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World Trade Organization

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**REFLECTION ON THE IMPLEMENTATION OF DECISION ON IMPLEMENTATION OF
ARTICLE 66.2 OF THE TRIPS AGREEMENT: INCENTIVE FOR TECHNOLOGY
TRANSFER TO LEAST-DEVELOPED COUNTRIES**

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Manuscript date: 13 December 2023

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Reflection on the Implementation of Decision on Implementation of Article 66.2 of the TRIPS Agreement: Incentive for Technology Transfer to Least-Developed Countries

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Abstract

Technology transfer is deeply embedded in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement). Several provisions address technology transfer, which constitute an essential part of the efforts made by the TRIPS negotiators to strike a balance between the advancement of technological innovation and the promotion of transfer and dissemination of technology. Article 66.2 specifically obligates developed country Members to provide incentives to enterprises and institutions in their territories to promote and encourage technology transfer to least-developed country (LDC) Members in order to enable them to create a sound and viable technological base. This paper summarizes the WTO TRIPS Council's work on the implementation of Article 66.2 from 2018 to 2020, including the implementation of a reporting mechanism for developed country Members' programmes established by the TRIPS Council and the TRIPS Council's review of the ensuing reports, and annual Workshops convened to enhance practical dialogue on technology transfer under this provision. In particular, it provides an analytical review of 708 programmes broken down into seven categories of technology, namely agriculture and food; environment and climate change; information and communication technology (ICT); public health and pharmaceuticals; intellectual property; business, trade and finance; and education and social sciences. The paper also reports on a survey of LDC Members which identified as priority areas for technology transfer as agriculture and food; environment and climate change; ICT; and public health and pharmaceuticals. The paper concludes by drawing on lessons learned from the past 25 years' experiences and reflecting on prospects for future work.

Keywords: technology transfer, LDCs, Article 66.2, TRIPS, incentives, agriculture, environment, public health, ICT, SDGs, knowledge transfer

JEL classifications: F13, O3, O31, O34, O38

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Table of Contents

EXECUTIVE SUMMARY	3
1 INTRODUCTION	5
2 DEVELOPED COUNTRY MEMBERS' REPORTING ON THE IMPLEMENTATION OF ARTICLE 66.2	6
2.1 Overview of the reports received from 2018 to 2020.....	6
2.2 Summary of incentive programmes	7
2.2.1 Agriculture and food.....	12
2.2.2 Environment and climate change	16
2.2.3 Information and communication technology (ICT).....	21
2.2.4 Public health and pharmaceuticals	27
2.2.5 Other technology fields.....	32
3 TRIPS COUNCIL'S ANNUAL REVIEW OF THE IMPLEMENTATION OF ARTICLE 66.2.....	41
3.1 Concept of incentive	42
3.2 Concept of technology transfer.....	43
3.3 Reporting format	44
4 WTO ANNUAL WORKSHOPS ON THE IMPLEMENTATION OF ARTICLE 66.2 AND SURVEY ON THE NEEDS AND PRIORITIES OF LDCS FOR TECHNOLOGY TRANSFER	44
4.1 LDCs' needs and priorities for technology transfer	45
4.2 Most relevant incentives for technology transfer	47
5 REFLECTIONS ON FUTURE WORK	48
ANNEX: LIST OF CURRENT WTO LDC MEMBERS AND OBSERVERS	50
REFERENCES	52

EXECUTIVE SUMMARY

Technology transfer is deeply embedded in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement). Several provisions address technology transfer; these constitute an essential part of the efforts made by the TRIPS negotiators to strike a balance between the advancement of technological innovation and the promotion of transfer and dissemination of technology in line with the objectives set out for the intellectual property system in Article 7 of the TRIPS Agreement.

TRIPS Article 66.2 specifically obliges WTO developed country Members to provide incentives to enterprises and institutions in their territories with the purpose of promoting and encouraging technology transfer to least-developed country (LDC) Members in order to enable them to create a sound and viable technological base.

Over the 25 years since the TRIPS Agreement came into force, the implementation of Article 66.2 has progressively developed. One of the most prominent developments is the adoption by the TRIPS Council of its 2003 Decision on the Implementation of Article 66.2, giving effect to instructions given the Council by the Doha Ministerial Conference in 2001. This Decision established a reporting mechanism to ensure the monitoring and full implementation of the obligations in Article 66.2. This Decision requires developed country Members to submit annual reports on actions taken or planned for fulfilling their obligations under Article 66.2. The Decision augmented and gave formal shape to an earlier more informal process of reporting.

Hence, between 1998 and 2020, developed country Members invested time and effort to collect and present in a digestible and distilled form a vast amount of information from diverse government agencies in their jurisdictions, resulting in a total of 337 reports on numerous technology transfer programmes.

Despite these efforts, LDCs continued to articulate concerns over whether developed country Members are fully meeting their obligations, and whether the 2003 reporting and review mechanisms are effective enough for monitoring the implementation of the obligation. LDC Members also requested assistance to analyse and review this complex and diverse material in order to draw conclusions about its implementation overall and to provide timely and effective feedback to reporting Members, with a view specially to matching incentives with priority areas for establishing viable technological bases.

In 2017, a WTO staff working paper (ERSD-2018-01) summarized developments from the negotiation to the implementation of Article 66.2 up to 2017 and suggested how to meaningfully improve the implementation of and reporting on Article 66.2, essentially through the continuous and effective engagement of both developed country and LDC Members.

The present paper follows up this work, providing a comprehensive analysis of the reports submitted from 2018 to 2020 and discussing the findings of a survey of LDC needs and priorities for technology transfer. It aims to assist LDCs in fully analysing the information contained in the reports; to assess the impact of these programmes on the development of a viable technological base in LDCs; to identify which incentives have had the most positive impact, and which may require further improvement; and to help identify the needs and priorities of LDCs for technology transfer as the basis for more focussed and effective technology transfer programmes.

The main findings are as follows:

- i) During the reporting cycle from 2018 to 2020, 25 reports were submitted covering 754 technology transfer programmes that targeted specific LDCs as beneficiaries. The EU, US and Japan together reported over two thirds of these programmes. The top five LDC beneficiaries were Myanmar, Uganda, Cambodia, Tanzania and Bangladesh.
- ii) A distinct majority of these programmes were provided in the fields of information and communication technology (ICT), environment and climate change, public health and pharmaceuticals, and agriculture and food. The US and EU were the leading providers in all four fields with Uganda and Tanzania as the top LDC beneficiaries.

- iii) The four domains of technology transfer programmes align with the priority areas for technology transfer identified by LDCs through surveys.

Regarding the future work, the paper indicates that LDC Members' active engagement and developed country Members' positive responses to LDCs' concerns are indispensable for the effective implementation of Article 66.2. This active engagement and positive responses are driven by Members' goodwill to enable LDCs establish a sound and variable technological base and their willingness to listen to one another and understand each other's concerns. Specifically, the paper puts forth several suggestions on how to enhance Members' formal and informal discussions within and beyond the TRIPS Council.

In conclusion, the paper highlights that the effective implementation of Article 66.2 will not only yield benefits in its own right but also offer valuable insights and experience applicable to broader discussions on technology transfer in the WTO.

1 INTRODUCTION

Technology transfer is deeply embedded in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement). Four provisions expressly address technology transfer: Article 7¹ on objectives, Article 8.2² on principles, Article 40.1³ on anti-competitive licensing, and Article 66.2 on technology transfer to least-developed country (LDC) Members⁴. These provisions constitute an essential part of the efforts made by the TRIPS negotiators to strike a balance between the advancement of technological innovation and the promotion of transfer and dissemination of technology, with a specific focus on the circumstances of LDCs.

Specifically, Article 66.2 obliges developed country Members to provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to LDC Members in order to enable them to create a sound and viable technological base.

Since the TRIPS Agreement took effect in 1995, the implementation of Article 66.2 has steadily evolved, as can be seen in Figure 1.

In 1997, Bangladesh first raised the issue of the implementation of Article 66.2 in the TRIPS Council.⁵ In 2001, at the Doha Ministerial Conference, WTO Members reached a Ministerial outcome for the establishment of a reporting and review mechanism to ensure the monitoring and full implementation of the Article 66.2 obligation.⁶

In 2003, the TRIPS Council adopted a decision on the 'Implementation of Article 66.2 of the TRIPS Agreement' (hereinafter referred to as the 2003 Decision),⁷ giving effect to the directive by WTO Ministers. This Decision provides detailed requirements for the information that developed country Members should present in their annual reports on actions taken or planned for fulfilling their obligations under Article 66.2.

From 1998 to 2020, the TRIPS Council received a total of 337 reports from developed country Members, of which 291 were submitted under the reporting and review mechanism established in 2003.⁸ During the same period, the Council conducted 18 annual reviews of these reports.

Since 2008, at the request of LDC Members, the WTO Secretariat organized annual Workshops back-to-back with TRIPS Council meetings with the purpose of promoting informal dialogue and coordination between LDC and developed country Members. From 2019 onwards, capital-based experts from LDCs, as well as experts from developed country Members, international organizations and the private sector also participated in this annual dialogue.

As part of the most recent series of annual Workshops, the WTO Secretariat developed a voluntary survey on LDC needs and priorities for technology transfer. A total of three rounds of survey were conducted, which yielded responses from 18 LDCs.

¹ Article 7: "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations" (emphasis added). The TRIPS Agreement, art 7.

² Article 8: "2. Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology" (emphasis added). The TRIPS Agreement, art 8.

³ Article 40: "1. Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have adverse effects on trade and may impede the transfer and dissemination of technology" (emphasis added). The TRIPS Agreement, art 40.

⁴ Article 66: "2. Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base." The TRIPS Agreement, art 66.

⁵ Watal J, Caminero L, 'Least-developed countries, transfer of technology and the TRIPS Agreement', Staff Working Paper [ERSD-2018-01](#) accessed 16 September 2021.

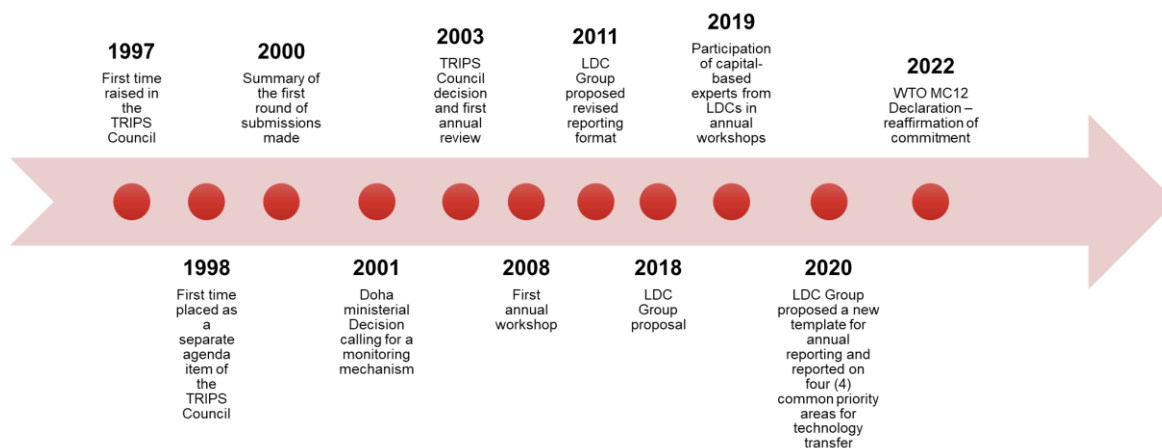
⁶ WTO, 'Implementation-Related Issues and Concerns - Decision of Ministerial Conference of 14 November 2001' (20 November 2001), WT/MIN(01)/17, para. 11.

⁷ WTO, 'Implementation of Article 66.2 of The TRIPS Agreement - Decision of the Council for TRIPS of 19 February 2003' (20 February 2003), [IP/C/28](#).

⁸ Annual reports have been provided since 2020, but fall outside the scope of this paper.

In 2017, the WTO published a staff working paper providing a detailed and first-hand negotiating background of Article 66.2 and analysing its implementation from 1996 to 2016.⁹ As a follow-up, this paper summarizes the TRIPS Council's work from 2018 to 2020, including the implementation of the reporting mechanism, the TRIPS Council's review of the implementation, and annual Workshops. It also draws upon lessons learned from the past 25 years' experience and reflects on future work.

Figure 1: Timeline of developments



Source: Authors' compilation based on official historical records.

2 DEVELOPED COUNTRY MEMBERS' REPORTING ON THE IMPLEMENTATION OF ARTICLE 66.2

2.1 Overview of the reports received from 2018 to 2020

According to the 2003 Decision, developed country Members are required to submit their annual reports on actions taken or planned with respect to the implementation of Article 66.2. To that end, they should submit new detailed reports every third year and, in the intervening years, provide updates to their most recent reports.

During the reporting cycle from 2018 to 2020, the TRIPS Council received 25 reports from nine developed country Members: Australia, Canada, European Union and its Member States (EU), Japan, New Zealand, Norway, Switzerland, United Kingdom (UK), and United States of America (US). These comprised new reports in 2018, and updates to these reports in 2019 and 2020. In 2018 and 2019, UK reports formed part of the report submitted by the EU, and the UK submitted a separate report in 2020 following its departure from the EU.

These 25 reports contain a vast amount of information on technology transfer programmes in various fields of technology. This section reviews and analyses 708 programmes reported in seven areas, namely agriculture and food; environment and climate change; information and communication technology (ICT); public health and pharmaceuticals; intellectual property (IP); business, trade and finance; and education and social sciences, according to the reporting Members, LDC beneficiaries, and geographical distribution.

To class these programmes according to fields and categories of technology, this paper used information provided either in the optional template available in the e-TRIPS submission system¹⁰ or in the reports as such. Of the 25 reports analysed, 19 were prepared according to the optional template.

⁹ Watal J, Caminero L (n 5).

¹⁰ The optional template requests information on "field of technology" or "category of technology".

When programmes spanned more than one field of technology, typically in connection with the use of ICT in the area of agriculture and food, environment and climate change, or public health and pharmaceuticals, they have been classed as ICT to avoid double counting. In addition, programmes that spanned more than a year, and thus repeatedly reported, were counted as a single programme.

