available for 2016-2019. Accordingly, in 2018, the proportion of Türkiye's sustainable fisheries resources was 16.6%, well below the global average. It is also the 3rd lowest country in sustainable fisheries resources in 2018 (FAO, 2018). This indicator shows that fishing activities in Türkiye are carried out in a biologically unsustainable manner. It is seen that Türkiye needs drastic measures to control overfishing in fishing activities.

Target 14.5 “Conservation of Marine and Coastal Ecosystems” aims to protect biodiversity and aquatic ecosystems in marine and coastal areas. In order to measure the success of this target, the ratio of protected marine areas to total marine areas is considered. Protected marine areas are critical for conserving marine biodiversity and ecosystems, transferring them to future generations, and protecting them from over-exploitation. This indicator assesses the effectiveness of marine conservation efforts. According to TurkStat (2022), the number of protected areas in Türkiye increased from 1,513 in 2013 to 1,695 in 2022. Thus, the size of the total protected area has reached 377 thousand km<sup>2</sup>. The protected marine area in Türkiye constitutes 4 percent of the total marine and coastal area. Accordingly, 34,613 km<sup>2</sup> of marine and coastal area is under protection. According to SDG 14, protected coastal and marine areas should reach at least 10 percent by 2020 and 30 percent by 2030. The target set for 2020 has not been realized. Furthermore, in a country such as Türkiye, which is bordered by seas on three sides, only 4% of the marine area is safeguarded, indicating that the level of marine protection is inadequate.

Target 14.6, “Combating Combating Illegal, Unreported and Unregulated (IUU) Fishing”, refers to eliminating financial incentives and subsidies in fisheries and preventing illegal, unreported, and unregulated fishing activities. To assess the achievement of this target, the level of progress towards implementing international instruments to combat illegal fishing is addressed. According to FAO (2022) data on a 5-point Likert scale, Türkiye's progress in implementing international fisheries regulations and instruments to combat illegal fishing is “4”. This indicates that Türkiye's efforts in this area have been quite successful and are seriously addressing illegal fishing.

Target 14.7, “Increasing Economic Benefits from Marine Resources”, emphasizes the balance between sustainable management of marine and aquatic resources and economic growth and job creation. In order to measure this target, sustainable fisheries as a percentage

of GDP is considered. According to FAO (2019), the share of sustainable fisheries in global GDP decreased from 0.1 percent in 2010 to 0.09 percent in 2019. However, there are value-based statistics on the fisheries sector in Türkiye. Furthermore, data on the share of agriculture, forestry, and fisheries in GDP are published. In 2022, the agriculture, forestry, and fishing sectors contributed 6.5 percent to the country's GDP. This target is unassessable due to the lack of data on the sustainable fisheries industry in Türkiye.

Target 14.a, "Increasing R&D on Marine Technology", emphasizes the transfer of science and technology to protect the health of the seas and oceans, maintain marine biodiversity, and contribute to developing countries, especially small island states and less developed countries. To assess the success of this objective, the total amount of research budget allocated to research in the field of marine technology is considered. Although data on direct R&D expenditures on marine technologies are not available, the success of this target can be evaluated according to the statistics on the share of R&D expenditures on marine sciences in GDP. According to IOC-UNESCO (2020), the share of R&D expenditures on marine sciences in GDP in Türkiye increased from 0.04 percent in 2017 to 1 percent in 2020. According to this indicator, although progress has been made, it is seen that research and development activities for marine technologies are still not given enough importance in Türkiye.

Target 14.b "Supporting Small-Scale Fisheries" aims to support small-scale fishers' economic and social development, especially in developing countries. To assess the success of this target, the degree of implementation of the legal, regulatory, or institutional framework that recognizes and protects the access rights of small-scale fishers published by the FAO (2022) as a composite indicator is addressed. According to this 5-point Likert scale indicator, it is determined that Türkiye's degree of ensuring access to small-scale fishers is at the highest level as "5". Accordingly, Türkiye's performance in ensuring access of small-scale fishers to marine resources and markets is quite high. These data indicate that Türkiye has effective policy and institutional frameworks to support small-scale fisheries and promote economic and social development.

Target 14.c, "Enforcement of International Maritime Law", aims to protect and sustainably utilize the oceans and ocean resources. In order to assess the achievement of this target, the number of countries that have ratified and implemented the United Nations Convention on the Law of the Sea (UNCLOS) and similar international law of the sea agreements is considered. Türkiye has not become a party to UNCLOS due to the article stipulating the width of the territorial sea as 12 miles and the provisions on compulsory jurisdiction in maritime law disputes. However, it is known that Türkiye is involved in many regional or global conventions

or programs on the protection of the seas, such as “The Convention on Biological Diversity, The Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention), The Convention for the Protection of the Black Sea Against Pollution (Bucharest Convention)” (Güneş, 2007; Akkutay, 2011).

## **7. Conclusion and Policy Recommendations**

Seas and oceans have an important potential for the world’s, and Türkiye’s economy. The resources from these waters are used in various sectors, such as food production, energy supply, maritime transport, tourism, fisheries, and deep-sea mining. While the Blue Economy promotes economic development by supporting the sustainability and growth of these sectors, it also prioritizes the protection of marine and ocean ecosystems. This includes a commitment to leave clean seas and healthy marine ecosystems for future generations. Implementing the Blue Economy aims to achieve a balanced combination of environmental sustainability, economic growth, and social well-being. Thus, the richness of the seas and oceans will be preserved for future generations while at the same time continuing to provide economic benefits for today’s societies.

This study outlines the overarching framework of the Blue Economy approach and analyzes the ten targets that fall under it. The indicators proposed by the United Nations for each of these goals are analyzed in terms of Türkiye. Accordingly, although important steps have been taken in Türkiye regarding sustainable management and protection of seas and oceans, more efforts are needed in many of the targets under SDG 14.

Türkiye can develop the Blue Economy concept by sustainably investing in and protecting marine and ocean resources. Firstly, it should strengthen environmental regulations and inspections to reduce marine pollution and control eutrophication. Monitoring and treating industrial waste can improve water quality in coastal areas and be an important step towards protecting marine ecosystems. At the same time, awareness-raising campaigns should be launched to ensure the cleanliness of marine and coastal areas and reduce pollution. Incentives for environmentally friendly technologies and fuels should be created to reduce the contribution of maritime transport and ship fuels to marine pollution. In addition, policies for recycling and reducing the use of plastics should be developed to prevent plastic waste leakage into the seas.

Increasing marine biodiversity conservation efforts can strengthen Türkiye’s sustainability efforts in marine and coastal areas. Accordingly, the network of marine national parks and marine protected areas needs to be expanded and more effectively managed to protect marine areas. Monitoring and enforcement activities should be increased in these areas, and projects

for protecting and restoring seafloor habitats should be supported. At the same time, catch limits and controls should be tightened to prevent overfishing and promote sustainable fisheries. These measures will contribute to sustainable biodiversity management while providing potential for economic activities such as marine tourism and fisheries.

R&D activities in marine sciences and technologies are important for a sustainable Blue Economy. Investing more in R&D activities for marine technologies can enable Türkiye to utilize its marine and ocean resources more effectively. For this purpose, public and private sector cooperation should be encouraged. Financial support incentive mechanisms should be established for these co-operations. In addition, training programs and scholarships should be provided to develop human resources for marine technologies.

As a result, Türkiye should enhance its policies and efforts toward SDG 14 to conserve marine and ocean resources, promote sustainable fishing, safeguard marine biodiversity, and allocate funds for marine technologies. This is important to promote the Blue Economy, combining economic growth and environmental sustainability in a balanced way. Further efforts and investments in reducing marine pollution, protecting biodiversity, and developing marine technologies will help Türkiye utilize its marine and ocean resources sustainably. These efforts are expected to support the commitment to leave clean seas and healthy marine ecosystems for future generations.

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## CHAPTER 23

### THE POLITICAL ECONOMY OF THE CONSERVATION OF BIODIVERSITY AND BIODIVERSITY-BASED TRADE: THE CASE OF TÜRKİYE

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#### **Abstract**

This study examines the situation of Türkiye regarding the conservation of biodiversity from a historical standpoint. It critically assesses the progress made by the public authority in terms of biodiversity awareness and the regulations implemented in this regard by reviewing the official reports such as development plans and by evaluating the components of the Environmental Performance Index, developed by Wolf et al. (2022). Given that the decline of biodiversity within a single country has repercussions not only for that country but also for the global ecosystem, international organizations have been addressing this issue since the 1970s. The Sustainable Development Goals (SDGs), which serve as the primary framework for this book, emphasize the need to minimize biodiversity loss and promote the sustainable utilization of biodiversity. These objectives are particularly relevant for SDG 15 and, to a lesser extent, for SDG 14 and SDG 12. To provide insights into Türkiye's progress over time, the study provides a historical depiction of the biodiversity-based global production and trade networks associated with the sustainable use of biodiversity. It figures out that international trade is one of the main drivers of biodiversity loss since colonialism. Additionally, the study conducts a critical analysis of international regulations aimed at promoting its sustainable use, while the regulations of Türkiye align mainly with these international developments. Lastly, by using the UNCTAD and CITES databases on biotrade, the study analyzes the biotrade flows of Türkiye, its sectoral linkages, and the significance of biotrade flows of Türkiye in comparison to the other regions as well as evaluating the national trade regulations. Overall, the study shows that biodiversity-based production and trade contribute significantly to the Turkish economy. Although some progress has been made in the sustainable utilization of biodiversity, Türkiye lags far behind in comparison to its peers. In that sense, Türkiye exhibits a realist/economic nationalist approach to the conservation of biodiversity. It tries to ensure not to undermine its economic development in not just agriculture as the most biodiversity-sensitive sector, but also in others such as tourism, energy, and industry while taking measures to safeguard biodiversity. Besides, there have been relatively few endeavors aimed at reducing the decline in biodiversity, even though the country's environmental performance indicators fall below the global average.

**Keywords:** The Conservation of Biodiversity, Biodiversity-based trade, Türkiye, International trade regulations

## 1. Introduction

Biological diversity refers to the variety of species, ecosystems, and genes on earth that sustain life for both their selves and human beings. In economic terms, biodiversity is the source of many products and services utilized by society, and it supports the livelihoods of more than half of the world's population, especially those who are most vulnerable and directly dependent on it to satisfy their livelihood (UNCTAD). In comparison to temperate zone regions, tropical regions are prosperously endowed with biodiversity (Hermann, 2014: 9), and most of their export revenues are generated from biodiversity (See Appendix Figure A1 and Figure A2). However, the loss of animal and plant species undermines a basic means of production for the poor in those regions where economic prosperity is well below the world average.

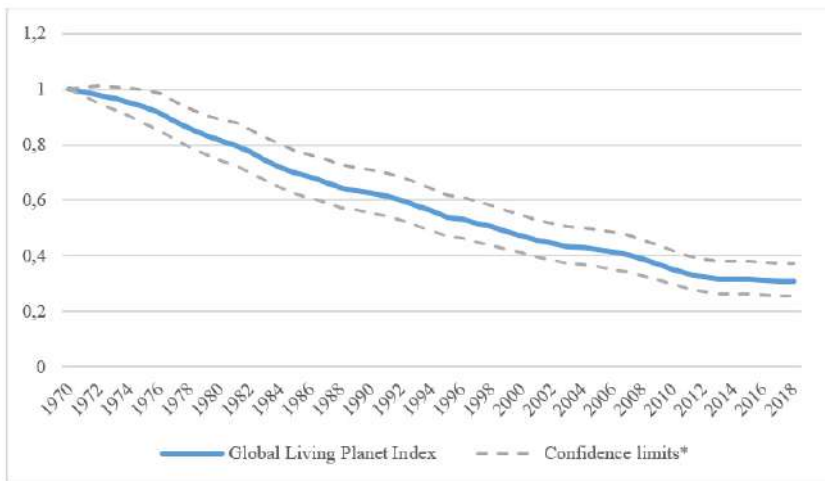
The loss of biodiversity is a direct side effect of global capitalism. An increased number of species are subject to commodification and commercialization to satisfy new demands of global production and trade. International trade is a significant driver of biodiversity loss, as it exacerbates not just import demand, particularly for biodiversity-based products but also maritime transport<sup>1</sup>, road building, and aviation facilities<sup>2</sup> for the continuous flow of all tradable products. In 2011, consumption in other world regions was responsible for 33% of biodiversity impact in Central and Southern America and 26% in Africa (Marques, 2019: 628).

Not only do the overconsumption and production patterns embedded into global capitalism threaten biodiversity, but they also undermine the resilience of ecosystems to climate change, pollution, land use change, and invasive alien species which are also unfortunate outcomes of globalization and the expansion of extractive activities. In turn, this vicious circle of environmental degradation increases the vulnerability of crop varieties, livestock breeds, wild species, forests, and habitats at unprecedented levels.

Even a cursory look well depicts the current estate of devastating extinction of species across different biodiversity groups<sup>3</sup>. Figure 1 shows the 48-year trend for the Living Planet

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- 1 It is estimated that Merchant shipping, which uses the most polluting type of oil, emits 1,2 billion tons of CO<sub>2</sub> per year (Dicken, 2015: 288).
  - 2 Aviation facilities puts pressure into biodiversity in a number of ways. They primarily cause land degradation by expansion and operation of airports, increase air, noise, and light pollution during the flight which in turn affect terrestrial and aerial ecosystems and aggravate climate change by increasing carbon emissions.
  - 3 The biodiversity can be grouped into four components: i) genetic diversity, ii) species diversity, iii) ecosystems (including forests, wetlands, and mountains) and habitats (including fallow land, hedges, shrubs, and trees) diversity, iv) conditions of natural resources (water, oil ext.) (UEBT, 2021: 5). The biodiversity loss is mainly associated with species diversity and especially diversity of vertebrate species (birds, mammals, reptiles, and amphibians). But it actually includes a wide concept of nature with all its generic forms.

Index (LPI) which is a weighted measure of the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater, and marine habitats around the world. The index represents 31821 populations of 5230 species as of 2018. As can be seen in Figure 1, the world has lost around 70% of its global vertebrate population between 1970 and 2018. The decrease in the index value reaches up to 83% when LPI is measured only for freshwater habitats for the same period (WWF, 2022: 36). Even the projections of better climate models reveal long-term declines in global marine animal biomass. In light of ocean warming, marine fishery harvests in southeast Asia are expected to decrease by between 20–30 percent, accompanied by a loss of 20 percent of marine biodiversity by 2050 (UNCTAD, 2021: 25).



**Figure 1.** Living Planet Index, 1970-2018

**Source:** [https://www.livingplanetindex.org/latest\\_results](https://www.livingplanetindex.org/latest_results), Accessed 13.04.2023.

\*Confidence limits illustrate the statistical certainty at 95%.

Other than the vertebrate diversity, ecosystems, and habitats have also been degraded and destructed by time. Some 420 million hectares of forest have been lost due to large-scale commercial production of agricultural commodities such as palm oil, soy, and other related land-use conversion for over 30 years (UNEP, 2021: 4). Global forest area is now approximately 68% of the estimated pre-industrial level (IPBES, 2019: XXVIII). Besides, the degradation of forests is quite uneven. Although forest cover stabilized in high-income countries, it has rather fallen 30% in low-income countries since 1990, as agricultural area fell in the former but rose in the latter (IPBES, 2019: 54). In terms of plant species, most of the conifers and cycads, several monocots, dicots and ferns are counted among those taxa which are threatened



by extinction (IUCN). It is estimated that approximately 15,000 (out of the 50,000–70,000) plant species utilized for medicinal purposes globally are considered at risk due to excessive utilization and the decline of their natural habitats (Hermann, 2014: 38).

Ongoing destruction in biodiversity and ecosystems is expected to undermine progress toward 80% (35 out of 44) of the assessed targets of the Sustainable Development Goals, related to poverty, hunger, health, cities, climate, oceans, and land (SDG 1, 2, 3, 6, 11, 13, 14 and 15) (UNEP, 2021: 2). Hence biodiversity loss has been a multidimensional and multi-layered phenomenon with its mutually reinforcing drivers and complex impacts. The market cannot be relied on to control the environmental and other costs of globalization (Ehrenfeld, 2003). However, governments, which are expected to regulate markets in a way to support biodiversity preservation, have still been following policies that are harmful to biodiversity (UNEP, 2021: 3). Among these policies, the most prominent ones are (i) agricultural supports for inefficient and/or geographically inadapted crops, which causes salinization and/or water-logging, (ii) pesticide, fertilizer and water subsidies, which result in groundwater aquifers, impaired air quality, depletion of water bodies, respectively, by incentivizing the overuse of these inputs, (iii) fisheries support, causing depletion in marine ecosystems through the promotion of overfishing, (iv) conversion of biodiversity-rich areas to biofuel crops or enhanced forest activity for timber, (v) construction of transport infrastructure or energy and mining facilities, which cause habitat fragmentation, ecosystem degradation and climate change (Matthews & Karousakis, 2022: 15).

On the other hand, multinational institutions began to include environmental degradation in their agenda at the beginning of the 1970s. Several international treaties have been developed to address the need for not just protecting particular species, but also the broader ecosystems in which they live. In line with this goal, the first global convention was the 1971 Ramsar Convention on the Protection of Wetlands<sup>4</sup>. Later on, the World Heritage Convention was adopted in 1972 for the protection of cultural and natural sites of universal value, including habitats (Bodansky, 1995: 629). In the same year, the UN Conference on the Human Environment (UNCHE) convened in Stockholm in 1972. UNCHE recognized the environmental consequences of modern economic growth, and the UN Environment Programme (UNEP) was established as a permanent bureaucratic tool in the UN system (O'Brien & Williams, 2010: 356).

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4 Wetlands include “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters” (Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971: Article 1.1).

Nevertheless, it took two decades before governments reached a consensus on mandatory conventions. Convention on Biological Diversity (CBD) was signed in 1992 at the Sustainable Development Conference held in Rio de Janeiro. CBD has 175 Contracting Parties, 174 states, and the European Community as a regional economic integration organization (Henne & Fakir, 1999: 316). Signatory countries were obliged to prepare and update the National Biodiversity Strategy and Action Plan (NBSAP) by Article 6 of UN CBD. They were further obliged to define their objectives to achieve the global targets considering their national priorities. Realizing the inverse effects of global production and trade on biodiversity, Agenda 21<sup>5</sup> also underlined the urgent need for a change in current consumption and production patterns (UN).

However, neither governments nor multinational institutions tackle the problem of biodiversity loss from an ecological framework. Instead, with a technocentric environmentalist perspective<sup>6</sup>, they believe in a reform of the existing international economic order without a satisfactory questioning of the relationship between natural systems, modern industrial growth, and human wants and their historical foundations.

In light of this information, this study takes into consideration first the relationship between biodiversity loss and biodiversity-based trade (hereafter biotrade). In the second part, it tries to shed light on the drivers of this pattern of trade, and the magnitude of biotrade flows in terms of countries and products. Besides, the study aims to review the international regulations on biodiversity conservation, utilization, and trade from a political economy framework. In doing so, it also becomes possible to evaluate regulations in Türkiye, while the country's legislation on biodiversity has evolved to a large extent in response to these developments. Lastly, the third section of the study is devoted to a detailed analysis of the recent developments in biodiversity conservation in Türkiye as well as a historical review of the environmental policies concerning biodiversity. Finally, this section ends with an assessment of the biodiversity-based trade in Türkiye and an overview of the regulations of trade policy in the conservation and utilization of biodiversity.

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5 Agenda 21, which emerged from the Rio Summit, was a flexible action plan that did not impose legal obligations. It aimed to guide countries and regions in implementing strategies tailored to their unique circumstances, capabilities, and priorities.

6 The technocentric approach to environmental degradation is based on an anthropocentric view, which puts humans at the center of the analysis. Nature, in this view, is accepted as an instrument in sustaining human life. Modern economic growth is necessary for progress. In contrast, the ecocentric approach recognizes the environment as central to the survival of all species as well as humans. It heavily criticizes the economic view of the technocentric approach and argues that the short-term marginal analysis of neoclassical economics cannot produce permanent solutions against environmental degradation. Because the ecosystem contains the economy, rather than vice versa, the ecosystem should be the unit of analysis (O'Brien & Williams, 2010: 352-355).

## **2. The Political Economy of Global Production and Trade of Biodiversity-Based Products**

For a long time, neither environmental problems nor their causes have been included in the mainstream economics literature. In the rise of development economics, they were all viewed as a by-product of industrialization, as in the case of poverty, which could be alleviated once the economy reached its take-off stage (Uzunyayla, 2017: 4). By the 1990s, the modernist growth rhetoric was replaced with the notion of “green development”. According to this liberal perspective, environmental degradation results from market failure, defined as the lack of proper valuation mechanisms for natural resources. Hence it becomes possible to value the environment by determining the “real costs” of resource use. In this view, valuation is a crucial tool in environmental protection. With the implementation of market principles, economic growth would bring about the protection of the environment rather than its retardation. Although the inclusion of the environment in pricing policies is widely recognized, what should be the efficient policy has been a disputed issue among environmental economists. Proponents of market-based solutions argue that tradable pollution permits or green energy certificates can be a useful policy tool. On the contrary, supporters of interventionist policies propose environmental taxes, subsidies for environmentally-friendly technologies, or other legal regulations, such as clean air acts, clean production requirements, and conservation measures for natural resources (O’Brien & Williams, 2010: 350-352).

Ongoing policy debate regarding the market versus interventionist solutions was extended towards the protection of biodiversity, biodiversity-based trade, and BioTrade. However, designing adequate instruments for protecting biodiversity has been a challenge, while biodiversity is a complex concept that includes not just species, but also the functional relations within the ecosystem (Bellora et al., 2020: 7). Besides any attempt toward reorganization of international trade in favor of biodiversity conservation requires an assessment of the political economy of the historical relationship between biodiversity and trade, including the demands of different interest groups (such as firms, countries, local communities, etc.) and the conflicts and negotiations that arise in response to these demands.

### **2.1. An Overview of the Historical Relationship between International Trade and Biodiversity**

International trade significantly contributes to the loss of biodiversity by intensifying the demand for biodiversity-based products and catalyzing trade-related infrastructure, including

maritime transport<sup>7</sup>, road construction, and aviation facilities, all of which facilitate the continuous flow of tradable goods. As for the former, international trade is, in a sense, controversial for biological diversity, as it is based on specialization patterns and comparative advantages of countries (Bellora et al., 2020, 9). From the viewpoint of traditional trade theories, a country can specialize and export a biodiversity-based product, if it has a comparative advantage on it. Specialization comes with higher levels of production in contrast to autarky, as a country produces not just for itself, but for other countries and in return imports other products out of its specialization cone. If the country's specialization cone consists of a limited range of products, biodiversity-based products turn out to be its sole means for acquiring imported products to satisfy domestic demand. When coupled with rising global demand for agricultural goods like palm oil, soy, cattle products (beef and leather), and timber, this can exacerbate the unsustainable exploitation of natural resources in a country due to insufficient environmental oversight (UNEP, 2021: 13-14). In turn, export specialization without any regulation will most probably bring overexploitation. The biodiversity-based trade (biotrade) had begun long before the conceptualization of classical trade theories. In the mercantilist era, which lasted for about 500 years, European colonialist activities led to the continuous extraction and transfer of plant and animal species. The growing international market for rubber, timber, tea, coffee, sugar, cotton, and wool paved the way for the destruction of forest ecosystems in the colonized world (Merson, 2000: 286). Plantation-style cultivation of export crops through the exploitation of local labor led to a massive transfer of economic value from indigenous territories, which were put into service of colonial powers under the private land ownership regime (as opposed to communal rights of indigenous people) (Domínguez & Luoma, 2020: 3-5).

On the other hand, European colonialism irreversibly transformed global biodiversity by introducing livestock (such as horses, rabbits, bees, cattle ext.) into the Americas (O'Brien and Williams, 2010: 72) and by spreading alien plant species around colonial territories via triangular trade since the post-Columbian era (Crosby, 2004: 148-151). In a recent study, Lenzner et al. (2022) traced back the legacy of four European empires (British, Spanish, Portuguese, and Dutch) in today's naturalized plant distributions. They measured the impact of colonization by quantifying the similarity of non-native species in 1183 regions. In sum, they found that occupied regions are still more like each other in terms of their alien floras

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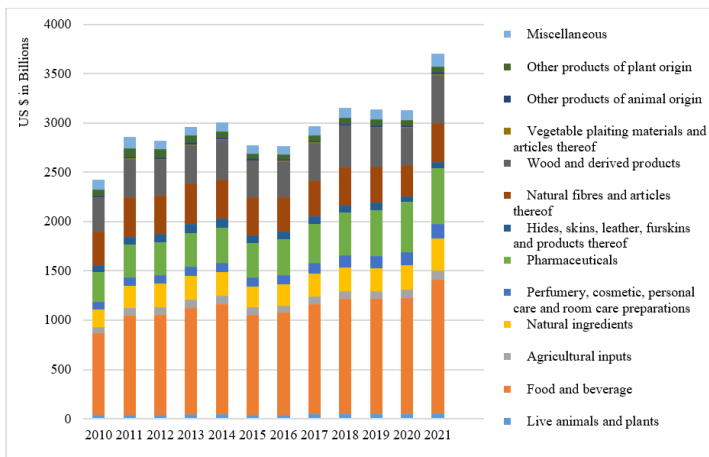
7 With the entrance of container ships for the logistics of international trade, maritime transport has developed tremendously. However, maritime shipping has various direct effects on biodiversity such as noise pollution, collision, accidental oil spills and carbon emissions. It also indirectly affects biodiversity by carrying alien species. For example, alien species, which come from the Atlantic Ocean coast of North America with ship ballast water, feed on the eggs and lava of native fish species and are about to become dominant among the native fish in the Black Sea (TÜBA Çevre Çalışma Grubu et. al., 2006: 54, 56).

than expected by chance and the similarity increases, as the occupation time gets longer (Lenzner et al., 2022: 1729). The main contribution of this study to the political economy of biodiversity was the acceptance of colonialism, as one of the socio-economic causes of conversion in biodiversity. In a recent report of the Intergovernmental Panel on Climate Change (IPCC), “colonialism” has finally been included as one of the drivers of climate change and also accepted as being responsible for the uneven distribution of outcomes (IPCC, 2022: 12).

Despite being well into the twenty-first century, the most basic features of the historical relationship between trade and biodiversity are still valid. Biotrade is defined by CBD as the “production of value-added goods and services derived from biodiversity, both for domestic and for international markets”. However, much biotrade is international, which is a good example of classical North-South trade. Compared to triangular trade, based on the acquisition of land, natural resources, and raw materials by colonial expropriation, present-day vertical trade flows are based on unequal exchange relations between “equivalent” states. Biodiversity-based exports flow from the biodiversity-rich “South” to the biodiversity-poor “North”, where the consumers with the greatest purchasing power reside. (Hermann, 2014: 17). In a recent research focusing on the consumption-based biodiversity loss, it is found that 40% and 63% of the consumption-based plant and vertebrate losses of the Global North are embodied in the imported commodities from the Global South (Sun et al., 2022: 5). For those wealthy consumers, healthy, ethnic, diversified and less artificial food began to form a significant part of their consumption basket. On the supply side, fierce competition in the food market forces companies to differentiate and add value to their products through novel ingredients and flavors, many of which are derived from biodiversity native to tropical countries (Jaramillo Castro, 2012: 1; Hermann, 2014: 31). For these agro-food companies, the motivation of product differentiation gives rise to biodiversity-based value chains, covering a range of products (natural foods, handicrafts, medicinal plants) (Foppes, 2019: 9). These value chains include various stages of production and services such as harvesting, collecting, and storing raw materials, processing, and transportation, research, and product development, manufacturing, or commercialization of the final product. For developing countries and their low-income producers, export-oriented growth strategy and integration into global value chains were suggested as a vital tool to get out of poverty, as the subsistence economy was recognized to be an archaic form of production without accumulating wealth (Uzunyayla, 2017: 12). This kind of global production sharing has further accelerated the biotrade flows between developed and developing countries, especially after the end of the Uruguay round meetings in 1993. One significant factor that led developed countries, previously reluctant to decrease agricultural

trade quotas, to change their stance was the recognition that trade liberalization in agricultural products was crucial for many leading companies within these developed nations. This was essential for them to expand their global trade connections and ensure a diverse supply of products from around the world (Balaam, 2005: 58).

In 2021, the value of total biotrade exports<sup>8</sup> in the world equaled US\$ 3.69 trillion, which accounted for 17.2 % of total world trade. Figure 2 shows the product composition of biotrade exports. Although the data in the figure does not provide information on the amount of utilization of species, as it is expressed in value rather than quantity, it provides insight into understanding the magnitude of the economic value of biotrade. As can be seen, “Food and beverage” has the highest product share in all years with an average (and almost stable) share of 36.6 %, followed by “Pharmaceuticals”, “Wood and derived products” and “Natural fibres and articles thereof”. In these twelve years, pharmaceuticals increased their share in biotrade from 12.5 % to 15.2 %, while the shares of “Wood and derived products” and “Natural fibres and articles thereof” decreased from 14.1 % and 14.3 % to 13.1 % and 10.6 %, respectively. The increased share of “Pharmaceuticals” demonstrates the growing importance of medicinal & aromatic plants as an input for this industry. Besides, the fact that food and beverage products account for the largest share of biotrade is an indication of the significance of the global food chains in the production and trade of biodiversity-based products.



**Figure 2.** World biotrade export flows

**Source:** UNCTADSTAT, retrieved from <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=227725>, accessed 30/05/2023.

8 Starting from 2010, UNCTAD contains data and indicators on biodiversity-based trade flows. In doing so, UNCTAD TraBio database takes into consideration not just species, but also products derived from biodiversity. In this conceptualization, the bilateral trade flows of products, based on biodiversity itself at a non- or low-processed stage or derived mainly from biodiversity-based products are also included in TraBio product list (Benda, 2022: 2,7).

Nevertheless, as an example of a buyer-driven supply chain, benefit sharing in these chains is mostly uneven and dependent on the power relations within the chain hierarchy. In this kind of supply chain structure, the demands, and preferences of a Western head-quartered international company (the buyer) shape the entire supply chain (Gereffi, 1999: 43). The buyer plays an active role in dictating the terms of the supply chain relationship to maintain low prices in final product markets. In a competitive world in which firms are seeking to cut costs, biodiversity-based chains raised anxiety for “race to the bottom”, as producers from developing countries compete with each other by lowering labor standards or environmental regulations (O’Brien & Williams, 2010: 368). However, deregulation in environmental standards is not always the case. Despite this, an increasing number of firms differentiate their brand for a particular product by making claims concerning environmental impact. The “bird-friendly” coffee, served in UK markets under the brand name Percol, is claimed to be a shade-grown coffee that does not destroy the forest canopy. By differentiating its product in terms of its environmental impact with a certification from the Smithsonian Migratory Bird Centre, the company adds increased value to its product in response to declining prices for agricultural commodities and increasing competition from new entrants to global food markets. In this way, production processes that promote a safe environment become a part of the product branding strategy in favor of credence goods (Humphrey, 2005: 5-6). In recent years, leader companies have redirected their focus away from highlighting their corporate social responsibility and public image in an endeavor to support sustainable development (Andrew, 2017: 14). However small producers tend to remain raw material suppliers in these kinds of high-value agri-food chains, as they cannot overcome their constraints related with scale, knowledge and expertise, and financing, all of which serve as a basis for eco-friendly product branding.

## **2.2. A Critical Review of the International Regulations on the Global Biodiversity-based Production and Trade**

In the global biodiversity markets, as described so far, various regulations were enacted for the global governance of international trade to protect biodiversity, make biodiversity-based trade sustainable, and distribute the gains from trade in a fair manner. However, in terms of their perception of environmental protection, these regulations may differ from one another and sometimes have contradictory policy obligations. This is mainly due to the diverse interests of international firms, developed and developing countries, and non-governmental organizations (NGOs), which have been reflected in their strategies to shape international attempts to set up rules (Görg & Brand, 2000: 376-377). The main issues of conflict usually

revolved around access and benefit sharing in genetic resources, conservation and sustainable use of biodiversity, transfer of environment-friendly technologies, and financing access to these technologies, all of which are directly related to global production and trade of biodiversity-based products (McGraw, 2002: 26). For instance, developed countries and their companies placed great importance on obtaining access to genetic resources while developing countries and their local producers emphasized the equitable distribution of benefits as a key priority. In a similar vein, developed countries were worried about their intellectual property rights, while developing ones tried to ensure technology transfer (McNeely et al., 1995: 37). Besides each regulation was more or less a reflection of the political and economic conditions specific to its period.