This paper analyses programmes taking place in 35 WTO LDC Members, namely Afghanistan, Angola, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Democratic Republic of the Congo (DR Congo), Djibouti, The Gambia, Guinea, Guinea-Bissau, Haiti, Lao People's Democratic Republic (Lao PDR), Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Senegal, Sierra Leone, Solomon Islands, Tanzania, Togo, Uganda, Yemen, Zambia; and in eight LDCs that are acceding to the WTO and currently count as Observers to the WTO, namely Bhutan, Comoros, Ethiopia, Sao Tomé and Príncipe, Somalia, South Sudan, Sudan, and Timor-Leste. The analysis also includes Vanuatu, which graduated from the LDC category in December 2020.¹¹

Given the wealth of detail and diversity in these reports, the paper cannot fully recount the content of all the programmes reported. Interested readers are encouraged to refer to the original reports submitted by these Members for a detailed account.¹²

2.2 Summary of incentive programmes

A total of 818 technology transfer programmes were reported by nine developed country Members between 2018 and 2020. 754 programmes targeted specific LDCs as beneficiaries. The difference of 64 programmes comprised 15 programmes targeting a specific developing country, and 49 that either targeted a region or did not specify a beneficiary. 63 programmes targeted both LDCs and developing countries as beneficiaries.¹³

These 754 programmes are grouped according to these fields of technology: agriculture and food; environment and climate change; ICT; public health and pharmaceuticals; IP; business, trade and finance; education and social sciences; construction, infrastructure and transport; manufacture; metrology; and mining.¹⁴

As shown in Figure 2, four fields of technology accounted for over 100 programmes: ICT (162), environment and climate change (152), public health and pharmaceuticals (132), and agriculture and food (125). These were also the four fields of technology that LDCs shared as priority areas in line with the LDC Group's report to the TRIPS Council on 6 February 2020.¹⁵

The analysis further extends to three other fields of technology covered in at least 40 programmes, namely IP (51), business, trade and finance (44), and education and social sciences (42). Manufacture (12), metrology (9) and mining (3) are comparatively infrequent and are not, therefore, analysed further in detail.

¹¹ At the time of writing, there are 46 LDCs recognized by the UN, three of which are full UN Members not affiliated with the WTO. These are Eritrea, Kiribati, and Tuvalu.

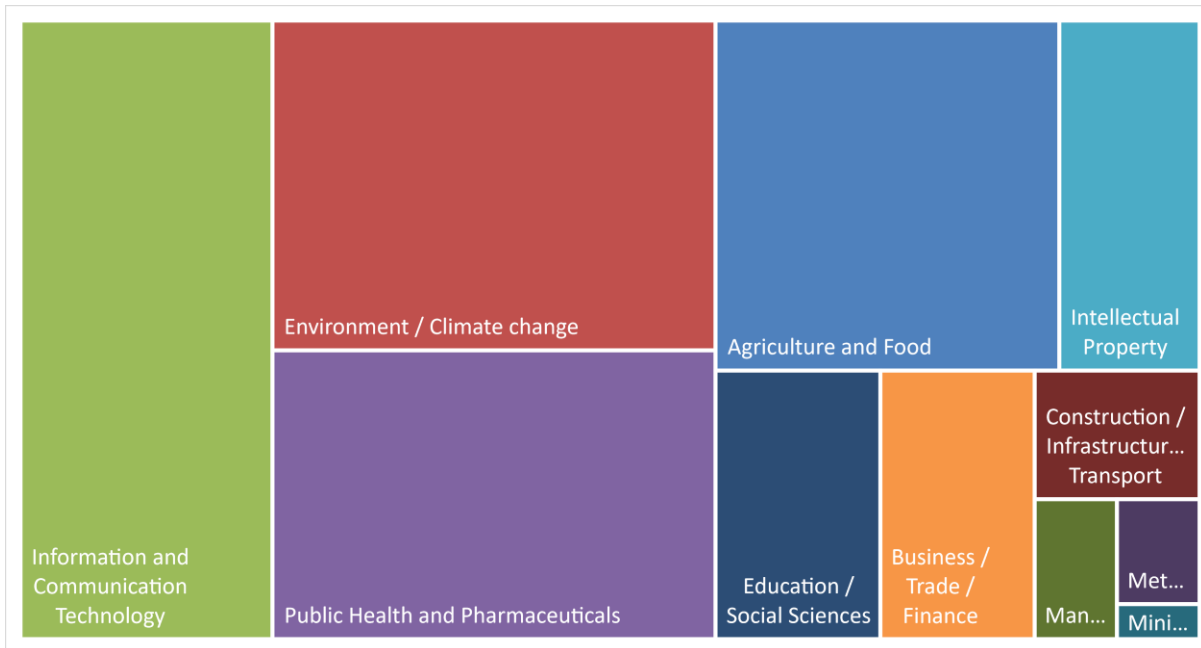
¹² The reports can be consulted through the e-TRIPS system: <https://e-trips.wto.org/En/Search/ImplementationOfArticle662>.

¹³ In addition, there were two programmes included in this total for which the LDC beneficiaries were non-WTO Members or non-WTO Observers, albeit full UN Members.

¹⁴ As this paper is a follow up to the 2017 WTO staff working paper, it may be interesting to note for purpose of comparison that the 2017 paper identified the following areas: Education, MSMEs/business, financial, construction/infrastructure, aid relief, standardization/metrology, trade, mining, manufacture, and other. See Watal J, Caminero L (n 5).

¹⁵ WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (16 April 2020), IP/C/M/94/Add.1, paras. 157 and 165.

Figure 2: Programmes by field



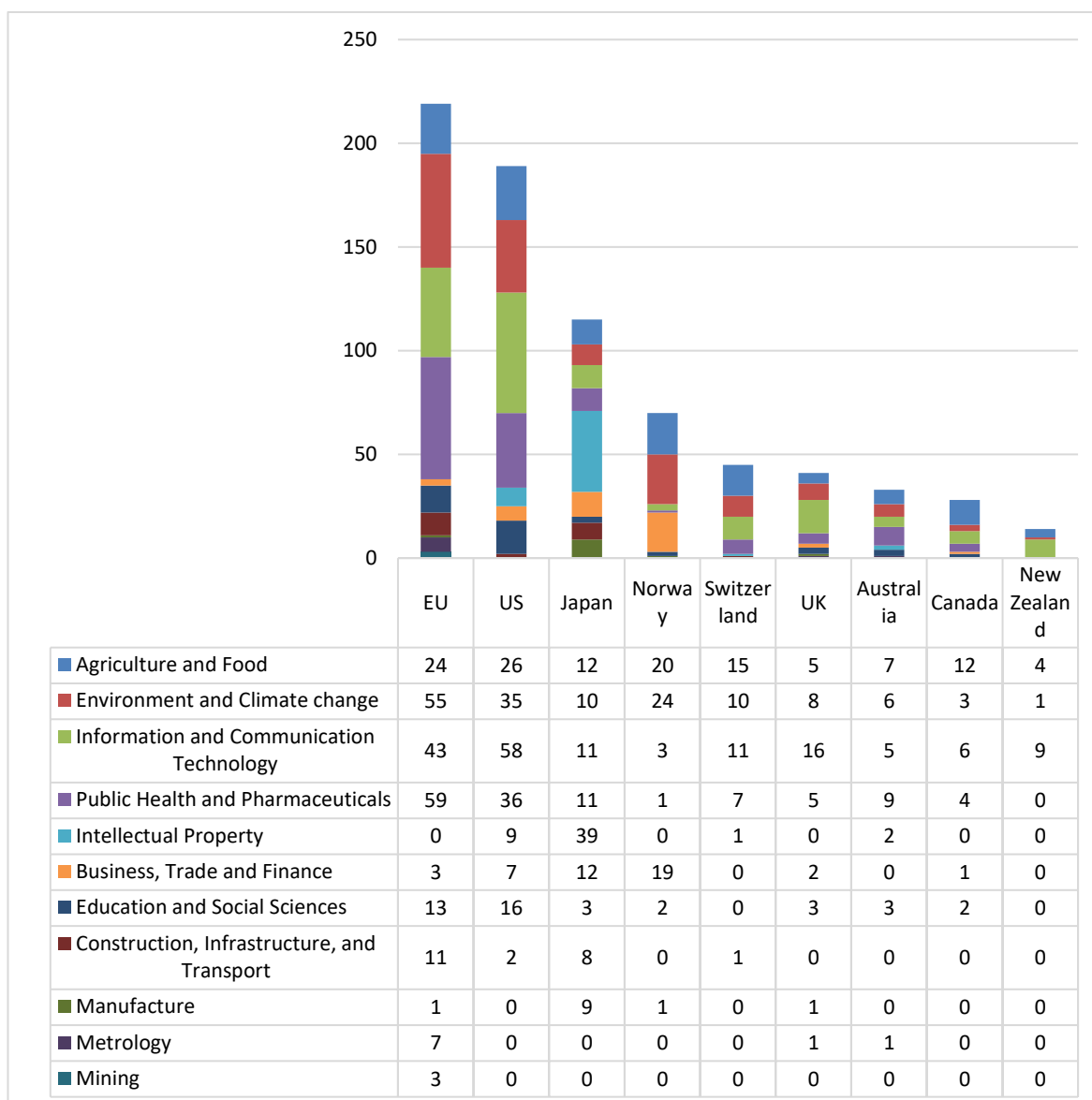
Source: Authors' calculations based on the reports submitted.

As Figure 3 illustrates, the EU, US and Japan provided more than two thirds (69%) of the 754 programmes.¹⁶

Australia and the EU provided most programmes related to public health and pharmaceuticals, while the programmes provided by New Zealand, the UK and US were concentrated in the field of ICT. A distinct majority of Japan's programmes were related to IP. Norway's programmes primarily addressed environment and climate change. Most of Canada's and Switzerland's programmes concerned agriculture and food.

¹⁶ Together these three reporting Members provided 526 out of 754 programmes.

Figure 3: Programmes by field and reporting Member

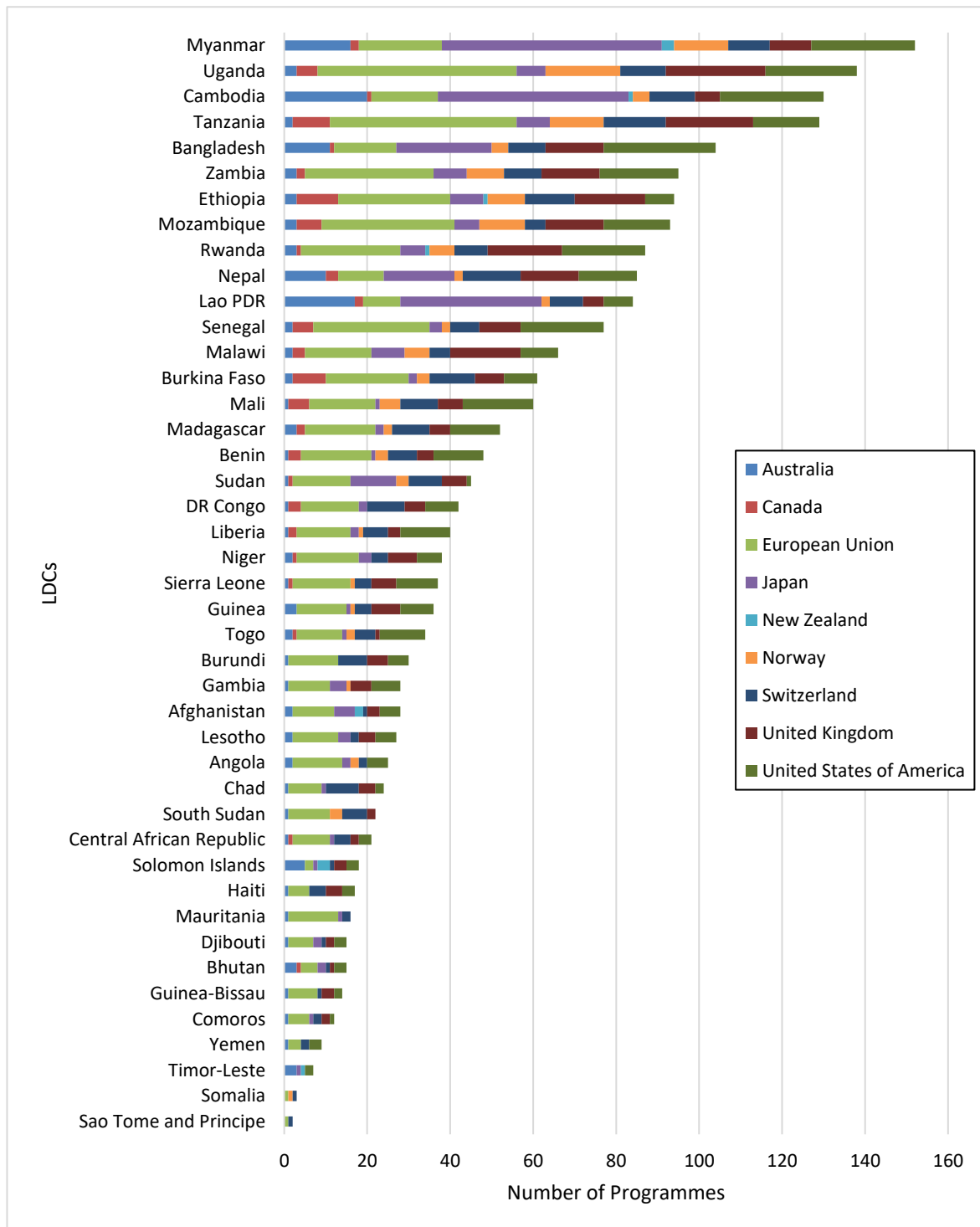


Source: Authors' calculations based on the reports submitted.

Figure 4 provides an overview of the number of programmes benefitting each LDC, as reported by each developed country Member. The major LDC beneficiaries were Myanmar (152), Uganda (139), Cambodia (130), Tanzania (129) and Bangladesh (104). Myanmar was the principal beneficiary of Japan's programmes, while Uganda was the top beneficiary of EU programmes. Australia's programmes benefitted Cambodia most. Tanzania was the main beneficiary of programmes provided by Switzerland, and Bangladesh was the main beneficiary of US programmes. Four LDCs benefitted from fewer than 10 programmes: Yemen (9), Timor-Leste (7), Somalia (3), and Sao Tome and Principe (2).¹⁷

¹⁷ It may be interesting to note that the non-WTO affiliated LDCs, Eritrea (2) and Tuvalu (9), also benefitted from fewer than 10 programmes cited in the 2018-2020 reporting cycle, while Kiribati benefitted from 11 programmes.

Figure 4: Programmes by LDC beneficiary and reporting Member

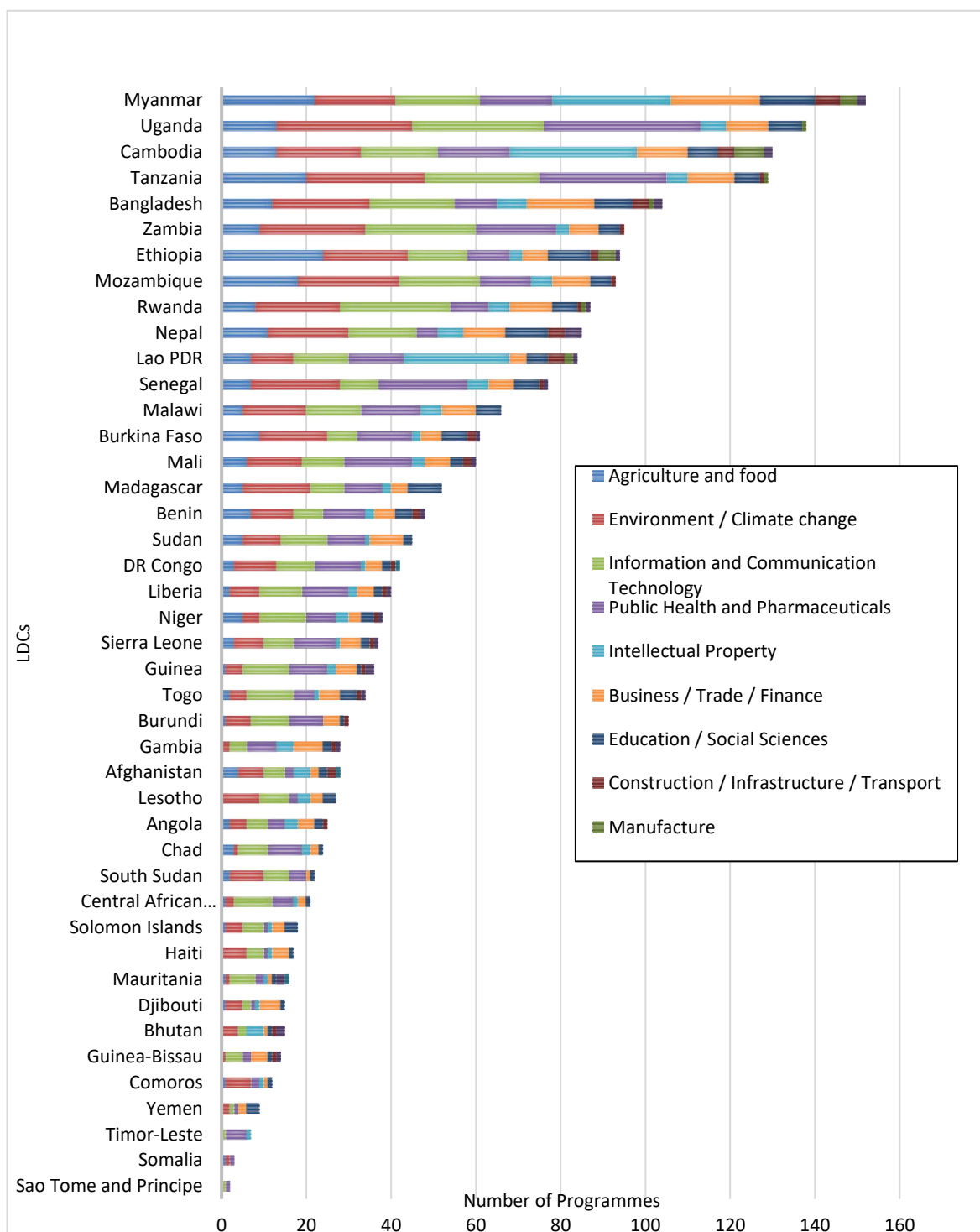


Source: Authors' calculations based on the reports submitted.

Figure 5 provides an overview of the number of programmes reportedly benefitting each LDC according to the field of technology. The leading beneficiaries of agriculture and food programmes were Ethiopia (24), Myanmar (22) and Tanzania (20). In environment and climate change, the leading beneficiaries were Uganda (32), Tanzania (28) and Zambia (25). These LDCs were also the top beneficiaries of ICT programmes: Uganda (31), Tanzania (27) and Zambia (26). In public health and pharmaceuticals, Uganda (38), Tanzania (30) and Senegal (21) benefitted most from the programmes provided, while Cambodia (30), Myanmar (28) and Lao PDR (25) were the top beneficiaries from IP-related programmes. In business, trade and finance, the leading beneficiaries

were Myanmar (21), Bangladesh (16) and Cambodia (12). Myanmar (13), Nepal (10) and Ethiopia (10) benefitted the most from programmes relating to education and social sciences.

Figure 5: Programmes by LDC beneficiary and field of technology



Source: Authors' calculations based on the reports submitted.

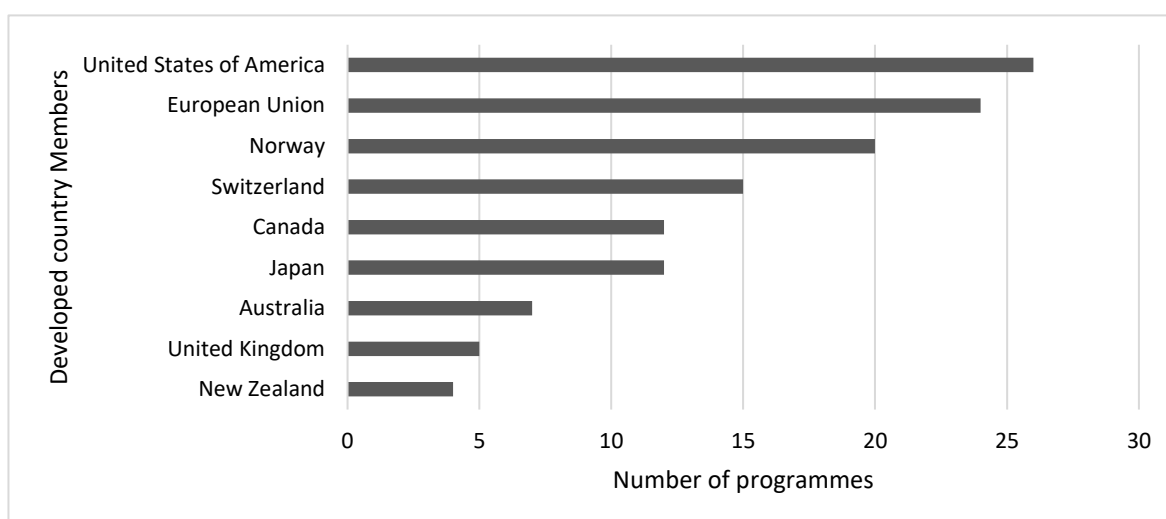
The following sections analyse more closely programmes in the fields of agriculture and food; environment and climate change; ICT; public health and pharmaceuticals; IP; business, trade and finance; and education and social sciences.

2.2.1 Agriculture and food

Agriculture and food is generally understood as a field that includes plant cultivating, livestock farming, and aquaculture.¹⁸ So this section addresses the programmes that contribute to the production, processing, and marketing of agricultural products, including fishery and forestry products.¹⁹ These programmes contribute directly to one of the UN Sustainable Development Goals (SDG): "End hunger, achieve food security and improved nutrition and promote sustainable agriculture" (SDG 2).

Nine developed countries reported 125 programmes involving the transfer of agriculture and food technologies. As Figure 6 illustrates, the US, EU, and Norway were the leading providers with each providing a minimum of 20 programmes.

Figure 6: Agriculture programmes by reporting Member



Source: Authors' calculations based on the reports submitted.

In total, 36 LDCs²⁰ benefitted from at least one agriculture and food programme. As depicted in Figure 7, the leading beneficiaries were Myanmar, Ethiopia, and Mozambique, followed by Tanzania, Uganda, Cambodia, and Bangladesh. In the case of Myanmar, Cambodia, and Bangladesh, this corresponds to priority fields they have themselves identified.²¹

Programmes provided by the EU, Switzerland, UK, and US were widely available, whereas Canada's and Norway's programmes appear to primarily focus on African countries, and programmes provided by Australia, Japan, and New Zealand mainly targeted LDCs in Southeast Asia and Africa.

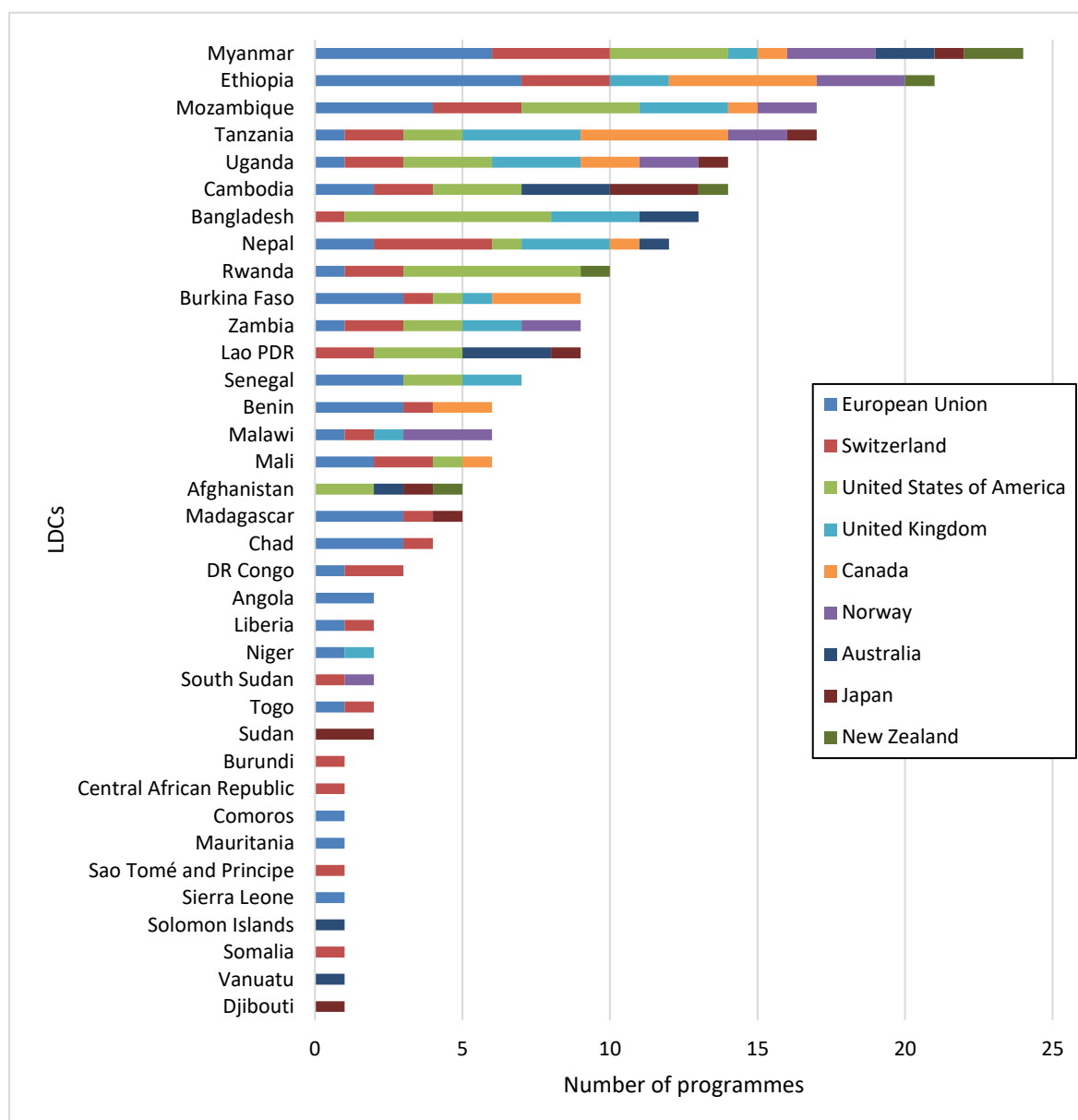
¹⁸ This section does not include programmes that employ ICT in the area of agriculture and those related to water, climate change, environment protection, and biodiversity. These programmes are discussed under the ICT and environment sections respectively.

¹⁹ It should be noted that, under the WTO Agreement on Agriculture, "fish and fish products" and forestry products are explicitly excluded from the product coverage of the Agreement. See Article 2. However, the Constitution of the Food and Agriculture Organization (FAO) states that the term "agriculture" include "fisheries, marine products, forestry and primary forestry products." According to International Standard Industrial Classification of All Economic Activities (ICIS) Revision 4, agriculture includes "forestry and fishing" alongside agriculture in its Section A. Thus, for the purpose of this paper, fisheries and forestry are considered as agriculture.

²⁰ Including the most recent graduate, Vanuatu, and countries in the process of accession to the WTO.

²¹ As apparent from the voluntary survey and from discussions at the annual workshops. No comparable data is available for the priorities of other significant beneficiaries, Ethiopia, Mozambique, Tanzania, and Uganda.

Figure 7: Agriculture and food programmes by LDC beneficiary



Source: Authors' calculations based on the reports submitted.

Figure 8 breaks down the programmes according to the types of technology. The first most reported type of technology is crop productivity and food security. These two terms are put under the same category because both are simultaneously identified in the same programme as reported, and increased productivity is intrinsically linked with and contributes to food security. Notably, more than one third of agriculture and food programmes are dedicated to this category.

One typical programme is the US Feed the Future (FTF) Initiative aiming at intensifying rice production and diversifying higher-value nutrient-rich crops in Bangladesh.²² Another example is the rice genomic breeding project reported by Japan, which introduces genes for rice with useful features²³ into locally adapted rice varieties in Myanmar.²⁴ Apart from rice, crop productivity

²² WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – United States of America' (29 September 2020), IP/C/R/TTI/USA/1, p. 28.

²³ Such as high yield, disease and insect resistance, environmental stress tolerance, and early maturity.

²⁴ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Japan' (27 September 2019), IP/C/W/656/Add.1, p. 7.

technologies related to cotton was also deemed important for food security. In this context, Switzerland reported on the Water Efficiency in Rice and Cotton programme benefitting 11 LDCs.²⁵

The second most reported category is agriculture, a generalized category covering programmes with more comprehensive or multiple types of technologies. It includes primarily programmes provided by Norway through the Norwegian Investment Fund for Developing Countries (Norfund), which broadly invests in food and agricultural businesses in Ethiopia, Malawi, Tanzania, Uganda, Zambia, Mozambique, and South Sudan and the Norwegian Agency for Development Cooperation (Norad), which provides incentives through pre-investment support and strategic partnership with the private sector.²⁶

The third category is related to rural development, which consists of 13 programmes. These programmes focus on promoting employment, entrepreneurship, and financial services in the rural area. An example is the EU programme on providing training, technical assistance, and advisory services to local MSMEs in the rural areas of Mozambique.²⁷

Other categories with 10 or less programmes are those related to trade, export, marketing, value chain, agriculture infrastructure, horticulture, livestock, fisheries, and forestry. Trade, export, marketing, and value chain are grouped into a single category as these are interconnected concepts often addressed together in one programme. Programmes under this category include the provision of technical expertise in sanitary and phytosanitary (SPS) measures. For example, Australia's Pacific Horticultural and Agricultural Market Access (PHAMA) Programme provided knowledge and technology to Solomon Islands and Vanuatu to respond to compliance requirements and to develop quality assurance and accreditation systems, with a view of gaining better access to target export markets.²⁸

Other programmes targeted the development of agriculture infrastructure, such as irrigation systems and quality assurance services. For instance, Switzerland supported the Private Infrastructure Development Group (PIDG) to invest in agriculture infrastructure projects with high costs and risks, including building reliable access to water for commercial crops through irrigation pivots and water extraction infrastructure in Zambia.²⁹ Canada also provided capacity building programmes to design, build, and manage small-scale crop irrigation systems in Ethiopia.³⁰

A few programmes specifically targeted at horticulture, livestock, fisheries, and forestry were mainly reported by Canada, EU, New Zealand, Norway, UK, and US.

In addition, Figure 8 indicates the contribution of the developed country Members with regard to each type of technology. Programmes provided by Canada, EU, Switzerland and US were widely spread across different types of agricultural technologies, whereas Australia and Japan focused mainly on crop productivity and food security related technology. Most technologies provided in New Zealand's programmes were related to horticulture and livestock. The UK also has more livestock technology programmes.

²⁵ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Switzerland' (27 September 2019), IP/C/W/656, p. 30.

²⁶ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Norway' (4 December 2020), IP/C/R/TTI/NOR/1, p. 9.