The first international regulatory framework related to biotrade is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which has been in force since 1975 with 175 member countries<sup>9</sup>. CITES aims to safeguard the survival of wild animals and plants by ensuring that international trade in their specimens does not pose a threat. CITES does not replace national laws but provides a binding framework to its member countries, which must enact their domestic legislation to enforce CITES at the national level. It enforces import, export, and re-export controls on CITES-listed species<sup>10</sup> through country-specific export quotas, which are set annually. To issue export permits, a country's scientific authority must certify that the proposed export will not be harmful to the species' survival. Therefore, each member country bears the responsibility for setting quotas, except when quotas are established by a CITES Conference of the Parties (Hermann, 2014: 56). As can be seen, CITES regulations on biodiversity are examples of interventionist and protectionist policy tools, which can also be considered as extensions of the Keynesian policies that marked this period.

However, since the 1980s, with the rise of neoliberal consensus, the agenda of the world trading system began to change to reverse the growth of protectionism and negotiate over and harmonize policies that shape the conditions of competition (instead of bargaining over

9 The number of countries and regional economic integrations, which have joined the CITES, is 184 as of 2022. (CITES Secretariat and UNEP-WCMC, 2022).

10 CITES regulates international trade in over 40,900 species – including roughly 6,610 species of animals and 34,310 species of plants (CITES). Species are categorized into three groups due to their level of vulnerability in terms of extinction. Appendix I includes at around 3% of all CITES listed species. Trade is subject to strict regulations (Article III of convention), which require the presentation of an export permit or re-export permit and import permit. Appendix II includes for about 97% of all CITES listed species. Trade is regulated under Article IV, which requires an export permit, whereas import permit does not necessary unless regulated by party(ies). Lastly, species listed in the Appendix III permitted but regulated, although it is not as restrictive as for Appendix II species. (Prihadi, 2013).



products). The establishment of WTO, at the end of the Uruguay Round negotiations, has accelerated this process as an international organization with a legal personality akin to other intergovernmental organizations such as the IMF and World Bank (O'Brien & Williams, 2010: 167-168). Since then, private access to nature as a resource and its valorization as an element of capitalist production and re-production have been on the agenda of WTO. One of the most conflicting issues related to benefit sharing in biotrade and bio-diversity-based chains is the usage of plant genetic resources as raw materials for pharmaceutical and agricultural biotechnology industries. The establishment of global intellectual property rights (IPRs) gave international firms exclusive rights to prevent other parties from reproduction or multiplication of the plant varieties with commercial ends, while these firms were not obliged to pay any fee for the use of genetic resources<sup>11</sup>. However, the protection of IPRs on behalf of international firms neither prevented the loss of genetic resources nor created any protective incentive for it. The free access regime intensified the unlimited usage of genetic resources, as there was no price formation (Ülker, 2002: 58-62). Besides, the fact that many of the indigenous people were prevented from the usage of plants with commercial ends, raised questions about the exclusionary effects of IPRs.

In contrast to the conservative position of WTO, the fair and equitable sharing of the benefits arising out of the utilization of genetic resources was one of three objectives, stated in Article 1 of CBD (CBD, 1992: 3). Although CBD accepts the adequate and effective protection of IPRs in the field of biotechnology, in Article 16.5, it requires Parties to cooperate to ensure that patents and other IPRs "are supportive of and do not run counter to" the CBD's objectives (IISD, 2003: 2). This clause could be viewed as a reform in the usage of genetic resources. However, the convention repudiated the notion of genetic resources being a common heritage. Instead, it agreed on two relevant principles. First, in Article 3, CBD recognized each nation's sovereign right to exploit them as national resources (Guruswamy, 1999: 81). This was viewed as an achievement of developing countries, who were concerned about the increasing extraction of these resources by commercial and public sector institutions in the developed world and struggled against it (Henne & Fakir, 1999: 324; McGraw, 2002: 17). However, it, in the meantime, raised questions and concerns about under which circumstances developing countries would choose to protect biodiversity or whether their powers and priv-

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11 Article 27.3(b) of the Trade-Related Intellectual Property Rights (TRIPS) Agreement allows governments to exclude some kinds of inventions from patenting, i.e. plants, animals and "essentially" biological processes. But micro-organisms, and non-biological and microbiological processes for plant and animal production have to be eligible for patents (Tabari, 2005: 1). Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system, or a combination of the two (WTO, 2008). In law, *sui generis* refers to a legal classification that exists independently of other categorizations.

ileges on biodiversity would lead them to sustain economic and social development at the expense of, for instance, tropical forests (Guruswamy, 1999: 80). Secondly, CBD recognized that biological diversity itself was a common concern of humankind. Within this context, the common concern was referring to a common but differentiated responsibility among developing and industrialized countries. Article 20.4 of the CBD gave the responsibility related to financial resources and transfer of technology to developed countries and stipulated it as a condition for developing countries' commitments to nature-based solutions<sup>12</sup>. On the other hand, the CBD is not just a conservation agreement, but also in a sense a trade agreement, as it established the basic terms of trade in genetic resources (Downes, 1994: 164-165). Although the CBD does not specifically obligate Parties to establish trade-related environmental measures (TREMs), its provisions on genetic resources such as those of Article 11 which call on incentives for conservation and sustainable use, clearly empower Parties to control exports of those resources. However, as the terms of the CBD are not mandatory, it is up to the Parties to strengthen their capacity to develop and implement measures that mitigate trade-related threats to biodiversity (Downes, 1999: 19). All in all, it can be said that the CBD offers a room for constructing provisions with regards to ecologically respectful trade and a fair-trading system between countries.

With an attempt to compare the TRIPs Agreement of WTO and TREMs provisions of the CBD, it can be seen that they have radically different goals and perspectives. While the TRIPs Agreement emphasizes patents and intellectual property rights of inventors and corporations involved in the formal research sector in developed countries and ignores any equivalent legal protection for indigenous traditional knowledge, The CBD calls on Parties to ensure that a share of the benefits from either genetic resources or biodiversity-related traditional knowledge returns to the providers, most of who are indigenous and local communities (Article 8 & 15) (Downes, 1999: xiv). In doing so, CBD opens the door for nations to establish protective measures for their biodiversity (as against bio-piracy) concerning patent applications, such as demanding proof of "prior informed consent" (PIC) and disclosing the "country of origin". However, the TRIPs agreement does not recognize these sovereign rights, leading to the current neglect of disclosing PIC and "country of origin" in patent applications (IISD, 2003: 4; Tabari, 2005: 1).

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12 The principle of "common but differentiated responsibilities" is based on the recognition that certain countries bear greater responsibility for environmental protection due to their historical contributions. It was a veiled acceptance of the inverse effects of historical phases starting with colonialism and particularly following the industrial revolution on the environment. In essence, the burden of responsibility for each party varies based on their level of development and historical accountability for environmental degradation. It can also be viewed as a historically extended version of the polluter pays principle.

Although the CBD and CITES give developing countries some room to protect their biodiversity against biotrade-driven extraction, it is a conflicting issue for those countries to support their small producers in the face of international biotrade firms and their contractual relationship with these producers. Besides developing countries are constrained by WTO rules to guarantee that restrictive measures to preserve the environment do not discriminate or are not overly trade-restrictive (Bellora et al., 2020: 6). Moreover, as far as indigenous people are concerned, international agreements are far from offering a convincing solution. Some critics argue that the CBD's 10 percent target of protected areas as a share of the total surface of a country is likely to displace local people without their free, prior, and informed consent to appropriate ever more land in the name of conservation (Domínguez & Luoma, 2020: 5-7). CBD's approval of the state (instead of indigenous governed lands) as the responsible authority of protected areas does not necessarily prevent destructive settlements, extractive industries, or expansion of lucrative agribusiness. But it certainly drives indigenous people and local communities into poverty, while they lack legal, political, and monetary instruments to claim their right for their predominant source of subsistence.

On the other hand, UNCTAD also took part in the policy debate by launching The BioTrade Initiative in 1996. BioTrade with a capital "B" and "T" reflects a fundamental difference from "biotrade", as it refers to those activities involving the collection, production, transformation, and commercialization of goods and services derived from native biodiversity under the criteria of environmental, social, and economic sustainability. Hence with this capitalization in BioTrade, UNCTAD tries to enable nations to (i) support the conservation of biodiversity, (ii) sustainable use of its components and (iii) fair and equitable sharing of benefits for poverty alleviation in line with the CBD's principles (Jaramillo & Onguglo, 2016: 1). The BioTrade initiative has been recognized by multilateral environmental agreements (MEAs), Conference of Parties (under CBD) and CITES (Jaramillo Castro, 2012: 25). Nevertheless, the main motivation of CITES on biodiversity is somewhat different from the BioTrade Initiative. While CITES primarily focuses on limiting the import and export of endangered species of wild flora and fauna rather than emphasizing their sustainable use and trade, The BioTrade Initiative certainly aims at promoting and facilitating international trade in nature-based biodiversity products including wildlife (Andrew, 2017: 9-10). In practice, while CITES requirements have been incorporated in UNCTAD BioTrade procedures, they jointly try to ensure that international trade in listed species is sustainable, legal, and traceable (Stahl et al. 2016: 60). However, UNCTAD has a broader product coverage than CITES, while it involves not only trade flows in plant and animal species but also biodiversity-based products<sup>13</sup>.

13 UNCTAD accepts a product as a biodiversity-based good, if that good meets at least one of the following criteria:  
(i) intrinsically and integrally based on biodiversity itself at a non- or low-processed stage (e.g., whole pineapples

In terms of trade-related measures and their effect on the protection of biodiversity, Andrew (2017: 4) distinguishes between two policy choices, driven by long-lasting discussions among environmental economists. The first approach involves regulatory interventions, which rely on the use of laws and institutions to implement and enforce measures, as seen in the case of CITES regulations. The second approach, on the other hand, revolves around market-based solutions that include the adoption of non-mandatory standards by private entities. Major examples of these kinds of standards are Codex Alimentarius of FAO/WHO, aiming at ensuring safe, fair, good quality international food trade, and Codex Planetarius of WWF as a complement of the former in terms of planetary health, not just human health (Clay, 2016: 4). In this categorization, the positive incentives<sup>14</sup> of BioTrade Initiative also typify the second policy tool. The main goal is to mainstream BioTrade in relevant multilateral, regional, and national processes and strengthen the policy and regulatory environment for BioTrade sectors (Andrew, 2017: 11). One crucial tool for this goal is the biodiversity branding schemes such as voluntary sustainability standards (VSS) combined with certification procedures. Nevertheless, these branding schemes tend to restrict sourcing to a relatively limited group of financially stable and well-managed producers who have access to superior infrastructure. This situation occurs particularly when voluntary sustainability standards (VSS) become increasingly stringent and intricate. Besides, in cases of saturated markets and excess supply for VSS-compliant commodities, prices go down, leaving the distribution of supply (and benefits) to those who can provide compliant goods at the lowest cost (Andrew, 2017: 13, 17). Hence the reliance of such initiatives on market forces creates a more consolidated market structure, which crowds out those suppliers that cannot stand on lower prices and higher compliance.

On the other hand, bilateral and regional trade agreements have also begun to include provisions related to biodiversity. The EU includes the most extensive array of biodiversity-related provisions in its trade agreements, surpassing all other entities in this regard. Since 1972, it has signed 55 agreements with a total number of 162 provisions as of 2018. Besides, the USA, Peru, Switzerland, and Canada are among the top five countries with the highest

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or ground coffee), (ii) if it's processed, solely or principally use biodiversity-based ingredients or products as inputs in their production processes (e.g., cotton shirts, wooden furniture, or chocolate bars), (iii) if it is a derivative, then derived mainly from biodiversity-based products (e.g., glycerol from natural oils and fats) (Benda, 2022: 7).

14 In terms of positive incentives, BioTrade Initiative develops and suggests (i) market incentives like biodiversity branding schemes, (ii) social incentives such as promoting increased interaction among all participants in the value chain and providing social recognition, (iii) financial incentives such as grants and microcredit for private entities that adopt sustainable and conservation practices, (iv) physical incentives such as improving access to equipment, transportation, and internet-based information systems, (v) adoption of property rights in a way to sustain the rights of communities to access natural resources, (vi) fiscal incentives such as tax breaks on imported equipment and training, preferential tariff schemes for sustainable products, and special tax regulations for community-based initiatives (Klein et. al, 2014: 6-8).

number of provisions, following the EU. These provisions include both environmental protection specific to various forms of biodiversity and MEAs with references to CBD and CITES (TREND Database).

Unfortunately, since the turn of the millennium, these international efforts to slow the loss of biodiversity have shown limited progress. Although various conservation measures have been implemented worldwide, resulting in significant positive impacts on specific species and ecosystems, the primary factors driving biodiversity loss continue to intensify (Secretariat of the Convention on Biological Diversity, 2020: 24). For this reason, the global community, through the consensus of governments worldwide, reached an important milestone by endorsing the groundbreaking Strategic Plan for Biodiversity 2011-2020 in the 10th Conference of parties of UN CBD in 2010. Besides, 2011-2020 Ten years of Biodiversity was declared by the General Board of UN and the 20 Aichi Biodiversity targets were accepted with the main aim to halt biodiversity loss in the world until 2020. The Strategic Plan acknowledged that efforts solely focused on conservation would be insufficient to counteract the ongoing decline in biodiversity unless substantial progress is made in addressing the leading causes of biodiversity loss. In this respect, the strategy was aimed at bringing biodiversity to the focus of decision-making on economic development, alleviation of poverty, financial subsidies, and incentives, and how goods and services are produced, consumed, and traded (Secretariat of the Convention on Biological Diversity, 2020: 25).

In this framework, BioTrade fits into the principle of “sustainable use”. Although not explicitly stated, both the Aichi Biodiversity Target’s Strategic Goal B and SDGs 12, 14, and 15 give attention to BioTrade, as they focus directly on promoting the sustainable use of biodiversity, reducing direct pressures on it and halting biodiversity loss (Foppes, 2019: 9-10; Benda, 2022: 69-70). Besides, BioTrade is expected to create positive externalities for SDG1 (ending poverty), SDG2 (Zero Hunger), SDG8 (inclusive and sustainable growth), SDG13 (climate action) as well as contributing to the post-2020 global biodiversity framework (GBF), which is to be adopted during the 15th Conference of the Parties to the Convention on Biological Diversity (CBD) (Benda, 2022: 2).

As can be seen, it is a multidimensional and conflicting issue for a country to regulate its trade policy in line with the BioTrade principles and thereby mitigate the inverse effects of international trade on biodiversity. Within the framework of WTO rules, CBD, CITES, BioTrade, and the conflicting nature of bilateral trade negotiations, it can be said that both tariffs and other trade policy instruments, such as non-tariff trade measures/barriers, tariff rate quotas, and private standards embedded in conditional trade agreements, have their limita-

tions. Nevertheless, non-tariff measures (NTMs) and reciprocal preferential trade agreements provide more flexibility when it comes to incorporating provisions related to biodiversity. Implementing sanitary and phytosanitary inspections, imposing trade bans on invasive species and the most endangered species listed in the CITES, and including commitments from international environmental agreements in preferential agreements can be considered the most effective trade policy tools for conserving biodiversity (Bellora, 2020: 16-17).

### **3. The Case of Türkiye in the Conservation and Sustainable Utilization of Biodiversity**

In this brief framework of the relationship between biodiversity, international trade, and its global governance, Türkiye occupies a critical position, while it hosts a significant part of the global biodiversity. This section first aims at illustrating components of the country's biodiversity, namely genetic diversity, species diversity, and ecosystems and habitats diversity together with mentioning the main problems in the protection of biodiversity. Thereafter, a historical review of environmental policies linked to biodiversity is conducted from the aspects of a critical political economy framework. Finally, the section ends up with an evaluation of the ongoing trade regulations and an analysis of the biotrade flows of Türkiye in comparison with its regional counterparts.

#### **3.1. Some Stylized Facts about the Biological Diversity of Türkiye**

Türkiye involves particular elements of three biogeographical regions (out of a total of seven) in the world. These regions are called Euro-Siberia, Mediterranean, and Iran-Turan. As a result of being at the intersection of continents, Türkiye resembles a small continent with its various climatic and geographical features at close distances (FAO, 2018: 16). It hosts a wide variety of terrestrial, aquatic, and aerial ecosystems as well as being a homeland for flora and fauna species. Besides, Türkiye is at the intersection of Mediterranean and Near East gene centers, which play a significant role in the emergence of cereals & horticultural crops (Demirayak, 2002: 5; Kunt, et al. 2020: 199). This feature serves as a basis for the country's agricultural product specialization and trade as well.

Starting with the species diversity, Türkiye is well endowed with flora diversity of 9996 plant species, 3035 (31.12%) of which are determined as endemic. When considered together with the number of taxa, the species diversity reaches 11707, and 3649 of them (31.82%) are endemic to Türkiye (Güner et al. 2012). Asteraceae, with a total of 572 endemic taxa, is the most diverse plant family in terms of endemism in Türkiye. It is followed by Fabaceae with 385 taxa and Lamiaceae with 326 taxa. Among the 3,649 endemic plant taxa in Türkiye,

several of them are closely related to important crop species that provide food worldwide, including wheat, barley, rye, oat, linseed, lentil, chickpea, and pea. Additionally, there are endemic plant taxa related to pasture plants such as alfalfa, clover, sainfoin, vetch, and various grasses. Furthermore, Türkiye is home to endemic horticultural plants like cherry, apricot, plum, almond, fig, and grape (T.R. Ministry of Agriculture & Forestry, 2019a: 58-59). Among seven regions of the country, the Mediterranean region is identified as the foremost area with 862 taxa when classifying endemic plants based on the specific region where they exclusively grow. It is followed by Eastern and Central Anatolia regions, which are dominated by the Irano-Turanian climatic and geographical features (Ekim, 2006: 47). In terms of Fauna diversity, Türkiye hosts an estimated 60000 to 80000 invertebrate species, the majority of which are insects. The total number of vertebrate species identified to date is nearly 1,500. There are 694 freshwater and marine fish species, 460 bird species, 30 amphibian species, 161 mammal species, and 120 reptile species (T.R. Ministry of Agriculture & Forestry, 2019a: 58). According to the International Union for Conservation of Nature (IUCN, 2023), the number of threatened animal and plant species in Türkiye are identified as 307 and 136, respectively. Among animal species, fishes are the most vulnerable group with 148 species, followed by mollusks and other invertebrates. Besides, 18 mammals, 21 birds, and 20 reptiles are counted as threatened in the list.

As for genetic diversity, Türkiye has five micro-gene centers thanks to its diverse geography and climate conditions. The major common species in these gene centers are wheat, barley, chickpea, and lentil for which Anatolia is the first-degree gene center. Besides species such as apple, pear, black cherry, melon, and watermelon are diversified and enriched in Anatolia as a secondary gene center (Kunt, et al. 2020: 200).

Lastly, Türkiye is characterized by different ecosystems, all of which have their distinct physical and biological features, such as climate, topography, soil types, and the composition of plant and animal species. As different ecosystems support different species and have unique ecological functions, they are an inseparable part of the conservation of biodiversity. In terms of terrestrial ecosystems, 29.4% (22.9 million ha) of Türkiye's total area was surfaced by forest ecosystems in 2020 (T.C. Tarım ve Orman Bakanlığı, 2021: 11), whereas steppe grasslands cover 28% (21.7 million ha) and mountain ecosystems account for at around 50% of the total land (Tekeli, et al., 2006: 51, 58). However, half of the forest ecosystems have degraded due to overexploitation, although degraded forest area has decreased by 8.9% since 1973. In 2011, a highly disputed legislation, the 2/B Lands Amendment (of the Forest Law), which allows the government to convert degraded forest areas to other uses and/or sell them



to private owners, was approved by the Constitutional Court of Türkiye. When considered together with the increased number of forest fires in recent years, this legislation is argued to be the major threat to the natural regeneration of forests (Şekercioğlu, et al., 2011: 2756). As for the steppe ecosystems, it is argued that the Anatolian steppes have suffered significant degradation, particularly within the second half of the 20<sup>th</sup> century. The destruction of steppe areas can be attributed to several primary factors. The main reasons may be listed as overpopulation and excessive consumption, afforestation, unregulated overgrazing without proper pasture management, the conversion of pastures into agricultural lands, improper practices within agricultural areas, uncontrolled hunting, stubble burning, pollution, erosion, the construction of roads and dams, unsustainable methods of collecting medicinal plants, and inappropriate mining activities (Tekeli, et al., 2006: 52; Ambarlı et al., 2016: 2505-2509).

With regards to aquatic ecosystems, Türkiye is also rich in coastal and marine areas, inland water ecosystems, and wetlands. With a cursory look, it can be seen that the total measure of the protected coastline accounts for 24% (2083 km) of the whole length of the coast (8592 km). Total marine protected areas are at around 1,5 million ha. Inland water ecosystems cover 1.6% of the total surface area of Türkiye (Kunt, et al. 2020: 216-217). Among them, Wetlands cover 1.1 million ha (around half of all inland water ecosystems) and 14 of a total of 105 wetlands are included in the Ramsar list (T.C. Tarım ve Orman Bakanlığı, 2023). Wetlands are natural habitats for numerous species of water birds, endemic aquatic species, and migratory birds. Nonetheless, starting from the 1960s, a notable portion of wetlands has suffered destruction primarily caused by the desiccation and reclamation of these areas to obtain agricultural and settlement land. Additional factors include debris filling, altering the course of streams for irrigation purposes, constructing dams that disrupt the water sources, unregulated cutting of reeds, excessive and illicit fishing, hunting, and the unlawful collection of species' eggs. Furthermore, pollution resulting from agricultural, industrial, and domestic waste, as well as other similar projects that disrupt the natural water balance, have further contributed to the degradation of wetlands (Tekeli, et al., 2006: 53). In recent years, numerous lakes and rivers in Türkiye have experienced significant shrinkage primarily as a result of escalating drought conditions and increased extraction of groundwater. This trend has had far-reaching consequences for aquatic ecosystems and the species that depend on them. On the other hand, marine diversity is threatened by the introduction of invasive marine species, overfishing, habitat destruction, and marine pollution. (FAO, 2018: 136). The entrance of alien species on the Mediterranean coasts of Türkiye has accelerated in recent years, although many fish species have migrated into the Mediterranean since the opening of the Suez Canal. In 2005,



there were 263 invasive alien species in Türkiye's seas, but that number has reached to near 450 in the Eastern Mediterranean waters of Türkiye (Kunt, 2016: 229). The main reason behind this upsurge is argued to be climate change, which has caused the water temperature of the Mediterranean Sea to increase and to become tropical thereby generating a suitable environment for alien species, whose dispersion was once limited until the mid-20<sup>th</sup> century as a result of temperature and salinity barriers (T.R. Ministry of Environment and Urbanization, 2018: 151-152). Besides ship ballast waters are another reason for the passage of alien species into the country's seas, especially the Black Sea. While 66% of the invasive alien species in the Mediterranean Sea have entered through the Suez Canal, 80% of those in the Black Sea have been introduced via ballast water from ships (Kunt et al., 2020: 245).

In a recent study, Eken et al. (2016) tried to conduct a nationwide threat assessment of key biodiversity areas (KBAs) in Türkiye. Taking into consideration 10214 species of eight taxonomic groups (plants, dragonflies, butterflies, freshwater fish, amphibians, reptiles, birds, and mammals), they determined 313 KBAs, 303 of which trigger the KBA criteria for one or more taxonomic groups at the global scale. These 303 KBAs cover 20.4 million ha (26%) of the country's total area. The comprehensive evaluation of KBAs has revealed that dams, irrigation, and drainage projects, which are part of water policies, pose the most significant threat to the country's biodiversity. Irrigation and drainage projects were estimated to have a direct impact on 225 KBAs, while hydroelectric power plants and dams affect a minimum of 185 sites. Furthermore, apart from water policies, the expansion of tourism and urbanization along the Aegean and Mediterranean coasts has led to the ongoing loss of biodiversity in numerous KBAs. Road construction and mining were determined to be among other major threats affecting the sites. In comparison to irrigation and drainage projects, the study argued that power plants and dams have an irreversible and higher impact on KBAs. Considering the projected implementation of 1738 dams and hydroelectric power plants by 2023, it was anticipated that rivers and freshwater ecosystems would face the highest level of threat. Lastly, the study found that KBAs are insufficiently protected, and the legally protected areas do not adequately represent the biodiversity of Türkiye, particularly steppic habitats, river valleys, and Mediterranean scrublands. These findings emphasize the necessity for enhanced conservation measures and the enlargement of protected areas to effectively encompass and safeguard these crucial ecosystems and the species that depend on them.

In Article 8 of CBD, Parties are required to establish a system of protected areas as part of In-situ conservation (CBD, 1992: 6). In a similar vein, conservation of ecosystems has been determined as one of the Aichi Biodiversity Targets in 2010. Hence, it is aimed at conserving

at least 17% of terrestrial and inland water, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services by 2020. Although the efforts were not enough to meet this target, the world's ratio of protected land to terrestrial land increased from 2.6% in 1970 to 13.2% in 2020, while it is 25.9% for the EU, and above 30% for Poland, Germany, and Greece. However, Türkiye lags far behind in this target. The total net size of the protected areas of the country is recorded as 67773 km<sup>2</sup> and accounts for 8.7% of the total surface in 2020. In the case of sea-protected areas, around 4% of Türkiye's territorial waters are legally preserved (WWF, 2021: 4-6).

Despite this, compared to the 4.34% portion of land that was protected in 2002 (T.C. Tarım ve Orman Bakanlığı), it can be stated that there has been some advancement over two decades. However, it is argued that this upsurge in the protected areas mainly resulted from the increase in recreational use, whereas the number and size of the nature conservation areas have diminished (Atmış & Artar, 2013). In a recent study, Serter (2020) has shown that from 2002 to 2018, there was a significant decline in the nature conservation areas, which are designated as having the highest conservation priority based on the criteria set by the IUCN. In contrast, there was a considerable rise in areas with lower conservation targets during the same period<sup>15</sup>.

On the other hand, Wolf et al. (2022) developed an environmental performance index (EPI) for 180 countries all around the world by using 40 different performance indicators. These 40 indicators measure how close countries are to meeting internationally set sustainability targets. They are grouped into 11 issue categories and then aggregated further into three policy objectives. Countries are ranked by their national efforts to satisfy these policy objectives, which are aimed at (i) protecting environmental health, (ii) enhancing ecosystem vitality, and (iii) mitigating climate change. Hence it will be useful to evaluate the performance of Türkiye in terms of these internationally determined indexes and compare it with its counterparts.

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15 In this period, as there was no further expansion of nature conservation areas with the highest conservation priority, five conservation areas were abolished due to pressures from human activities, resulting in a decrease in their number from 35 to 30. While four of these areas were converted into national parks, one of them was converted into a nature park with a much lower protection status. Although the number of national parks increased from 32 to 44 in this process, 4 of the 12 newly declared national parks were converted from nature conservation areas and 6 of them were declared as national parks due to their historical importance rather than their natural qualities. Finally, although the number of nature parks has increased tremendously due to the declaration of 139 recreation areas as nature parks in 2011, they are far from meeting the nature park criteria of neither the Law on National Parks nor the IUCN's nature park criteria (Serter, 2020).

Table 1. Environmental Performance Index for Türkiye, 2022				
Index Name	Score	World Rank	Regional Rank	10 Year Change
Environmental Performance Index	26.3	172	19	-0.5
Environmental Health Index	47.8	60	11	7.1
Climate Change Mitigation Index	21.5	166	19	-3.2
Ecosystem Vitality Index	20.3	176	19	-1.7
Source: Wolf et al. (2022).				

Table 1 shows that Türkiye ranks 172nd out of 180 countries in the world with an EPI score of just 26.3. By looking closer at three policy objectives, the weights<sup>16</sup> of which construct the EPI score, it can be seen that Türkiye underperforms especially in enhancing ecosystem vitality and climate change mitigation, both of which are crucial targets for biodiversity conservation. In its regional group of Eastern European nations, Türkiye emerges as an exception, while its peers attain high scores. The low score on the climate change mitigation index is related to the failure of Türkiye to mitigate rising greenhouse gas emissions. If Türkiye’s current trajectory does not improve, the projected emissions in 2050, as indicated by the EPI, indicate that Türkiye will become the 11th largest contributor to greenhouse gas emissions by the middle of the century (Wolf et al., 2022: 22).

Table 2. Ecosystem Vitality Index: a comparison of Türkiye with selected countries					
Country	Score	World Rank	Regional Rank/Total	10 Year Change	Region
Germany	66.8	6	4/22	-1.5	Global West
Poland	60	26	10/19	-0.1	Eastern Europe
Greece	53.9	47	13/19	0.1	Eastern Europe
Mexico	53.7	48	4/32	13.1	Latin America & Caribbean
USA	51.4	57	20/22	1.1	Global West
South Korea	48.8	70	3/25	0.1	Asia-Pacific
Egypt	43.7	95	4/16	4.2	Greater Middle East
Russia	39	117	11/12	0.4	Former Soviet States
China	24.5	169	19/25	4.5	Asia-Pacific
Türkiye	20.3	176	19/19	-1.7	Eastern Europe
Source: Wolf et al. (2022).					

16 The weights for three policy objectives in constructing EPI is as follows; (i) 20% for protecting environmental health, (ii) 42% for enhancing ecosystem vitality, and (iii) 38% for mitigating climate change. As can be seen, ecosystem vitality has the highest weight in the calculation of EPI score.

In Table 1, the Ecosystem Vitality Index<sup>17</sup> (EVI) deserves special attention, because it is directly related to the conservation of biodiversity. Furthermore, as one of the richest countries in the Mediterranean region in terms of species and habitat diversity and high endemism rate, Türkiye must take steps to improve its EVI score. In Table 2, the EVI performance of Türkiye is demonstrated once again in comparison to a group of selected countries.

In the selection of countries, it is aimed at not just looking at regional peers of Türkiye, but also including both developed countries of the Global West and developing countries from other regions. As can be seen, Poland, Greece, and Mexico performed far better than Türkiye with EVI scores of 60, 53.9, and 53.7, respectively. While Mexico, China, and Egypt developed their EVI scores prominently, Türkiye turned out to become worse with a -1.7 change in the last ten years. The reasons for this decrease in EVI score in the ten years are mainly related to three performance indicators, namely fish stock status (-16.6 change), species habitat index (-10.2 change), and wetland loss (-10.2 change) (see Appendix Table A1).

### **3.2. An Evaluation of Environmental Policies Concerning Biodiversity from a Political Economy Framework**

For an evaluation of the performance of Türkiye's 100 years on the conservation of biodiversity, the planned development period is a good point of departure. In the First (1963-1967) and Second (1968-1972) Five-Year Development Plans of Türkiye, environmental problems were not yet on the agenda<sup>18</sup>. This was mainly because the primary aim of the plans in this period was to modernize the economic and social structure and to ensure the transition from a pre-industrial society to an industrialized one. This agenda also corresponded to the modernist understanding of development as a dominant strategy during this period. Accordingly, industrialization, modernization in agriculture, and urbanization were considered to be the driving forces of development. Urbanization was accepted as a factor directly affecting economic development as it accelerated technological changes by creating external economies (DPT, The 2nd Five-Year Development Plan: 264). The Third Five-Year Development Plan (1973-1977) was the first material which included environmental problems as a sub-heading. However, the plan clearly stated that *"In the studies and legal regulations to be carried out at the international level in relation to environmental problems, any obligation that would divert Türkiye from the goal of development through industrialization shall not be accepted"* (DPT,

17 The ecosystem vitality index comprised of 6 issue categories and 18 performance indicators. For a detailed illustration of the components of this index for Türkiye, please check for the Appendix.

18 Before the planned economy period, a number of articles (such as The Law on Land Hunting, Article 2, dated 1937; The Law on Forests, Article 14, dated 1956) were issued for conservation of biological diversity. But there wasn't any systematic understanding about the concept of biodiversity.

The 3rd Five-Year Development Plan: 866). Nevertheless, it accepted to seek a solution to environmental problems without alienating it from industrialization and development.

In the Fourth Five-Year Development Plan (1979-1983), environmental problems started to be addressed in more detail by mentioning the situation in Türkiye in terms of water, sea, air, and noise pollution, land erosion and pollution (DPT, The 4th Five-Year Development Plan: 83-85). This was the first plan which tried to link environmental problems with urbanization, industrialization, and agriculture. However, the plan was reluctant to suggest policy advice that would also be favorable for the economic and social structure. Nevertheless, urban, and industrial waste were accepted to be the main determinant of water, land, and air pollution. In terms of sea pollution, the plan underlined Türkiye's geographical position where the Black Sea countries export northern oil to the Mediterranean through Bosphorus and the Dardanelles. Accordingly, this Mediterranean oil traffic was estimated to account for 30% of all marine traffic in the straits. In return, empty tankers were reported to wash their tanks in and dump bilge water into Turkish territorial waters due to the heavy measures taken by neighboring countries. As a preventive measure, Türkiye signed the Barcelona Convention in 1976 and agreed to take action against pollution of the Mediterranean Sea and to protect the marine ecosystem as a common heritage for the present and future generations (Barcelona Convention, 1976). To the best of our knowledge, this was the first international agreement to which Türkiye became a party about the conservation of biodiversity. In that sense, it can be argued that the international initiative, that emerged from the Barcelona Convention was quite reflected in the Fourth Plan by Turkish authorities.