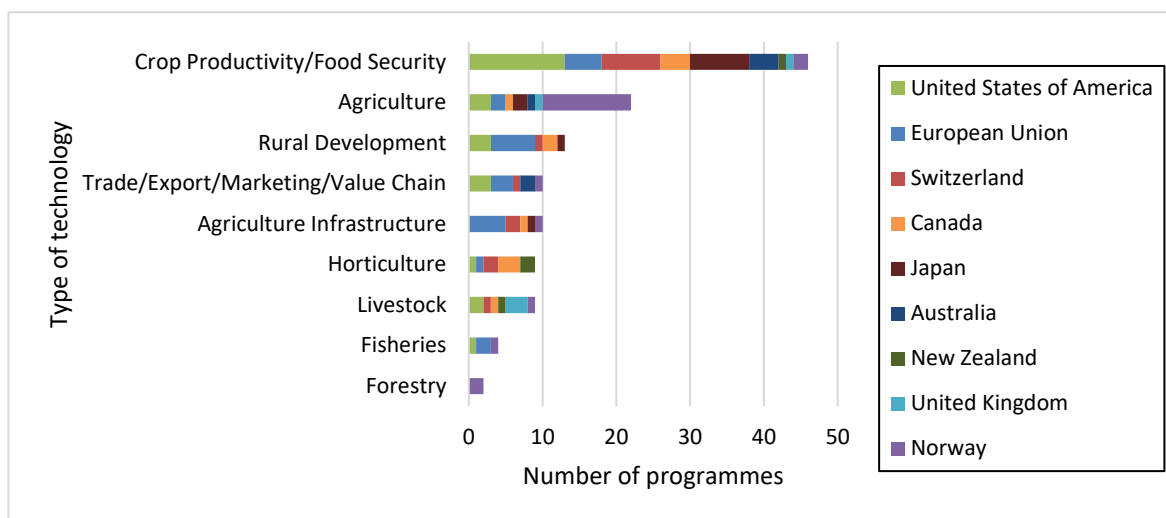
²⁷ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – European Union' (29 January 2019), IP/C/W/646/Add.7, p. 3-4.

²⁸ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Australia' (29 September 2020), IP/C/R/TTI/AUS/1, p. 8.

²⁹ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Switzerland' (28 September 2020), IP/C/R/TTI/CHE/1, p. 13-14. See also PIDG, [Chanyanya Irrigation Pilot](#).

³⁰ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Canada' (10 October 2019), IP/C/W/656/Add.4, p. 13.

Figure 8: Agriculture and food programmes by type of technology



Source: Authors' calculations based on the reports submitted.

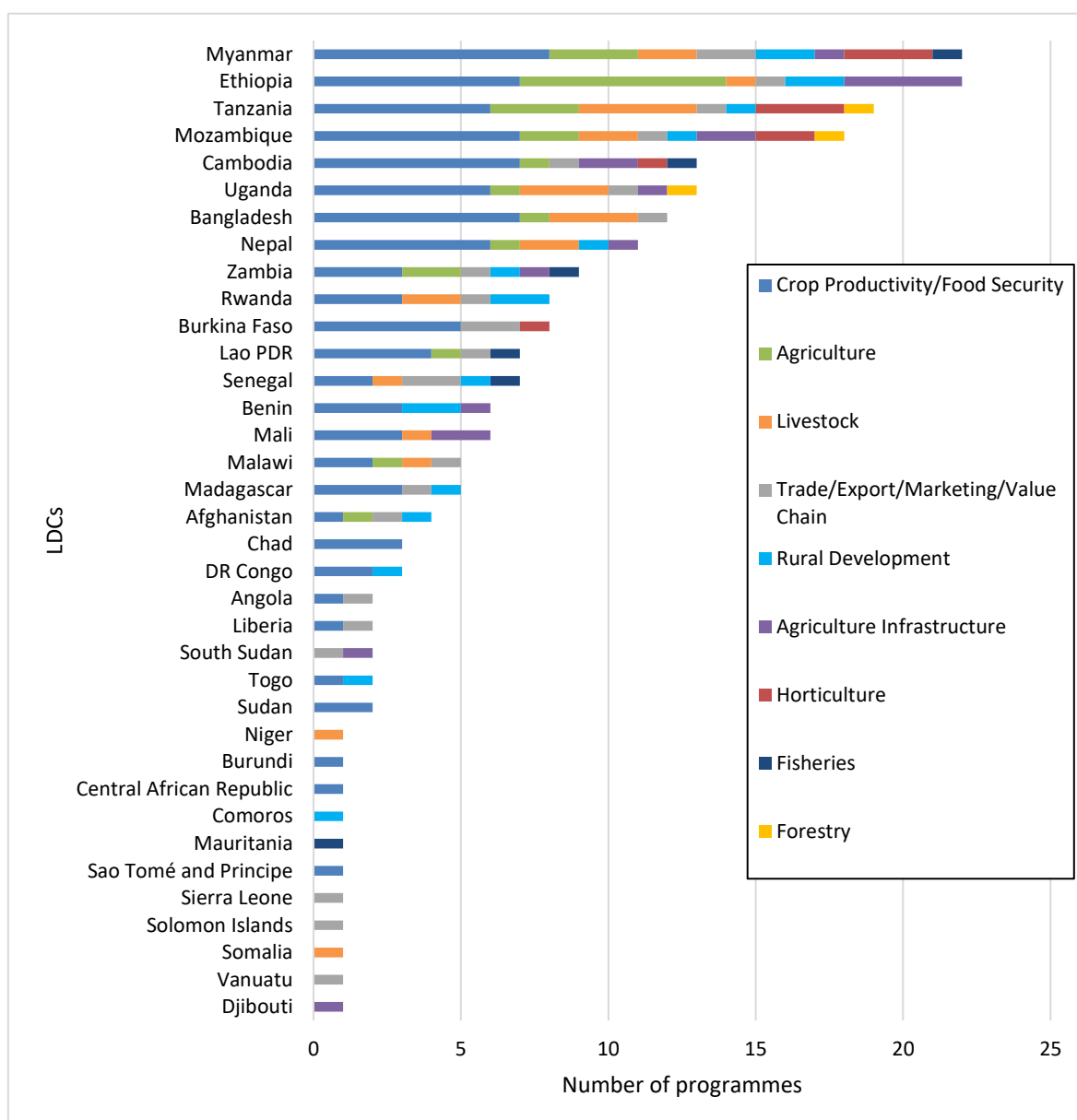
As indicated in Figure 9, each colour represents a type of technology where agriculture and food programmes have taken place. For example, agriculture and food programmes in Myanmar covered almost every type of technology. In Ethiopia, the programmes were more related to crop productivity and food security as well as agriculture in general. In Tanzania, crop productivity and food security, livestock, and horticulture were the main focus of agriculture programmes.

Figure 9 also demonstrates which LDC benefitted most from which type of technology. For crop productivity and food security-related programmes, Myanmar, Ethiopia, Tanzania, Mozambique, Cambodia, Uganda, Bangladesh, and Nepal were each benefitting more than five programmes. For livestock programmes, Tanzania, Uganda, and Bangladesh benefitted from three or more programmes. Myanmar and Tanzania were the main beneficiaries of horticulture programmes, and Ethiopia benefitted the most from programmes in agriculture infrastructure.

Around 29 LDCs received five or less programmes, from Malawi to Djibouti in Figure 9, these LDCs benefitted from one programme related to agriculture infrastructure. Eight LDCs did not benefit from a single programme.³¹ Agriculture programmes appeared to concentrate more on the East Africa and Southeast Asia regions.

³¹ These are Bhutan, The Gambia, Guinea, Guinea Bissau, Haiti, Lesotho, Timor-Leste, and Yemen.

Figure 9: Agriculture and food programmes by type of technology and LDC beneficiary



Source: Authors' calculations based on the reports submitted.

2.2.2 Environment and climate change

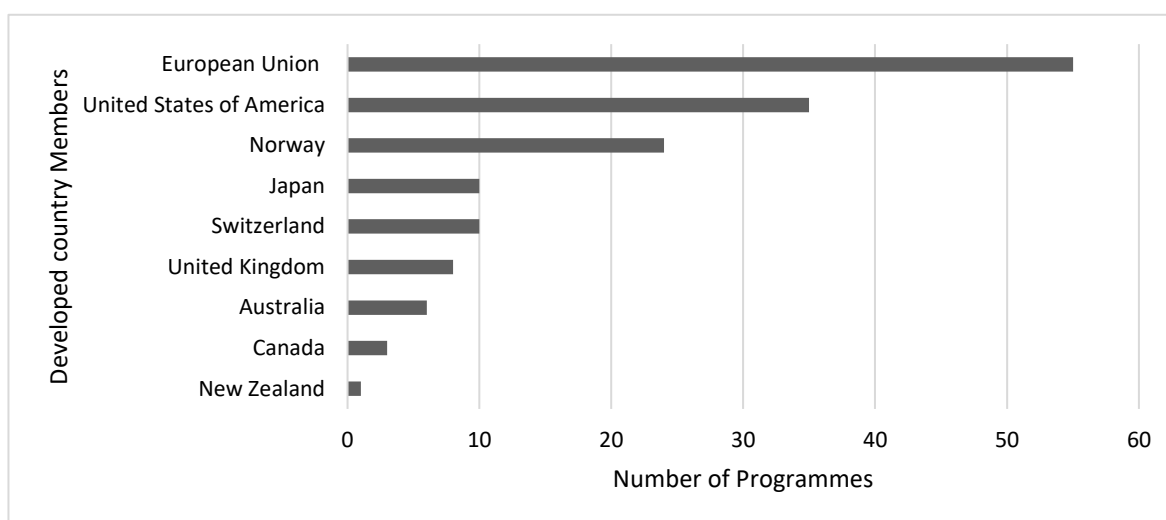
This section summarizes programmes related to clean and renewable energy, water management, climate change, biodiversity protection, waste management and disaster prevention.³² While recognizing that "energy" can be treated as a separate field of technology transfer, it is addressed in this paper as an integral part of environment and climate change technology transfer. Altogether, programmes in this field contribute to the UN Sustainable Development Goals (SDG) 6, 7, 12, 13 and 15.

A total of 152 programmes were identified as related to environment and climate change technology transfer. Figure 10 provides a breakdown of this total per developed country Members. With 36%, the EU leads in the number of programmes provided. This number includes national programmes

³² As already indicated, this section does not include environment and climate change programmes employing ICT, which are covered in the section on ICT technology transfer.

offered by individual EU member states. The US follows directly thereafter with 23%, and Norway takes third place with 16%. Collectively they account for 75% of the total.

Figure 10: Environment and climate change programmes by reporting Member



Source: Authors' calculations based on the reports submitted.

The term "environmental technology" is used interchangeably with "green" or "clean" technology. For the purpose of this paper, environment and climate change technology is divided into four categories: climate change mitigation, climate change adaptation, biodiversity and ecosystem, and waste management.

Climate change mitigation includes technologies related to clean and renewable energy, energy efficiency (EE) as well as greenhouse gas capture, storage and disposal. Under climate change adaptation, technologies for climate resilience, disaster prevention, resource availability and conservation are addressed. Technologies related to the conservation, monitoring and analysis of biodiversity and ecosystem, including wildlife and forest management, as well as genetic technologies are grouped under biodiversity and ecosystem. Waste management includes technologies on pollution control, environmental remediation, wastewater treatment and solid and hazardous waste management.

Figure 11 provides an overview of the number of environment and climate change programmes per category as reported. Slightly more than half (51%)³³ falls under the climate change mitigation category.

A prominent example for promoting know-how and technology transfer of renewable energy, resource and energy efficiency is the Swiss Platform for Renewable Energy, Energy Efficiency and Resource Efficiency Promotion in International Cooperation (REPIC).³⁴ This programme is of long-term duration³⁵ and benefitted 15 LDCs.³⁶ Switzerland also reported on the Energy Sector Management Assistance Programme (ESMAP), which specifically aims to achieve SDG 7 on ensuring access to modern energy technologies.³⁷ Another example is the US Programme for Scaling-Up Renewable Energy (SREP) for Low Income Countries.³⁸ This long-term programme aims to increase access to renewable energy. At least 17 LDCs benefitted from this programme. The UK Energy Catalyst programme also focuses on energy access and benefitted 10 LDCs.³⁹

³³ 79 out of 152 programmes.

³⁴ WTO IP/C/R/TTI/CHE/1 (n 29) p. 10.

³⁵ The programme is reported to spread over four years, from 2018 to 2022.

³⁶ These are Haiti, Mali, Nepal, Uganda, Cambodia, Liberia, Bangladesh, Benin, Burkina Faso, Comoros, Ethiopia, Madagascar, Senegal, Tanzania, and Zambia.

³⁷ WTO IP/C/R/TTI/CHE/1 (n 29) p. 15.

³⁸ WTO IP/C/R/TTI/USA/1 (n 22) p. 41.

³⁹ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – United Kingdom' (1 October 2020), IP/C/R/TTI/GBR/1, p. 31.

The second largest is the climate change adaptation category, accounting for 30%⁴⁰ and contributing to SDG 13 on strengthening resilience and capacity for climate action. One notable example is Australia's Green Climate Fund (GCF), which invests 50% or more of its adaptation resources in vulnerable countries,⁴¹ including LDCs.⁴² At least 39 LDCs benefitted from this programme. A more country specific example is Japan's Project Hydro-microbiological Approach for Water Security in Kathmandu Valley, which aims to develop a water treatment technology system suitable for places with limited energy and water resources like Kathmandu Valley.⁴³

Biodiversity and ecosystem account for 13%, and programmes in this category play a significant role in achieving SDG 15 for the sustainable management of biodiversity, ecosystems and forests.⁴⁴ For example, EU's programme on biodiversity conservation and valorising of ecosystem services in significant cross-border wetlands of the Nile Basin focused on strengthening technical and institutional capacities of eight LDCs in the Nile River area.⁴⁵ Through the World Bank, Canada supported two Forest Carbon Partnership Facility (FCPF) Funds to reduce greenhouse gas emissions from deforestation and forest degradation.⁴⁶ These programmes benefitted 17 LDCs.

Surprisingly, the category with the smallest number of programmes is waste management, which only accounts for 5%.⁴⁷ However, one noteworthy example is the hospital waste treatment facility in Felege Hiwot Referral Hospital of Ethiopia.⁴⁸ This EU programme aimed at the transfer of specialized know-how for "stopping pollution of the environment by infected hospital waste"⁴⁹ in Ethiopia. Through Norway's enterprise development for jobs initiative, Ethiopia benefitted from yet another programme on waste management/disposal.⁵⁰ Programmes in this category contribute to SDG 6 targets aimed at pollution reduction and wastewater treatment and SDG 12 targets related to environmentally sound management of waste and chemicals.

⁴⁰ 45 out of 152 programmes.

⁴¹ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Australia' (18 October 2018), IP/C/W/646/Add.2, p. 18, and WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Australia' (10 October 2019), IP/C/W/656/Add.3, p. 16. See also <<http://www.greenclimate.fund/home>>.

⁴² These include Bangladesh, Burkina Faso, Cambodia, The Gambia, Madagascar, Mali, Malawi, Rwanda, Senegal, Solomon Islands, Tanzania, Uganda, Vanuatu, Zambia, Afghanistan, Angola, Benin, Burundi Central African Republic, Chad, DR Congo, Djibouti, Guinea, Guinea-Bissau, Haiti, Lao PDR, Lesotho, Liberia, Mauritania, Mozambique, Myanmar, Nepal, Niger, Sierra Leone, Togo, Yemen, Bhutan, Ethiopia, and Tuvalu.

⁴³ WTO IP/C/W/656/Add.1 (n 24) p. 6.

⁴⁴ 21 out of 152 programmes.

⁴⁵ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – European Union' (13 October 2020), IP/C/R/TTI/EU/1, p. 124.

⁴⁶ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Canada' (26 October 2018), IP/C/W/646/Add.4, p. 25.

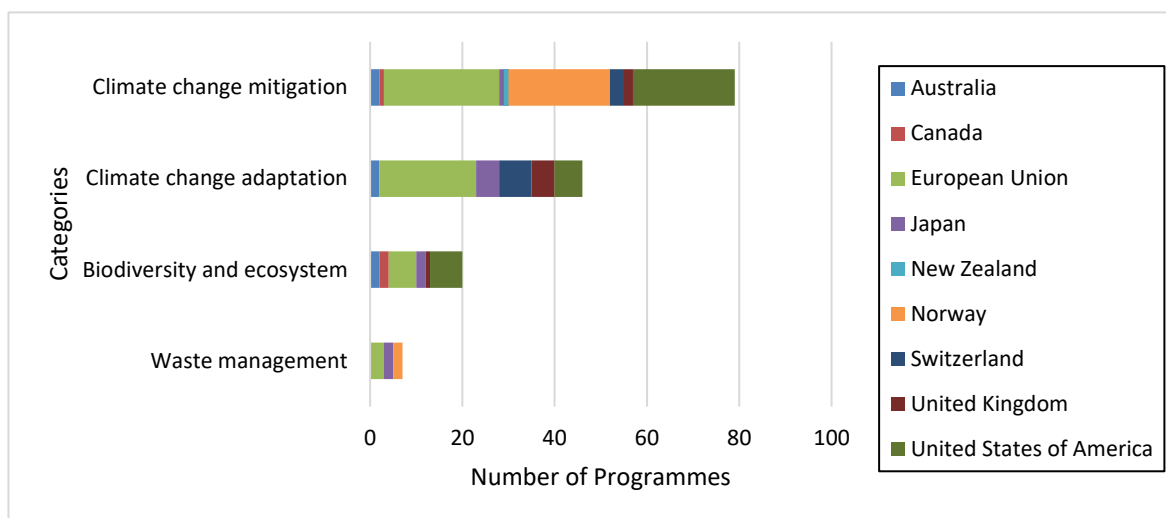
⁴⁷ This category counts for seven out of 152 programmes.

⁴⁸ WTO IP/C/R/TTI/EU/1 (n 45) p. 67.

⁴⁹ WTO IP/C/R/TTI/EU/1 (n 45) p. 67.

⁵⁰ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – Norway' (2 November 2018), IP/C/W/646/Add.5, p. 5.

Figure 11: Environment and climate change programmes by category



Source: Authors' calculations based on the reports submitted.

Figure 12 provides an overview of the number of environment and climate change programmes benefitting each LDC as reported. Nine LDCs benefitted from 20 or more programmes: Uganda (32), Tanzania (28), Zambia (25), Mozambique (24), Bangladesh (23), Senegal (21), Ethiopia (20), Cambodia (20), and Rwanda (20). Four of these LDCs also expressed a need in environment and climate change technologies.⁵¹

Programmes provided by Norway and the UK benefitted Uganda the most. Tanzania was the primary beneficiary of EU programmes, whereas Bangladesh benefitted most from US programmes.

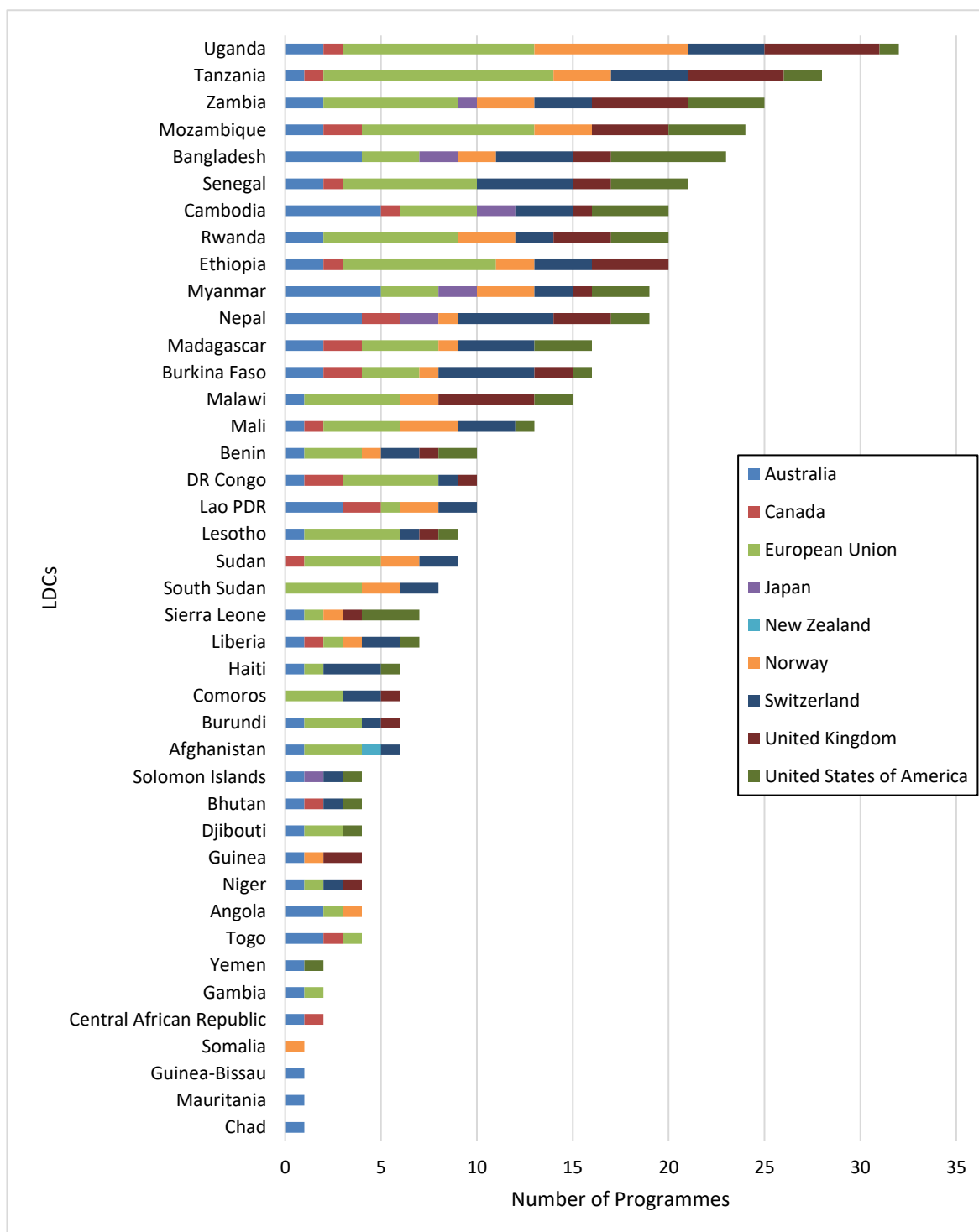
14 LDCs benefitted from fewer than five programmes⁵², and two LDCs, Timor-Leste and Sao Tome and Principe, were not a beneficiary of any environment and climate change programme.

On regional distribution, as can be seen in Figure 12, the programmes were generally made widely available across different continents. However, Japan's and New Zealand's programmes mainly focused on Southeast Asia.

⁵¹ These are Zambia, Bangladesh, Senegal and Cambodia, as per their respective responses to the voluntary survey and from discussions at the annual Workshops. Unfortunately, no data is available as regards the other five LDCs.

⁵² These are Togo (4), Solomon Islands (4), Niger (4), Angola (4), Djibouti (4), Bhutan (4), Guinea (4), Yemen (2), The Gambia (2), Central African Republic (2), Guinea-Bissau (1), Mauritania (1), Chad (1), and Somalia (1).

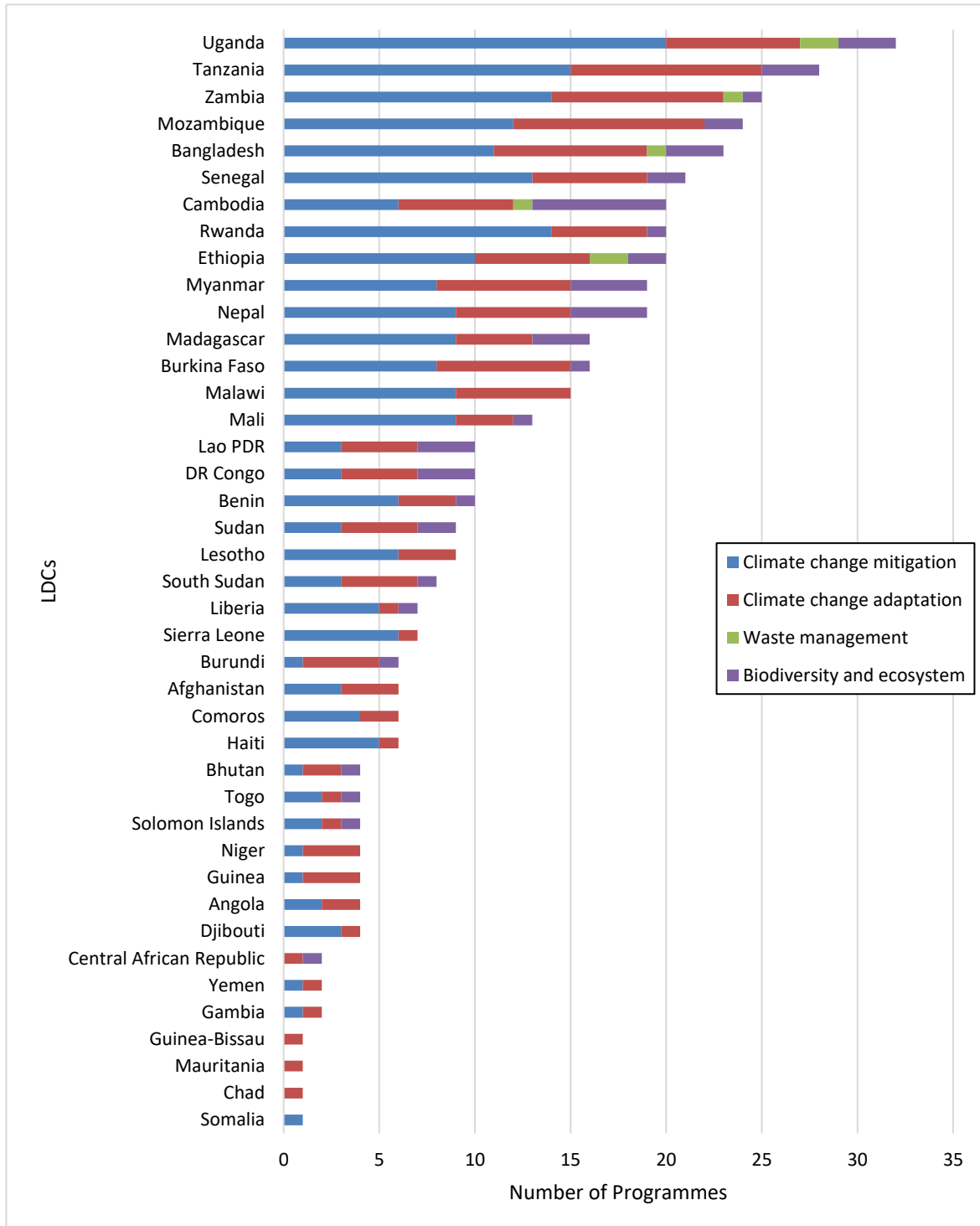
Figure 12: Environment and climate change programmes by LDC beneficiary



Source: Authors' calculations based on the reports submitted.

Figure 13 provides an overview of the number of programmes benefitting each LDC in the four categories. Uganda (20) was the biggest beneficiary of climate change mitigation programmes in the African region. For the Southeast Asia region, Bangladesh was the leading beneficiary of climate change programmes, while Cambodia (7) was the main beneficiary of biodiversity programmes. Tanzania and Mozambique each benefitted from 10 climate change adaptation programmes, whereas Ethiopia and Uganda each benefitted from two programmes on waste management.

Figure 13: Environment and climate change programmes by category and LDC beneficiary



Source: Authors' calculations based on the reports submitted.

2.2.3 Information and communication technology (ICT)

There is no universal definition of information and communication technology (ICT). Before the development of the internet, the term "information technology (IT)" was widely used. Today, however, ICT is the more accepted term, which encompasses both the ability to process information,

such as by means of computers, hard drives, databases and software, and to communicate information, such as through the internet, wireless networks, and mobile telephony.

According to the OECD, "[t]he production (goods and services) of a candidate [ICT] industry must primarily be intended to fulfil or enable the function of information processing and communication by electronic means, including transmission and display."⁵³ This general principle, published in 2007, is based on a late draft of the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev. 4), which groups ICT sector into ICT manufacturing, trade, and services industries.⁵⁴

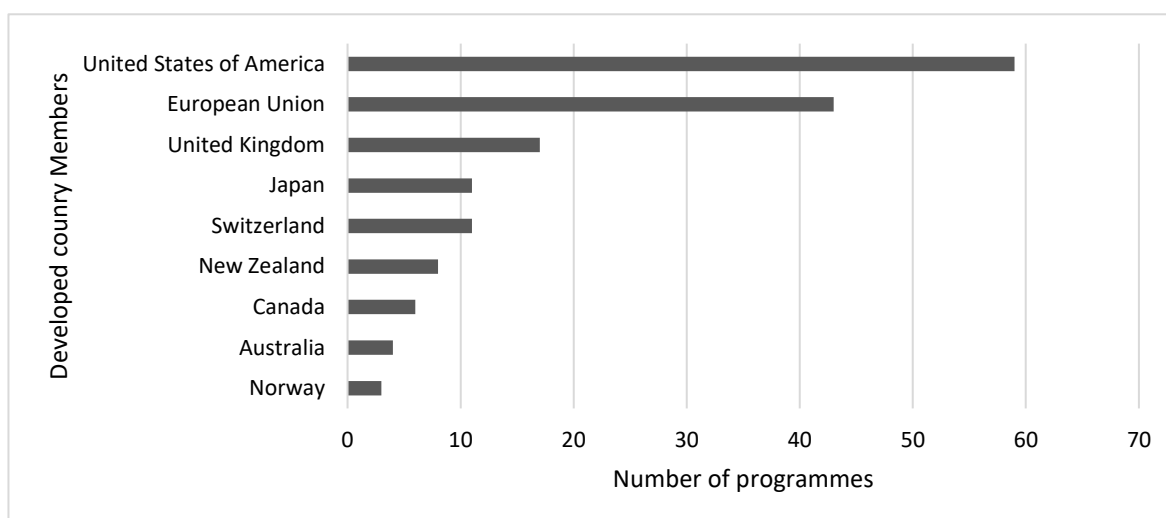
Subject to rapid technological change, ICT is one of the most volatile industries. It exerted a pervasive impact on all other areas and technologies as the backbone of the digital economy.⁵⁵ During the COVID-19 pandemic, ICT enabled telemedicine, remote working, e-commerce, and online education, helping to slow down the spread of the coronavirus and to ease its impact.