At the end of the Fourth Development Plan period, Türkiye enacted the Law on Environment, one of the purposes of which is to ban over and misuse of ecological systems, which causes endangerment of animal and plant species and destruction of natural wealth (The Law on Environment, 1983, Article 9). The Law adopted the "polluter pays" principle (T.R. Ministry of Environment and Urbanization, 2018: 76).

Concerns about future generations are also mentioned in the Fifth (1985-1989) and Sixth (1990-1994) Five-Year Development Plans of Türkiye. In the Fifth Plan, it was stated that to ensure the preservation of natural resources for future generations, it was essential to prioritize optimal utilization and advancement of them with due consideration to ecological balance (DPT, The Fifth Five-Year Development Plan: 171). The significance of natural resource management was emphasized in the Sixth Plan, which highlighted the need to safeguard a sustainable natural, physical, and social environment for the well-being of future generations. The Plan further emphasized the necessity of environmental impact analysis in the implementation

of economic policies, in energy production, and all planning stages. Besides, the plan promised to take precautionary measures against the destruction of wild plant genetic resources. The Sixth plan also underlined, for the first time, the importance of harmonization with the environmental policy of the European Community (DPT, The Sixth Five-Year Development Plan: 312-313). In addition, the Fifth and Sixth plans both emphasized the importance of water sanitation and waste management. The Sixth Plan's Industry and Environment Specialized Commission report pointed out the negative effects of industrial harmful gas emissions on land. Specific to the East Black Sea region, acid precipitation was determined to be one of the reasons for the disruption in the biological activity in the soil and plant development, as the naturally acidic soil structure could not absorb much acid through rain (DPT, 1993: 27).

In all these development plans thus far, the emphasis was mainly on the measures against pollution rather than on protection. As a result of the lack of a preventive perspective, regulatory efforts aimed at resolving environmental problems have faced limitations in their implementation and effectiveness. As an example in terms of forest biodiversity, 68000 hectares of forest land were lost due to the forest fires, and 113000 hectares of forest land were excluded from the forest regime using various laws in the sixth plan period, although 260000 hectares of land were afforested, and erosion was controlled in 33000 hectares (The Seventh Five-Year Development Plan: 58). In respect to this, it can be said that 1992 Rio Summit was a turning point for raising environmental awareness in Türkiye. 1992 Earth Summit paved the way for the three conventions on Biodiversity, Climate Change, and Desertification, which Türkiye ratified in 1996, 2004, and 1998, respectively<sup>19</sup>. Thereafter, Türkiye began to take part in several international conventions. Türkiye signed the Ramsar Convention in 1994, 15 years later it came into force (Yeniyyurt & Hemmami, 2011: iv), and CITES in 1996, 21 years later it came into force (CITES). Hence, the legal status of biodiversity in Türkiye began to be shaped by laws & related bylaws after taking part in International Conventions<sup>20</sup>. However, each component of biodiversity was regulated with a specific rule which created a fragmented structure in the protection of biodiversity. Türkiye's aim to align its national legislations with the European Union (EU) *acquis* and thereby improve enforcement was another reason for these excessive numbers of secondary and cross-cutting legislation (T.R. Ministry of Environment and Urbanization, 2018: 76).

19 Türkiye signed the UN Biodiversity Convention in 1992 and ratified it through Law No. 4177 dated 29 August 1996 (T.R. Ministry of Agriculture and Forestry, 2019b: 4, 8). Türkiye ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 2004 (T.R. Ministry of Foreign Affairs). Türkiye became a party to UN Convention to Combat Desertification (UNCCD) through Law no. 4340, which was signed in Paris on 15 October 1994 and was also published in the Official Gazette no. 23258 dated 11 February 1998 (T.R. Ministry of Forestry and Water Affairs).

20 For a detailed list of national and international regulations, Türkiye adopted with regard to biodiversity, also see: T.C. Çevre ve Orman Bakanlığı, 2010: 6-7, 11-13.

The Seventh Five-Year Development Plan (1996-2000) of Türkiye, which was prepared in light of these developments in international awareness, determined a number of factors that contributed to the limitations in effectively solving environmental problems. The Plan pointed out the fragmented structure of legal regulations as a drawback in the effective enforcement of environmental legislation due to the inconsistencies and duplications in legal texts. Other than insufficient legal arrangements, the weak institutional structure of the Ministry of Environment, the lack of harmony among public institutions responsible for environmental management, the lack of data and knowledge capacity, technical incompetence of human resources, the misuse of environmental funds, and the lack of a proper environmental financing system were identified to be among those factors that hindered capacity of previous development plans in making necessary transformations (The Seventh Five-Year Development Plan: 189-194). The Seventh Plan's Environment Specialized Commission report further mentioned the lack of capacity to transfer prepared plans into practice (rather than lack of a plan) as the main reason for the insufficiency of environment management (DPT, 1994: 34). In the report, the protection of biological diversity was clearly defined and together with genetic resources, they were accepted as the most vulnerable segments to the environmental degradation. The report also underlines the need for a legal basis for the regulation of international trade in biodiversity and natural resources (DPT, 1994: 106, 109, 201).

While the seventh plan demonstrated the increased awareness of Turkish authorities on biodiversity in internal affairs, Türkiye adopted a more reluctant stance in terms of foreign policy during this period. In this respect, it can be argued that Turkish authorities followed a more realist/economic stance from the aspects of international political economy. Türkiye, as a participant in the Conference of Parties (COP) meetings since the 4th COP meeting in 1998, has often chosen to make individual declarations rather than aligning with groups such as the regional group of West Europe and Other countries or the European Commission as a candidate country (T.C. Çevre ve Orman Bakanlığı, 2010: 5-6). Nonetheless, in the 2002 World Summit on Sustainable Development, Türkiye acted together with the G-77 countries in the negotiations of renewable energy resources. In the Summit, the EU adopted the ecosystem approach<sup>21</sup> which emphasizes the interconnectedness and interdependence of living organisms, their habitats, and the interactions between them and their surrounding environment. EU aims at prioritizing this emphasis in socio-economic decision-making. In this respect, the

21 Ecosystem approach or ecosystem-based approach was first held in the CBD workshop in Malawi in 1998. It arose from the need to overcome the shortcomings and deficiencies of classical nature conservation approaches. Thereby, it tries to generate solution especially for the failure to integrate or coordinate with other sectoral interests, which are often managed separately by different governmental bodies in a non-integrated fashion (Hoffman & Wagner, 2006).



EU suggested excluding larger dams from renewable energy resources due to their inverse effects<sup>22</sup> on ecosystem services. However, the Turkish delegation argued that the conservation of the ecosystem as a part of nature conservation was quite enough and refused the inclusion of ecosystem approach into the implementation plan as well as the exclusion of dams (Ağca, 2002). Hence, it can be argued that Türkiye took sides with G-77 countries in the trade-off between biodiversity and economic development. From an international political economy framework, the realist stance of Türkiye is related to its national objective to ensure that economic growth is not compromised while taking measures to safeguard biodiversity.

The Eight Five-Year Development Plan (2001-2005) maintained the self-criticism of the former plan with a promissory discourse. Specific to the protection of biodiversity, the plan stated that the National Biological Diversity Strategy and Action Plan (NBSAP) would be brought into force. It was in a sense inevitably necessary to take on the responsibility of developing this plan in alignment with Article 6 of the CBD, after Türkiye became a participant in 1996 (T.R. Ministry of Environment and Urbanization, 2018: 172). Hence the proposed plan was prepared by the former T.R. Ministry of Environment in 2001 to be a guide to be used in the implementation of the CBD in compliance with other obligations and in solving the problems caused by biodiversity loss (T.C. Çevre ve Orman Bakanlığı, 2008: 19).

In the early 2000s, significant progress was made towards harmonization with international conventions that the country had agreed to. During this period, the number of legal regulations, programs, and strategies enacted in the first decade of the 2000s exceeded the number of previous ones up to 2000<sup>23</sup>. After Türkiye's candidacy for EU membership in 1999, it became crucial to consider not only those international regulations Türkiye took a part in, but also the EU *acquis* while aligning national legislation in favor of the conservation of biodiversity<sup>24</sup>. Efforts to establish a single legal instrument for biodiversity conservation first emerged in 2003 as part of the preparatory work for the "Law on Nature Conservation and Biodiversity" initiated under the Global Environment Facility (GEF), bringing together civil society organizations and various experts. (Özgen & Soldamlı, 2013). This was the first initiative on the way towards a national law for biodiversity. However, the viewpoint of the

22 Dams and other forms of infrastructure pose a threat to rivers that flow freely because they create obstacles that lead to fragmentation and changes in the natural flow patterns. Furthermore, dams have a negative impact on migratory fish that rely on long-distance migrations, as they block their migration routes, making it challenging or even impossible for them to complete their life cycles (WWF, 2016: 36).

23 For the timeline of related regulations, see T.C. Çevre ve Orman Bakanlığı, 2010: 6-7, 11-13.

24 Hence in light of the importance of aligning Türkiye's nature protection activities with European Union standards, the NBSAP of Türkiye has been revised to ensure conformity with EU regulations in this domain (T.R. Ministry of Environment and Urbanization, 2018: 172).



public authority on this matter triggered a two-decade-long dispute that embroiled various stakeholders, including the Ministry of Environment, Ministry of Forestry and Water Affairs, civil society, experts, opposition parties, and local communities.

In this respect, The Ninth Five-Year Development Plan (2007-2013) provided indications regarding the viewpoint that would be reflected in the upcoming draft law. It put forward the idea of economic value, embedded in biodiversity. This mindset of “protection via valuation” was a reflection of the liberal green development perspective, which pervaded international environmental organizations since the 1990s. In this regard, alongside of conservation and investigation of biodiversity and genetic resources, the Ninth Plan emphasized the economic valorization, utilization, and efficient and multi-purpose management of them (The Ninth Plan, 2006: 74,78). The plan also emphasized the need for new financing methods including the participation of the private sector, since high-cost investments are required for harmonization with the EU Environmental Policy. The Ninth Plan’s Environment Specialized Commission report paid particular attention to the biodiversity and protected areas. The report highlighted a deficiency in effective collaboration among different institutions that possess authority or responsibility stemming from diverse legal regulations (DPT, 2007: 32). It also discussed the factors that pose a threat specific to biodiversity (not to the environment in general). Industrial and domestic waste, large-scale infrastructure projects such as construction of power plants, motorways, airports, bridges, factories, dams, and housing, agricultural and livestock activities such as overgrazing, usage of pesticides, alteration of the direction of water flow, excessive and illegal fishing, unconscious hunting, maritime accidents and oil spill and tourism activities were identified as the main factors behind the loss of the biodiversity (DPT, 2007: 32). The urgent need to dissolve the problem of complex authorization and duty distribution among responsible parties was emphasized as a main policy advice by the report as well as reviewing legal regulations and holistically reorganizing them (DPT, 2007: 82). Moreover, during the EU negotiation process, chapter 27 on Environment and Climate Change was opened to accession negotiations at the end of 2009. Hence based on both the National Biodiversity Action Plan and Related Directives<sup>25</sup> of the EU, Türkiye guaranteed to prepare a framed law towards protecting biodiversity (T.R. Ministry of Environment and Urbanization, 2018: 172).

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25 These are The Birds Directive (Council Directive 79/409/EEC) and The Habitats Directive (Council Directive 92/43/EEC, which serve as the fundamental pillars of the European Union’s biodiversity policy. They establish a robust legislative framework that mandates all EU member countries to safeguard the most valuable and endangered biodiversity. In conjunction, these directives have given rise to the Natura 2000 network, which currently stands as the largest integrated network of protected areas globally (Sundseth, 2015).

In light of these developments, the draft law was prepared by the Ministry of Environment and Forestry in 2010. However, it faced significant criticism and due to the election period, it was unable to be enacted and subsequently became obsolete (TBMM, 2012: 15). Since then, three consecutive drafts were introduced in 2012, 2017, and most recently in 2021<sup>26</sup>, although not finalized. The primary rationale behind them was more or less the same. They underlined the necessity to address the management gap and eliminate overlapping issues resulting from the intricate nature of both legal and administrative procedures (TBMM, 2012: 4). Nevertheless, upon analyzing the draft law, it has been determined that there are regulations that go beyond the stated justification, and some of these regulations may facilitate practices that jeopardize the preservation of biodiversity. Specific concerns have gained prominence in the criticism directed toward these drafts. These concerns revolve around the inclusion of provisions for (i) trade-offs between biodiversity conservation and sustainable utilization and (ii) supreme public interest<sup>27</sup>. These provisions<sup>28</sup> have drawn opposition and have been subject to scrutiny by experts in the field due to their potential implications for various investments, including mining, tourism, transportation, energy, settlements, and hydroelectric power plants, which may have detrimental effects on natural areas (TBMM, 2012: 22; Kuvan, 2014: 291; TMMOB, 2011; TEMA Vakfi, 2013). For these reasons, the draft law has been evaluated as a document that primarily focuses on regulating the circumstances in which biodiversity shall not be protected and instead emphasizes its utilization, rather than addressing measures for its conservation.

With the approval of the Aichi Biodiversity Targets in 2010, a collective decision was made to require each party to implement an effective, participatory, and updated NBSAP by the year 2015. Concordantly, the first strategic plan of Türkiye (NBSAP) was reviewed, and the National Biodiversity Action Plan (NBAP) has been prepared from 2018 to 2028 (T.R.

26 The structure of the Ministries was reorganized and with the legislative decree no: 645, the Ministry of Forestry and Water Affairs was established in 29.06.2011. Hence The Draft Laws of 2012 and 2017 were prepared by the Ministry of Forestry and Water Affairs. In 2018, the structure was reorganized once again, and The 2021 Draft Law was prepared by the Ministry of Agriculture and Forestry.

27 The preamble of The 2012 Draft Law clearly stated what is intended with “supreme public interest”. Accordingly, it is expressed that “*It is a necessity to allow the operation of activities that are of great importance for strategic and national development and that are deemed to be of superior public interest, subject to certain conditions, if they remain within the boundaries of the area requiring absolute protection. The authorizations to be granted to such activities are secured with the permission of the Ministry*” (TBMM, 2012: 6).

28 For example, Article 8/3 of The 2012 Draft Law states that a plan or project of “supreme public interest” can be conducted by the Ministry of Forestry and Water Affairs with compensatory measures, even though its effects on the protected areas are determined to be negative through ecological impact assessments. In a similar vein, according to Article 14 of The 2012 Draft Law, the rights of permits, usufruct and easements can be established, providing that all kinds of measures are taken. Besides with Article 57 of The 2012 Draft Law, The Law on National Parks, which constitutes the main basis for the lawsuits filed against hydroelectric power plants was planned to be repealed (Gökalp Alica, 2012: 188; TBMM, 2012: 23).

Ministry of Agriculture and Forestry, 2019: 4, 8-9). In the NBAP (2018-2028), seven national objectives were identified. When the objectives are analyzed, it is seen that the utilization of biodiversity is as prominent as its conservation. In terms of conservation, NBAP promises to determine, reduce, and remove pressures and threats on biodiversity (National Objective 1), to construct a national biodiversity inventory via DNA barcoding method and e-DNA monitoring technique (National Objective 2), to rehabilitate and restore degraded ecosystems (National Objective 5). In terms of sustainable use, NBAP aims at sustainable management of biodiversity as a source for industries of agriculture, forest, food, and medicine (National Objective 3), to increase benefits from ecosystem services by utilizing them effectively (National Objective 4), to develop high value-added products based on knowledge and technology in consideration with conservation and sustainable use of biological resources and to promote producers in the process of commercializing of the products developed with modern biotechnological methods from the biological resources (National Objective 6) to access the traditional knowledge associated with genetic resources and to develop products (T.R. Ministry of Agriculture and Forestry, 2019: 50-77). As can be seen, the perspective of “protection via valuation” prevails also in the NBAP of Türkiye.

Nevertheless, some of the Aichi targets which include the implementation of enforcement measures or sanctions in the protection of biodiversity have not been fully accomplished within the national plan<sup>29</sup>. The notion of sustainable management and utilization of biodiversity smooths the path for commercialization of natural resources for countries like Türkiye, which has not fully utilized their natural endowments pervasively and intensively. In this respect, it can be said that the CBD’s recognition of Türkiye’s sovereign right to its national resources led to not just increased responsibility of the country in taking measures to protect biodiversity, but also the identification of its targets from that day forward. However, it is a disputed issue whether these national targets are satisfactory for the conservation of biodiversity as against to utilization of them.

### **3.3. Biodiversity-Based Trade and Türkiye**

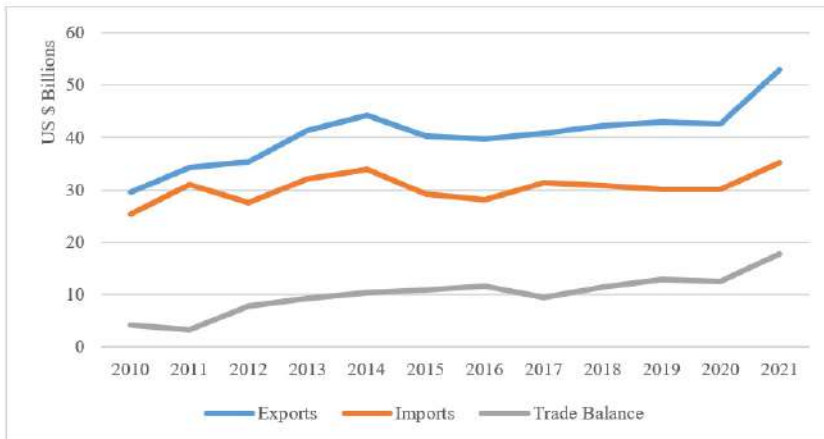
According to the UNCTAD biotrade database, Türkiye’s export value of biodiversity-based products was realized at 52.9 billion US dollars in 2021. This accounts for 23.5% of the total merchandise exports of the country and 1.4% of the total world biotrade. It can be said that biotrade exports have a significant share in the country’s specialization pattern, although its world market share is low. A comparison of the country’s biotrade exports share

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29 For instance, Aichi Target 3 aims that incentives, including subsidies, harmful to biodiversity shall be eliminated, phased out or reformed.

with other income groups of countries and geographical regions might give an insight into the biotrade's national relevance. In terms of the economic criterion, the significance of biotrade exports share resembles the group of middle-income developing countries, while Türkiye matches up to Europe and the Americas in recent years with regards to geographical regions (See Appendix Figure A1 and A2).

Nonetheless, with a comparison of the 2021 data with 2010, it can be seen that the situation tends to reverse. In these twelve years, Türkiye's biotrade as a share of world biotrade has risen 17.4%, while the share of biotrade in the country's merchandise exports has fallen 10.3% (UNCTADSTAT). It is understood that Türkiye has increased its world market share of biotrade in this period, while the country's specialization pattern has slightly shifted away from biotrade.



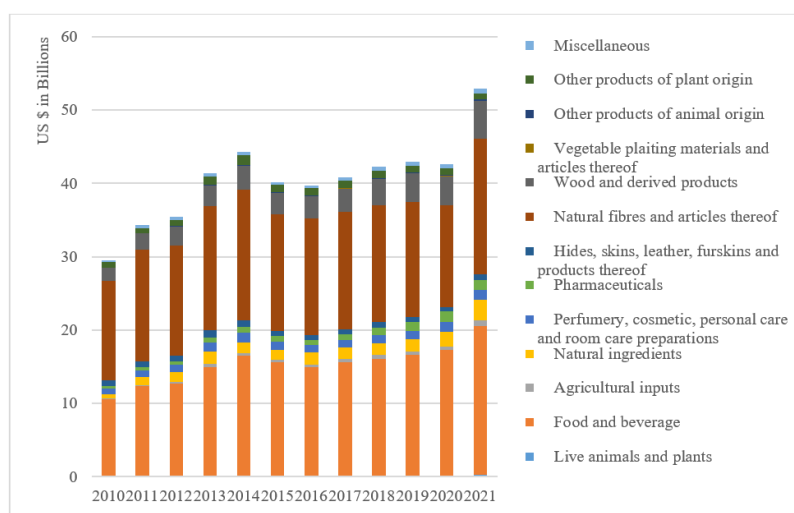
**Figure 3.** Biotrade flows of Türkiye

**Source:** UNCTADSTAT, retrieved from <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=227725>, accessed 30/05/2023.

Figure 3 shows that biotrade exports are higher than imports for all years and the trade balance has improved during this period. The sharp increase in 2021 hasn't been reflected in the ratio of biotrade in total merchandise, which is the result of the fact that all merchandise exports have increased in the same year.

In terms of product groups, the distribution of biotrade exports of Türkiye can be seen in Figure 4. Two product groups stand out in this composition: (i) food and beverage and (ii) natural fibres and articles thereof. In 2021, these two product groups accounted for 73% of all biotrade exports with 38.2% and 34.8% shares, respectively. However, in the twelve years, it is seen that the share of the "*natural fibres and articles thereof*" product group decreased

from 45.8% in 2010 to 34.8% in 2021. This group is directly related to textile production chains in Türkiye, while articles of apparel and clothing accessories<sup>30</sup> accounts for around 70% of all-natural fibre exports. In this respect, Türkiye has specialized in the upper ladder of the global textile chains, mainly as a first-tier supplier in the global textile industry for global fashion brands and with a limited range of original apparel brands. In 2021, as an example of a labor-intensive industry, textile, and clothing industries accounted for approximately 26% of the manufacturing industry employment and contributed at around 15% of all manufacturing value-added, leaving other significant industries such as heavy metals, automotive, and chemicals behind (TÜİK).



**Figure 4.** The Composition of the biotrade export flows for Türkiye

**Source:** UNCTADSTAT, retrieved from <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=227725>, accessed 30/05/2023.

However, Figure 4 only measures “biotrade” flows, while it is not possible to understand whether these export products are derived from sustainable utilization of biodiversity<sup>31</sup>. In this respect, it would be helpful to look at the organic farming figures of Türkiye in these product categories. It can be said that good agriculture practices and organic farming are key in terms of the conservation of biodiversity, while they aim at re-establishing the natural balance lost due to improper practices as a result of intensive cultivation. Turkish legislation constructs

30 Articles of apparel and clothing accessories mainly consist of final consumer products such as jackets, trousers, dresses, skirts ext. in the Harmonised System nomenclature in the TraBio statistical tool of UNCTAD (Benda, 2022: 10) in comparison to raw materials and semi-processed products such as yarns, woven or fabrics in the group of “natural fibres and articles thereof”.

31 TraBio statistical tool of UNCTAD only measures “biotrade” flows, while it is not possible to distinguish and label some part of these activities as “BioTrade” in respect to their sensitivity for biodiversity (Benda, 2022: 8).

the relationship between organic farming and biodiversity. With the By-Law on the Principles and Implementation of Organic Farming (Official Gazette, No: 27676), the protection and development of biodiversity is necessitated for organic farming. The regulation in organic farming is based on market-based certification systems. In terms of organic cotton production, Türkiye holds the position of the second-largest producer worldwide, accounting for 23.6% of the global production after India in 2020-2021 (Textile Exchange, 2022). Türkiye was also the biggest contributor by far to the global growth of organic cotton production in 2020-2021 (Willer, et al., 2023: 124). However, in terms of ecological sustainability, a limited number of studies have shown that the efforts of a couple of Turkish textile firms cannot be generalized to the whole industry. By conducting a content analysis of the sustainability reports of the firms, Saygılı et al. (2019) found that among a selected number of 184 textile and apparel companies in Türkiye, 34 (18%) of them issued sustainability disclosures in the form of international quality certificates and standards. Besides, only 21% of these 34 certificated companies disclose some keywords and phrases in their reports, which resembles the biodiversity standards of the Global Reporting Initiative (GRI). In a similar vein, Ecevit (2023) investigated the sustainability activities of Turkish-origin apparel brands and determined that only 5 of the 25 apparel brands consistently conducted sustainability activities in the form of less water, more recycled material, and more organic cotton usage. Besides, only one firm promises to preserve ecological balance, not to harm biodiversity and animals, and impose restrictions on the use of materials of animal origin. According to Oral (2019), the environmental problems arising in the textile and ready-made garments industry appear to be primarily linked to the weak enforcement of existing laws, rather than deficiencies in the laws themselves. In this respect, the reluctance of textile producers to adopt responsible production technologies is argued to be related mainly to the substantial costs of these technologies in foreign currencies. Overall, it can be said that Turkish textile firms need to make more progress in terms of definition and criteria, developed under the framework of BioTrade.

Turning to the composition of biotrade export flows in Figure 4, in the case of **food and beverage**; fruits, vegetables, cereals, and their derived products constitute 54.3% of the whole product group. The significance of the food and beverage product group in the biotrade exports of Türkiye can be attributed to the fact that Türkiye was the 8<sup>th</sup> largest producer of agricultural products in the world in 2020 (WDI, 2022). Despite the constantly rising share in the production and export of the industry and service sectors, agriculture is still a major occupation of some part of the Turkish population (FAO, 2018: 15). In that sense, agriculture, as an artificial ecosystem, is the primary source of subsistence for the rural population (which accounts for 17.3% of the total population) in Türkiye.

In terms of organic production of food and beverage, it can be said that the Turkish organic agriculture sector has started to develop as a response to the increased foreign demand after 1985. In these years, the main export products were dried forms of figs, raisins, apricots, and also hazelnuts (Ak, 2002: 34). In 1994, regulation on “Production, Processing, and Marketing of Vegetable and Animal Products Produced by Organic Farming Methods” has been issued, using the European Union’s related regulations as a foundation. Since the beginning of the 1990s, organic farming and good agriculture practices have gradually expanded in the country. While there were only 8 organic products, covering an area of 1037 ha in 1990 (Demirayak, 2002: 9), the number of crops has reached 268 with an area of 310584 ha in 2022 (including wild collection areas) and about 1.6 million tons of production. While the production level peaked at 2.47 million tons in 2016, it began to decrease gradually after that year, although the number of crops and farmers continued to increase during the same period (T.R. Ministry of Agriculture & Forestry, 2023). This diminishing trend in production level is also reflected in the organic farming area, which decreased from 661210 ha in 2016 to 351917 ha in 2021, adding up to a 46.7% decrease. Over five years, 196194 ha out of the total area loss was attributed to a reduction in organic agriculture areas, while the rest was lost due to an 113099 ha decrease in wild collection areas. In 2021, the organic share of total agricultural land in Türkiye is 0.9%, which is a ratio far below 9.63% for the EU and 3.58% for Europe (Willer, 2023: 241). Besides this share has decreased from a ratio of approximately 2% in 2016. Main problems restricting the development of organic farming are identified as follows; the small scale of agricultural enterprises, fragmented and dispersed land, the lack of agricultural cooperatives, and inadequate organization of producers. Under these conditions, organic producers cannot carry the burden of certification costs on their own and cannot commercialize their organic products as “organic” without a certificate either, causing sales below the cost (T.C. Kalkınma Bakanlığı, 2018: 30).

With regards to bilateral trade volumes in organic farming, Türkiye ranked as 6<sup>th</sup> among countries that the EU imported mostly, and the EU member states are the main destination for Turkish organic products. Besides, in recent years, Türkiye has begun to diversify its export markets towards the USA, Gulf countries, China, Japan, and other European countries (Willer, 2023: 142, 209). The top five export products of Türkiye in 2022 were dried figs, fruits, raisins, dried apricots, and hazelnuts, all of which account for 84% of all organic exports<sup>32</sup>. However, the total value of organic farming exports in 2021 accounts for barely 0,012% of all biotrade in food and beverage<sup>33</sup>.

32 The ratio is calculated by the author. Source: T.R. Ministry of Agriculture & Forestry, 2023.

33 The ratio is calculated by the author. For the organic farming exports data, source: T.R. Ministry of Agriculture & Forestry, 2023; for the food and beverage biotrade exports, source: UNCTADSTAT.



Other than this market-based system of organic farming practices and certification, Türkiye has implemented the National Environmental Label System through the “By-Law on Environmental Labeling,” which was published in 2018 (Official Gazette, No: 30570). This implementation aligns with the EU Directive 66/2010/EC on Eco-Label. The primary objective of the system is to assess the environmental impact of products or services that are produced, distributed, exported, or imported, based on international standards (T.R. Ministry of Environment & Urbanization, 2020: 311). In Article 1.2 of the By-Law, it is clearly stated that *“the regulation aims to prevent the deterioration of ecosystems, to reduce the negative impacts on the environment, human, health, climate and natural life in the consumption of natural resources during the whole process of the life cycle of products and services starting from the use of natural resources and raw material stage to the final disposal stage, including stages such as production, use, consumption, recycling etc”*. Unlike the EU Directive, although the term “biodiversity” is not explicitly stated in the By-Law, its emphasis on the mitigation of ecosystem degradation and negative impacts on natural life from a life cycle perspective is undoubtedly a significant step forward in the conservation of biodiversity. However, these forms of branding schemes combined with organic certification procedures as an example of BioTrade-based positive incentives have their limits, as they require the voluntary participation of market actors in the economy to obey certain sustainability standards. Environment Labels have been granted to a total of nine companies starting from the year 2020. The product range is limited to ceramic tiles, textiles, tissue paper, and dishwashing detergent for now (T.C. Çevre ve Şehircilik Bakanlığı).

In terms of regulatory interventions and enforcement measures in the international trade of biodiversity, CITES serves as the main foundation, while Türkiye has been a party to the convention for 27 years. The Regulation on the implementation of the CITES was published in 2001 and revised in 2019 (Official Gazette, No: 24623 & Official Gazette, No: 30837). Accordingly, international trade in species of animals and plants is strictly regulated concerning three categories of CITES. For achieving an international trade permit to export a specimen from Category I species, designated authorities<sup>34</sup> must identify that the concerned specimen is obtained in compliance with related legal provisions on the protection of the plant and animal species. In addition, the scientific authority (TUBITAK) must furnish a written opinion clearly

34 For terrestrial invertebrates, mollusks, bivalves, aquatic products including marine and inland water plants and their eggs, marine mammals, the Directorate General of Fisheries and Aquaculture; for all live plants, the Directorate General of Plant Production; for birds, mammals except marine mammals, reptiles, arthropods and other species, the General Directorate of Nature Conservation and National Parks are determined as designated authorities with the related regulation. These General Directorates are affiliated with the Ministry of Agriculture and Forestry.



stating that the exportation will not harm the survival of the specimen in question. Lastly, the healthy transportation of the live specimen must be guaranteed to the designated authorities. In the case of imports, the scientific authority is required to provide an additional written opinion explicitly stating that the importation will not have any adverse effects on the native species of the country. Besides importer must guarantee that the sample specimen shall not be used for trade purposes. For Category II, the trade permits are conditional to compliance with the annual quota set specified for that specimen, while there isn't any specific quota for Category III.

Table 3. Wildlife export quotas of Türkiye					
	Family	Species Name	2003	2013	2023*
Plants	Amaryllidaceae	Galanthus elwesii	6000000	6500000	7200000
		Galanthus woronowii	2000000	3500000	7800000
		Leucojum aestivum		4000000	8000000
	Araceae	Arum italicum		350000	
		Arum dioscoridis		250000	
		Dracunculus vulgaris		350000	
	Asparagaceae	Drimia maritima		15000	500000
	Geraniaceae	Geranium tuberosum		1000000	
	Liliaceae	Lilium martagon		2500	
	Primulaceae	Cyclamen cilicium	250000	300000	830000
		Cyclamen coum	300000	750000	1200000
		Cyclamen hederifolium	1750000	2000000	3650000
	Ranunculaceae	Anemone blanda		6000000	
		Eranthis hyemalis		3500000	3000000
Animals	Anguillidae	Anguilla anguilla		20000	100000
	Hirudinidae	Hirudo medicinalis	8000		
		Hirudo verbana		3000	1500
<b>Source:</b> for all species in 2003 & animal species in 2013 and 2023; CITES, retrieved from: <a href="https://cites.org/eng/resources/quotas/export_quotas">https://cites.org/eng/resources/quotas/export_quotas</a> , (accessed 02.07.2023). For plant species of 2013 and 2023; Annexes of Official Gazette, No: 28489 & Official Gazette, No: 32050.					