In order to fully capture this nature of ICT and its impact on the development of LDCs' technological bases in other areas, and to avoid double counting of programmes in multiple sections, this section covers all programmes containing the transfer of ICT, including those using ICT in the areas of public health and pharmaceuticals, agriculture and food, or environment and climate change.

Nine developed country Members reported a total of 162 ICT programmes representing the highest number of programmes reported for a particular technology field, which seems to coincide with the increase observed in knowledge flows and collaboration in ICT.⁵⁶ These ICT programmes contribute to particularly achieve SDG Target 9.c on providing access to ICT and the internet in LDCs.⁵⁷

Counting for more than 60%, the US and EU provided 59 and 43 programmes respectively (see Figure 14). Japan, Switzerland and the UK each reported more than 10 ICT programmes.

Figure 14: ICT programmes by reporting Member



Source: Authors' calculations based on the reports submitted.

⁵³ OECD, *Guide to Measuring the Information Society 2011* (OECD 2011), p. 59.

⁵⁴ UN, *International Standard Industrial Classification of All Economic Activities, Revision 4* (UN 2008), p. 277-278.

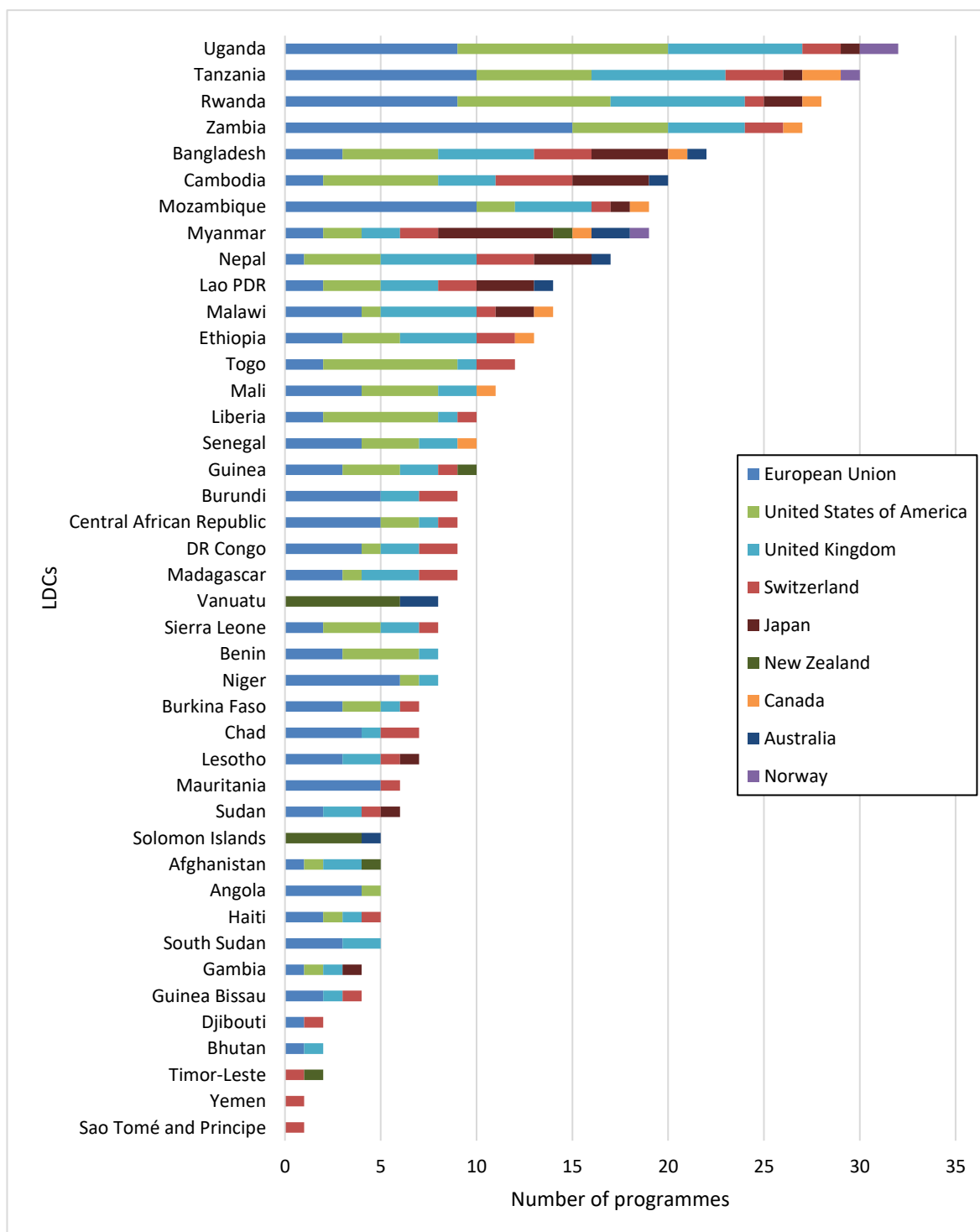
⁵⁵ WTO, *World Trade Report 2020* (WTO 2020). The Report provides a broader context for the challenges and opportunities faced in the digital age, as well as the government policies that promote innovation.

⁵⁶ Ciaramella L, De Rassenfosse G, Seliger F, 'Sources of Knowledge Flow between Developed and Developing Countries'; Taubman A, Watal J, 'Thematic Overview: Charting the Evolution of Knowledge Flows'; Taubman A, 'Looking Forward: Building the Foundations for Policymaking in the Knowledge Economy', in Taubman A and Watal J (Eds.), 'Trade in Knowledge: Intellectual Property, Trade and Development in a Transformed Global Economy' (2022) WTO/Cambridge University Press, p. 10, 265, 272, and 790.

⁵⁷ SDG Target 9.c is part of SDG 9 on building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation.

42 out of 44 LDCs benefitted from at least one ICT programme, with Uganda, Tanzania, and Rwanda as the top three beneficiaries, followed by Zambia, Bangladesh, Cambodia, Mozambique, Myanmar, Nepal, and Lao PDR. These LDCs also expressed a need in ICT.⁵⁸

Figure 15: ICT programmes by LDC beneficiary



Source: Authors' calculations based on the reports submitted.

⁵⁸ With the exception of Uganda, Tanzania, Rwanda and Mozambique for which, as already mentioned, no data is made available through the voluntary survey or discussions at the annual Workshops.

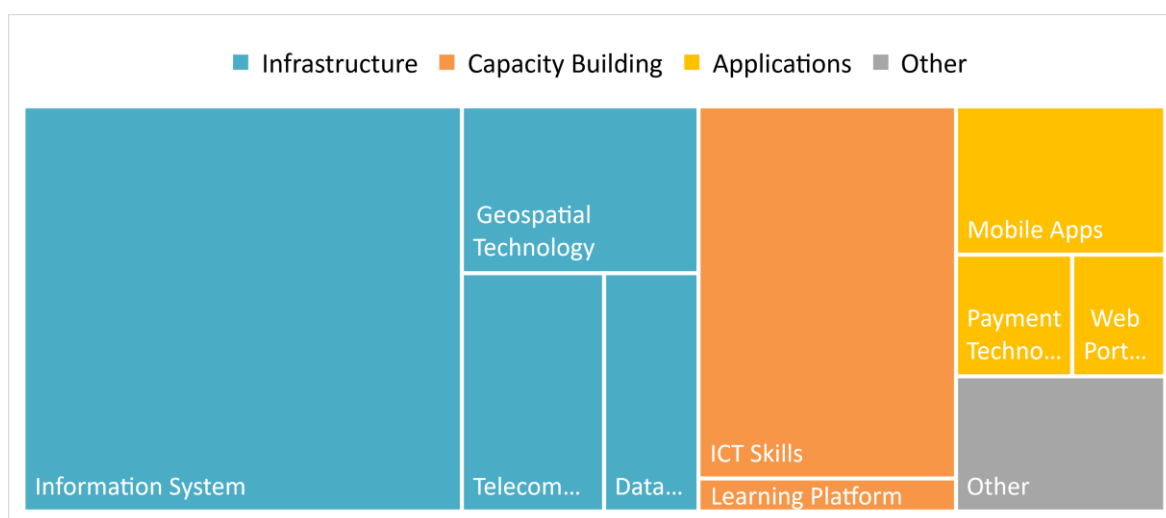
Figure 15 covers the regional distribution of ICT programmes. East African and Southeast Asian LDCs were the primary focus of these programmes. ICT programmes offered by the EU, Switzerland, UK, and US were more widely available, whereas Japan, New Zealand, and Australia reported more programmes to LDCs in the Southeast Asia and Pacific region.

For a better understanding of the nature of the ICT programmes, Figure 16 groups them into the categories of infrastructure, capacity building, and applications. ICT infrastructure, including information systems, geospatial technologies, telecommunications, and databases, serves as the backbone for ICT products and services. 60% of ICT programmes fall into this category, indicating the lack of ICT infrastructure in LDCs.

The second category, capacity building, covers almost a quarter (22%) of ICT programmes, such as those related to the transfer of knowledge and technical skills to develop and utilize ICT, and technical expertise for forming national innovation policies of LDCs with a view to strengthen the innovation ecosystem. Capacity building programmes include provision of online learning platforms, which enable the digital delivery of training of ICT, intellectual property, and other knowledge.

The third category, applications of end-user software, can be further divided into mobile applications, payment technology, and web portals. This category constitutes 12% of ICT programmes. Other types of ICT include government-supported investment funds for MSMEs and businesses, and awards to encourage research and innovation in ICT. Programmes without a specific type of ICT were also grouped under this category, which account for 6% of ICT programmes.

Figure 16: Nature of ICT programmes



Source: Authors' calculations based on the reports submitted.

As stated previously, ICT has been adopted in many industrial sectors to improve productivity and efficiency. Figure 17 demonstrates that environment and climate change, business, trade, and finance, agriculture and food as well as public health and pharmaceuticals are covered in more than 20 ICT programmes. Most of the environment and climate change programmes focused on ICT infrastructure, and a typical infrastructure is the geospatial technology based on space satellites widely used to monitor natural resources such as water, land, forests, and wildlife. For example, the EU⁵⁹, UK⁶⁰, and US⁶¹ provided various forms of geospatial technology and the data obtained through their satellites. LDC beneficiaries of these satellite-based technologies included Bangladesh, Cambodia, Madagascar, Mali, Mozambique, Senegal, and Zambia. New Zealand also supported Vanuatu in developing information management systems for water and sanitation by transferring a mobile data collection platform.⁶²

⁵⁹ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – European Union' (6 February 2020), IP/C/W/656/Add.5, p. 11.

⁶⁰ WTO IP/C/W/646/Add.7 (n 27) p. 139.

⁶¹ WTO IP/C/R/TTI/USA/1 (n 22) p. 43-44.

⁶² WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – New Zealand' (3 December 2018), IP/C/W/646/Add.6, p. 6.

In business, trade, and finance, almost one third are capacity building programmes, such as training on coding, app development, and data management, as well as ICT advisory services for enterprises to help leverage the potential of e-commerce and further integrate into the digital economy. For example, Canada provided training in ICT skills for the youth in Ethiopia to strengthen youth-run small businesses.⁶³ ICT was also applied to trade facilitation, typically through customs information systems to collect trade statistics and streamline customs procedures so as to improve transparency in trade. For example, Australia established online trade platforms in the form of national and regional trade portals in Solomon Islands and Vanuatu, to support the implementation of transparency obligations under the PACER Plus agreement.⁶⁴

In agriculture and food, geospatial technology was widely used to provide timely and precise agricultural information for weather and crop growing conditions and to support crop insurance. This involved not only big, remote satellites, but also small cameras and survey drones as reported by the EU, Switzerland, and the US. LDC beneficiaries included Afghanistan, Nepal, Zambia⁶⁵, Bangladesh, Cambodia⁶⁶, Ethiopia⁶⁷, and Senegal⁶⁸. Another example is the development of mobile applications reported by Switzerland to supply agricultural and financial services through mobile phones to smallholder farmers in Nepal⁶⁹, Uganda, and Zimbabwe⁷⁰.

In public health and pharmaceuticals, information and communication systems were widely provided as an effective means to notify public health issues and to organize health-related data. Since the outbreak of the COVID-19 pandemic, WTO Members have also been using ICT to facilitate information sharing. For example, the US reported the transfer of the District Health Information Software 2 (DHIS2) to collect data of COVID-19 cases and their contacts and to send test results to test takers in Guinea.⁷¹ Additionally, the US worked with Liberia on a Mobile Text Message Communications Platform (mHero) to send COVID-19-related messages to health workers.⁷²

Programmes only involving ICT infrastructure or that have not targeted any other specific area are labelled as ICT in Figure 17. One example is the Togo Threshold Programme administered by the US Millennium Challenge Corporation (MCC).⁷³ This programme aimed to improve access to the internet and mobile phone services in Togo by supporting private sector investment, expanding services to underserved areas, and increasing the use of ICT among women and small businesses.

Programmes not falling into the above-mentioned areas are covered under the "other" category, including aviation (information systems), metrology (web portals), standardization (standard operating procedures systems), and art (portal and mobile telephone services to facilitate networking among artists).

⁶³ WTO IP/C/W/656/Add.4 (n 30) p. 4.

⁶⁴ WTO IP/C/R/TTI/AUS/1 (n 28) p. 22.

⁶⁵ WTO IP/C/R/TTI/USA/1 (n 22) p. 32.

⁶⁶ WTO IP/C/R/TTI/CHE/1 (n 29) p. 21.

⁶⁷ WTO IP/C/R/TTI/EU/1 (n 45) p. 19.

⁶⁸ WTO IP/C/R/TTI/USA/1 (n 22) p. 14.

⁶⁹ WTO IP/C/R/TTI/CHE/1 (n 29) p. 40.