Table 3 illustrates wildlife export quotas of Category II in Türkiye by comparing three periods. For the year 2023, species of two flower families, better known as Primroses (*Primulaceae*) and Amaryllis (*Amaryllidaceae*) are regulated with a maximum of 5680000 and 23 million pieces, respectively. Together with Winter Aconite (*Eranthis hyemalis*) and Maritime Squill (*Drimia maritima*), the export quota of total flower bulbs reaches 32180000 in 2023. Besides, the animal species of European Eel (*Anguilla Anguilla*) and Medicinal Leech (*Hirudo verbana*) are regulated at 100000 kg and 1500 kg, respectively. All the plants in question are geophytes, primarily cultivated on a large industrial scale worldwide to cater to the demand

in the cut flowers and dried bulbs markets. In addition to their role in the ornamental plant industry, some of these plants are also utilized as medicinal resources for the treatment of specific illnesses. There are three approved methods for exporting these plants: wild collection, nurturing, and artificial production. In addition to species that have export quotas, the Ministry of Agriculture and Forestry compiles and publishes a list of species prohibited for export each year through an official communiqué in the Official Gazette.

Upon examining these lists every year, the following pattern becomes evident. While the scope of the prohibition of exports via wild collection has expanded, exports through artificial production have become increasingly liberalized. By comparing the list of 2006 with the list of 2023, it is observed that the exportation of nine species, which were previously allowed to be exported through wild collection under a specific quota, has now been prohibited, and the export of these species has become unrestricted as long as they are exported through artificial production.<sup>35</sup> This regulation implies a policy shift in favor of artificial production at the expense of wild collection. Since the 1970s, with the unregulated and unconscious collection of geophytes from the wild, some species like *Orchidaceae* threatened with extinction. The policies that prohibit the wild collection of these species for an extended duration have not effectively prevented it. On the contrary, these policies have inadvertently stimulated an increase in illegal collection activities. Therefore, the primary policy approach that emerged as effective was the encouragement of sourcing these bulbs from production areas (Demir, 2009: 37-48).

<b>Table 4. International Trade of Plant Species by Top Ten Countries, 2021</b>				
	<b>Exporter</b>	<b>Number of Specimens</b>	<b>Importer</b>	<b>Number of Specimens</b>
1	China	89524158	USA	66782923
2	Netherlands	36984531	Germany	56945609
3	Dominican Rep.	30764835	Netherlands	30131407
4	Thailand	25892100	Viet Nam	20712913
5	<b>Türkiye</b>	23116136	UK	17531122
6	Zimbabwe	18964800	South Korea	7970558
7	Kenya	16486000	<b>Türkiye</b>	5959644
8	South Korea	8362915	Canada	5602277
9	Costa Rica	3483457	UAE	4965487
10	South Africa	1082028	Japan	3754409
<b>Source:</b> CITES Wildlife Tradeview, accessed 18/05/2023.				

35 For a detailed list of names of related species for 2006 and 2023, see Official Gazette, No: 25996 & Annex of Official Gazette, No: 32050, respectively.

Türkiye's export of CITES-listed species has mainly concentrated on plant species. Table 4 shows that Türkiye ranks 5<sup>th</sup> in the exports and 7<sup>th</sup> in the imports of plants in terms of CITES taxa all over the world. In 2021, the number of plants, exported and imported accounted for around 23,1 million and 5,96 million, respectively. Among these plants, the amaryllis family was the most exported family with 15,1 million roots. In terms of export destinations, the Netherlands ranks first by far with a 70% share in the exports of Türkiye, followed by the United Arab Emirates (14%), Réunion (9%), and the United Kingdom (6%). In the case of Réunion, the bilateral flows consist of re-exports of Türkiye from France and Belgium (CITES Wildlife Tradeview).

Lastly, Türkiye has also signed biodiversity-related trade agreements with a couple of provisions. The first agreement was signed in 1991 with EFTA on the protection of whales and seals and MEA provisions for CITES. Since then, Türkiye has signed other agreements with Malaysia, Chile, and Korea, including a total of eight provisions related to biodiversity (TREND Database).

#### **4. Concluding Remarks**

Biodiversity loss has been a multidimensional and multilayered phenomenon with its mutually reinforcing drivers and complex impacts. It is mainly driven by the increased commodification and commercialization of biodiversity-based products. International trade is a significant driver of biodiversity loss, as it exacerbates not just import demand, particularly for biodiversity-based products but also maritime transport, road building, and aviation facilities for the continuous flow of all tradable products. The "Food and beverage" industry ranked first in the composition of biotrade flows, followed by "Pharmaceuticals", "Wood and derived products" and "Natural fibres and articles thereof". Increased specialization comes with overexploitation of biodiversity, especially for those countries which are directly dependent on it. Hence, the regulation of global biodiversity-based production and trade is crucial for the conservation and sustainability of biodiversity. However, designing adequate instruments for protecting biodiversity has been a challenge, while the historical relationship between biodiversity and trade includes the demands of different interest groups (firms, countries, local communities, etc.) and the conflicts and negotiations that arise in response to these demands.

In the global governance of biodiversity-based trade, international organizations sometimes have contradictory policy obligations depending upon their primary concern. In this respect, developing countries are constrained by WTO rules to guarantee that restrictive measures to preserve the environment do not discriminate or are not overly trade-restrictive, while

the CBD and CITES rather give developing countries some room to protect their biodiversity against biotrade-driven extraction. In terms of trade-related measures and their effect on the protection of biodiversity, two policy choices are in the foreground: regulatory interventions as in the case of CITES trade quotas, and market-based solutions that include non-mandatory standards by private entities, supported by the BioTrade Initiative of UNCTAD. It can be argued that NTMs and reciprocal preferential trade agreements provide more flexibility in this system of WTO-regulated global trade when it comes to incorporating provisions related to biodiversity. While it cannot be asserted that these international regulations embody the ideal standards for the protection of biodiversity, they do represent a progressive and comprehensive framework compared to the standards observed in developing countries. Currently, developing countries face a dual challenge. On the one hand, they strive to safeguard their interests concerning their economic development. On the other, they cannot avoid embracing the prevailing global economic paradigm of green development and the concept of “protection via valuation”. Hence, developing countries reshape their national legislation about these developments.

In a similar vein, the legal status of biodiversity in Türkiye has begun to be shaped by laws & related bylaws after taking part in international conventions since the 1990s. Türkiye hosts a wide variety of terrestrial, aquatic, and aerial ecosystems as well as being a homeland for flora and fauna species. Besides, Türkiye plays a significant role in the emergence of cereals & horticultural crops, which serves as a basis for the country’s agricultural product specialization and trade. However, improper practices within agricultural areas, pollution resulting from agricultural, industrial, and domestic waste, unregulated irrigation projects, construction of the power plants and dams, illegal hunting, fishing, wild collection of plants, and invasive alien species are the primary reasons for ecosystem degradation in Türkiye. Besides, recent studies show the insufficiency of Türkiye at in-situ conservation. An international comparison of Türkiye with its counterparts also shows that Türkiye performed poorly with an EVI score of 20.3. As one of the richest countries in the Mediterranean region in terms of species and habitat diversity and high endemism rate, it is crucial to take enhanced conservation measures and to expand protected areas to effectively encompass and safeguard Türkiye’s crucial ecosystems and the species that depend on them. To achieve the strategic objectives aimed at effectively protecting and sustainably utilizing biological diversity, one of the key shortcomings that need to be addressed is the lack of coordination among different institutions that possess authority or responsibility stemming from diverse legal regulations. Despite Türkiye’s notable advancements since the planned development era, the fundamental outlook of the public au-

thority has exhibited limited transformation. It has persisted in prioritizing economic growth, particularly in sectors like agriculture, which are highly sensitive to biodiversity, as well as in tourism, energy, mining, and industry. Recently, the ongoing debates surrounding the draft law on biodiversity reveal a clear trade-off between the preservation of biodiversity and economic development. The ongoing situation in Türkiye serves as an example that highlights the challenges associated with the CBD's acknowledgment of each nation's sovereign rights over biodiversity. It demonstrates that the exercise of this right by developing countries does not necessarily guarantee actions that favor the conservation of biodiversity.

Lastly, Türkiye's biotrade exports account for 23.5% of the total merchandise exports of the country and 1.4% of the total world biotrade. It can be said that biotrade exports have a significant share in the country's specialization pattern, although its world market share is low. In terms of product groups, it is observed that two product groups stand out in this composition: (i) food and beverage and (ii) natural fibres and articles thereof. While the former is related directly to agricultural production, the demand for the latter is driven by the textile and clothing industry. In terms of trade-related measures, Türkiye applies market-based regulations such as organic farming and environmental labeling as well as regulatory interventions by aligning its legislation with CITES requirements. Organic farming is mainly conducted by small-scale agricultural enterprises in fragmented and dispersed areas. In this kind of production structure, producers are insufficient in collaborating to cover the high costs of the certification system. Hence, it becomes infeasible to apply organic agriculture across all forms of food production. The total value of organic farming exports in 2021 accounts for barely 0,012% of all biotrade in food and beverage. On the other hand, eco-labeling is a very recent development for Türkiye with a limited number of firms in ceramic tiles, textiles, tissue paper, and dishwashing detergent production. Finally, the wildlife export quotas of Türkiye comprise eight plant species and two animal species. In addition to species that have export quotas, the Ministry of Agriculture and Forestry compiles and publishes a list of plant species prohibited for export. Upon examining these lists every year, the following pattern becomes evident. While the scope of the prohibition of exports via wild collection has expanded, exports through artificial production have become increasingly liberalized. This policy shift is a consequence of certain species being endangered due to unregulated and unconscious harvesting from the wild. Because Türkiye ranks 5<sup>th</sup> in the exports and 7<sup>th</sup> in the imports of plants in terms of CITES taxa all over the world, enforcement measures are becoming even more important for the conservation of biodiversity. It can be argued that no matter which regulation is implemented, it is necessary to mainstream biodiversity in national development policies and across different sectors.

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## Appendix

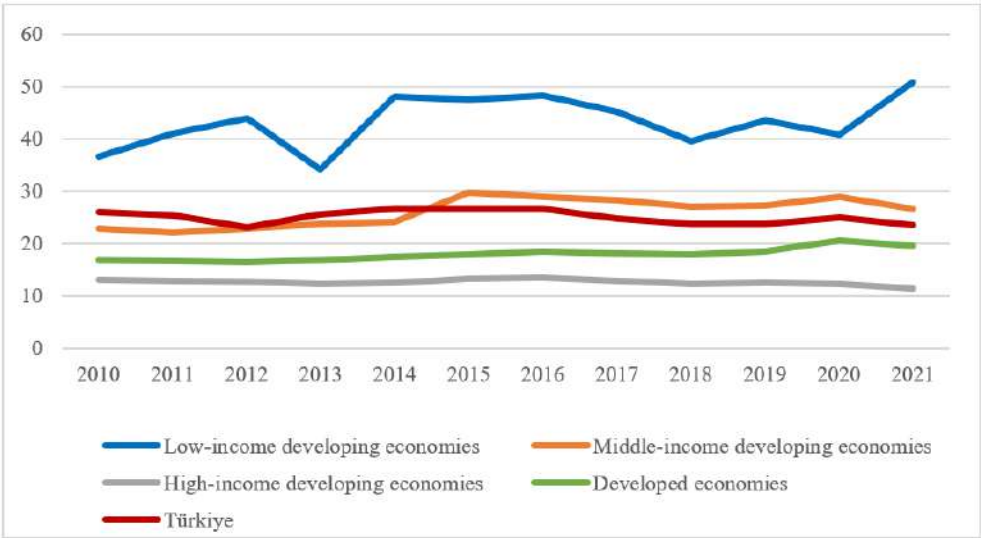
**Table A1.** Ecosystem Vitality Index and its components for Türkiye, 2022

		Score*	World Rank	Regional Rank	10 Year Change	Regional Mean	Weights**
<b>ECO</b>	Ecosystem Vitality	20.3	176	19	-1.7	55.68	0.42
<b>BDH</b>	Biodiversity & Habitat	7.5	178	19	0.1	69.38	0.4285
<b>TBN</b>	Terrestrial biome protection (national weights)	1.1	178	19	0	84.59	0.2222
<b>TBG</b>	Terrestrial biome protection (global weights)	1.4	178	19	0	86.59	0.2222
<b>MPA</b>	Marine protected areas	0.0	119	12	0	64.68	0.2222
<b>PAR</b>	Protected Areas Representativeness Index	9.1	158	19	2	40.76	0.13888
<b>SHI</b>	Species Habitat Index	87.1	72	8	-10.2	80.44	0.08335
<b>SPI</b>	Species Protection Index	1.1	171	19	0.1	69.57	0.08335
<b>BHV</b>	Biodiversity Habitat Index	37.3	132	9	0	37.27	0.0278
<b>ECS</b>	Ecosystem Services	22	111	13	-6.1	27.95	0.19045
<b>TCL</b>	Tree cover loss	17.1	76	11	-5.1	17.06	0.75
<b>GRL</b>	Grassland loss	30.6	134	17	-8	54.69	0.125
<b>WTL</b>	Wetland loss	43.0	93	13	-10.2	66.53	0.125
<b>FSH</b>	Fisheries	9.5	125	11	-5.6	23.56	0.11905
<b>FSS</b>	Fish Stock Status	6.9	102	6	-16.6	34.37	0.36
<b>RMS</b>	Marine Trophic Index	13.1	72	9	0	25.25	0.36
<b>FTD</b>	Fish caught by trawling	8.2	59	6	1.5	11.42	0.28
<b>ACD</b>	Acidification	61.8	113	18	-1.2	92.87	0.09524
<b>SDA</b>	Adjusted emissions growth rate for sulfur dioxide	55.9	125	18	-5.1	92.81	0.5
<b>NXA</b>	Adjusted emissions growth rate for nitrous oxides	67.7	84	18	2.6	92.94	0.5
<b>AGR</b>	Agriculture	39.1	75	13	2.2	46.86	0.09524
<b>SPU</b>	Sustainable Pesticide Use	20.9	113	14	0	40.61	0.5
<b>SNM</b>	Sustainable Nitrogen Management Index	57.4	32	11	4.5	53.09	0.5
<b>WRS</b>	Water Resources	30.5	52	12	0	42.75	0.0715
<b>WWT</b>	Wastewater treatment	30.5	52	12	0	42.75	1

**Source:** EARTHDATA. Socioeconomic data, and application center. <https://sedac.ciesin.columbia.edu/data/set/epi-environmental-performance-index-2022/data-download> (accessed 29.05.2023).

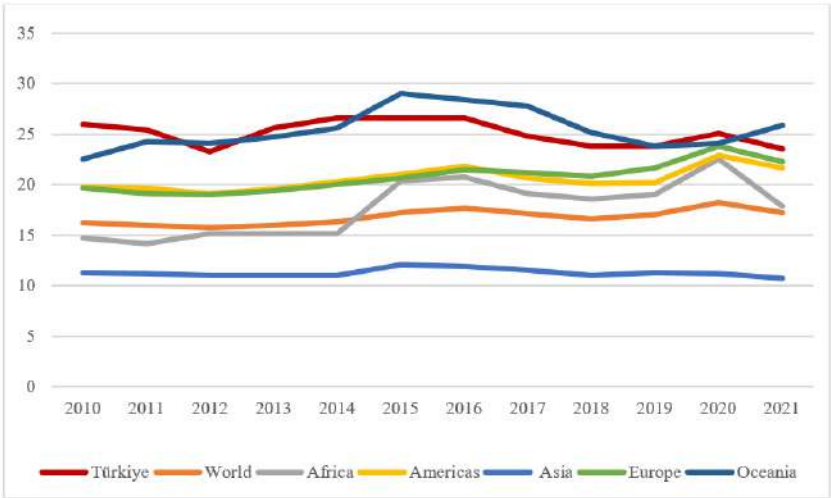
\* The data for each performance indicator is transformed by Wolf et al. (2022) into scores ranging between 0 and 100, from worst to best performance.

\*\*Weights show the contribution of each performance indicator to the calculation of each of the 6 issue categories, and then these issue categories are weighted to compute the Ecosystem Vitality Index (EVI). The final weight (42%) for the EVI shows the contribution of this policy objective to the EPI score.



**Figure A1.** The share of biotrade in total merchandise exports: A comparison of Türkiye with other groups of economies

**Source:** UNCTADSTAT. retrieved from <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=227725>. accessed 30/05/2023.



**Figure A2.** The share of biotrade in total merchandise exports: A comparison of Türkiye with other geographical regions

**Source:** UNCTADSTAT. retrieved from <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=227725>. accessed 30/05/2023.

## CHAPTER 24

### SUSTAINABLE LAND AND FOREST MANAGEMENT IN TÜRKİYE

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#### Abstract

Since its formal adoption as a global concept at the Rio Summit in 1992, sustainable development has been guiding sectoral policies. Forests and other terrestrial ecosystems play a crucial role in achieving sustainable development goals (SDGs), particularly SDG15, which focuses on “Life on Land”. This study explores the current situation and performance of Türkiye by examining the studies conducted in the field of sustainable land and forest management and provides recommendations for improving Türkiye’s position in the Sustainable Development Goals Index. We first analyzed and discussed Sustainable Development Reports, National Development Plans, Strategic Plans, and key policy documents, including Voluntary National Review Reports. This allowed us to assess the current position and progress of Türkiye in the world ranking. Important developments and areas for improvement in the targets and indicators of SDG were detailed. Due to increasing population, urbanization, and industrialization, forest areas are under pressure. In Türkiye, the total forest area increased from 20.7 million hectares to 23.1 million hectares in the last two decades, thanks to the reforestation of abandoned arable lands and afforestation activities. Moreover, erosion control and pasture improvement activities have enabled Türkiye to achieve success in combating desertification and land degradation. Notwithstanding this considerable progress, there are still significant challenges in achieving the targets and indicators outlined in SDG-15. These challenges require management of land and forest resources with a holistic approach, enhancement of collaboration among relevant institutions, provision of financial support, and establishment of a monitoring and evaluation system.

**Keywords:** Sustainable development goals, sustainable forest management, forest ecosystems, policy documents, forest sector

## 1. Introduction

Until the 1960s, natural resources were assumed to be almost unlimited, defined as “common goods” or “free goods”. These resources were considered as sufficient for industrialization and the economic growth process. Globally, this approach led to excessive and unsustainable consumption of resources and environmental problems, such as water pollution, air pollution, desertification, global warming, and climate change. The cross-border effects and global dimension of environmental problems were initially discussed in a conference organized by the United Nations (UN) in Stockholm in 1972. By the 1970s, it was clear that economic growth and development policies that ignored natural resources could not be sustainable in the long term so strategies based on sustainability of these resources in economic development became important.

In the following years, important international meetings were held to provide solutions to these problems, and decisions were implemented. In 1987 the concept of sustainable development was first introduced in the report, “Our Common Future,” published by the World Commission on Environment and Development (Brundtland Commission). Following the Brundtland report, there were important turning points in the international agenda regarding sustainable development, such as the Rio Declaration on Environment and Development (1992), the Program of Action of the International Conference on Population and Development (1994), the Millennium Declaration, the World Summit on Sustainable Development (2002), the 2005 World Summit and the UN Conference on Sustainable Development (Rio+20) in 2012. All these paved the way for the 2030 Agenda (Eurostat, 2022).

The member states of the United Nations unanimously adopted the “2030 Agenda for Sustainable Development” in 2015, recognizing that global problems require global solutions and collective actions. This international agreement formulated 17 Sustainable Development Goals (SDGs) with 169 targets, including reducing poverty around the world, securing a healthy and quality life, providing quality education, addressing the needs of disadvantaged groups, protecting ecosystems, sustainably managing agriculture, forests, and water, promoting sustainable energy, fostering economic growth, and promoting sustainable production and consumption practices.

Due to globalization, countries are facing a challenging and competitive environment. In these conditions, countries must focus on ensuring competitiveness and productivity growth in all sectors. Sustainable development is an important part of the process as countries develop their growth potential to ensure they are competitive in the global economy for the long

term. In this process, issues such as ensuring sustainable development by protecting the environment, recognizing the importance of natural resources, safeguarding social and cultural values, reducing poverty, and increasing welfare are included in the development agenda of countries (SBB, 2020).

In Türkiye, the planned development period started in 1963. National Development Plans (NDPs) in Türkiye have been created since that time. In these development plans, the objectives and strategies for all sectors were prepared in line with the macro objectives and strategies at the national level (Geray, 1998). Since its introduction in 1987 and formal adoption at the United Nations Conference on Environment and Development in 1972, the “Brundtland Report” concept of sustainable development was incorporated into NDPs and other sectoral policy and strategy documents (MoD, 2016; PSB, 2019; SBB, 2020).

The 11th Development Plan, in effect between 2019 and 2023, prioritizes competitiveness and productivity across all sectors, with a strong emphasis on sustainable development as a key theme. The objectives, policies, and measures in this plan were determined in accordance with the SDGs. The main objective was to align with the SDG’s priorities while also establishing an effective mechanism for follow-up and review (PSB, 2020).

Sustainable development provides a comprehensive and fundamental impetus to all countries’ development efforts. The forestry sector in Türkiye is one of the sectors where sustainable management activities are applied more intensively (KB, 2018a). Forests and other terrestrial ecosystems provide environmental, economic, social and cultural products, services and benefits that are essential for all living things, such as food, clean water, carbon sequestration, soil protection, and climate regulation (FAO 2001; Türker et al., 2005; Mercer et al., 2011).

As one of the development goals in the 2030 Agenda for Sustainable Development, SDG-15 (Life on Land) aims to “protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss” (URL, 1). Under SDG-15, twelve targets and 14 indicators are identified (see Table 1).

With sustainable land management and forest management approaches, forest resources and other terrestrial ecosystems can be managed more effectively and efficiently. In this way, it will be possible to meet the product and service needs of society to sustainably, halt land degradation, and reduce the loss of biodiversity (KB, 2018).

Türkiye has made progress in achieving certain targets for sustainable land and forest management related to SDG-15 over the last two decades. However, there are still signifi-



cant challenges in meeting some of the targets and indicators, as outlined in the Sustainable Development Report prepared by the United Nations Sustainable Development Solutions Network Initiative. This study explored the current situation and performance of Türkiye in sustainable land and forest management by analyzing the existing research. The goal is to provide recommendations for improving Türkiye’s position in the SDGs Index. We first analyzed Sustainable Development Reports to assess the progress of Türkiye and its current position in the world rankings. The discussion focuses on National Development Plans (NDP) and key policy documents such as Voluntary National Review Reports, Türkiye’s Sustainable Development Report, and Strategic Plans of related institutions and Forestry Specialization Commission Reports (SCRs). Important developments and areas for improvement in achieving SDG-15 targets and indicators are outlined for Türkiye. At the end of the study, policy and action suggestions are provided.

Table 1. SDG-15 targets and indicators			
Targets		Indicators	
15.1.	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements.	15.1.1	Forest area as a proportion of total land area
		15.1.2	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
15.2.	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.	15.2.1	Progress towards sustainable forest management
15.3.	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation-neutral world	15.3.1	Proportion of land that is degraded over total land area
15.4.	By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits that are essential for sustainable development.	15.4.1	Coverage by protected areas of important sites for mountain biodiversity
		15.4.2	Mountain Green Cover Index
15.5.	Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.5.1	Red List Index
15.6.	Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed	15.6.1	Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits

<b>Table 1. Continued</b>			
<b>15.7.</b>	Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.	<b>15.7.1</b>	Proportion of traded wildlife that was poached or illicitly trafficked
<b>15.8.</b>	By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	<b>15.8.1</b>	Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species
<b>15.9.</b>	By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts.	<b>15.9.1</b>	(a) Number of countries that have established national targets in their national biodiversity strategy and action plans (b) integration of biodiversity into national accounting and reporting systems
<b>15.a.</b>	Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	<b>15.a.1</b>	(a) Official development assistance on conservation and sustainable use of biodiversity (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments
<b>15.b.</b>	Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.	<b>15.b.1</b>	(a) Official development assistance on conservation and sustainable use of biodiversity; and (b) revenue generated and finance mobilized from biodiversity-relevant economic instruments
<b>15.c.</b>	Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	<b>15.c.1</b>	Proportion of traded wildlife that was poached or illicitly trafficked

## 2. Sustainable Land and Forest Management in Türkiye

The 2030 Agenda has brought a new perspective to sectoral development policies in Türkiye with its broad framework, integrated approach and holistic structure that addresses all elements of development. Instead of preparing and implementing a separate action plan or policy document for SDGs, Türkiye has chosen to integrate them into NDPs and sectoral strategy documents with a comprehensive approach, to implement and monitor SDGs and their indicators (PSB, 2019). Although extensive efforts have been made to implement the SDGs since their inception, Türkiye has major challenges to achieve the SDGs which will require significant improvement (Sachs et al., 2022).

According to the Sustainable Development Report 2022, Türkiye ranks 71<sup>st</sup> out of 163 countries with a country score of 70.4, reflecting average performance across all SDGs. (Sachs et al., 2022). According to a report of European countries, Türkiye ranks last with a country

Inventory Year	Total Forest Area	Economic Function		Ecological Function		Socio-cultural Function	
		<i>Hectare</i>	%	<i>Hectare</i>	%	<i>Hectare</i>	%
1973	20,199,296	20,199,296	100.0	-	0.0	-	0.0
2012	21,678,134	13,621,559	62.8	6,912,424	31.9	1,144,151	5.3
2015	22,342,935	11,243,094	50.3	9,287,847	41.6	1,811,994	8.1
2020	22,933,000	9,696,156	42.3	11,120,745	48.5	2,116,099	9.2

Source: OGM (2018), OGM (2021)

Türkiye, with its diverse geography and ecology, boasts a rich biological diversity. Throughout history the country has faced numerous pressures on its ecosystems, particularly land use, due to population movements. The effects of climate change have already started to manifest in the country, which is in the arid and semi-arid Mediterranean climate zone. Türkiye is rich in flora, with 11,707 natural species, 3,649 of which are endemic. Moreover, Türkiye is rich in fauna. There are 460 bird species, 161 mammal species, 141 reptile and amphibian species, 480 species of sea fish, and 236 species of freshwater fish. Therefore, it is of great importance to protect natural habitats, reduce biodiversity loss, and prevent deforestation and desertification (PSB, 2019).

## **2.1. Current Situation and Performance of Türkiye**

The progress of sustainable land and forest management in Türkiye was assessed through various means, including NDPs, SCRs, strategic plans, voluntary national review reports, and other policy documents.

### **2.1.1. Sustainable Land and Forest Management in National Development Plans and Specialization Commission Reports**

The concept of sustainable development was first included in Türkiye's Seventh Five-Year Development Plan, which was prepared for the period 1996-2000 as a result of the developments experienced at the Rio Summit. The plan includes a statement that highlights the increasing significance of integrating environmental policies into economic and social policies within the framework of sustainable development. The same plan includes targets for sustainable development. *"In order to prevent deforestation, desertification, flood, landslide, pollution, soil erosion and avalanche in the country, and to protect and improve the balance of plant-soil-water resources, which plays a crucial role in sustainable development, , it is expected that a total of 250,000 ha of afforestation, 50,000 ha of erosion control and 8,000 ha of in-forest pasture rehabilitation works will be carried out during the Plan period."* and *"Forests will be planned and operated in accordance with the principles of continuous, balanced and multifunctional utilization, taking into account the of wood production yield and the carrying capacity of the National Park and similar areas, and considering biodiversity, environmental protection, forest landscape, and ergonomic criteria. Forest management and silviculture plans will be revised and implemented to consider both wood and non-wood products as well as other functions of forests"* (DPT, 1995). The fact that the 7<sup>th</sup> NDP includes other purposes similar to those mentioned above indicates that sustainable land and forest management is being adopted in Türkiye as well.

In the eighth NDP (2001-2005), the goals, principles, and policies of the forestry sector were outlined in detail. In the plan, targets were set to ensure that forests are managed using the ecosystem approach in accordance with the principles of continuity, multi-purpose utilization, participation, specialization, protection of biological diversity, water and wildlife, and development of social stability. Forest management plans were revised to align with the principles of sustainable forest management. Additionally, measures were taken to prevent natural disasters such as deforestation, desertification, soil erosion, floods, landslides, and avalanches. These measures would contribute to the improvement of the global carbon balance and meet the need for wood raw materials. A total of 300,000 ha of afforestation, 175,000 ha of soil conservation, and 30,000 ha of pasture improvement would be carried out to achieve these goals. *“To prevent natural disasters such as deforestation, desertification, soil erosion, floods, landslides and avalanches, to contribute to the improvement of global carbon balance, and to meet the need for wood raw materials, a total of 300 thousand ha of afforestation, 175 thousand ha of soil conservation and 30 thousand ha of pasture improvement works will be carried out during the Plan period”* The discourse of the plan indicated that sustainable land and forest management practices are considered significant (DPT, 2000).

In the Forestry SCR of this plan, a section titled “Forest Ecosystem and Its Role in Sustainable Development”. This section provided a detailed explanation of the role of forest resources in sustainable development, as well as the goals to be achieved and the policies to be implemented (DPT, 2001). This report presented the current situation and problems related to sustainable forest management in Türkiye. It emphasized the importance of the economic, social, and environmental functions of forests in sustainable development.

The Ninth Development Plan acknowledged that rapid population growth and the industrialization process were significant pressures on the sustainable use of natural resources. The plan noted that uncertainties in the distribution of duties and powers between institutions and organizations in the sustainable use of natural resources were not adequately resolved and that there were important bottlenecks in the sustainable management of forests (DPT, 2006). In addition, the targets of effectively protecting the natural forest ecosystem against various factors, particularly fires and pests, and managing it in a multi-purpose and efficient manner while considering the balance between conservation and use, biodiversity, gene resources, forest health, non-wood products and services, and the development of ecotourism, as well as better utilization of lands by taking into account desertification, public health, industrial and soil conservation afforestation, rehabilitation works, urban forestry, and agro-forestry based on the watershed, demonstrated the importance of research on sustainable land and forest management.

In the forestry SCR prepared for this NDP, there was an emphasis on sustainable forest management with detailed targets provided (DPT, 2007). In this report, there was a section titled “2023 Vision” which outlined the goal of prioritizing sustainable forest management by protecting forest areas, borders, and biodiversity. The report emphasized the need to provide institutional capacity with experienced staff to achieve this vision by 2023. This expression indicated the development of long-term thinking in sustainable forest management in Türkiye.

The Tenth Development Plan focused on sustainable development, with the aim to adopt a planning approach that considered the economic, social, and ecological functions of forests. This included identifying, protecting, sustainably using, maintaining, and monitoring the biological diversity that was crucial for agriculture, forestry, food, and the pharmaceutical industries (KB, 2013). As part of the Tenth Development Plan, SCR was prepared under the title of “Sustainable Forest Management.” It established the 2023 vision of the forestry sector *“To be a leading industry on a national, regional and global level that fulfills the ecological, economic and social functions of forests, protected areas and associated ecosystems and supports sustainable development”* (KB, 2014). This indicated that Türkiye’s forestry sector recognized the importance of forests in sustainable development and developed policies in line with global progress even before the adoption of SDGs by the United Nations.

While preparing the Eleventh Development Plan, which is currently in effect, the SDGs outlined in the “2030 Agenda for Sustainable Development” were evaluated under a distinct category. The main objective was to ensure that SDGs are reflected in the preparation of institutional strategic plans and sectoral and thematic policy documents and to establish an effective follow-up and review mechanism (PSB, 2020). The plan also includes targets such as *“increasing the contribution of forests to the economy through sustainable forest management.”* and *“creating an efficient agricultural sector that is environmentally, socially and economically sustainable.”* These targets indicate that sustainable land and forest management is one of the primary objectives of the current NDP.

In the Forestry and Forest Products Working Group Report of the development plan, there is a section titled “Relationship and Harmonization of Plan Goals and Policies with SDGs.” This section includes evaluations of the relationship between the issues discussed in the report and SDGs, as well as recommendations for research to be conducted to achieve the objectives (KB, 2018a). The report also identified targets, such as *“enhancing institutional, administrative, human capacity and information infrastructure for the sustainable management of forests”* and *“building capacity for Sustainable Development Goals and Ecosystem Services”*.

In the Sustainable Management of Environment and Natural Resources Working Group Report, which was prepared as part of the Eleventh Development Plan, the main targets for sustainable management of the environment and natural resources were determined. The report aimed to ensure compliance with the SDGs in Türkiye during the Development Plan period (KB, 2018b). The report includes other important targets such as “*enhancing national and sectoral capacity and awareness of sustainability, environment and natural resources*” and “*aligning all strategies and action plans developed during the Plan period with the SDGs, while also considering the Eleventh Development Plan and other national and strategic plans.*”

### **2.1.2. Sustainable Land and Forest Management in Strategic Plans**

Currently, the General Directorate of Forestry and the Ministry of Agriculture and Forestry are responsible for ensuring sustainable forest management, combating desertification, preventing land degradation, and protecting biological diversity in Türkiye, but the government office has undergone changes in name and structure. The changes in the Ministry throughout history is outlined as follows (TOB, 2019):

- Until 1969, there was no independent Ministry of Forestry. The General Directorate of Forestry was responsible for the execution of forestry activities.

- The first Ministry of Forestry in the country was established in 1969 and operated until 1980.

- In 1981, the Ministry of Forestry was merged with the Ministry of Agriculture to form the Ministry of Agriculture and Forestry.

- In 1983, the Ministry of Agriculture and Forestry merged with the Ministry of Rural Affairs and Cooperatives, resulting in the new name of the Ministry of Agriculture, Forestry and Rural Affairs.

- In 1991, it was renamed the Ministry of Forestry.

- In 2003, the organization was restructured and became the Ministry of Environment and Forestry.

- In 2011, the structure of the Ministry underwent a change, resulting in the establishment of the Ministry of Forestry and Water Affairs.

- In 2018, the Ministry of Agriculture and Forestry was established by merging the Ministry of Food, Agriculture and Livestock and the Ministry of Forestry and Water Affairs. It is currently the responsible Ministry in Türkiye.

Another Ministry responsible for the protection and management of environmental resources in Türkiye is the Ministry of Environment, Urbanization, and Climate Change. The changes in the structure of the Ministry throughout history are outlined as follows (ÇŞİDB, 2021):

- ▶ The protection of the environment and the implementation of environmental policies were carried out by different Ministries and organizations until 1984.
- ▶ In 1984, the General Directorate of Environment was established and made responsible for implementing the Environmental Law.
- ▶ The first Ministry of Environment was established in 1991.
- ▶ In 2003, the organization was restructured and became the Ministry of Environment and Forestry.
- ▶ In 2011, first the Ministry of Environment, Forestry and Urbanization, and then the Ministry of Environment and Urbanization was established.
- ▶ In 2021, it was restructured as the Ministry of Environment, Urbanization, and Climate Change.

The frequent changes in the structure of the ministry have led to changes in the central and provincial organizations several times. At the same time, various ministries encountered difficulties in determining and implementing a coherent policy. In each Ministry period mentioned above, the General Directorate of Forestry (GDF) remained responsible for the management of forest resources in Türkiye. Therefore, this section examines the current Strategic Plan of the Ministry of Agriculture and Forestry and the Strategic Plan of the GDF, both of which are valid for 2019-2023.

The Strategic Plan of the Ministry of Agriculture and Forestry outlines the mission of the Ministry as *“To ensure economic security, food supply security and human health through ecological, plant and animal added value by mobilizing the ecological resources in our country in an effective, efficient and sustainable way with the perspective of the development model.”* It was stated that the United Nations 2030 SDGs were considered the primary policy document used in the process of preparing strategic plans. The strategic goals were determined based on these policy documents. The main strategic goals outlined in the Strategic Plan are *“to increase welfare in rural areas, ensure food and feed safety, protect fisheries and aquaculture resources, ensure sustainable management of soil and water resources, effectively combat climate change, desertification and erosion, protect biodiversity and ensure its sustainable management, and develop institutional capacity”*. (TOB, 2019).



Türkiye's strategic goals of "ensuring the sustainable management of soil and water resources, effectively combating climate change, desertification, and erosion, protecting biodiversity and ensuring its sustainable management" are directly related to SDG-15. The targets and performance indicators included within these three strategic goals directly contribute to SDG-15. Examples of these targets under the title of "Combating climate change, desertification and erosion effectively", are "*to establish the monitoring and evaluation infrastructure of regions subject to desertification/land destruction and erosion*", and "*preparing plans and projects for combating desertification/land destruction and erosion*". Moreover, targets such as "*protecting genetic resources and ensuring their sustainable use*", and "*providing the protection and continuity of biological diversity, and conducting awareness-raising activities*" can be cited as instances falling under the category of "Protecting biological diversity and ensuring its sustainable management".

Similarly, it is emphasized that the United Nations 2030 Sustainable Development Goals are considered the prime policy document in the Strategic Plan of the GDF prepared for the 2019-2023 period. In fact, the mission of OGM is stated as "*to protect forest and forest resources, to develop with a close understanding of nature to manage in an ecosystem integrity and to provide multidimensional benefits to the society*". Its vision is *to be the leading institution in sustainable forest management practices* (OGM, 2018). GDF's mission, vision as well as its basic values are directly related to the SDGs, particularly SDG-15. Strategic goals outlined in the plan were established within these parameters. These goals are:

- ▶ Protecting forest and forest resources against biotic and abiotic pests.
- ▶ To develop forests, increase productivity, and expand forested areas.
- ▶ Ensuring the maximum social benefits are derived from the goods and services produced by forests.
- ▶ Increasing institutional capacity.

The targets and indicators outlined for these strategic goals directly contribute to achieving SDG-15.

### **2.1.3. Sustainable Land and Forest Management in Voluntary National Review Reports**

After the adoption of the UN 2030 SDGs, countries were requested to prepare their Voluntary National Review (VNR) Reports. Türkiye has shown its commitment to contributing to a sustainable world since the adoption of Agenda 2030. Türkiye was among the first 22 countries that submitted their VNR Reports in 2016. Türkiye's first VNR Report included a

roadmap that detailed planned steps to achieve SDGs (MoD, 2016). The second VNR Report was prepared in 2019, with a focus on the progress made toward achieving the SDGs (PSB, 2019).

As part of the preparations for VNR, legislation, institutional framework, policies, projects, and practices were reviewed for each SDG. In the Second VNR, progress made between 2010 and 2018 was evaluated, with a particular focus on the period following the adoption of Agenda 2030. The report identified focus areas based on each goal and examined the goals using a systematic approach. A participatory approach was adopted while preparing the VNR, which involved engaging with various stakeholders, including public institutions, private sector representatives, and non-governmental organizations. A total of 2,962 individuals and institutions, including 312 NGOs, 2,000 company representatives, 50 municipal representatives, and 600 experts participated in the VNR process (PSB, 2019).

Türkiye's implementation performance was evaluated in prominent developments and areas for improvement. This was done by first examining the current situation, policies, and legislation based on each SDG in the VNRs. To analyze the progress of each SDG, we identified areas of focus and linked them to the corresponding goals.

The “Report on Türkiye's Initial Steps towards the Implementation of the 2030 Agenda for Sustainable Development”, prepared in 2016, discussed the concept of sustainable development in Türkiye's policy environment, the implementation of SDGs and the integration of SDGs into the 11<sup>th</sup> NDP (MoD, 2016).

In the Second VNR Report, SDG-15 was assessed based on important developments and areas for improvement, with a focus on:

- i. Conservation and sustainable management of terrestrial ecosystems.
- ii. Conservation of biodiversity and genetic resources.

To protect and manage terrestrial ecosystems, biodiversity, and genetic resources sustainably, the VNR described in detail the studies that were conducted and planned to combat desertification, land degradation, soil pollution, deforestation, and drought.

#### **2.1.4. Sustainable Land and Forest Management in Other Documents**

Other key policy documents regarding SDG-15 for Türkiye include:

- Forest Management Plans
- National Climate Change Adaptation Strategy and Action Plan

- ▶ Climate Change Action Plan
- ▶ National Forestry Program
- ▶ National Strategy and Action Plan for Combating Desertification
- ▶ National Drought Management Strategy and Action Plan
- ▶ National Basin Management Strategy
- ▶ Strategy and Action Plan for Combating Agricultural Drought in Türkiye
- ▶ National Biological Diversity Action Plan

In Türkiye, forest management plans have been prepared since 1917 to meet the expectations of society from forest resources and to manage forest resources. As a result of the developments in the world and Türkiye, expectations from forest resources have increased and diversified, and many ecological and sociocultural functions of forests have come to the forefront apart from wood production. Forest management plans have changed depending on developing conditions, and forest management regulations have been renewed. The first forest management regulation issued in 1918 was renewed in 1973 after the transition to the planned development period. Then, in 1991, a new management regulation was published to meet social expectations. In 1992, the Forest Principles adopted at the UN Conference on Environment and Development held in Rio de Janeiro emphasized that forest resources and forest areas should be managed to meet the social, economic, ecological, cultural, and spiritual needs of present and future generations (UN, 1992).

An ecosystem-based functional planning was brought to the agenda, and Türkiye's forestry sector adapted to this new approach. In the 7th and 8th Development Plans, it was set as a target that forest management plans would be renewed to align with the principles of sustainable forest management. As a result, the "Forest Management Regulation" was prepared according to the ecosystem-based functional planning approach and entered into force in 2008. A new era was begun in forest management planning that adopted sustainable forest management as a dimension of sustainable development (Resmi Gazete, 2008). With Notification No. 299 issued in 2014 within the scope of this regulation, the procedures, and principles for the preparation of ecosystem-based functional forest management plans were determined in detail (OGM, 2014). Forest management plans prepared based on ecosystem-based functional planning is a milestone in ensuring future sustainable land and forest management in Türkiye.

The National Climate Change Adaptation Strategy and Action Plan, along with Climate Change Action Plans, outlined Türkiye's strategies and actions to combat climate change.

Both plans stated that climate change is a sustainable development issue, and that ecosystem services, biodiversity, and forestry are among the key areas that will be impacted by climate change in Türkiye (MEU, 2010; MEU, 2012).

The National Forestry Program, prepared for the period 2004-2023, defines the national forestry principles as sustainability, protection of biological diversity, multifunctional utilization, participation, and equitable sharing of public benefits. In addition, the main objectives of the Program were stated as “addressing forestry issues from a comprehensive perspective within the context of sustainable development”, “preparing development policies and strategies for the forestry sector in a participatory approach,” and “providing maximum contribution from national and international financial resources to forestry activities” (ÇOB, 2004). Just like in other plans and programs, the National Forestry Program prepared in 2004 clearly demonstrated that Türkiye took immediate action on sustainable development and sustainable forest management following the 1992 Rio Summit and kept up with international developments in these areas. Policies, strategies, and action plans related to the protection of forests, development of forests, and utilization of forest resources were expressed in detail, and sustainable development was as the main goal of these.

The National Strategy and Action Plan for Combating Desertification (2019-2030) was developed in accordance with the UN 2030 SDGs, with particular emphasis on SDG-15. The mission outlined in the plan is to develop and implement strategies, programs, and innovative methods that promote sustainable ecosystem management, encourage local participation and governance, and facilitate international dialogue at both national and international levels. The goal is to effectively combat desertification, prevent and reduce land degradation, mitigate the effects of drought, and ensure food security” (ÇMUSEP, 2019). Under the section titled “Strategic Objectives and Expected Impacts” in the Plan, the detailed actions to combat desertification and halt or reverse land degradation, as expressed in SDG-15, are outlined until 2030. Similarly, the National Biological Diversity Action Plan includes national targets and actions that align with SDGs, with a particular emphasis on the importance of SDG-15. (DKMPGM, 2019).

## **2.2. Important Developments and Areas for Improvement in Achieving SDG-15 Targets**

In this section of the study, we discuss the developments, legislation, institutional framework, policies, and strategies in Türkiye regarding the targets outlined in SDG-15. The protection, restoration, and sustainable use of ecosystems and their services, as outlined in Target 15.1, are among the top priorities in policy documents, including Development Plans, Annual Programs, and the National Biological Diversity Action Plan. Actions and strategies for

Year	Forest Type	Normal Forest		Discontinuous Forest		Total	
		Hectare	%	Hectare	%	Hectare	%
1973	High Forest	6,176,899	31	4,757,708	23	10,934,607	54
	Coppice	2,679,558	13	6,585,131	33	9,264,689	46
	Total	8,856,457	44	11,342,839	56	20,199,296	100
1999	High Forest	8,237,753	40	6,180,587	29	14,418,340	69
	Coppice	1,789,815	9	4,555,093	22	6,344,908	31
	Total	10,027,568	49	10,735,680	51	20,763,248	100
2004	High Forest	8,940,215	42	6,499,380	31	15,439,595	73
	Coppice	1,681,006	8	4,068,146	19	5,749,152	27
	Total	10,621,221	50	10,567,526	50	21,188,747	100
2012	High Forest	10,281,728	47	6,978,864	32	17,260,592	79
	Coppice	1,276,940	6	3,140,602	15	4,417,542	21
	Total	11,558,668	53	10,119,466	47	21,678,134	100
2015	High Forest	11,919,061	54	7,700,657	34	19,619,718	88
	Coppice	785,087	3	1,938,130	9	2,723,217	12
	Total	12,704,148	57	9,668,571	43	22,342,935	100
2021	High Forest	13,1150,371	57	8,682,995	38	21,833,366	94
	Coppice	349,629	1	927,005	4	1,276,634	6
	Total	13,500,000	58	9,610,000	42	23,110,000	100

According to GDF Strategic Plan, a total of 344,961 ha of afforestation were completed between 2010 and 2017, with an average of 43,120 hectares per year. The plan increased the normal forests to 14 million hectares through afforestation and rehabilitation efforts between 2019 and 2023 (OGM, 2018). According to GDF (OGM, 2012), Türkiye ranked fourth in the world for afforestation in non-forest areas and twelfth for reforestation efforts between 2015 and 2020. In summary, this data shows that the forestry organization in Türkiye carries out successful work on stopping deforestation, restoring deforested lands, and reforestation and afforestation.

Policies combating desertification and restoring degraded lands, within the scope of Target 15.3, were included in the Seventh Development Plan. In fact, the National Strategy and Action Plan for Combating Desertification prepared for the period of 2019-2030, and studies within this scope are being carried out in Türkiye in accordance with this action plan. Türkiye has gained significant success and experience in combating desertification/land degradation since 1946. Between 1955 and 2018, erosion control measures were implemented on 1,528,464 hectares of land. Similarly, between 1962 and 2018, 250,443 hectares underwent pasture improvement activities (ÇMUSEP, 2019).

Actions preserving the mountain ecosystem and promoting biological diversity, reducing the degradation of natural habitats, protecting threatened species, and preventing their complete extinction, as stated in Targets 15.4 and 15.5, are incorporated in the National Biological Diversity Action Plan (2018-2028). In this plan, national targets and actions were adopted for the identification, monitoring, conservation, and sustainable management of biodiversity and the rehabilitation and restoration of damaged ecosystems (DKMPGM, 2019).

Environmental Law is centered on protecting endangered, threatened, and rare plant and animal species, with the goal of preserving biological diversity and ecosystems and promoting their sustainability. The Law on the Protection of Animals was established for the protection of endangered species and their habitats as its foundation. As a party to international conventions such as the Convention on Biological Diversity, the Ramsar Convention on Wetlands of International Importance, Especially as Waterfowl Habitat, and The Council of Europe's Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), Türkiye can prevent loss of biodiversity, protect species, and prevent their complete extinction.

Target 15.6 prioritized research, protection, sustainable use, and the economic value of genetic resources in the 9th, 10<sup>th</sup>, and 11th NDPs. Measures were determined to achieve these

goals. The National Biological Diversity Action Plan outlines targets and actions for conducting inventory studies to conserve and utilize genetic resources, as well as for recording species using DNA Barcoding.

Target 15.7 in the Strategic Plan of the Ministry of Agriculture and Forestry and the National Biological Diversity Action Plan involves taking measures to prevent the unauthorized and uncontrolled collection of biological resources and their exportation (also known as bio-smuggling). In addition, it ensured that wild animals protected under the Land Hunting Law cannot be hunted. Wildlife protection and development areas were declared to safeguard endangered wildlife in Türkiye, and measures were taken to prevent illegal hunting activities. Environmental Law prohibits the commercialization of endangered or threatened species, as well as rare plant and animal species.

Target 15.8 prevents the entry and spread of non-native species that pose a threat to native species, habitats, and ecosystems. This is achieved through effective control measures. The United Nations Convention on Biological Diversity and the National Biological Diversity Action Plan policies determine the entry routes of invasive alien species, monitor and control them, and develop measures for addressing them.

Significant progress has been made in Türkiye regarding the inclusion of ecosystem and biodiversity values in national and local plans and development processes, as stated in Target 15.9. Ecosystem and biodiversity values were incorporated into development plans, strategic plans, and other policy documents that were prepared following the 1992 Rio Summit. As part of the National Biological Diversity Action Plan, one of the key objectives was to establish strategies and implementation systems for the fair use, conservation, and maintenance of the rich biological diversity of ecosystems. In addition, the duties and responsibilities of all stakeholders were defined.

In Target 15.a and 15.b, it stated that alternative financial resources should be utilized to protect and sustainably use biodiversity and ecosystems, as well as to finance sustainable forest management. Relevant institutions should have access to international grants and loans, as well as government budget resources, to support the conservation, utilization, and maintenance of biological diversity. There are two types of financing sources for the forestry sector in Türkiye. These are internal and external financial resources. Internal financial resources include budgets, contributions from non-governmental organizations, and development aid from development agencies. External financial resources include funding from international organizations such as the Global Environmental Facility (GEF), World Bank, and EU funds, as well as funds from FAO and UNDP, along with national organizations (Türker, 2008; Daşdemir 2011).

In addition to traditional financial resources, new financial resources and tools are used worldwide to support sustainable forest management. Some of these financial resources are public, while others are private. While general government revenue, revenue from state-owned forests, and international official development assistance are considered as public resources, forest owners, the forest industry, philanthropic funds, and NGOs are considered as private sources (Simula, 2008; Ok et al., 2013). However, the utilization of alternative resources used for the protection of biodiversity and sustainable forest management in Türkiye has not yet reached the desired level (Demirci and Öztürk, 2015). For this reason, greater financial support should be provided by enhancing collaboration with international organizations.

In Target 15.c prevents bio-smuggling and increases the livelihood of rural people living in protected areas, such as forests and national parks where there is rich biological diversity. This target also falls within the scope of rural development policies. At this time, current legislation has sufficient regulations in place to achieve the intended target.

### 2.3. Important Developments and Areas for Improvement in SDG-15 Indicators

Initially, 14 indicators were identified for SDG-15. Based on the data obtained for these indicators the success of the countries was compared. In addition, the changes in the indicators over the years were determined. The change in indicators in Türkiye in the period of 2010-2017 is presented in Figure 1. In the relevant period, the ratio of the total forest area to the total land area increased from 27.2% to 28.6%. As a result of the rehabilitation, the ratio of degraded (discontinuous) forests decreased in the same period, while the ratio of normal forests increased.

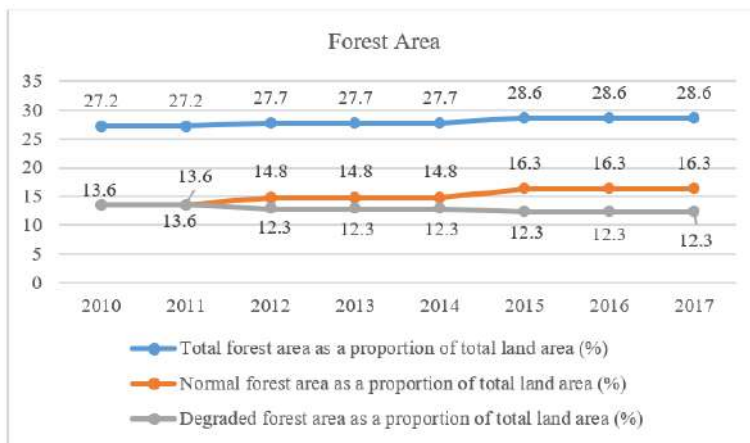


Figure 1. Forest area as a proportion of total land area



Again, in the same period, the change in indicators related to “Progress toward sustainable forest management” is presented in Table 4 (PSB, 2019). For some indicators, there is no data for some years. During this period there is a regular increase in the “forest area under an independently verified forest management certification scheme indicator.” “The proportion of forest area under a long-term forest management plan” indicator value is 100, and this value shows that all forest areas in Türkiye are managed with a long-term forest management plan.

<b>Table 4.</b> Progress towards sustainable forest management								
	2010	2011	2012	2013	2014	2015	2016	2017
Forest area net change rate (%)			0.5			1.4		
Above-ground biomass stock in forest (million tons)	916	944	960	1000	1014	1035		1031
Proportion of forest area located within legally established protect areas (%)	3.5	3.5	3.3	3.3	3.3	5.5	5.5	5.5
Proportion of forest area under a long term forest management plan (%)	100	100	100	100	100	100	100	100
Forest area under an independently verified forest management certification scheme (thousand ha)		72	1360	2110	2367	2367	2367	2367
<b>Source:</b> PSB (2019)								

However, in 2020, these indicators were revised, and only five of them were calculated and compared. These five indicators for Türkiye are presented in Table 5 (Sachs et al., 2022):

<b>Table 5.</b> SDG-15 indicators			
Indicator	Year	Value	Rating
Mean area that is protected in terrestrial sites important to biodiversity (%)	2020	2.3	Major challenges remain
Mean area that is protected in freshwater sites important to biodiversity (%)	2020	4.2	Major challenges remain
Red List Index of species survival (worst 0–1 best)	2021	0.9	Challenges remain
Permanent deforestation (% of forest area, 3-year average)	2020	0.0	SDG achievement
Terrestrial and freshwater biodiversity threats embodied in imports (per million population)	2018	0.7	SDG achievement
<b>Source:</b> Sachs et al. (2022)			

While deforestation continues in the world, due to successful sustainable land and forest management practices, there is no deforestation in Türkiye. In fact, there is an increase in the total forest area in Türkiye. For this reason, the “permanent deforestation” indicator value is 0.0, and it is considered an SDG achievement. Although Türkiye seems to be in a good position when looking at the policies, legislation, strategies, and targets in this regard, it is debatable whether the issues are reflected in practice. At this point, it is necessary to pay

attention to the deforested areas in Türkiye and the forest allocations made for non-forestry purposes. Within the scope of Article 2 of Forest Law No. 6831, some forest areas can be removed from the forest border for various reasons. Since 1973, the deforested are close to 620 thousand hectares (2.7% of all forests.) Forest areas can be used for non-forestry purposes such as mining, energy, and tourism. The number of forests allocated for non-forest purposes reached 748 thousand hectares (3.3% of all forests) as of 2020. This has resulted in a six percent (6%) reduction of Türkiye's forests through political decisions and regulations (Atmış et al., 2022; OGM, 2022).

The International Union for Conservation of Nature (IUCN) Red List Index monitors the average extinction status of species over time and indicates that endangered species are increasingly at risk. According to the Red List, species are classified into eight categories based on their level of endangerment. These categories include extinct, extinct in the wild, critically endangered, endangered, vulnerable, near threatened, least concern, data deficient and not evaluated. The risk of species extinction is increasing at an unprecedented rate in human history. The Red List Index, which indicates the overall risk of extinction for species in various taxonomic groups, indicates a 9.2% decline between 2000 and 2022 (UN, 2022).

While the number of defined plant and animal species in the world is 1,740,330, the number of defined species in Türkiye is approximately 76,539. There are 2,545 species from Türkiye on the Red List (SBB, 2019). The Red List Index for species survival in Türkiye is 0.9, but this value is still considered a challenge. In other words, Türkiye needs to take additional measures to be successful in this indicator.

To protect and maintain biological diversity and natural and cultural resources in Türkiye, various protected areas were designated, including national parks, nature parks, natural monuments, nature protection areas, wildlife development areas, natural protected areas, wetlands, special environmental protection zones and other similar protected areas. Protected areas are managed and monitored by the Ministry of Agriculture and Forestry and the Ministry of Environment, Urbanization and Climate Change. The ratio of terrestrial protected areas to the country's surface area is 7.24% in Türkiye (SBB, 2019). However, Türkiye does not have the desired global rates of the "mean area that is protected in terrestrial sites important to biodiversity" and "mean area that is protected in freshwater sites important to biodiversity" indicators. Globally, the average percentage coverage of protected areas over key biodiversity areas increased from 25% in 2000 to 50% in 2021 (UN, 2022). Since Türkiye's indicator values are well below the world average, this situation is evaluated as facing major challenges.

### **3. Policy Recommendations for Sustainable Land and Forest Management**

Türkiye has made progress in sustainable land and forest management over the last two decades. However, there are still major challenges in a significant part of the targets and indicators as stated in the Sustainable Development Report and Sustainable Development Goals in Türkiye's Second VNR. Türkiye aims to achieve targets for 2023, the 100<sup>th</sup> anniversary of its establishment, through sustainable development and human-centered principles. For this reason, many policies were developed, and actions have been taken to implement SDG-15. However, there are still many actions that need to be taken to achieve the above-mentioned targets and indicators. Within the scope of this study, we developed the following policy and action recommendations:

► The 2030 Agenda for Sustainable Development is an inclusive one that urges the co-operation of all stakeholders and their participation in the implementation process through collaborative mechanisms. To achieve the SDGs by 2030, it is imperative to foster innovative practices and solutions, particularly through the establishment of multilateral cooperation and the diversification of financing resources. Since the adoption of SDGs in Türkiye, they have been integrated into the national agenda and policies. The interconnectedness and comprehensiveness of the SDGs necessitate the dissemination of a collaborative working culture. Efforts to achieve this need to continue in Türkiye.

► In addition, the achievement of the SDGs requires a significant source of financing in Türkiye as well as in the rest of the world. It is imperative to combine public resources with the contributions of the private sector, local actors, international financial institutions, and NGOs. It would be beneficial to explore alternative financial resources for sustainable land and forest management rather than relying solely on government budgets.

► To effectively monitor and review SDG-15 at the national level, it is crucial to record data on targets and indicators in a reliable and systematic manner. Along with the advancements made in global SDGs indicators, it is necessary to broaden the scope of national indicators and revise it accordingly. In this way, inconsistencies in the datasets that emerged over the years can be eliminated.

► For sustainable land and forest management, it is vital to establish a monitoring and assessment system for sustainable development goals. This system should be staffed with experts in the field who can keep track of global developments. Skilled personnel must be employed and trained in the management of terrestrial ecosystems.

► Türkiye needs to do a regularly scheduled analysis to keep up with the developments and trends worldwide within the scope of sustainable development over the long term. It would be beneficial to develop proactive policies based on available data gathered through this analysis and consider the potential impacts of long-term trends on sustainable land and forest management.

► When assessing activities related to the targets of SDG-15, the targets about combat desertification, erosion and drought, protection and development of forest areas, and conservation and sustainable use of biological diversity and gene resources should be included in action plans of responsible organizations in Türkiye. Raising awareness among all segments of society, especially those who benefit from these resources, and involving them in decision-making and implementation processes can contribute to achieving sustainable land and forest management now and in the future.

► For sustainable land and forest management, it is vital to adopt an ecosystem approach. Therefore, it is important to determine the products and services provided by terrestrial ecosystems, conduct an inventory of these ecosystem services, map them, estimate their economic value, and integrate all this information into holistic management plans.

► It is important to support local communities, especially forest villagers living in forested areas, who have direct contact with these ecosystems for better protection of terrestrial ecosystems. For this purpose, it would be beneficial to provide social and economic assistance to local people, implement integrated watershed management projects to prevent natural resource degradation, and take measures to increase the income and improve the quality of life of local people.

► To protect biological diversity and genetic resources, holistic policies should be developed at the scale of genes, species, habitats, and ecosystem functions. In Türkiye, various activities and projects are conducted by the public, academia, and NGOs to detect, protect, and monitor endemic or endangered species. Management plans for areas and conservation-utilization practices are prepared to support these efforts. Increasing the number of these projects and disseminating them widely while also providing financial support for more initiatives can help Türkiye improve its position in international indicators regarding the protection of biological diversity.

► Similarly, to promote sustainable forest management, greater support should be provided for studies that view forests as ecosystems and aim to identify the ecosystem services they provide. It is crucial to resolve the problems experienced in reliable data on these services. By

representing the contribution of forests to the national economy in a more realistic manner, Türkiye's performance in sustainable development and growth can be better emphasized.

► In addition, the revision of criteria and indicators for sustainable forest management in accordance with SDGs will not only advance the field of sustainable forestry but also highlight the contribution of the forest ecosystem to the development of the country.

► It is necessary to collect the data needed within the scope of Land Degradation Neutrality<sup>1</sup> to achieve sustainable land management, reduce desertification and land degradation, update and report national indicators, and establish a monitoring and evaluation system. Intervention methods should be determined and prioritized according to problem areas. Agricultural support tools should be directed in a way that contributes to the sustainable use of land planning.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**







## CHAPTER 25

### TÜRKİYE AS AN ACTOR IN SUSTAINING INTERNATIONAL PEACE: THE CASE OF UKRAINE WAR

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#### **Abstract**

From the beginning of the establishment of Turkish Republic, the main foreign policy goal has been ‘peace at home and peace in the World.’ With the centennial of the Republic approaching, Türkiye has become an actor in international level, protecting international peace and human rights in various conflict locations. This study aims to analyze Türkiye’s role in terms of its contribution to international peace in the 2022 Ukraine war within the framework of the United Nations’ Peace, Justice and Strong Institutions goal. The goal of Peace, Justice and Strong Institutions ranks 16th among the 17 Sustainable Development Goals included in the United Nations’ Sustainable Development Agenda. Based on the principles of human rights and the rule of law, this goal aims to promote peaceful and inclusive societies for sustainable development, ensure access to justice for all, and create effective, accountable, and inclusive institutions at all levels. From this purpose, the scope of the study is to evaluate Türkiye’s role in the management of Ukraine war that is for the benefit of Ukrainian people and of international peace. The study is conducted with the qualitative document analysis method. Document analysis, as a scientific research method that ensures the collection, examination, comparison, and analysis of primary and secondary data within the research, provides the opportunity to examine Türkiye’s contribution to international peace through Ukraine war. This study, which deals with Ukraine war in terms of Türkiye’s contribution to international peace, has the potential to shed light on the current debate of the international conflict from a different perspective and to evaluate and analyze Türkiye’s Sustainable Development performance in terms of contributions to international peace.

**Keywords:** Ukraine War, Peace Justice and Strong Institutions Goal, Sustainable Development, International Peace, Türkiye’s, Role

## 1. Introduction

The goal of Peace, Justice and Strong Institutions ranks 16th among the 17 Sustainable Development Goals included in the United Nations' Sustainable Development Agenda. Based on the principles of human rights and the rule of law, this goal aims to promote peaceful and inclusive societies for sustainable development, ensure access to justice for all, and create effective, accountable, and inclusive institutions at all levels. With this aim in mind, this article discusses how Türkiye mediated in Ukraine war and contributed to the UN's Sustainable Development Goal No. 16 by working towards peacebuilding.

The Ukraine-Russia war is one of the most important events that preoccupy the international community. Its significance is primarily tied to the historical background of the two countries. Therefore, this study will first provide a detailed and chronological historical background of the relations between Ukraine and Russia. Examining the historical dynamics of the two countries is essential in understanding the causes of the war. Mediation, which forms the theoretical framework of this study, is a peaceful conflict management approach. It aims to facilitate negotiations, maintain dialogue, and redirect the conflict towards a peaceful resolution. Thus, this study will explore whether Türkiye's actions align with the role of mediators in conflicts, by drawing upon the mediation literature. In the analysis section, which combines the historical relationship and the theoretical background, Türkiye's policies and actions concerning the war will be analyzed, and its contribution to the UN goals will be examined.

The study employed the qualitative document analysis method. Document analysis is a scientific research method that involves collecting, examining, comparing, and analyzing primary and secondary data relevant to the research topic. It provides an opportunity to explore Türkiye's contribution to international peace through its involvement in Ukraine war. This study, focusing on Türkiye's role in Ukraine war with regards to its contribution to international peace, has the potential to offer a fresh perspective on the ongoing discourse surrounding international conflicts. Furthermore, it aims to evaluate and analyze Türkiye's Sustainable Development performance in terms of its contributions to international peace.

## 2. Historical Background

At this point, it is important to mention the process until the 21st century, which is the first step in the chronological development of the Ukraine-Russia conflict, whose severity and magnitude have increased since the mid-2010s. Historically, both Russia and Ukraine recognize the Kievan Rus', which emerged in the 9th century, as the starting point of their history (Buyar & Şener, 2022, p.137). The Slavs, who were severely affected by the Mongol raids

that continued until the 14th century, started to look for new ways to ensure their own security and established a new center of their own, separating from the Kievan Rus' and forming the Moscow Knezate (Samedov, 2022, p.9). This separation also constitutes the oldest historically traceable example of the war between Ukraine and Russia today.

In 1547, during the reign of Ivan III, the Moscow Knezate made raids towards the Black Sea and the Caspian Basin, expanded its territory, and became Tsarist Russia (Samedov, 2022, p.9). From this period onwards, the Russian Tsardom, advancing to the west, annexed the eastern part of Ukraine to its territory. This situation can be analyzed in terms of the Russian Tsarist regime's regional advancement goals. For the tsarist regime, which aimed to advance to the Balkans and Eastern Europe, Ukraine was seen as a strategic point where an open-door policy could be pursued (Sönmez, Bıçakçı & Yıldırım, 2015, p.657). In the same period, the western part of Ukraine fell under the influence of Kingdom of Poland, which is today's Poland. In other words, by the 17th century, the distinction between east and west in the territory of Ukraine started to become clearer as the western part of the country fell under the influence of the Kingdom of Poland and the eastern part under the Russian Tsardom (Erkem-Gülboy, 2014, pp.268-269).