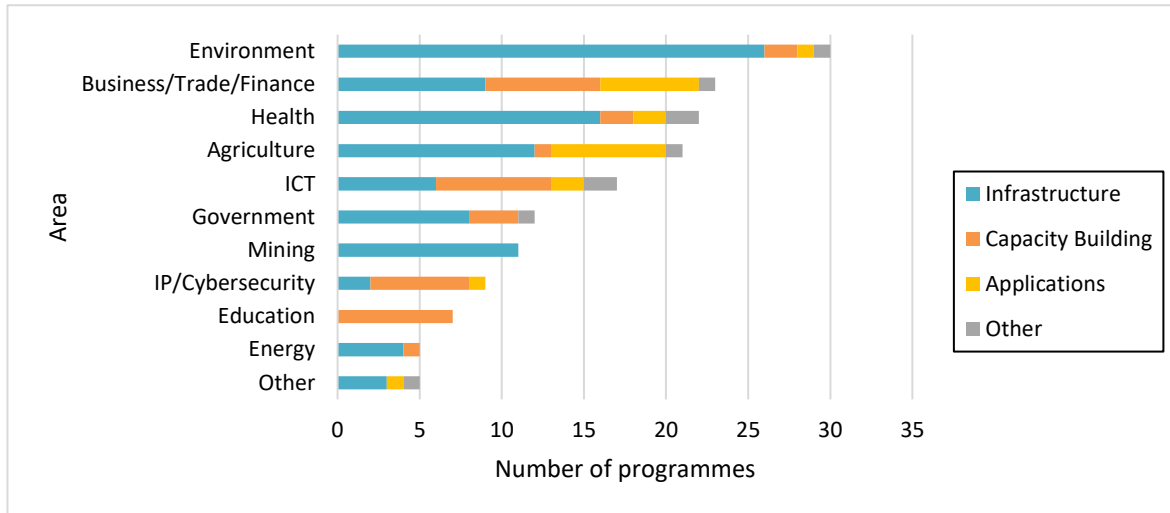
⁷⁰ WTO IP/C/W/656 (n 25) p. 29.

⁷¹ WTO IP/C/R/TTI/USA/1 (n 22) p. 50.

⁷² WTO IP/C/R/TTI/USA/1 (n 22) p. 8.

⁷³ WTO IP/C/R/TTI/USA/1 (n 22) p. 27.

Figure 17: ICT programmes by field

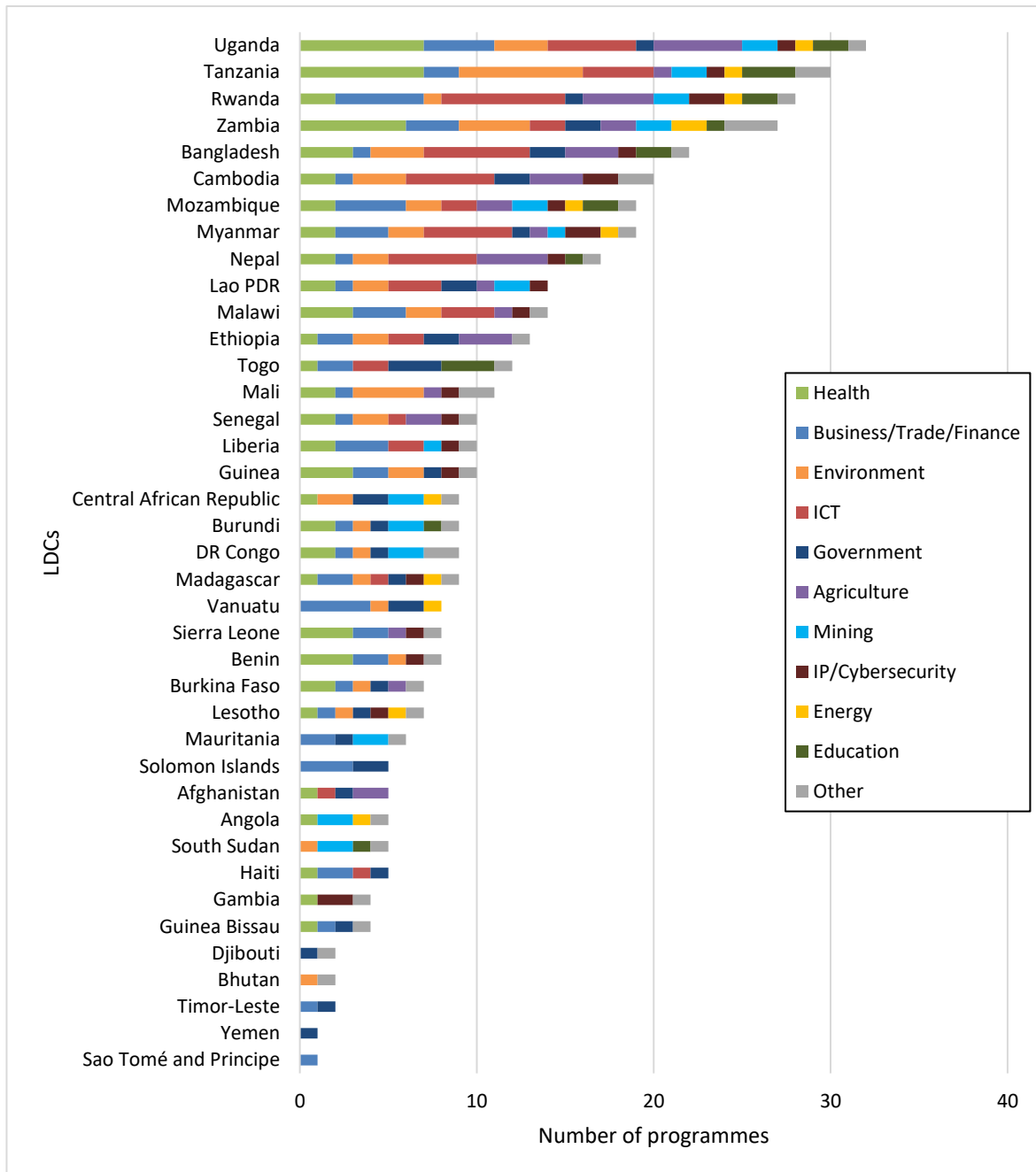


Source: Authors' calculations based on the reports submitted.

As depicted in Figure 18, more than 20 LDCs benefitted from transfer of ICT in the environment and climate change, agriculture and food, public health and pharmaceuticals, and government fields respectively. Among 42 LDCs, Uganda, Tanzania, and Rwanda were the top three beneficiaries. Uganda received 35 ICT programmes, while 14 LDCs only received five or even less: Solomon Islands, Afghanistan, Angola, South Sudan, Haiti, The Gambia, Guinea Bissau, Djibouti, Bhutan, Timor-Leste, Yemen, Sao Tome and Principe, Comoros, and Somalia. Two LDCs, Comoros and Somalia, were not even beneficiaries of any ICT programmes.

Figure 18 further indicates the areas of focus for each LDC beneficiary. For example, there were more ICT programmes in Uganda deployed in the fields of health and agriculture. In Tanzania, the ICT programmes mainly covered environment and health. For health-related ICT, the top beneficiaries were Uganda, Tanzania, and Zambia. For environmental ICT, Tanzania, Zambia, and Mali benefitted the most. For agricultural ICT, Uganda, Rwanda, Bangladesh, Cambodia, Myanmar, and Nepal were the leading recipients.

Figure 18: ICT transfer programmes by field and LDC beneficiary



Source: Authors' calculations based on the reports submitted.

2.2.4 Public health and pharmaceuticals

This section provides an overview of 132 programmes reported⁷⁴ in the field of public health and pharmaceuticals.⁷⁵ As shown in Figure 19, the EU and US together reported 95 health-related programmes, accounting for 72% of the total. Among these 95 programmes, the EU is responsible for 45%, and the US for 27%.

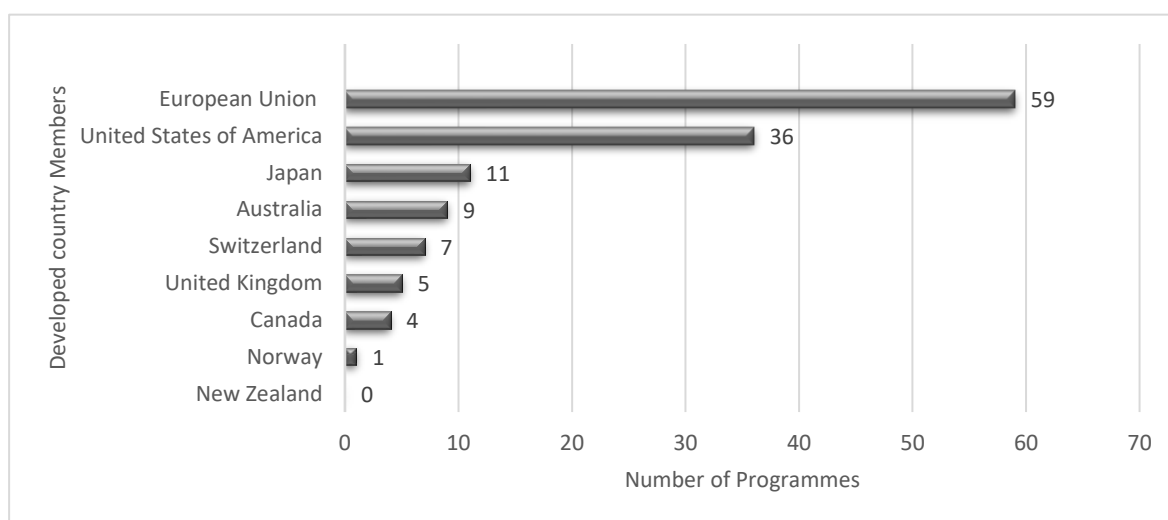
⁷⁴ New Zealand has not reported on any programmes in this area.

⁷⁵ This section does not address programmes that are beyond human health and pharmaceuticals, as well as programmes that are ICT-based.

These 132 programmes are predominantly research oriented.⁷⁶ Other programmes focus on technical assistance and training.⁷⁷

Altogether, these health-related programmes contribute directly to achieving the targets of SDG 3 on ensuring good health and promoting well-being. The recently adopted Doha Programme of Action for LDCs (2022-2031) also recognize the importance of TRIPS Article 66.2 in enabling LDCs to produce life-saving medicines, including COVID-19 vaccines.⁷⁸

Figure 19: Health-related programmes by reporting Member



Source: Authors' calculations based on the reports submitted.

For the purpose of this paper, the 132 health-related programmes are divided into five categories: communicable diseases; non-communicable diseases; reproductive, maternal and child health; regulatory standards, safety and security; and healthcare system, services and equipment.

The communicable diseases category includes programmes for the containment, treatment, vaccine development and diagnosis of diseases, such as HIV, malaria, tuberculosis and other parasitic, vector and infectious diseases. Under the non-communicable diseases category, programmes on diabetes and mental health are reported. The category of reproductive, maternal and child health includes programmes for the diagnosis and treatment of infections and diseases affecting women and children. The regulatory standards, safety and security category includes research, education and training programmes on the quality of medicines and safety monitoring system. Under healthcare system, services and equipment, programmes related to strengthening the health system in general, as well as training in health services and equipment are addressed.

Figure 20 provides an overview of the number of health-related programmes per category as reported by the developed country Members. Roughly 42%⁷⁹ falls under the communicable diseases category.

The US reported on four programmes related to COVID-19 training, testing and data collection and analysis.⁸⁰ Another example is the Swiss programme on Medicines for Malaria Venture.⁸¹ This global programme aims at, amongst others, facilitating equitable access to quality antimalarial medicine, and benefitted 26 LDCs. The EbolaMoDRAD⁸² is an EU capacity building programme for developing diagnostic tools and providing outbreak management training for the containment of the Ebola virus disease in West Africa. Six LDCs in that region benefitted from this programme. Through the HIV

⁷⁶ 69 out of 132 programmes take the form of research, research capacity and R&D grants. The EU provided a large portion of these research-oriented programmes.

⁷⁷ 38 out of 132 programmes, with the US at the lead in providing technical assistance and training.

⁷⁸ UN OHRLLS, '[Doha Programme of Action for LDCs \(2022-2031\)](#)', para. 65.

⁷⁹ 54 out of 132 programmes.

⁸⁰ WTO IP/C/R/TTI/USA/1 (n 21) p. 50, 57-58.

⁸¹ WTO IP/C/R/TTI/CHE/1 (n 28) p. 16.

⁸² WTO IP/C/W/646/Add.7 (n 26) p. 25-28.

Rapid Diagnosis Test (RDT) programme, USAID provided HIV testing and counselling in five supported provinces in Burundi, including procuring the tests and overseeing the supply chains.⁸³ Altogether, these programmes contribute to achieving SDG Target 3.3.⁸⁴

The second largest category is the healthcare system, services and equipment category, accounting for 27%.⁸⁵ A typical example is the US programme on Building Capacity for Lab Equipment Maintenance in Uganda.⁸⁶ Operating from the Central Public Health Laboratory, biomedical engineers and technicians are enabled to "provide equipment calibration services to health facilities across the country." This capacity building programme also supported COVID-19 testing and monitoring. Japan offered a training programme on knowledge and technical skills for designing and manufacturing of medical equipment⁸⁷ in Myanmar. Another example is the Innovations for quality health systems provided by Switzerland⁸⁸, which through the establishment of the Quality Health System Design Lab aims to develop instruments and measures for enhancing the quality of the health system in four LDCs.⁸⁹

The reproductive, maternal and child health category accounts for 17%⁹⁰ and contributes to SDG Targets 3.1, 3.2 and 3.7.⁹¹ Canada's Innovating for Maternal and Child Health in Africa Initiative⁹² is developing locally adaptable and scalable solutions for improving the health of mothers, newborns, and children in Sub-Saharan Africa. This long-term Initiative benefitted 12 LDCs. Under the *Ensemble pour une Solidarité Thérapeutique Hospitalière En Réseau* (ESTHER)⁹³ umbrella, Swiss institutional health partnership projects are developed for improving sexual and reproductive health in 12 LDCs.

Although accounting for 11%⁹⁴, the regulatory standards, safety and security category plays an important role. The US programme on Promoting the Quality of Medicines (PQM) in Bangladesh⁹⁵ aims to improve the pharmaceutical regulatory system through the strengthening of the Drug Testing Laboratory (DTL) so as to enable it to obtain either a WHO prequalification or ISO 17025-laboratory accreditation. Australia's Indo-Pacific Regulatory Strengthening Programme⁹⁶ supports institutional partnerships between national medicines regulatory authorities for the efficient regulation and safety improvement of medical products.

The non-communicable diseases category only accounts for 4%⁹⁷ and these programmes are all reported by the EU. For example, the Integrating and Decentralising Diabetes and Hypertension Services in Africa⁹⁸ programme aims to "improve the health outcomes for people living with chronic conditions"⁹⁹ in Tanzania and Uganda. Using Peer Support in Developing Empowering Mental Health Services¹⁰⁰ in Uganda is a 2020 Horizon programme focusing on the development of best practices based on case studies evidence for improving mental health treatment. These programmes contribute to achieving SDG Target 3.4.¹⁰¹

⁸³ WTO IP/C/R/TTI/USA/1 (n 21) p. 52.

⁸⁴ SDG Target 3.3 aims to end the rapid spread of various communicable and neglected tropical diseases.

⁸⁵ 37 out of 132 programmes.

⁸⁶ WTO IP/C/R/TTI/USA/1 (n 21) para. 234, p. 48.

⁸⁷ WTO, 'Report on The Implementation of Article 66.2 of the TRIPS Agreement - Japan', (25 September 2020) IP/C/R/TTI/JPN/1, p. 11.

⁸⁸ WTO IP/C/R/TTI/CHE/1 (n 28) p. 25-26.

⁸⁹ These are Ethiopia, Malawi, Nepal, and Tanzania.

⁹⁰ 23 out of 132 programmes.

⁹¹ These SDG Targets aim to reduce maternal and neonatal mortality, end preventable deaths of newborns, and ensure access to sexual and reproductive healthcare services.