Following centralization and Russification policies, the Russian Tsardom annexed Ukraine to its territory in the 18th century by ending the autonomy of the east as well as the west of Ukraine (Samedov, 2022, p.10). From this date onwards, the territorial integrity of Ukraine and its people were subordinated to the rule of Tsarist Russia. The period from the 18th century to the mid-19th century was the period when the Ukrainian territory was under Russian rule and thus the Russian influence intensified (Nialtseva, 2019, pp.25-26). Also, during this period, the Crimean Khanate, which was removed from the Ottoman Empire, was occupied by the Russians. After this occupation, the Russians, who established more dominance in Ukraine, accelerated their Russification policies to accomplish the project of the 'great Russian nation' which included all Ukrainians (Sönmez et al., 2015, p.658).

One of the important steps taken in accordance with the centralization and Russification policy of the tsarist regime is related to the industrialization policy. The industrialization policy, which was deemed essential for the survival of the state, is important for the relations between Ukraine and Russia, considering the fertile lands and mines that Ukraine possesses. Because in this way, Ukraine became an important part of Russian industrialization. The industrialization of Ukrainian territory was accompanied by the migration of Russian villagers to the south of Ukraine (Plokyh, 2017, p.150). In this way, the Russian population began to increase in Ukraine as a result of the Russification policy as well as the increasing accumulation

of capital. Another step taken in line with the Russification policy was the prohibition of any activity in Ukrainian or the use of the Ukrainian language in public spaces (Nialtseva, 2019, p.27). As a result of such increasing Russian pressures, the pro-Russian and pro-Ukrainian divide, which was already evident, has begun to progress on a more nationalism-oriented ground (Plokyh, 2017, pp.144-145).

Russification and centralization policies of the tsarist regime triggered the nationalist movements of Ukraine. The effects of the French Revolution, which happened in the same century, affected the Ukraine. The awakening and triggering of Ukrainian national identity, which began to develop during this period, paved the way for the organization of Ukrainian nationalism in Ukraine. From the mid-19th century onwards, the Ukrainian National Movement began to gain strength.

Towards the end of the 19th century, when Tsarist Russia abolished the practice of land slavery, the people living in Ukraine gained their freedom and the development of Ukraine accelerated (Kurat, 1999, pp.339-341). However, from the beginning of the 20th century, footsteps towards the dissolution of the Tsarist regime began to be heard. Especially the Russo-Japanese war that started in 1904 accelerated the rise of a nationalist wave in Tsarist Russia and caused Russia to enter a crisis in economic and political terms (Nialtseva, 2019, p.37). This crisis processes naturally affected Ukraine as it was in the Tsarist lands. For Ukraine, it was considered that this situation would serve the purpose of the country's autonomy, and for this purpose, it was thought that it would give Ukrainian nationalists the opportunity to make their voices heard by regressing the dominant Russian nationalism (Plokyh, 2017, pp.163-165).

## **2.1. 20<sup>th</sup> Century Ukraine-Russia Relations**

In the period from 1907 to 1917, especially with the devastating effect of the First World War, Tsarist Russia began to dissolve economically, socially, and politically. During this process, Ukraine began to stand out as an important region in terms of the size of its territory, population, grain and industrial accumulations (Nialtseva, 2019, p.42). The process leading to the 1917 Revolution began with the disintegration of the Tsarist regime and the recognition of Ukraine's position and significance in the region. In this process, a concrete step was taken in Ukraine in line with the aim of the country's autonomy, and the People's Republic of Ukraine was declared, and after the October Revolution, this formation continued under the name of the Ukrainian Socialist Republic (Samedov, 2022, pp.9-10).

The one-year period after the First World War was the period when the socialist regime gained institutional character in Ukraine. In other words, this period is the Sovietization

period for Ukraine. Similar to the frequent implementation of Russification policies by the Tsarist regime since its establishment, it can be argued that the socialistization process of Ukraine commenced during this period, effectively dampening the aspirations for long-term independence as a separate state. In fact, the invasion of Ukraine by the USSR and its incorporation into the Union in 1922 is the clearest example of this situation (Torbakov, 2001, p.299; Nialtseva, 2019, p.55).

By 1928, the grain shortage that emerged in the USSR had a significant impact on both the Soviet scale and the relations between Ukraine and the Soviets. In this period, agricultural lands were expropriated and state-owned agricultural enterprises were established to provide a solution to the grain crisis that became a problem throughout the country (Turan, 2011, p.317). This situation was undoubtedly fulfilled as a state policy within the USSR. In fact, the policies produced to prevent the grain crisis were strictly implemented in the USSR during the Stalin era and caused famine and death, especially in Ukrainian territories in the early 1930s (Samedov, 2022, p.11). This had a negative impact on relations between Ukraine and the USSR.

During the Second World War, when the USSR took the western part of Ukraine under its rule, all Ukraine was united under the USSR. However, different eastern and western oriented affiliations continued among the Ukrainians; Ukrainians living in the western regions and disapproving of Stalin's practices joined the German army, while the Ukrainians living in the eastern regions joined the Soviet Army (Sönmez et al., 2015, p.658). However, this situation changed during the war. The view of Hitler, who saw Ukraine as an exploitable country due to its wheat and coal resources, disturbed the Ukrainians over time and eventually the Ukrainian people began to take a stance against Hitler (Samedov, 2022, p.12).

During the Cold War period after the Second World War, the USA and the USSR were recognized as the two great powers in the international system and the bi-polar world system began. In this period, Ukraine was seen as a region that needed to be rebuilt quickly for the USSR in terms of its resources (Nialtseva, 2019, p.70). With the death of Stalin in 1953, the number of Ukrainian administrators, especially Nikita Khrushchev, began to increase in the USSR high ranks (Nialtseva, 2019, p.71). In other words, the fact that Khrushchev, who came to the presidency in 1953, was Ukrainian directly affected the relations between the USSR and Ukraine and paved the way for Ukraine to become more visible. A significant example substantiating this argument is the annexation of Crimea to Ukraine in 1954. To address the administrative and economic challenges in Crimea and maintain control over the region, Crimea was transferred to Ukraine in 1954 (Balacan, 2021, p.18). According to Plokhly (2017, p.246), rather than the fact that Khrushchev was originally from Ukraine or that this period showed good relations between

Ukraine and the USSR, the main purpose was to ensure that Crimea, which was burdened with the responsibility of recovery after the Second World War would have easy access to the support it needed by being given to Ukraine as its only land connection.

On the other hand, under the more conservative Brezhnev who succeeded Khrushchev, the Sovietization and centralization policies of the USSR continued in Ukraine. These policies caused the Russians living in Ukraine region to get closer to the high cultural identity and the existing Russian-Ukrainian or pro-Russian-pro-Western dichotomy to deepen (Erkem-Gülboy, 2014, p.270). It maintained a similar marginalizing effect on the economy as well. For example, under Brezhnev, who prioritized a mono-centric economy and military empowerment, the Ukrainian economy began to decline, and Ukraine's strengthening against the center was tried to be prevented (Nialtseva, 2019, pp.77-79; Ploky, 2017, p.250).

Gorbachev, who assumed leadership of the USSR after Brezhnev in 1985, is remembered as the driving force behind the perestroika and glasnost reforms, which marked the beginning of an era of more moderate relations with the West. Due to these characteristics of his period, Brezhnev led a period that tended to transform socialism, but the USSR gradually weakened, especially in the political and economic field (Samedov, 2022, p.12; Nialtseva, 2019, p.80). In addition, one of the most important points that affected the relations between the USSR and Ukraine during the Gorbachev era was the explosion at the Chernobyl nuclear power plant. The radioactive explosion that took place in 1986 posed a serious threat to both the region and human health. However, the explosion also affected the relations between Ukraine and the USSR. The attitude of Moscow in the face of the explosion was aimed at concealing its magnitude. The Ukrainian government, disturbed by this attitude, clung to the belief that it could rely on itself in the face of a major disaster (Ploky, 2017, p.253). This belief paved the way for the reawakening of national consciousness in the Ukrainian people.

By the end of the 1980s, the USSR, which was in an economically weakened state, began to also dissolve politically over time. As of this process, pro-independence movements started in Ukraine, and thoughts on the future of the country came to the fore. These thoughts focused on the duality of whether Ukraine would remain dependent on Russia or become an independent state after the collapse of the USSR (Nialtseva, 2019, p.85). As a result of this dichotomy, a referendum was held in Ukraine and Ukraine, which declared the Sovereignty Declaration in 1990 according to the result of the referendum, became an independent state in 1991 under the administration of the first President Leonid Kravçuk (Sönmez et al., 2015, p.659). In this period, the Ukrainian identity was highlighted against the Russian identity and a nation-state was built based on the Ukrainian identity (Erkem-Gülboy, 2014, p.264).

## 2.2. Post-Independence Developments in Ukraine

After its independence, pro-Western and Russian bias in Ukraine continued to be a duality in the country. In parallel with the historical process, while the west of Ukraine consists of the Ukrainian national identity and the Ukrainian-speaking part, the eastern part of the country also consists of the Russian-speaking part that has a Ukrainian identity but rejects Ukrainian nationalism (Ismayilova, 2022, p.95). In the late 1990s and 2000s, the social and political opposition in Ukraine progressed along the axis of this duality. The process until the 2014 annexation of Crimea shows how this post-independence duality affected the political and social life of Ukraine.

The fact that pro-Russian Yanukovich and pro-Western Yushchenko were nominated for the first time in the 2004 elections shows the two main parties in the conflict dynamic (Sönmez et al., 2015, p.661). The Orange Revolution that took place in 2004 manifested itself as a public action against Russia and the Russian supporters in Ukraine, in which Western values and Ukrainian nationalism were supported (Ismayilova, 2022, p.95). After the election, Yushchenko declared his victory, and an atmosphere of Ukrainianism was created in the country against Russia. However, despite the change in power in Ukraine after the Orange Revolution, political turmoil and economic crises continued. Until the Presidential elections in 2010, the governments established under Yushchenko could not maintain stability, and many coalition governments, including Yanukovich, took part in power (Sönmez et al., 2015, p.661). This situation negatively affected the 2010 elections, and due to the ongoing impotence, the people demanded a change in power. Therefore, the 2004 Revolution process could not have the expected effect, and the pro-Russian Yanukovich won the 2010 presidential election.

The duality of West and Russia orientation, which is the internal conflict of Ukraine, can also be observed through other countries with which the country has or has not established relations during the 2010-2014 period. Yanukovich, who has been intending to follow a pro-Russian policy and compensate for the deteriorated relations with Russia since 2010, has given up on signing the Partnership and Cooperation Agreement with the EU, which has been tried to be signed since 2009 (Samedov, 2022, p.75). Although this renunciation pleased the pro-Russian segment living in eastern Ukraine, it paved the way for the opposition protest called Euromaidan that started in the capital, Kiev. Against Yanukovich, who took refuge in Russia because of the uprising, the Ukrainian Parliament retracted the decision in February 2014 that included the adoption of Russian as an official language in eastern Ukraine (Uyaniker, 2018, p.142). This situation undoubtedly disturbed both the pro-Russians in Ukraine and Russia.



### 2.3. Crimea Conflict

Russia reacted to these events by intervening in the eastern regions of Crimea and Ukraine. These events led to the impact of Ukraine's internal politics on Crimea, and shortly thereafter, political activity began in Crimea. Due to the divided social and political structure in Ukraine, the crisis quickly spread to Crimea, giving rise to separatist tendencies. As separatist movements gained momentum in Crimea, Russia claimed that the freedom of expression and security of the Russian minority or pro-Russian individuals residing in Crimea were under threat. Consequently, in February 2014, Russia resorted to military intervention and occupied Crimea. With the occupation, the Russian flag was raised on public buildings in Crimea, and control over the Crimean Supreme Council and the Council of Ministers were seized (Paul, 2015; Ismayilova, 2022, p.100).

Under the control of the invading Russian troops, the Supreme Council of Crimea announced on April 25, 2014, that a referendum would be held to decide on joining Russia (Uyaniker, 2018, p.144). However, shortly after, the initially determined date was brought forward, and the new date was changed to March 16, 2014. In response to Russia's hasty actions following the military occupation, a referendum was held in Crimea on March 16, 2014, upon Russia's request, and it was declared that Crimea (including Sevastopol) had voted to join Russia (Sönmez et al., 2015, p.663). The day after the referendum, Russian President Vladimir Putin accepted the results and signed the decision indicating that Crimea was now part of the Russian Federation based on the right to self-determination (Taşdemir & Özer, 2015, pp.50-51). Therefore, Crimea was officially annexed by Russia on March 17, 2014.

Russia's annexation of Crimea violated three international agreements (the 1994 Budapest Memorandum, the 1997 Russia-Ukraine Friendship, Cooperation and Association Agreement, and the 2003 Russian-Ukrainian State Borders Agreement) according to international law (Vialtseva, 2019, pp.140-141). Consequently, many countries, particularly the United Nations, reacted to this situation. On March 27, 2014, the United Nations General Assembly emphasized that the referendum was unlawful and declared its support for the territorial integrity of Ukraine (The UN General Assembly 68/262). However, following the referendum results, the OSCE, European Union, United States of America, and NATO condemned Russia for violating basic norms of international law regarding the occupation of Ukrainian territory and the illegitimate referendum's outcome (Morkva, 2014, pp.379). Additionally, these countries and international organizations imposed various sanctions, such as visa restrictions on Russian state officials, trade and investment limitations on Russia, and prohibition of imports from Crimea (Keskin, 2017, p.92; Morkva, 2014, p.379).

However, the annexation of the Crimea was not the sole issue between Ukraine and Russia in March 2014. The uprisings that originated in the Crimea during the occupation and annexation process spread to the eastern regions of Ukraine, leading to escalating violence. It is noteworthy that the events of 2014 are associated not only with the Crimea but also with the cities of Donetsk and Luhansk in the Donbass region. The Donbass region, situated in eastern Ukraine, holds historical significance as an industrial area with a dense pro-Russian population and Ukraine's largest coal reserves (Samedov, 2022, p.84). Another significant factor is that Russian is the first and predominant language spoken in these cities. The rate of Ukrainian and Russian speakers in these cities, according to the most recent census conducted in Ukraine, is shown in Table 1.

<b>Table 1.</b> Rate of languages spoken as first language in Ukraine (all), Donetsk, and Luhansk			
<b>Region/Speakers</b>	<b>Ukrainian</b>	<b>Russian</b>	<b>Other Languages</b>
Ukraine (all)	67.67%	29.83%	2.5%
Donetsk	24.10%	75.11%	0.79%
Luhansk	30.09%	69.28%	0.63%
Source: (Clear Global, 2001)			

Based on these ratios, the historical Ukrainian-Russian duality problem in Ukraine can be observed through the regional differences in the languages spoken. According to the table, the proportion of people who speak Russian as their first language in across Ukraine is 29.83%. However, this rate significantly increases to an average of 72.19% in the cities of Donetsk and Luhansk. Undoubtedly, while this difference does not justify the Russian occupation of the region, it indicates that Ukraine is a society that is divided on this issue.

Due to the abovementioned characteristics of the region, separatist movements against either the Ukrainian administration or pro-Westernism have emerged throughout the region's history. Specifically, declarations of independence began to emerge from cities like Donetsk and Luhansk in the Donbass region of Eastern Ukraine, influenced by the change in administration in Kiev and the events in Crimea (Ismaylova, 2022, p.105). Consequently, the situation rapidly escalated towards a conflict. Although this crisis, which began in 2014, is referred to as the start of a civil war, the presence of Russian identities and weaponry among the soldiers fighting against the Ukrainian army in the Donbass region indicates a multifaceted situation (Tsvetkova, 2015). This demonstrates Russia's involvement in Ukraine's internal affairs and reveals that the bi-communal nature of Ukraine has resulted in such a significant conflict for the first time, reaching international dimensions.

## 2.4. Donbass Incidents

The Ukrainians, seeking to defend their lands against Russia's support for the uprisings in eastern Ukraine, began fighting alongside the Ukrainian army against the separatists in the Donbass region. However, despite their efforts, the Ukrainians were unable to regain full control over their territories, and the Russian-backed separatists swiftly took control of Donetsk and Luhansk (Uyaniker, 2018, p.151). The pro-Russian separatists attempted to legitimize this de facto occupation. Consequently, two separate referendums were held in Donetsk and Luhansk. The day before the referendum, the OSCE called for "the cancellation of the so-called referendum" by separatists in eastern Ukraine (OSCE, 2014). However, on May 11, 2014, the separatists of the Donbass region went ahead with the referendum. According to the results, the "yes" vote in Donetsk, with a 75% voter turnout, was 89%; and in Luhansk, where 96% of the population participated, the "yes" vote was 75% (AA, 2014a). As a result, the Donetsk People's Republic and the Luhansk People's Republic were established as two separate entities in the Donbass region by the separatists (Karadeli, 2014, pp.132-133).

During this ongoing process, another event that escalated tensions between the two countries was the downing of Malaysia Airlines Flight MH17 over the Donetsk region on July 17, 2014. It was discovered that the plane had been shot down by a missile of Russian origin, prompting the international community to increase sanctions on Russia significantly (BBC, 2020). This incident proved that Russia was supporting the separatist movements in Eastern Ukraine. Although Russia denies responsibility (Pangalos, 2019), the international community reacted immediately after the accident. Former US President Obama announced the expansion of sanctions on Russian banks and defense industry companies, while the EU declared an arms embargo on Russia and restrictions on certain technologies used in the oil and gas sectors (BBC, 2014b). Additionally, following the annexation of Crimea, France suspended Russia's G8 membership, citing Russian threats to international stability and violations of international law (BBC, 2014a).

However, following the incident, the UN, EU, and OSCE intervened, calling for a cease-fire to allow the repatriation of the victims to their families (AA, 2014). In an effort to resolve the Donbass crisis through diplomatic means rather than military action, meetings were initiated known as Minsk I, involving Russia's Ambassador to Ukraine Mihail Zubarov, former President of Ukraine Leonid Kuchma, President of the Donetsk People's Republic Aleksandr Zakharenko, President of the Luhansk People's Republic Igor Plotnisky, leader of Ukraine's Election Party Victor Medvechuk, and representatives from the OSCE (Uyaniker, 2018,

p.154). These meetings resulted in a ceasefire agreement reached on September 5, 2014, in Minsk, the capital of Belarus. The primary objectives of the Minsk I Agreement were to end the conflicts in the Donetsk and Luhansk regions, to provide humanitarian aid, to withdraw heavy weapons from the region, to revive the severely damaged economy in Donbass, and to initiate negotiations for a political solution.

However, the continuation of conflicts in the region and the failure to fully implement disarmament demonstrated that the ceasefire and the agreement were being violated. Consequently, the Minsk II Agreement was signed in February 2015, involving the Foreign Ministers of Ukraine, Russia, France, and Germany, collectively known as the Normandy Quartet<sup>1</sup>, under the supervision of the OSCE. According to the agreement, a ceasefire line was established to delineate the borders of the Donbass region. Consensus was also reached on the removal of heavy weapons from the conflict zone, the return of the Russia-Ukraine border to Ukrainian control under OSCE supervision, the transformation of Ukraine into a federal structure, and the retention of Eastern Ukraine within the territory of Ukraine through decentralization within a federal framework (Tüysüzoğlu, 2016, p.59).

Although the objective was to achieve lasting peace, the desired peaceful environment could not be realized due to the failure of two consecutive agreements. The ongoing clashes, particularly in the city of Debaltseve, were an early indication of the ceasefire process's failure (BBC, 2015). From this perspective, the reasons for the agreements' failure can be attributed to the disregard for the ceasefire, the inability to withdraw heavy weapons from the region, the failure to implement planned political solutions for regional governance, and the ongoing harm inflicted on the civilian population because of the conflicts.

As evident, the relations between Ukraine and Russia have escalated into a de facto war since 2014. Throughout the ongoing war, agreements concerning economic, political, and military cooperation between the two countries were terminated. For instance, in 2014, Russia terminated the Free Trade Zone Agreement with Ukraine, while Ukraine, in the same year, passed a law to cease military cooperation with Russia (The Moscow Times, 2015; BBC, 2015a; BBC, 2015b).

In this process, the ongoing economic, political, and military problems between the two countries also impacted the perception of national identity among the Ukrainian people. The western and northern regions of Ukraine, historically striving to emphasize Ukrainian identity,

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1 The Normandy Quartet or Normandy Format is a diplomatic initiative established to address the Ukraine crisis, involving peace talks with the participation of Ukraine, Russia, Germany, and France. For further details on the concept, see (CSIS, 2022).

have witnessed a surge in nationalism. This is evident in the significant number of volunteers from the western part of the country who traveled to the Donbass region to fight back the separatists (Özdemir and Eminoğlu, 2022, p.73). The increasing nationalism in these regions primarily aimed to safeguard Ukraine's territorial integrity and defend the nation.

As the challenges resulting from the management of the bicomunal structure in Ukraine persisted, the Donetsk People's Republic, situated in the Donbass region, declared its intention to establish a new country named Malorossiya (Little Russia) in 2017 (Euronews, 2017). This decision sparked reactions from European countries and Ukraine. Germany and France voiced their condemnation of this move, while Ukrainian Foreign Minister Klimkin stated that they would not permit Russia's attempts, facilitated by the Donbass separatists, to execute this plan (Interfax-Ukraine, 2017). This statement further emphasized Ukraine's refusal to politically recognize the republics established in the Donbass region.

While tension between Ukraine and Russia continued, a new crisis emerged in the Azov Sea in 2018. According to a bilateral agreement signed between the two countries in 2003, both Ukrainian and Russian ships have the right of free navigation in the Azov Sea and the Kerch Strait<sup>2</sup>. However, on November 25, 2018, Russian warships intervened near the Kerch Strait in the Azov Sea, alleging that three Ukrainian warships departing from the port of Odesa to Mariupol violated Russian territorial waters (Euronews, 2018). Ukraine and NATO reacted promptly to this incident. Ukrainian leader Poroshenko declared martial law nationwide, considering this event as a threat of war, while NATO, convening in an extraordinary session regarding the crisis, emphasized that Ukrainian warships had the right to navigate freely in the Azov Sea (NATO, 2018). This incident brought the two countries to the brink of war.

Another event that occurred simultaneously with the Azov Sea crisis in 2018 was the church crisis. During this process, Poroshenko demanded the separation of the Ukrainian Orthodox Church from the Russian Orthodox Church. The Kiev Patriarchate, seen as a symbol of Ukrainian nationalism, along with Poroshenko, announced the establishment of an independent Ukrainian Orthodox Church with the positive response of the Fener Greek Orthodox Patriarchate in Istanbul, thus separating from Russia (Euronews, 2018a; AA, 2018). Upon the independence of the Ukrainian Church, Poroshenko stated, "Today is the day of obtaining ultimate independence from Russia. This is a church without Putin and Kirill (Moscow Patriarch)" (BBC, 2018). With its decision, the Fener Greek Orthodox Patriarchate hindered

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2 For more information about the Agreement between the Russian Federation and the Ukraine on cooperation in the use of the sea of Azov and the strait of Kerch, signed on 24 December 2003 see <https://www.ecolex.org/details/treaty/agreement-between-the-russian-federation-and-the-ukraine-on-cooperation-in-the-use-of-the-sea-of-azov-and-the-strait-of-kerch-tre-149547/>

Russia's control policy over the Orthodox world. Therefore, the separation of the church indicates a slight weakening of Russia's power in Ukraine. In addition to its significance for Ukraine's independence, the separation of the church is also important for Poroshenko to gain votes from the nationalist western part of Ukraine in the upcoming 2019 elections.

However, Poroshenko's expectations were not met in the 2019 general elections. In the first round held on March 31, 2019, neither of the parties secured an absolute majority, leading to a second round. The contenders in the second round were the incumbent President Poroshenko and Volodymyr Zelensky, the candidate of the Servant of the People Party. Zelensky emerged as the new president of Ukraine on April 21, 2019, receiving 73.22% of the votes, while Poroshenko garnered 24.45% (OSCE, 2019). Although this outcome reflects the majority's preference, it is worth noting that the election did not take place in the Crimea and Donbass regions. D'anieri (2022, pp.1927-1928) argues that including the Donbass region in the Ukrainian borders would have yielded different election results. Additionally, after Zelensky's victory, Russia stated that "Poroshenko lost the election due to his anti-Russian stance" (Euronews, 2019). This discourse implicitly reveals Russia's expectations from the Zelensky administration.

Shortly after the election, Putin's statement regarding passports sparked the first post-election dialogue between Zelensky and Putin. Three days after the election, Putin signed a decree facilitating the issuance of Russian passports to separatists in Donetsk and Luhansk, despite the reactions from Kiev and the EU. He further announced plans to expand this decision on April 27, aiming to grant Russian passports to all Ukrainian people (Euronews, 2019a; Euronews, 2019b). In response, Zelensky rejected the passport offer and instead pledged to grant citizenship to Russians suffering under Kremlin's rule (DailyNews, 2019). These events, occurring shortly after the election, provide insight into the trajectory of relations with Russia during the Zelensky era.

When Zelensky officially assumed office on May 20, 2019, he stated that, in addition to his anti-Russian stance, he was open to sit down with Putin to resolve issues diplomatically. He proposed an initial step of exchanging imprisoned Russians and Ukrainians (BBC, 2019). As a result of talks between Putin and Zelensky, individuals detained in Russia and Ukraine were mutually released and repatriated to their respective countries in September 2019 (NPR, 2019). This event was seen as a ray of hope for future negotiations between the two countries and brought the Steinmeier Formula back<sup>3</sup> into focus. The Steinmeier Formula, named

3 The Steinmeier Formula was first proposed in 2016 by the then German Foreign Minister Frank-Walter Steinmeier, but it was not accepted.

after the former German Foreign Minister Frank-Walter Steinmeier, proposed holding local elections in the Donbass region under the supervision of the OSCE, with the region's status becoming permanent based on the election results (Euronews, 2019c). Although Zelensky viewed this plan positively, citizens in central and western Ukraine protested, fearing that it would grant autonomy to the Donbass region (AA, 2019). The plan, due to the protests, was not implemented. On the other hand, Russia insisted that the plan should be implemented and legally secured (Sputnik, 2019).

In terms of foreign policy, Zelensky aimed to establish closer relations with the EU and NATO. In October 2019, he met with NATO Secretary General Jens Stoltenberg and EU Council leader Donald Tusk to discuss Russian aggression and the security of Eastern Ukraine (Euronews, 2019d). During these meetings, Zelensky also raised the issue of Ukraine's membership in the EU and NATO. In December 2019, Putin and Zelensky had their first meeting under the leadership of French President Macron and German Chancellor Merkel. Although they agreed to a ceasefire and a prisoner swap by the end of the year, lasting solutions could not be reached to resolve the conflict in the long term (Euronews, 2019e). Additionally, Ukrainians in Kiev reacted to this meeting, expressing their concerns that the country should not compromise its territorial integrity and unity. They gathered in Independence Square in Kiev to voice their opposition (RFERL, 2019).

The 2020s saw intermittent conflicts between Ukrainian forces and separatists in the eastern part of the country. Initially, relations between Ukraine and Russia started on a calm note, but they later escalated dramatically. The annexation of Crimea and the situation in the Donbas region were key topics of discussion between Putin and Zelensky during the year 2020, as the ceasefire in the eastern region of Ukraine continued to be periodically violated.

In 2021, Ukraine made efforts to improve its relations with NATO countries. To this end, Ukraine conducted various military exercises with the USA and the UK, while Russia intensified its own military exercises (REUTERS, 2021). As a result, the ceasefire between Ukrainian soldiers and separatists in eastern Ukraine was broken in March 2021. Russia's deployment of troops to the Donbas region and Crimea, coupled with Ukraine's official call to mobilize its army, heightened the possibility of a full-scale war between the two countries. This possibility was realized in February 2022 when Putin announced the launch of a military operation against Ukraine, officially starting the war.

## 2.5. Ukraine War

Throughout the period from 2021 to the onset of the war, many countries expressed their concerns about the escalating tensions between Ukraine and Russia. Particularly Türkiye repeatedly stated its willingness to mediate between the two countries. However, these warnings did not prevent Russia from declaring war on Ukraine. Putin justified the declaration of war by stating the need to protect people who had allegedly been subjected to abuse and genocide by the Kiev regime for the past eight years (AA, 2023).

Following the outbreak of war, the USA and EU countries announced their provision of aid to Ukraine and imposed airspace restrictions on Russia (İKV, 2022). Just four days after the war began, on February 28, 2022, Ukraine applied for EU membership and requested an expedited membership process through a special procedure (RFE/RL's, 2022). Ukraine, believing that EU membership would provide a means to safeguard itself from the Russian sphere of influence, was granted candidate country status on June 23, 2022.<sup>4</sup>

March 2022 witnessed significant diplomatic efforts between Ukraine and Russia. The foreign ministers of both countries held meetings in Antalya, Lviv, and Istanbul under the mediation of Türkiye to discuss the reestablishment of peace in Ukraine. Meanwhile, the UN General Assembly convened urgently and passed a resolution regarding the war. With the support of 141 countries, the resolution expressed serious concerns about the ongoing situation in Ukraine, called for an immediate ceasefire, emphasized the need for unhindered humanitarian aid access, urged a return to dialogue and diplomacy, demanded the cessation of military force by Russia, the immediate withdrawal of Russian troops from Ukraine, and emphasized compliance with the UN Charter (The UN, 2022). This resolution, in which Türkiye was among the participants, represented the most inclusive response of the international community to the war.

Furthermore, the Ukraine-Russia war had global ramifications beyond the involved parties. It raised concerns about a potential global food crisis since the war hindered the export of crucial agricultural products from Ukraine, leading to worries about food shortages and increased prices. In response to this situation, the “Initiative on the Safe Transportation of Grain and Foodstuffs from Ukrainian Ports” was signed in Istanbul on July 22, 2022, between Türkiye, Russia, Ukraine, and the UN. This initiative aimed to prevent a food crisis worldwide (AA, 2022a; The UN, 2022a). Additionally, the validity of this agreement was subject to ex-

4 For detailed information on Ukraine's EU membership process and the views presented, see <https://www.consilium.europa.eu/en/policies/enlargement/ukraine/>



tension as it was signed for a period of two months. In every extension time, Russia threatened to withdraw, and Türkiye mediated the process for the continuation of the deal.

In September, a prisoner swap took place between Russia and Ukraine, initiated by Türkiye (BBC, 2022). This event raised hopes that relations between the two countries could improve to some extent at the negotiation level. It was announced that a referendum would be held in the occupied regions of Donetsk, Luhansk, Zaporizhia, and Kherson in eastern Ukraine. Despite the reactions of Ukraine, the USA, the EU, and the OSCE, the Russian authorities and separatist governments in the region held a referendum between September 23rd and 27th, 2022 (TRT Haber, 2022). The referendum asked the people in the region whether they wanted to join Russia or not. The results of the referendums revealed that in all four regions, the majority (on average, 93.3%) voted in favor of joining Russia (BİANET, 2022). However, the OSCE, which observed the elections, declared that the results would lack legal validity due to the referendum's non-compliance with Ukrainian laws and international standards, in addition to concerns over the safety of the regions (Euronews, 2022b). Ukraine, in response, declared its refusal to recognize the results of the referendum and condemned it (REUTERS, 2022a). The USA and EU also declared that they do not consider the referendum results as legal and stated that they would not recognize the annexation of these regions, which was the next step. Nevertheless, Russia officially annexed these regions by approving a bill that aimed to connect them to Russia (BİANET, 2022a). In response, Zelensky stated that he would never engage in negotiations with Russia if Putin remained in office, and then on September 30, he officially applied for Ukraine's NATO membership (Euronews, 2022a; (BİANET, 2022b). Russia strongly condemned Ukraine's application for NATO membership, warning that the conflict in Ukraine could escalate into the Third World War (REUTERS, 2022).

While the war continued, another issue between the two countries revolved around the Kerch Bridge, which was constructed after the annexation of Crimea to provide a land and railway connection between Crimea and Russia. As a symbol of the annexation, this bridge, which Putin personally attended in 2018, served as a crucial transportation link for supplying the Russian army in Southern Ukraine (AA, 2022; The Moscow Times, 2022). However, in October 2022, an explosion occurred on the bridge, further escalating the conflict between the two countries. On October 8, a truck exploded on the Kerch Bridge, causing the train wagons carrying fuel to catch fire and ignite a blaze on the bridge (AA, 2022). Putin described this incident as a terrorist attack by Ukraine and declared that a response was necessary (Euronews, 2022). This response was not limited to verbal statements. Zelensky stated that Ukraine was

not involved in the explosion and reported that Russia had bombed city centers, particularly Kiev and Lviv, dozens of times since the incident (The Kyiv Independent, 2022).

When it comes to 2023, it is observed that international diplomatic relations and active warfare continue simultaneously. During this process, both countries engage in ongoing mutual missile and UCAV attacks. In terms of diplomatic relations, the support of the USA, Türkiye, and certain EU countries (Germany, Netherlands, England) towards Ukraine persists. Additionally, the UN Secretary General Antonio Guterres, who defined the war an affront to the collective conscience, penned a letter to Putin regarding the extension and expansion of the grain corridor agreement in terms of humanitarian needs (AA, 2023a; BBC, 2023a).

As a result, according to the analysis by the UN High Commissioner for Human Rights in February 2023, it was reported that since the official start of the war in February 2022, a total of 8,006 civilians have lost their lives, 13,287 civilians have been injured, approximately 18 million civilians have the need for humanitarian aid, and nearly 14 million civilians have been displaced (OHCHR, 2023). The war and its devastating effects, leading to loss of life, displacement, and widespread suffering caused humanitarian crises.

### **3. Mediation in Conflict Resolution**

From the beginning of Ukraine war Türkiye offered mediation and its role during the war performed mediation. Therefore, before analyzing Türkiye's actions to see how close they were to mediation, in this section of the article, literature on mediation will be discussed. Definitions on mediation, identity, role, and rules of mediator and a taxonomy of mediation will be discussed.

According to Johan Galtung, conflict arouses when there is contradiction among goals and means of the parties and that causes hatred and violence in the behavior of conflicting parties (Galtung, 2007, p.28). The UN Charter recognizes three methods of peaceful transformation of conflicts; negotiation of the conflicting parties, mediation, or arbitration (UN Charter, Chapter VI, Article 33; Bercovitch, 2009, p.340). In most conflicts, the conflicting parties have difficulty in continuing negotiations by themselves as the ways of understanding the interests are conflicting and each side sustain their position, which is also the cause of the conflict that makes it almost impossible for the sides to negotiate. Therefore, mediation and arbitration are more plausible options, particularly for violent conflicts. Arbitration is a method in which the third-party intervention brings forth binding outcomes; the decisions out of the arbitration process are binding upon the conflicting parties. Both sides need to accept the results of the third-party intervention in arbitration. That third party may be a commission

like the Badinter Commission for the Dissolution of Yugoslavia, it may be a court, or an international organization. As the outcome of arbitration is binding, it is a less preferred option for the conflicting parties.

The other option of transforming a conflict peacefully is through the help of a mediator. To transform the behavior from hatred and violence to a peaceful direction where nonviolent behavior is encouraged and empathy among the parties is targeted, mediation aims to create 'a new, acceptable and sustainable, reality' (Galtung, 2007, p.28). To do that, opening and sustaining the dialogue between the parties in a 'favorable environment for negotiation' is essential (Horowitz, 2007, p.51). Similarly, Touval and Zartman (2001, p.442) describe mediation as 'a form of assisted negotiation', which encourages the conflicting parties or to create the available environment to build communication. Jeong describes mediation as a process that 'facilitates communication' thus enabling negotiation, as it helps to 'control fear, reduce stereotypes and prejudices' with the inclusion of the third party's expertise (Jeong, 2010, p.172). Also, it is a voluntary process therefore more democratic than arbitration, as the acceptance of the outcome of the mediation process depends on the acceptance of the conflicting parties (Jeong, 2010, p.142).

Mediation process is based on consent of the parties, is non-violent, and opposed to arbitration, is non-binding (Bercovitch, 2009, p.343). It may prevent conflict from escalating, help it to revert to politics rather than violence, resolve incompatibilities between the parties or transform relations into a cooperative way (Zartman, 2009, p.322). The role of the mediator is not ending the conflict, but transforming it to a less violent form, and enabling the ways of communication so that communication among the parties can start and eventually ways to a peaceful transformation can be achieved in time. This process may not be smooth or uninterrupted, but the role of the mediator is to provide a common ground for communication to create empathy among the actors, so that the negotiation process goes on.

Mediation is a process where a third party is involved in the conflict, without any arbitrary force, and accepted voluntarily by the conflicting parties. Therefore, the identity and culture of the mediator is an important determinant in the success of the mediation role. According to Bercovitch and Houston, identity of the mediator and the context of the conflict are more important than what the mediator does during the mediation process (2000, p.198). Besides identity and culture, Wall and Lynn also mention about the importance of ideology of the mediator in the success of the process; it is influential in the 'reading of the conflict, selection of tactics and relations with the conflicting parties (1993, p.170). Previous relations of the mediator with the conflicting parties like alliances, history, values bring familiarity, understanding and trust, providing legitimacy and power to the mediator (Bercovitch & Houston,

2000, p.181). These issues are important because mediation does not incorporate any use of force; it aims for a voluntary solution that will be accepted by both parties to the conflict (Zartman & Touval, 1996, p.445). It is both a voluntary process and a peaceful method, targeting transformation of the ideas and attitudes of the conflicting parties towards each other, to overcome contrasting behaviors by constructing a positive relationship.

During the mediation process, mediators contribute with their ideas, knowledge, experience, and resources and may have their own agendas and interests from the mediation process (Bercovitch, 2009, p.343). The motives of the mediator can be twofold; to protect its own interests and a desire to increase influence (Zartman & Touval, 1985, p.32). Among its own interests, besides gaining prestige and influence, contributing to the security of and stability within the region or international system will be of benefit for the mediator depending on the mediator's character, whether a state, an interstate actor, etc. Humanitarian costs of the conflict, like minority flows or human rights abuses, or the spreading of the conflict to other areas, are among other factors to be avoided for the mediators, particularly when the mediator is a state, NGO, or an intergovernmental organization (Zakowska, 2017, p.91).

The mediator role can be performed by different types of actors. Sara Horowitz defines mediator as a person who is trusted by the parties, impartial, respectful, unfamiliar with the conflict and its sociocultural environment, who has good communication skills, and persuasion skills (Horowitz, 2007, p.53). The mediators can come from different backgrounds. In traditional societies, mediators are the elder people, who are the leaders of their community in political or spiritual terms, so their expertise is the point of trust for transforming the conflict (Horowitz, 2007, p.52). In modern societies, the mediator can be a diplomat, a former politician, a key figure. According to Bercovitch, the mediators can also be states, international institutions, or non-governmental organizations (Bercovitch, 2009, p.340). The key element is to have the ability to change the perception of the conflicting parties regarding their relations. The ability is not consistent of material force but of leverage.

There are no institutionalized, formal rules of mediation, but in general neutrality, impartiality, credibility are expected from the mediator. The mediator is someone whose impartiality, expertise and wisdom are trusted by the conflictual parties. In general, mediators are expected to be neutral and impartial in their role. However, Bercovitch states that mediators can behave in different manners to reach their target, like actively suggesting solutions to reach a compromise or not acting neutral (Bercovitch, 2009, p.342). In an active mediation process, mediators can interpret information, suggest alternatives, impress their opinions, and propose solutions (Jeong, 2010, p.142).

In order for the mediation to be successful, besides all other odds, ripeness, or mutually hurting stalemate point, needs to be reached according to Zartman (2001, p.8). The mutually hurting stalemate position is painful for both of the parties and is like a deadlock that they feel like they cannot be triumphant in the conflict anymore, so they need a way out of it (Zartman, 2001, p.8). A mutually hurting stalemate is the point where the losses caused from the conflict exceed the possible gains from the conflict. When both parties realizes that the conflict has reached a stalemate, the chances of a peaceful settlement rises, and the need and success of mediation also increases. The mediator's greatest chance of bringing the parties to the negotiation table is this moment while before the chances for the mediator to succeed is harder.

Fisher (2007) mentions a taxonomy of mediation/negotiation procedures as; conciliation, consultation, pure mediation, and power mediation, which are among the voluntary third-party interventions in a conflict. In conciliation, the mediator provides communication through negotiation, aiming at lowering tensions. In consultation, mediator aims to solve the conflict with creative problem-solving methods based on communication and human relations. In pure mediation, besides communication, persuasion and suggesting alternatives are used. And in power mediation, rewards and punishments may be used by the mediator (Fisher, 2007, p.314). Bercovitch and Houston describes the taxonomy of mediation procedures as communication-facilitation, procedural and directive strategies: in the communication-facilitation role the mediator is bridging information and facilitation cooperation, while in the procedural strategy the mediator exert more influence by coordinating the meetings, the media publicity and communication processes (Bercovitch & Houston, 2000, p.175). In the directive strategy, the mediator exerts more influence in the bargaining process and even uses ultimatums, to change behaviors (Bercovitch & Houston, 2000, p.175). In both Fisher's taxonomy and Bercovitch and Houston's, an overall classification occurs from a passive to more active mediator, where in the passive strategy only communication facilitator role is played, and in the most active one mediation role goes to the point of exerting pressure to reach an agreement.

In this chapter, we perceive the role of Türkiye in the war among Ukraine and Russia, as mediation, particularly communication-facilitation in Bercovitch and Houston's terms, or conciliation, consultation, and pure mediation roles, in Fisher's terms, can be found in the actions of Türkiye starting from the beginning of the conflict. Therefore, next section will focus on the role of Türkiye as a mediator in the Russia-Ukraine war.

## 4. Mediation of Türkiye in the Russia-Ukraine War

A mediation process is composed of parties to the conflict, mediator, process of mediation and the context of mediation (Bercovitch, 2009, p.343). In our case study, the conflict has occurred between Ukraine and Russia. The main effective incidents in the development of the conflict can be stated as the invasion of Crimea, intervention to the Donbas region of Ukraine by Russia, claiming the protection of Russian minority of Ukraine, and later the beginning of violent conflict between Ukrainian and Russian forces, as Russia claimed independence of Donbas region and started its military operation. As the history of these events were discussed in the previous section, this section will evaluate Türkiye's mediation efforts throughout the war, in compliance with the UN's Peace, Justice and Strong Institutions goal, which is 16<sup>th</sup> Sustainable Development Goal in the United Nations' Sustainable Development Agenda.

From the beginning of the conflict in Ukraine, different actors offered to perform as a mediator in the conflict. In this article we are focusing on Türkiye's role, particularly President Recep Tayyip Erdoğan's role as a mediator in the conflict, in collaboration with international institutions. Although the role of Türkiye in the Ukrainian conflict was not expected to exceed being a facilitator in the beginning, with the initiatives it has taken and successful impartial foreign policy that it pursued between Russia and Ukraine, it turned to be mediation (Ünal, 2022). This role was evident in various events like international trade of Ukrainian grain or prisoners swap, which will be discussed in detail throughout the following pages. Following Bercovitch's method, we will analyze the **context of mediation, the mediator and the process of mediation** in detail. The conflict has been discussed in detail in the historical analysis section, therefore it will not be retaken in this section again.

### 4.1. The Context of the Mediation

The context of mediation is an important factor to mention in order to understand the conflict and its mediation better. The shifting power relations in the global system create a multi-polar world in which democracies and authoritarian systems seem to compete (Clove, 2022, p.7). The conflict has been rooted in the history of the conflicting parties, most recently Crimean issue in 2014, and the attitude of Russia regarding Donbas region were the signs that a violent conflict might occur in the region. In this process, Russia adopted an aggressive attitude towards Ukraine, claiming that the Russian population in Crimea and Eastern Ukraine was under threat. Regarding Russian aggression, the foundations of the ongoing war were established in March 2014 when Russia occupied and subsequently annexed Crimea, as well as providing support to separatists in the Donbas region (BBC, 2014c). Additionally, Russian

aggression towards neighboring, ex-Soviet countries were experienced before, in places like South Ossetia or Abkhazia. However, in this conflict, the region in which it takes place mattered considerably. As Ukraine is perceived as a European country, the conflict was perceived by the Western states, as a reminder of the Cold War, as a conflict between democratic and non-democratic regimes (Clove, 2022, p.16).

Consequently, international embargoes were spelled in a short time and were supported by majority of European states. To weaken Russia's economic foundation, to deny it from critical technologies and markets, and diminish its fighting capabilities, European states have implemented embargoes and sanctions such as extensive export bans, airspace closures, and visa policies (European Council, 2023; BBC, 2014b). Additionally, during this process, Russia's representation rights in the Council of Europe were initially suspended and eventually, Russia was expelled from the Council of Europe (İKV, 2022).

In this international context, Türkiye has declared its non-recognition of Russia's occupation and annexation of Crimea, as well as the political entities formed by separatists (MFA, 2014). Furthermore, Türkiye actively participated in international reactions by endorsing the resolution in the UN General Assembly that condemned Russia for its causing in the war (BBC, 2022a). On the other hand, while condemning Russian aggression and calling for the realization of the international law, Türkiye tried to follow an impartial stance. Türkiye did not take part in the embargos against Russia, stating that 'between the allies, embargoes should not even be talked upon' and repeated that Türkiye will continue its contacts with both Ukraine and Russia (T.C. Cumhurbaşkanlığı, 2023, p.41). Moreover, Türkiye has consistently sought to mediate for a peaceful resolution of the conflict. In this context, President Erdoğan and Foreign Minister Mevlüt Çavuşoğlu held bilateral meetings with Ukraine and Russia, establishing Türkiye as the diplomatic center of this process (AA, 2022b).

## **4.2. The Mediator**

The aim of mediator can be the settlement of the conflict or to mitigate the negative effects of the conflict for both sides, and for the world stability and peace (Bercovitch, 2009, p.347). In the foreign policy paper, Türkiye names the dispute as a 'war' and declares that it affects the 'regional stability and security,' therefore naming the dispute and stating its reasons for taking part in the resolution efforts (MFA, 2022c, p.13). Türkiye has spelled its foreign policy aim regarding Ukraine crises as diminishing the negative effects of the war in Ukraine, confidence building among the parties of the conflict through mediation, reaching a ceasefire first and then finalizing the conflict with a permanent peace agreement in its foreign policy

paper (MFA, 2022c, pp.13-14). Besides that, creating permanent solutions for the stability and security within its region is among the foreign policy goals of Türkiye (MFA, 2022c, p.13).

Türkiye has played a role of facilitator and mediator throughout the crises. From the beginning of the war, Türkiye has argued for the territorial integrity and sovereignty of Ukraine and remained impartial in the conflict but called for the international community to react and respect for international law. First, Türkiye has supported the sovereignty and territorial integrity of Ukraine from 2014 Crimean invasion to 2022 Ukrainian war (MFA, 2022c, p.13). It has defined the war in Ukraine as a threat to regional and international peace and Russia's 'unfortunate venture' against international law (T.C. Cumhurbaşkanlığı, 2023, p.63). Meanwhile, Türkiye kept its impartiality, refrained from taking sides in the war, contrary to most European states, refrained from joining the sanctions against Russia, though taking part in the international condemnations against it.

Close relations of Türkiye with both Ukraine and Russia provided it with the ability to continue its dialogue with both actors, and more importantly, being accepted by both actors as a trustworthy mediator. Türkiye is a neighbor to both countries from the Black Sea. It has good relations with both states so that visa free travel schemes were implemented among Türkiye and the other parties. Türkiye is home to many Russians and Ukrainians, there is a high number of inter-marriages among the peoples, and south Türkiye is a preferred holiday destination for both Ukrainian and Russian citizens. The trade relations among Türkiye and both Ukraine and Russia are growing, with Turkish citizens either doing trade or establishing companies overseas (DEİK, 2016; HurriyetDailyNews, 2023; T.C. Kültür ve Turizm Bakanlığı, 2020). Besides tourism, Türkiye has strong relations and collaborations with Russia in energy and defense areas. The nuclear plant construction in Akkuyu, Türkiye is realized under Russian Rosatom (Eruygur, 2023b). Türkiye depends on natural gas from Russia, and is an energy corridor for the transportation of the gas. On other hand, Türkiye never accepted the invasion of Crimea or Donbas by Russia and therefore stood by Ukraine against the international aggressions. Moreover, Türkiye established military cooperation with Ukraine in 2020 and Turkish drones are used by them (Karadsheh, 2022).

Additionally, President Erdoğan is known for having good personal relations with Russian President Putin, which enables him to carry out the mediator role as a facilitator of communication in a successful way. Erdoğan mentioned this relation in his speech to CNN as 'we have a special relation with Putin, (which enabled us to extend the grain deal)' (BBC, 2023b; Damilano, 2022). The mediator's role with regards to communication is composed of elements like 'carrying messages, clarifying meanings' (Jeong, 2010, p.174), overcoming prejudices and



trying to find a common ground for negotiation. Erdoğan's good relations with both Zelensky and Putin enabled Türkiye to sustain dialogue with both of the parties and carry out the role of building communication among the parties. In the foreign ministry's information booklet, this was stated as: Türkiye acknowledges the importance of dialogue and frequent and regular contacts at all levels of diplomacy to sustain communication and positive relations, with both Russia and Ukraine (MFA, 2022c, p.13). Similarly, President Erdoğan stated in his cabinet speech on February 28<sup>th</sup>, 2022, that both Ukraine and Russia are perceived as friends to Türkiye, who desires peace and stability in its region, and for that Türkiye has advised the conflicting parties to solve their problems through dialogue and offered mediation in order to reach peace (T.C. Cumhurbaşkanlığı, 2023, p.55). Turkish Minister of Foreign Affairs, Çavuşoğlu, has stated that Türkiye is 'a country that Russia trusts and listens to what it says' and 'the leaders of both states have a dialogue that is based on mutual respect and trust' (T.C. Cumhurbaşkanlığı, 2023, pp.82-83). The statements of Çavuşoğlu mentions the good relations between Türkiye and Russia. Moreover, in Istanbul Summit, Erdoğan called both presidents as his 'friends' (T.C. Cumhurbaşkanlığı, 2023, p.99).

As stated before, identity, culture and ideology of the mediator is an important factor. From this view, Türkiye's role as mediator can be evaluated from a positive frame. Consequently, Erdoğan's role in the grain deal or prisoners swap were the outcomes of close contact and open dialogue.

When we look at the **reasons of the mediation efforts** of Türkiye towards Ukraine-Russia conflict, first Türkiye is neighbors with the conflicting parties in the Black Sea region. Türkiye has concerns about the regional stability and security in the Black Sea region. Therefore, peace and stability of the region is important for Türkiye. Reflecting this, President Erdoğan stated on February 3<sup>rd</sup>, 2022, in his visit to Ukraine that 'as a Black Sea country, we invite all parties to be moderate and engage in dialogue, and to ensure peace in the region' (T.C. Cumhurbaşkanlığı, 2023, p.65). Economic and security concerns are important factors for Türkiye to get involved in the peace process. Both Ukraine and Russia are trading partners of Türkiye so economical gains are among motivations for Türkiye. Although Türkiye has had good relations and cooperation with Russia during the Erdoğan era, due to balance of power politics, instead of an irredentist and stronger Russia, Türkiye would prefer an independent Ukraine as a counterweight against it (Pearson, 2022). And lastly, prestige is a factor; both personal prestige and extending the influence of Türkiye as a middle power state, to an important actor in the region and within NATO are among the motivations for Türkiye to get actively involved in the peace process. Accordingly, it is stated in the Multilateral Diplomacy for Peace

document of Presidency, that ‘Türkiye, as a NATO member, has performed a balancer role in the conflict through mediation efforts in order to prevent a wider conflict in the region and to be able to continue its relations with both states’ (T.C. Cumhurbaşkanlığı, 2023, p.93).

### 4.3. The Process of Mediation

According to the Presidency booklet on Ukraine war, Türkiye describes its foreign policy regarding the war as active, impartial, mediator, peace oriented (T.C. Cumhurbaşkanlığı, 2023, p.96). Türkiye states its role in the war as mediation and facilitation (MFA, 2022c, 14). According to President Erdoğan, Türkiye played a role in the peace process of Ukraine in three areas: Ceasefire and bringing conflict sides to negotiation table, prisoners swap and grain deal and its continuation (BBC, 2023c). It has pursued facilitation and conciliation activities in the beginning of the crises and then, eventually its role has evolved to mediation particularly with the solution to the grain crisis. We will focus on these three mediation performances of Türkiye followingly.

First, in the beginning of the conflict, starting from November 2021, later on 20 January 2022 and March 2022 Türkiye offered mediation, as well as other countries like China and Israel. Both parties accepted Türkiye’s mediation and conflicting sides came together for negotiations, discussing a ceasefire and a peace plan, which in time proved unimplementable (Marandici, 2023, p.107). As a part of these efforts to bring the parties to negotiation table, President Erdoğan has called for peace and political solution to the conflict to prevent more humanitarian crises, in his talk with President Putin in the beginning of the crises on March 6<sup>th</sup>, 2022 (T.C. Cumhurbaşkanlığı, 2023, p.18).

As a part of facilitation activities, Türkiye has provided procedural aspects to peace efforts like organization of the meetings in Antalya and Istanbul, providing the environment for negotiation. In March 2022, Türkiye provided the environment for the meetings in Antalya and İstanbul for the foreign ministers of both states, to negotiate and reestablish peace in Ukraine. First the parties met in Antalya on 10 March 2022, in an environment provided by Türkiye, which proves one of the roles of mediators as provider of negotiation environment. In Antalya, a trilateral meeting between the foreign ministers of Ukraine, Russia and Türkiye took place on the margins of Antalya Diplomacy Forum. On 16 and 17 March 2022, Turkish Foreign Minister Mevlüt Çavuşoğlu met with Russian Foreign Minister Sergey Lavrov and Ukraine Foreign Minister Dmitro Kuleba separately. Turkish Foreign Minister Çavuşoğlu stated the aim of the meeting as the reestablishment of peace at a point that it is needed the most (MFA, 2022a; AA, 2022b). As a prelude to Antalya Diplomacy Forum, the 8th Istanbul

Mediation Conference was also held in Antalya, showing the importance Türkiye gives to the development of mediation activities and peace. After the mediation efforts of Foreign Minister of Türkiye, negotiators of both sides had a face-to-face meeting in Istanbul on 29 March 2022, which was an important development of the peace process (Reuters, 2022c). According to Türkiye Presidency information booklet, as a part of the peace efforts, President Erdoğan has conducted 34 talks with the other world leaders in the beginning of the conflict, and more than 20 face to face talks during the Antalya Diplomacy Forum, which was organized for reaching **ceasefire** in Ukraine, in an effort to bring peace to Ukraine war (T.C. Cumhurbaşkanlığı, 2023, p.14). Türkiye continued its calls for ceasefire, caring for humanitarian aspects of the conflict.

Secondly, due to concerns regarding the negative effects of the war on the people in Ukraine, Türkiye cared for the humanitarian conditions and made efforts to open **human corridors** for the security and well-being of the victims of the war. Additionally, Türkiye showed mediation efforts to realize a prisoner's swap. Türkiye mediated for the swap of 200 Russians held in Ukraine and 800 Ukrainians held in Russia; hosting Ukrainian and Russian ombudsmans in Ankara with Turkish ombudsman Şeref Malkoç, enabling them to exchange lists of the prisoners (DHA, 2023). For the **prisoners swap** that happened on September 21<sup>st</sup>, 2022, President Erdoğan has conducted diplomacy traffic with President Zelensky and President Putin. Türkiye provided venue for the meetings of ombudsmans of both sides for another round of swapping prisoners later in January (Toksabay, 2023). As a part of the swap deals between Ukraine and Russia, Ukraine's five commanders, so called Azov's commanders, were held in Türkiye as Russia had agreed to give them under Türkiye's supervision, for which Ukraine plaided gratefulness (Eruygur, 2023a). Türkiye has perceived the prisoners swap process as a part of humanitarian crises and acted for the resolution of it for the benefit of civilians (T.C. Cumhurbaşkanlığı, 2023, p.156).

Thirdly, Türkiye took an active mediation role in the **grain crisis**. As Ukraine is one of the leading exporters of grain to the world market, the war in Ukraine had negatively impacted both Ukraine's economy and caused rising of the global grain prices and grain shortages. As a result of these, a world food crisis was about to come. To prevent this, Türkiye had made efforts in accordance with the UN to get Russia agree on the usage of the Black Sea ports by Ukraine, to transfer its grain to world markets. Through various efforts that had been undertaken by Türkiye together with the UN, meetings of President Erdoğan with the conflicting parties and meetings at ministerial levels took place. Türkiye not only provided an environment for the meetings but also took an active part in mediation efforts. As a result, an agreement

was reached by July 22<sup>nd</sup>, 2022, among the conflicting parties in the Presidential Office of Erdoğan in İstanbul. Besides the agreements, a Joint Coordination Centre was established in Istanbul under the auspices of the UN, headed by a Turkish admiral, with forces from Ukraine, Russia, Türkiye and the UN, to follow the process of shipments. The result was showing the success of Turkish mediation efforts in bringing the conflicting sides to negotiation and opening a channel of dialogue. Regarding the effort of Türkiye government and President Erdoğan, the UN Secretary-General Antonio Guterres stated that ‘Your facilitation and persistence have been essential through every step of this process’ and concluded with ‘We count on the government of Türkiye to maintain its critical role going forward’ (The UN, 2022b).

Similar efforts were undertaken to prolong the grain agreement, as it was a temporary agreement which had to be prolonged each time it expired. After the agreement expired, when Russia had left the agreement, stating concerns, Türkiye took an active part and mediated to bring Russia back to agreement. During this process, Türkiye showed mediation efforts. Türkiye also mediated in other crises moments during the war. In one of these, Türkiye provided venue for the talks between Russian Rosatom and International Atomic Energy Agency for the protection of Zaporijya Nuclear Power Plant from the negative effects of the war (MFA, 2022c, p.15; AA, 2022c).

In all three areas, calling for ceasefire, prisoners swap and grain deal, Türkiye acted facilitator and mediator role. In the first instance, while calling for a ceasefire, Türkiye offered the venue for the parties to build contact and begin negotiating. Prisoners swap and grain deal were the incidents where Türkiye played a more active role and beyond facilitating, performed mediation to reach agreement on the mentioned issues. Particularly the grain deal showed the impact of Türkiye’s mediation efforts. As Türkiye has kept its communication channels open for both parties from the beginning of the conflict, it reserved a position that is suitable for a mediator; neutral and impartial, with ability to communicate with both parties.

#### **4.4. Türkiye’s Mediation in Ukraine War in Compliance with the UN Sustainable Development Goals**

The UN sustainable development goal, number 16, states the importance of peace, justice, and strong institutions. Among the ten targets of the peace, justice, and strong institution goals, particularly the first three targets are relevant for the acts of Türkiye in Ukraine crisis: reducing all forms of violence and related deaths, reducing all forms of violence against children, promoting the rule of law at national and international level. Additionally, Türkiye has mentioned the need of Ukraine to be a member of NATO, which is related with the UN target

16.8 ‘Broaden and strengthen the participation of developing countries in the institutions of global governance’ (The UN Türkiye, 2023).

From the beginning of the crisis, starting from the alleged annexation of Crimea by Russia, Türkiye has called the international community to react and implement international law. Later in the beginning of the war in Ukraine, Türkiye called the conflict as a ‘war’ from the beginning and joined the international society’s condemnation of Russia within the UN framework on March 2<sup>nd</sup>, 2022, and stood by the territorial integrity and sovereignty of Ukraine, the main principles of international law. Türkiye has developed its military and economic relations with Ukraine during the conflict, while continuing its similar relations with Russia. Therefore, Türkiye showed an impartial stance among the parties. But from the beginning of the crises to the end, Türkiye has declared its support for the territorial integrity and sovereignty of Ukraine and emphasized the importance of peace in the region and establishment of international law, therefore supporting the UN goals of peace and justice.

Türkiye has showed a respectful stance towards international peace and rule of law by implementing the Montreux Convention, Article 19, to stop the passage of warcraft from the straits. At the same time, this move meant accepting the conflict in Ukraine as a war, against the claims of Russia that it was an operation (Ateşoğlu Güney, 2022, p.45). Turkish Minister of Defense Hulusi Akar explained the implementation of Montreux Convention Articles 19, 20, 21 as due to the protection of security and peace in the Black Sea and to avoid any further damage to the parties of the conflict (T.C. Cumhurbaşkanlığı, 2023, p.58). Türkiye’s immediate implementation of the Articles of Montreux Convention reflected its respect for and utilization of international law.

Moreover, in accordance with the UN goals of peace, Turkish officials have mentioned the need for a humanitarian and peaceful solution, abiding international law. The humanitarian aspects of the war were given importance by Türkiye and acts like exchanging captives, opening humanitarian corridors or making a grain deal had strong humanitarian motives. For instance, the Turkish Minister of Defense Akar called for ‘a humanitarian and peaceful solution’ to Ukraine crises in February 2022 (T.C. Cumhurbaşkanlığı, 2023, p.78). Also, President Erdoğan mentioned the importance of humanitarian conditions and called for diplomatic solutions to the war in his talks with Russian President Putin (T.C. Cumhurbaşkanlığı, 2023, p.82).

Türkiye has contributed to UN’s Peace, Justice and Strong Institutions goal of the United Nations’ Sustainable Development Agenda by supporting peace, human rights, and the rule of law in Ukraine during the Russian-Ukrainian war. First, Türkiye has announced its

foreign policy goals in the centennial of the Republic as entrepreneurial and humanitarian, human-oriented and regional stability-minded, with a fairer world vision and an emphasis on international law, legitimacy, and dialogue (MFA, 2022c, p.4). Also, it has stated that its efforts aim to protect the ‘territorial integrity, independence and sovereignty of Ukraine’ and to contribute in this ‘unjust war’ according to ‘international law’ (MFA, 2022c, p.15). President Erdoğan also implied the importance of and respect for the international norms, law, fairness, and rights in international politics, particularly regarding Ukrainian war, in his opening statements within the booklet ‘Multilateral Diplomacy for Peace’ (T.C. Cumhurbaşkanlığı, 2023, p.7). Also, as the research has shown, Türkiye’s role during the management of Ukraine war has been for the benefit of Ukrainian people and of international peace. As all these statements and the activities of Türkiye during throughout the crisis demonstrate that Türkiye, with its foreign policy and its efforts in the Ukrainian war has contributed to the UN’s Peace, Justice, and Strong Institutions goals.

## 5. Conclusion

This article evaluated the activities of Türkiye during Ukraine war from the perspective of the UN sustainable development goals. Among the sustainable development goals of the UN, the targets of Goal 16: peace, justice and strong institutions, reflect the activities of Türkiye. In the article we argued that Türkiye fulfilled the targets of peace, justice and strong institution goals with its mediation activities during the conflict.

Throughout the article, first history of Ukraine-Russia relations was described in detail, then the literature on mediation were summarized and lastly, Türkiye’s mediation activities regarding the war in Ukraine were analyzed from the perspective of the UN goal number 16.

From the beginning of the conflict, even starting from the Crimea conflict, Turkish authorities have stressed out the importance of sovereignty and territorial integrity of Ukraine. Later, with the start of Russia’s ‘operation’ in Ukraine, Türkiye have named it as a war, and called the international community for the establishment of peace and international law. Moreover, Türkiye consistently mentioned the humanitarian aspects of the war, and offered assistance to find solutions to humanitarian crisis.

Within these terms, Türkiye fulfilled the goal by calling for and offering mediation for peace, justice, and international law. Türkiye acted as a mediator, particularly with communication-facilitation in Bercovitch and Houston’s terms and reached three significant successes: start of negotiations in the beginning of the war, a prisoner’s swap and a grain deal. The article examined these efforts and reflected that the Turkish policy approach towards the conflict

focused on these crises. As shown with the policy analyses throughout speeches and policy booklets, Türkiye acted in these areas in establishing peace, security, and stability within the region and for humanitarian concerns. Therefore, Türkiye contributed to the international peace efforts of the UN with its mediation activities in Ukraine.

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**SUSTAINABLE  
DEVELOPMENT  
GOAL**





## CHAPTER 26

### POSSIBLE IMPACTS OF INNOVATION ON EMPLOYMENT

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#### **Abstract**

As defined by the Oslo Manual, innovation encompasses novel or significantly improved products, processes, marketing methods, or organizational approaches. It engenders both creative and destructive outcomes, making it an indispensable yet challenging process. While innovation undeniably fuels economic development, competitiveness, and welfare, its impact on employment remains contentious. The innovation-employment relationship's exploration at various levels, including firms, sectors, and regions, reveals diverse effects. Innovation, being a dual force of job creation and destruction, amplifies discussions on the synergy between economic growth and employment. This chapter delves into the types of innovation and their employment effects, providing evaluations at firm and sector levels. Drawing from the research in the literature, predictions are formulated, and insights are garnered to guide discussions. Acknowledging that innovation is a pivotal catalyst for sustainable development, it's imperative to recognize and mitigate the disruptions it may cause. Research underscores that innovation significantly influences economic growth with varying effects on employment contingent on its scope, effectiveness, and priorities.

**Keywords:** Innovation, Employment, SDG17



## 1. Introduction

Three views on the impact of technological developments on employment are widely expressed. First, technological developments reduce the demand for labor and lead to unemployment. Second, the effects of technologies on labor demand are small, and while employment decreases in some sectors, there is an increase in other sectors. Last, technological developments increase the demand for labor. It is known that similar comments are made when it comes to the impact of innovation on employment. However, this issue needs to be examined in detail.

According to the definition of innovation in the Oslo Manual published jointly by the OECD and the European Commission, “Innovation is the realization of a new or significantly improved product (good or service) or process, a new marketing method or a new organizational method in internal business practices, workplace organization or external relations” (OECD, 2005: 50). As can be understood from this broad definition, innovation has an impact on both goods and services and processes and therefore leads to different results. Innovation, which shows its effect as creative and destructive innovations, is an indispensable, unpreventable, and unstoppable process and, therefore, cannot be ignored.

Innovation: While there is general agreement about its positive impact on economic development, competitiveness, welfare increase, and regional development, there is no consensus when it comes to its impact on employment. At what level the innovation-employment relationship is handled and which type of employment effect is examined is important because the effects at firms, sectors, local, regional, and global levels differ. Innovation, which has the potential to create and destroy jobs, intensifies the discussions on unemployed economic growth; “unemployment growth” comes to the fore in the context of the relationship between economic growth and employment. Despite the increasing emphasis on the effect of innovation on reducing employment, studies with the opposite results are also intensified.

In this chapter, the types of innovation and its effect on employment will be discussed, evaluations will be made at the level of the firm and the sector, the data obtained will be evaluated, and predictions will be made in light of the research in the literature.

## 2. Innovation Types and Impact

Traditionally, the process of technological change consists of three different stages: invention, innovation, and diffusion. Invention is the production stage of new knowledge; Innovation is the first stage of the application of existing knowledge in production, and diffusion of this model means extensive use of new technologies (Cook & Memedovic, 2001:4). The

three-way effect of technology is also seen in the innovation process and shapes the economy and employment. Because innovation is complex and multidimensional, it is also difficult to produce an idea about its effects. This is because innovation, along with other developments, leads to a paradigm shift and provides a transition from a social structure based on industry and resources to a social structure based on knowledge.

Technological change is recognized as the main driver of growth and development. In economic thinking, it is common to assume that long-term growth can be largely explained by technical progress. Robert Solow, winner of the Nobel Prize in Economics for Growth Theory, estimated that technical progress accounted for about 80 percent of US economic growth in the first half of the 20th century. Technological changes are also dynamic processes that inevitably involve (a) both the destruction and creation of employment and (b) consideration of existing business, in particular, how the business will be organized and transformed. Both aspects have critical impacts on workers, employers, and their families. The extent and pace of technological change have always been the subject of economic and social debate with opinions generally differing between optimists and pessimists (ILO, 2019:1). For this reason, there are both optimistic and pessimistic views on the effects of innovation on employment.

Since the effects of innovative initiatives differ according to the type, five innovation types need to be examined. Schumpeter identified innovation types:

1. New product manufacturing (innovation);
2. Introducing new means of production based on scientific invention (process innovation);
3. Development of a new market (regardless of whether it is in the market or not) (Marketing innovation);
4. Involvement of new raw materials in production (raw innovation);
5. New organizational forms of production (business execution) (organizational innovation) (Mihailovsca, 2016:2).

The effects of these innovation types on the economy are different, and their relations with employment also differ. For this reason, it is very important to conduct research on the effect of innovation based on innovation types. Otherwise, it will not be possible to achieve correct results.

On June 2, 2018, G7 ministers, who were responsible for humanitarian action and development assistance, endorsed the Whistler Principles to increase development impact and accelerate innovation. According to these principles, supporting innovation, investing in local solutions, encouraging innovative initiatives in developing countries, increasing public-private sector co-operation, removing the obstacles that negatively affect the project processes, supporting the

growth of beneficial innovations, and increasing their impact were brought to the fore. These principles, which will accelerate innovation and development, will ensure the spread of innovation and reduce its negative effects. However, digitalization and artificial intelligence, which are areas where innovative initiatives have concentrated in recent years, will produce larger and more effective results than the fluctuations of change that have existed so far.

The latest fluctuations of technological change within the digital paradigm are once again attracting widespread attention, and while there is broad consensus on its productivity potential, recent years have witnessed growing concerns about the “labor-replacement potential” of such technological change—not entirely different from those in the past. Some believe that the current fluctuation has already reached a revolutionary point so that unemployment-creating digitization of the economy (or society) may become a reality in the near future. But not every researcher agrees. Some are more optimistic, pointing to the job creation process, which is often more powerful than destroying the job. Still, it is recognized that technological innovation puts jobs at risk, but that this is not inevitable. According to the second view, the effects of technology on the labor market will depend on social choice and policy actions, and therefore, an employment-rich digital economy is accepted as the achievable future (ILO, 2019:1). As it can be understood from this determination, it would be more accurate to make evaluations by taking into account the effects of the digital economy because a development that negatively affects a company or sector may positively affect another company and sector.

Despite the belief that technological advances will have positive effects, recent developments in artificial intelligence (AI) and related emerging technologies (ET) have led to widespread concerns about increases in layoffs and inequality. In previous decades, there was a widespread belief among economists that technological progress would eventually positively affect all processes. For all that, the experience of the last decades has led to rethinking and the recognition that some technological developments can make workers worse (see, for example, Acemoğlu & Restrepo, 2018; Korinek & Stiglitz, 2021). These trends have raised the question of how to distinguish between innovations that will benefit workers and innovations that will reduce workers’ wages in the competitive market. When it comes to innovation, it is also difficult to determine in advance how it will affect employment.

ICT, such as robots, self-driving cars, and 3D printing machines that can change production processes trigger a widespread fear of technological unemployment, as in agriculture and industry. Not only does employment appear to be at risk in the manufacturing sector, but jobs in the service sectors, including jobs that require cognitive skills, are no longer guaranteed employment. This includes IBM Watson Explorer, which replaces lawyers and doctors, and

open online university courses provided by top US universities. There are developments that will displace university professors all over the world (Piva & Vivarelli, 2018:1). The developments in Chat GPT4 have reached the level of expressing opinions in different fields, from writing articles to interpreting images. It seems that writing articles based on literature reviews ceases to be a scientific activity. Artificial intelligence chatbot and ChatGPT seem to be useful tools, especially in scientific writing, assisting researchers and scientists in organizing, first drafting, and/or redaction. (Salvagno et al., 2023:1). It is clear that this software, which is useful in article summarization and translation, will be more functional in the coming years.

The US labor force has identified that at least 10% of jobs can be affected by GPT, with research results showing that at least 50% of the jobs of approximately 19% of workers are affected by GPT. The impact involves all pay levels, with high-income jobs potentially at greater risk. Remarkably, however, the impact is not limited to industries with recent higher productivity growth. Research results show that close to 49% of employees, in half or more of their jobs, will be influenced by large language models (Large Language Models, LLM) (Eloundou et al., 2023:1-2). It is clear that the effects of productive artificial intelligence on employment will be more than what has been experienced so far. Although it seems that ChatGPTs will make human labor more productive, improve skills, and positively affect the economy, the positive effects of these developments on employment have not been sufficiently revealed yet.

Innovative policies are developments that support the growth of countries and companies, increase competitiveness, and support productivity, and these initiatives need to be integrated with national development strategies to succeed. It is also important for countries to consider the specific characteristics of innovation. Adaptation, and application possibilities, qualifications of the workforce, and the competence of the capital will increase the chances of success because of the weight of traditional industries. The success of this process will undoubtedly vary according to the type of innovation and its contribution to the economy.

While innovation eliminates old jobs and occupations and reduces the importance of old products and services, it also creates new employment areas, leads to the introduction of new products and services and makes our lives easier. Looking at the technological revolutions that have emerged in the last 200 years, it is seen that while each revolution eliminates some jobs, it also creates a large number of “new” jobs. However, the fact that innovations that replace physical labor are replaced by innovations that replace both physical and intellectual labor deepens the effects of innovations on employment. Especially the developments in the field of artificial intelligence seem to have the potential to have a greater impact than the developments that have existed so far.

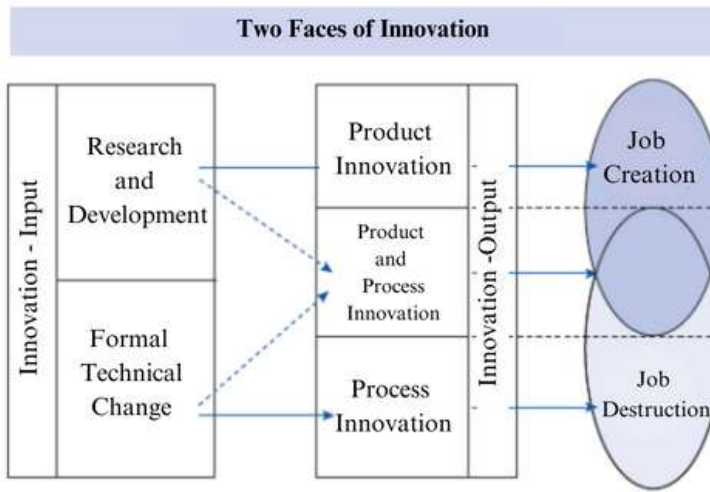
### 3. Impact of Innovation on Employment

With the Industrial Revolution, intense changes in the production process affected employment relations, and technological developments played an important role in this change. Concerns in the past have come to the fore again due to the intensification of the discussions on unemployment growth, the threat of technological developments to the existence of workers, and the negative effects of innovation on employment. Because of these discussions, an answer is sought to the question of whether the fear of mass technological unemployment has returned.

Although the debates on the effects of innovation on employment are not all of equal significance, they also bring up the opposition to mechanization in the first period of industrialization. Because the effect of mechanization on employment was met with a negative reaction in the first years of industrialization, it turned into hostility. Still, when the workers who waged war against machines saw that they could take part in working life with machines after a while, they gave up this hostility and started to see it as a means of facilitating work. The reaction towards threshing machines in the agricultural sector was shown by Swing and their friends; new machines and threshing machines were evaluated as innovations that had negative effects on employment. In the 19th century, during the first industrial revolution, the destruction of machinery by British manufacturing workers led by Ned Ludd was a similar reaction. This process, expressed as Luddism<sup>1</sup>, is still experienced today, and innovation is approached with suspicion because it destroys some professions and jobs. In addition, in the 21st century, the need for physical labor is quickly decreasing, and technological developments that can replace intellectual labor and the emergence of concepts such as “end of work” bring old fears to the agenda again today. It is possible to call this situation Neo-Luddism. For these reasons, it is necessary to think about innovation’s impact on employment, do research, and create predictions. In addition, doing research by taking into account the type of innovation will positively affect the accuracy of the results to be obtained.

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1 Luddism: In Nottingham, a worker named Ned Ludham destroyed the hosiery loom and despite all the bans, the workers’ reaction to the machines could not be stopped. The actions of the workers, called “machine breakers”, became widespread first in England and later in Continental Europe.



**Figure 1.** The Two Faces of Innovation: The Impact of Product and Process Innovation on Employment

**Source:** Vivarelli, 2015:3

As shown in Figure 1, product innovation is often associated with employment growth because new products generate new products (possibly to replace existing products). Process innovations generally increase productivity by reducing the need for labor in production processes. Therefore, process innovations are often suspected of bringing technological unemployment.

The positive effect of innovation on employment in high technology and R&D-intensive sectors can be proven by studies. However, the effect of process innovation on employment in the production and services sector differs. In terms of the quantitative effects of innovation, process innovation tends to create a labor-saving effect. In contrast, product innovation has a labor-friendly nature (Vivarelli, 2011:32). Some results of studies carried out to determine the effects of innovation on employment confirm the finding that there is a positive relationship between innovation and employment.

The impact of innovation on employment has significant and positive results in the UK, Italy, and Taiwan data (Van Reenen, 1997; Piva & Vivarelli, 2005; Yang & Lin, 2008). The effect of product innovation was found to be positive and significant (Van Reenen, 1997; Yang & Lin, 2008), but the effect of process innovation is weaker (Yang & Lin, 2008) or insignificant (Van Reenen, 1997); (cited in Meriküll, 2010). In the manufacturing sectors of high-income European countries, it is concluded that innovation has a negative impact on employment, but product innovation has a positive but insignificant impact. The impact of

product and process innovation on employment differs greatly. The results of process innovation provide more activity in production, and in conclusion, there is a fall in production price. Normally, there is a fall in employment, but when product quality is improved or output price is reduced, innovation can lead to increased employment due to increased demand.

While a significant portion of the research results show the positive effect of innovation on employment, the magnitude and statistical significance of the effect differ. However, this result differs depending on theoretical conditions, empirical estimation methods, and data characteristics (Meriküll, 2010). One of the important factors that can change these results is the increase in demand, which leads to an increase in employment. When assessing the impact of innovation on employment, four helpful considerations should be considered: knowledge-based labor versus physical strength, tasks versus jobs, technology as job destruction versus job creation, and time. We see physical strength and knowledge-based labor as interchangeable; this is not true. They are not exchangeable things. Therefore, how labor is substituted by machines is different. When we look at the tasks that are part of the job, it is necessary to see that some of them can be done by machines, but others will only change or improve slightly. One of the most important variables in understanding the future is time (Frank et al., 2019:53) because the results of innovative effects vary according to the short and long term.

As it will be possible to produce better quality products and services at reasonable prices with the effect of innovation, demand increases, and this increase in demand leads to an increase in employment. New products or services, and radical innovation or imitation, often help to increase production and employment, as well as opening up new markets, and improving the quality of goods. However, in some cases, the result can also be different; product innovation does not impact employment, and new products replace old products with little economic impact (Pianta, 2005; Smolny, 1998); (cited in Meriküll, 2010).

While empirical results generally confirm a positive relationship between employment growth and product innovation, the effect of process innovation on employment is mostly negative, but this effect is always meaningless (Harrison et al. (2008); Hall et al., (2008)). This result does not depend on the income level of the countries within the scope of the research. In addition to France, Germany, Spain, England, and Italy, Benavente and Lauterbach (2007) found similar results for Chile (Meriküll, 2010). The positive effect of innovation on employment in high technology and R&D-intensive sectors can be proven by studies. However, the impact of process innovation on employment within the production and services sector varies. Results on the correlation between innovation and employment are important

for public policy. In particular, innovation policy should follow the employment target more directly than productivity (Addier & Vinci, 2017:14). At the same time; this issue becomes more complicated if we consider that innovation has direct effects on employment as well as many indirect effects through various “substitution channels”. For example, initiating a labor-saving production process may result in an immediate and local reduction (direct effect) in workers within the facility. Still, developments in the economy due to increased demand may result in positive employment changes. New machines can bring about a fall in prices, an increase in income, an increase in new investments, or a decrease in wages (see Spiezia & Vivarelli, 2000; Rao, 2007:2). All these developments have the potential to have consequences that will affect the level of employment.

Since economic theory does not have a clear answer about the effects of innovation on employment, the need for aggregate, sectoral, and microeconomic empirical analysis that can take into account the different forms of technological change and its direct effects on labor is quite high (Vivarelli, 2014: 32). As can be understood from the results obtained, factors such as the level of development of the economy and the type of innovation cause different results on employment. However, reaching general conclusions from these determinations has the potential to lead to misleading results. In a period when the unemployment problem is growing, it is one of the basic needs to develop supportive public policies based on the employment creation potential of innovation.

### **3.1. Impact of Innovation on Firm-Level Employment**

Research on the effect of innovation on employment at the firm level has been examined in three categories. Firstly, most firms do not grow very much, and their growth does not seem to have anything to do with innovation. Secondly, firms with rapid employment growth largely owe this growth to their previous innovative initiatives. Thirdly, for companies shedding the most jobs, there appears to be a connection between the increase in innovative activities and the job losses. (Coad & Rao, 2007:18). When the research results confirming these determinations are examined, it is revealed why and how companies are affected and how they differ.

In some studies, it is seen that innovative firms increase business by taking advantage of innovations regardless of industry, size, or other factors (Vicini, 2016:42). However, we should not ignore the fact that other companies operating in areas that these companies will affect have the potential to be adversely affected by the process. However, increasing the productivity of labor (and other factors) can cause a decrease in marginal cost; as prices fall, demand and employment increase. These two balancing effects are usually associated with



the price elasticity of demand. Also, demand change can be strengthened by firms' (product) innovations (Garcia et al., 2005:2). Therefore, the possibility of reflecting the truth weakens in research conducted without considering the demand-increasing factors.

It has been determined that innovation activity in large companies affects employment more positively than innovation activities in smaller companies (Rao, 2007:18). According to the observations and findings on the heterogeneity of firm behavior, innovation, and employment, the increase in employment in large firms is associated with innovative activity more positively than innovative activities undertaken by small firms (Coad & Rao, 2007:19). These results reveal that the effects of innovation at firm level vary according to firms and firm sizes. In addition, from the point of view of their effects on the company, while innovative initiatives create positive effects, they affect rival companies negatively. Moreover, it is necessary to focus attention on the decrease in the number of workers using physical force against the increase in the employment of knowledge workers.

The results of the net impact of innovation on employment at the firm level may also differ at the sector level because firm-level analyses often do not allow these results to spread across the industry. There are several reasons why firm-level results cannot be applied to the industry level (Harrison et al., 2008; Piva & Vivarelli, 2005):

- It cannot be observed that the employment of other firms will increase or decrease as a result of firm innovation;
- Entry and exit of firms are not observed; innovators can close non-innovators;
- Completely new economic branches may emerge, and new jobs may be created (Meriküll, 2010:6).

These findings explain why the results obtained at the firm level differ from the industry level. In addition, the type of innovation leads to different effects on employment at the firm level. While product innovation affects demand for products, process innovation is assumed to affect a firm's production function. Greenan and Guellec (2001) found that companies that introduce process innovation make price reductions that lead to increased demand. If the demand does not change, employment at the firms decreases, but as the demand increases, employment at the firms increases. Product innovation leads to an increase in demand, and accordingly, high employment can be created. Surprisingly, the positive impact of process innovation on employment is greater than the impact of product innovation. This result is rare in the literature; Generally, the effect of product innovation is greater (Meriküll, 2010). The effect on employment may differ due to reasons such as the sector in which the firms are located, the size of the firm, its competitors, the market value of innovation, and the demand it creates.

Van Reenen (1997) obtained results on the positive employment impact of innovation in manufacturing in the case of the UK, using data from the SPRU innovation database covering the period 1976-1982; this research result turned out to be robust after controlling for fixed effects, dynamics, and internality. In Italy, Piva and Vivarelli (2018) found that although firms are particularly small, innovative investment has a positive impact on employment. In addition, Barbieri et al. (2018), using a panel data set covering 265 innovative firms in the 1998-2010 period, found that while the labor-friendly nature of R&D was observed, it could not create jobs due to technical change in companies operating entirely in high-tech industries and in large companies. Lachenmaier and Rottmann's (2007) panel data set of manufacturing firms in Germany over the 1982-2002 period concluded that different measures of innovation had a significantly positive effect on employment, but it was found that process innovation had a higher positive effect than product innovation, partly contrary to theoretical expectations. Ciriaci et al. (2016) conducted quantitative regressions based on a comprehensive longitudinal sample of 3304 Spanish firms over the 2002–2009 period using the annual paired waves of the Spanish Innovation Society Survey (CIS). Their results concluded that innovative, smaller, and younger firms are more likely to have periods of high and sustained employment growth than non-innovative firms. For example, Bogliacino et al. (2012) analyzed a longitudinal sample of European manufacturing and service firms over the period 1990-2008 and found that R&D spending in high-tech manufacturing and services had a positive and significant employment impact. Using CIS data from four European countries (France, Germany, Spain, and the United Kingdom), Harrison et al. (2008) showed that process innovation was responsible for employment reduction, while product innovation was basically labor-friendly. Using data on nearly 20,000 European firms covering the period 2003–2012, Van Roy et al. (2015) found that technological change (represented by forward-citationweighted patents) is labor-friendly. However, this positive employment effect of innovation was statistically significant only for firms in high-tech manufacturing industries. Overall, previous firm-level studies provide consistent evidence of a positive link between innovation and employment. However, this effect is seen more clearly when R&D and/or product innovation is considered as the result of technological change, and high technology sectors are considered. (Piva & Vivarelli, 2018:5). Most empirical studies reveal a positive relationship between product innovation and employment at the firm level (Van Reenen, 1997; Greenan & Guellec, 2001; Harrison et al., 2008), and the results are more diverse for process innovation. Greenan and Guellec (2001), Fung (2006), and Harrison et al. (2008) found the relationship positive, Van Reenen (1997) concluded that there was no significant relationship, and Evangelista and Savona (2003) found this relationship to be negative (Meriküll, 2010). As it is understood from

the results of the research, many different factors, from the type of innovation to the size of the firms, affect the relationship between innovation and employment.

In the analyses made at the firm level, the conditions of the firm are taken into account, and other firms and macroeconomic effects are ignored. The interdependence of the firms, the effects of global conditions, and the size of the markets determine the effects of innovation on employment. In addition, a significant part of the research is done in developed countries and high-paid companies. This reveals that we need to recognize the fact that research gives limitedly accurate results. Most studies analyze short-term effects, but different results are likely in the medium and long term. According to Vivarelli, because economic theory does not have a clear answer about the employment impact of innovation, there is a great need for aggregate, sectoral, and microeconomic empirical analysis that can take into account the different forms of technological change and their direct effects on labor. (Vivarelli, 2014:32). As can be understood from this determination, research at different levels is needed.

According to the results of the research conducted in small and medium-sized businesses using a quantitative regression approach, innovation has a positive effect on employment in both growing and shrinking small and medium-sized businesses. The impact of innovation on employment growth is, therefore, comprehensive. In addition, innovation has a much stronger impact on firms already experiencing strong growth than their slower-growing or shrinking counterparts. One explanation for this finding is that innovations in expanding firms are more “aggressive” in nature and, therefore, have stronger effects on demand and employment. In the segment of non-growth firms, it is also possible that a larger percentage of firms are less commercially successful, and their innovations fail more often. When distinguishing between product and process innovations, the analysis shows (at least from a relatively short-term perspective) that introducing new or improved processes has a greater impact on employment than introducing new or improved products. Cirera and Sabetti (2019: 161) analyzed the technological and organizational innovation on firm-level employment growth using a global sample of more than 15,000 firms in developing countries. According to the results of the research on the direct impact of innovation on employment growth at the firm level, the main findings show that new sales related to product innovation are generated, on average, with as much labor intensity as old products or higher. However, its contribution to employment declines with productivity represented by per capita income. Parallel to other studies, process innovation does not have additional effects on employment, but some conclusions have been reached that automation reduces

the impact of product innovation on employment. There is general agreement that when product innovation is successful in generating additional sales for the firm, it has direct positive effects on employment in the short run. However, the extent to which sales create additional employment varies according to the income level of the country and is directly related to the impact of the innovation process on productivity.

According to the results of the research conducted on 27 manufacturing companies in Africa, it shows that the increase in employment is positively related to both process and product innovations. Also, process and product innovation complement each other in their relationship to employment growth. However, the findings also reveal that the relationship between employment growth and innovation depends on firm size, not firm age. In addition, simply put, the relationship between innovation and employment growth depends on the quality of the business environment (Okumu et al., 2019:22). As companies grow, their probability of existing increases. A study concluded that the survival of firms with more than nine employees does not depend either on innovation or company size. In addition, as companies grow, the impact of regional innovation in maintaining the firm's existence decreases (Tsvetkova et al., 2014:673). As can be understood from these explanations, it is not correct to attribute the increase or decrease in employment only to the effect of innovation.

Empirical estimates show that employment growth is associated with an increase in sales of innovative products, particularly in low- and middle-income countries in Africa, and in countries where innovation is more gradual and where less productivity gains may occur due to innovation. Indeed, the model predictions support forecasts that for most countries, if all products could be replaced with new or improved products, the firm's overall employment level would be at least as high as before. This is a significant finding, given some pessimistic views that innovation efforts are often purely labor-saving for the firm. In contrast, for high-income countries, new sales attributable to innovation create new jobs, but at lower rates because new or improved products are more efficient at using labor than older products, and thus, some labor is displaced (Cirera & Sabetti, 2019:175). The more we diversify the number and results of research, the more different results can be achieved. For this reason, it would be the most correct approach to evaluate the research without generalizing it and looking at the scope of the research. Although it is a fact that innovation saves labor, the potential to create new employment should not be overlooked because every new innovation brings new production and services to the agenda and has the potential to increase demand. For this reason, research conducted only at the firm level is insufficient in terms of showing the effect of innovation.

### **3.2. Impact of Innovation on Employment at Sectoral Level**

Innovation is very important at the sectoral level since innovation has the potential to affect and transform the entire sector, and its impact on economic growth and employment will be greater than innovation at the firm level. However, its impact at the sectoral level is also complex and multi-directional, with innovation able to create new jobs but also destroy them. Innovation leads to new business opportunities in industries that adopt technological advances. As industries adopt new technologies, new demands for business arise. Innovation leads to changes in the structure of occupations; new roles and occupations can positively affect sectoral employment. Increasing entrepreneurship and creating new job opportunities, economic growth stimulating demand at the sectoral level, and developments in supply chains contribute to increasing overall employment. However, innovation at the industry level also has some challenges and negative effects. Some of them are high costs, technological problems, intellectual property rights, and the potential to adversely affect employment. It is possible to reduce the negativities of innovation with the right incentives, preparing appropriate environments, establishing collaborations, and using resources correctly, however, studies show that different results arise.

According to the results of the research on the effects of innovation, Greenan and Guellec (2001) found that the effect of product innovation at the industry level (possibly the effect of market expansion) is positive. Evangelista and Savona (2003) concluded that the positive effects of innovation on employment in the Italian service sector are greater at the sector level. Simultaneous surveys on firm and industry levels found that the same results were not obtained at all levels of analysis, particularly when distinguishing between product and process innovation. It has been observed that the effect of process innovation on employment is more negative at the industrial level (Meriküll, 2010). While there are findings that innovative sectors create more employment compared to non-innovative ones, opposite results are also obtained. For this reason, it will not be wrong to determine that different results are obtained from research on the effects of innovation at the sectoral level.

Antonucci and Pianta (2002) tried to estimate the employment change rate in the industry for the years 1994-99 depending on innovation and other variables between 1994-96, and according to the results they obtained, they concluded that the effect of innovation on employment in manufacturing was negative in 8 EU countries with high income (Meriküll, 2010). In a study conducted in Spain, it was determined that the employment created by environmental innovators is higher than that of non-environmental innovators (Rasi & Ros, 2016). Higher employment created by environmentally friendly innovative investments is a very meaningful

result for the future, but the results regarding the negative impact of innovation on employment are disturbing.

Antonucci and Pianta (2002) conclude that in the manufacturing sectors of high-income European countries, innovation has a negative impact on employment, but product innovation has a positive but insignificant impact. While innovation is defined as one of the main factors in employment growth (e.g., Buerger, Broekel, and Coad, 2012; Capello & Lenzi, 2013), it is stated that the direction and level of the impact of innovation on employment at the enterprise level is unclear (Horbach & Janser, 2016). The effect of innovation on employment has significant and positive results in the UK, Italy, and Taiwan data (Van Reenen, 1997; Piva & Vivarelli, 2005; Yang & Lin, 2008), but it is not possible to see this effect in all countries. For literature reviews, see Pianta (2005) and Djellal and Gallouj (2007) (Meriküll, 2010).

Bogliacino and Vivarelli (2012), who covered 25 manufacturing and service sectors for 15 European countries in the 1996-2005 time period, found that R&D expenditures have an employment-creating effect, especially in high-tech industries. Interestingly, the labor-friendly nature of R&D has emerged in both workflows and stock specifications. In addition, Piva and Vivarelli updated their previous analysis (1998–2011) and found evidence that R&D expenditures are labor-friendly (Piva & Vivarelli, 2018:4). The findings regarding the employment creation potential in these results are promising.

If we summarize the current sectoral studies, a labor-saving trend has emerged in low and medium-technology manufacturing, while a dominant labor-friendly effect has been detected in high-tech manufacturing sectors and information-intensive services (Piva & Vivarelli, 2018: 4). As can be understood from the explanations made, the effects of innovation can differ, and innovation can create different effects at the sectoral level.

It is necessary to recognize the fact that the impact of innovation on employment can vary by sector and region, and its net impact will depend on the pace of technological change, the readiness of the workforce to adapt, and the existence of policies implemented to support innovation. While some jobs may be relocated or changed due to innovation, it should not be ignored that many jobs can be transformed or increased by technology. Successful integration of innovation across industries requires effective support systems and policies to facilitate labor market transitions. Governments, educational institutions, and businesses must collaborate and develop new policies to provide retraining programs, career counseling, and job placement services to support workers affected by technological changes. This enables individuals to acquire the skills necessary to transition into growing industries and reduces the potential for innovation to negatively impact employment.

## 4. Conclusion

Technological developments and innovation are the most important driving forces for sustainable development. However, it is not possible to say that every country, society, company, and employee adapts to this process at the same level. For this reason, implementing innovations is painful and causes problems. Therefore, it is always important to reduce the impact of the results expressed as creative destruction.

The research shows that innovation affects economic development and that a significant part of economic growth depends on this factor. It is seen that the results of the effect of innovation, which has an undisputed positive effect on economic growth and employment, differ. There are results showing that it has a positive effect on employment at the sectoral level as well as at the firm level, and there are also opposite results depending on the type of innovation. For this reason, there is no single innovation effect for countries; it differs according to its scope, effectiveness, and priorities.

While innovation leads to an increase in employment at the regional and national level, it can negatively affect employment abroad. The low unemployment rates in high-tech countries and high rates in other countries are clear indications of this. Projects carried out in areas such as nanotechnology, biotechnology, space, and aviation, their transformation into products and services, and their transfer to the markets are conducive to the creation of new employment areas, but we should not ignore the jobs and professions that these and similar technologies have eliminated.

As a result of the innovation carried out at the enterprise level, while employment decreases in some companies, it is sometimes difficult to explain the increase in others according to the type of innovation. For example, process innovation generally increases production and decreases employment. It is possible to make a general determination that product innovations at the firm level increase employment. New production, service, organization, and marketing create new demand and affect employment levels. This effect is seen in different forms. For example, the software sector is the sector with the highest employment rate among the information and communication sectors. It is also the sector with the highest income per employed person. It can be seen that there is an increase in employment in these sectors. However, it is seen that the impact of the products produced by these sectors is not always the same. The main result of research on the effects of innovation on the firm level is that the relationship between innovation and employment varies according to firm size.

Considering the decreasing and increasing effect of innovation on employment, it is possible to make the following determinations: **Declining:** The need for physical labor is declining,

typical employment is declining, and the lifespan of occupations is shortening. **Increasing:** The number of knowledge workers is increasing, the need for professional renewal is increasing, the concern for the professional future is increasing, and atypical employment patterns are increasing. There is a change in the quality as well as the numerical effects of innovation, and these changes highlight the effects of more flexible employment forms and new professions.

While it is unquestionably accepted that there will be an increase in employment in countries that can implement and spread innovation effectively in the coming period, the effects at the firm level are different. While companies that create, implement, and disseminate innovation grow rapidly and create new employment, the same result is not seen in competing companies. There are also differences at the sectoral level. For example, while employment increases in the IT sector, employment decreases in production sectors based on physical strength. Unmanned factories are a good example that can be used to express this process.

It is possible to reduce negative effects and eliminate potential losses if governments and companies have the opinion that while implementing innovations, they should not adversely affect employment. The important thing is to have a perspective based on social welfare. This point of view is a necessity for solving social problems, ensuring social balance, and ensuring a sustainable social future.

There is a relationship between innovation and income level. In high-income societies, there is purchasing power to support innovations, and this power makes innovations widespread. There is also a relationship between education level and innovations. It is seen that as the level of education increases, employers provide more financial support to higher education, employees who receive additional training have more knowledge and skills, and it helps to reveal the capacity needed for innovation. The impact of innovation will be negative in societies that do not have sufficient basic education and have limited arithmetic skills. The support of innovative companies by public policies positively affects both innovation and employment. For these and similar reasons, determining the effect of innovation on employment by only looking at the number of workers in companies and sectors prevents the facts from coming out.

As can be understood from the explanations, the impact of innovation on employment at the firm and sectoral level is complex and multidirectional. Job creation involves a combination of job transformation, layoffs, and shifts in skills needs. By understanding these dynamics, policymakers, businesses, and individuals need to seek to work together to capitalize on the opportunities offered by innovation and overcome the challenges to promote inclusive and



sustainable employment outcomes. For this reason, evaluations should be handled in terms of firm, sector, national, and international dimensions, and the effects should be examined according to the type of innovation.

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