⁹² WTO, 'Report on The Implementation of Article 66.2 of the TRIPS Agreement - Canada' (13 October 2020), IP/C/R/TTI/CAN/1, p. 11.

⁹³ WTO IP/C/R/TTI/CHE/1 (n 28) p. 22.

⁹⁴ 14 out of 132 programmes.

⁹⁵ WTO IP/C/R/TTI/USA/1 (n 21) p. 53.

⁹⁶ WTO IP/C/R/TTI/AUS/1 (n 27) p. 23.

⁹⁷ 5 out of 132 programmes.

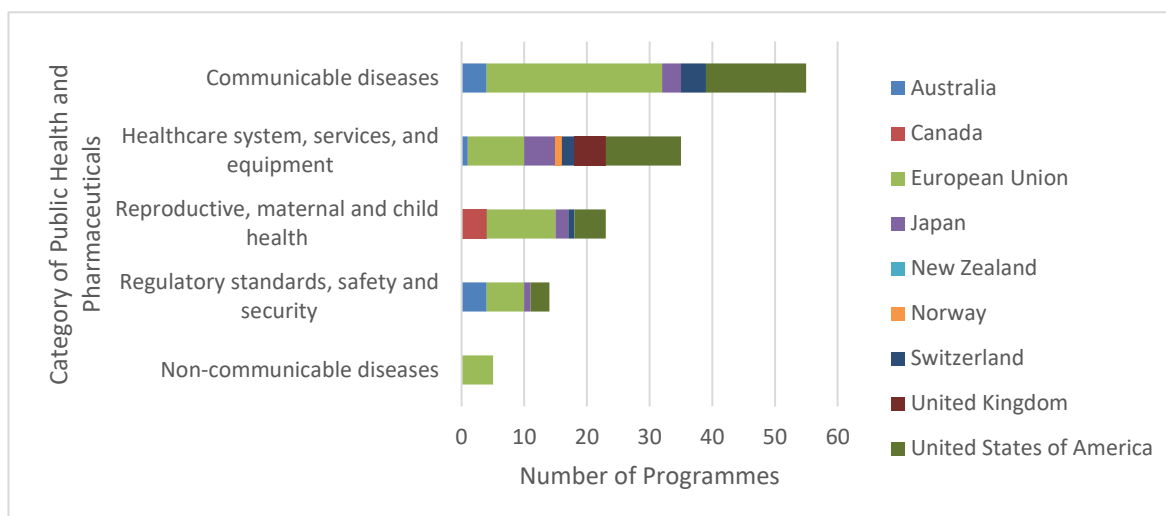
⁹⁸ WTO IP/C/R/TTI/EU/1 (n 44) p. 47.

⁹⁹ <https://cordis.europa.eu/project/id/825698>, accessed on 19 November 2021.

¹⁰⁰ WTO IP/C/W/646/Add.7 (n 26) p. 20.

¹⁰¹ SDG Target 3.4 aims to reduce premature mortality from non-communicable diseases and promote mental health and well-being.

Figure 20: Health-related programmes by category



Source: Authors' calculations based on the reports submitted.

Figure 21 depicts 42 LDCs¹⁰² that were the beneficiary of at least one health-related programme. Both Uganda and Tanzania benefitted from 30 or more programmes, whilst 17 other LDCs¹⁰³ benefitted from five or less. Of these 17 LDCs, Nepal, Angola, Togo, Haiti, Djibouti expressed a need in health technologies.¹⁰⁴ Bhutan¹⁰⁵ and two non-WTO-affiliated LDCs¹⁰⁶ did not benefit from any health-related programme.

Uganda was the leading beneficiary of EU programmes, whereas Myanmar was the primary beneficiary of US programmes in this area. Programmes provided by Switzerland benefitted Tanzania the most, while Cambodia and Lao PDR were both top recipients of programmes provided by Australia.

On the geographical distribution, programmes provided by the EU, Japan, Switzerland, UK, and US were available to 10 LDC beneficiaries or more across different continents. While Canada's programmes focused on the African region, the programmes provided by Australia mainly targeted LDCs in Southeast Asia and the Pacific.

¹⁰² Including the most recent graduate, Vanuatu, and countries in the process of accession to the WTO.

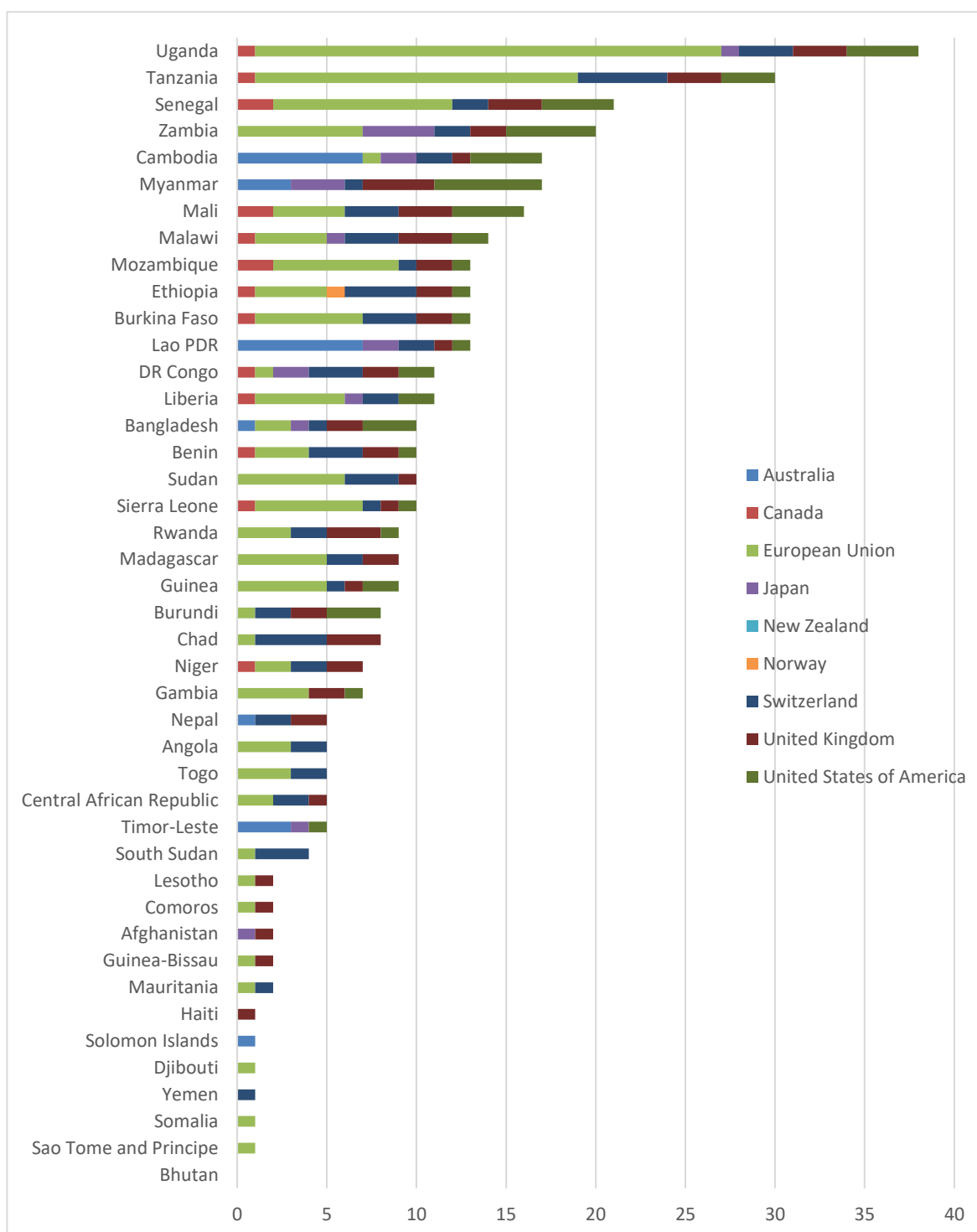
¹⁰³ These are Nepal (5), Angola (5), Togo (5), Central African Republic (5), Timor-Leste (5), South Sudan (4), Lesotho (2), Comoros (2), Afghanistan (2), Guinea-Bissau (2), Mauritania (2), Haiti (1), Solomon Islands (1), Djibouti (1), Yemen (1), Somalia (1), and Sao Tome and Principe (1).

¹⁰⁴ Other LDCs expressing such need in their respective responses to the voluntary survey or from discussions at the annual Workshops: Bangladesh, Burkina Faso, Cambodia, The Gambia, Lao PDR, Madagascar, Myanmar, Senegal, Sudan and Zambia.

¹⁰⁵ At a recent annual Workshop, however, Bhutan did express a need for health system technologies.

¹⁰⁶ These two (2) non-WTO-affiliated LDCs are Tuvalu and Kiribati.

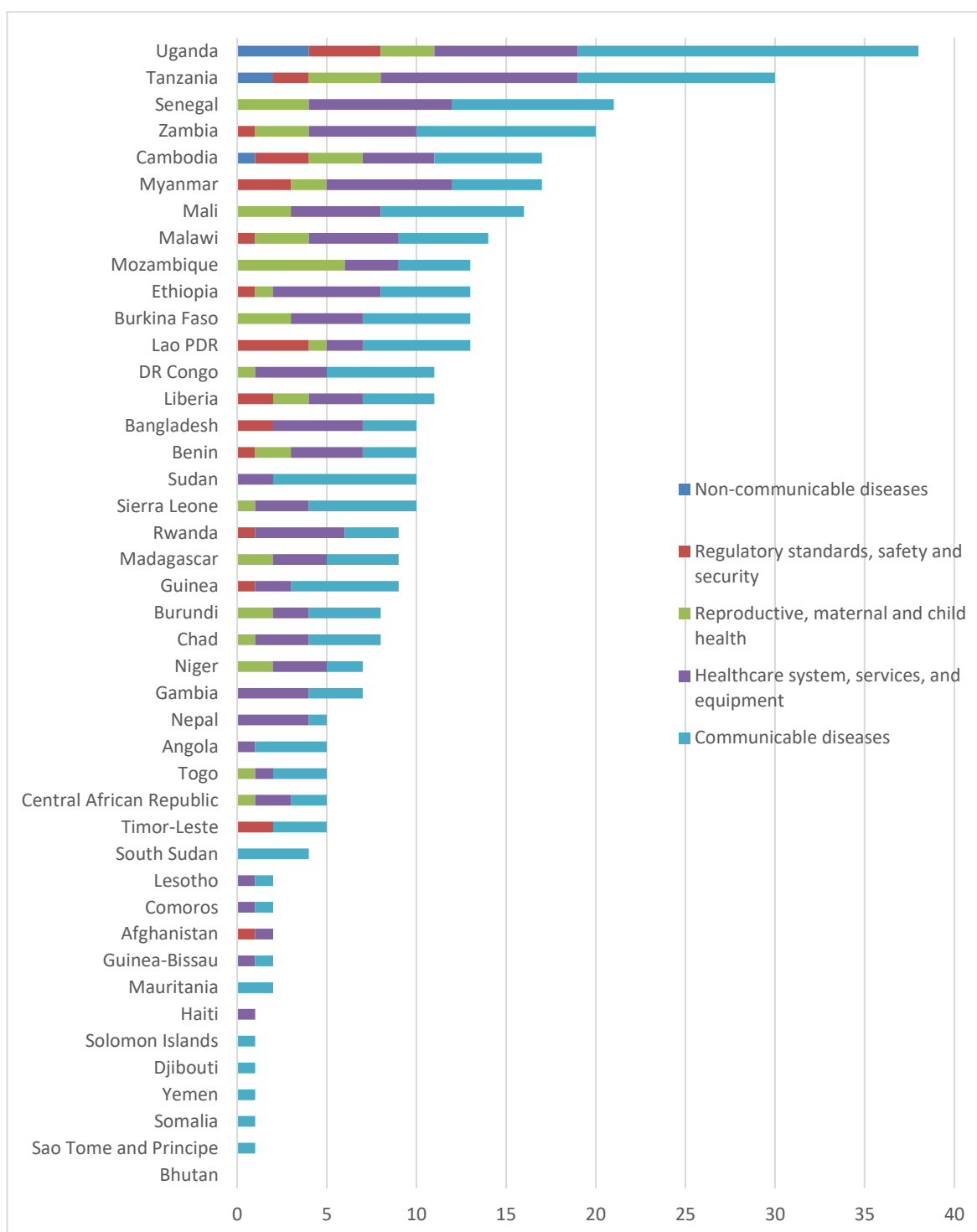
Figure 21: Health-related programmes by LDC beneficiary



Source: Authors' calculations based on the reports submitted.

Figure 22 provides an overview of the programmes benefitting each LDC Member according to the five categories. With 20 programmes, Uganda was the biggest beneficiary of programmes in both the communicable and non-communicable disease categories. Tanzania benefitted from 11 programmes in the healthcare system, services and equipment category, while Mozambique was the beneficiary of six programmes in the reproductive, maternal and child health category. Lao PDR benefitted from four programmes in the regulatory standards, safety and security category.

Figure 22: Health-related programmes by category and LDC beneficiary



Source: Authors' calculations based on the reports submitted.

2.2.5 Other technology fields

This section covers three fields for which more than 40 programmes were reported: intellectual property (51); business, trade and finance (44); and education and social sciences (42).

2.2.5.1 Intellectual property

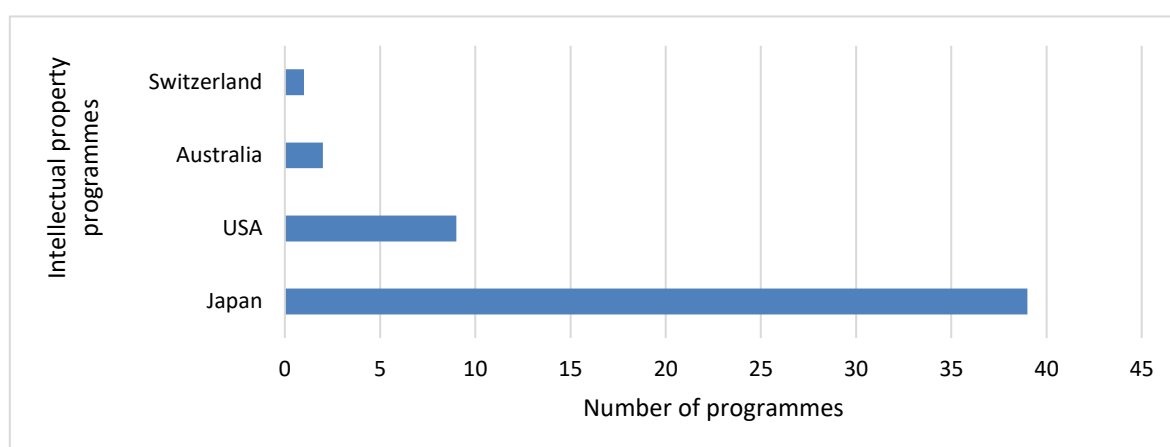
This section provides an overview of the 51 programmes related to IP reported by Australia, Japan, Switzerland and the US.¹⁰⁷ As shown in Figure 23, Japan provided 39 programmes, accounting for 76%. The US offered 18% or nine out of 51 programmes. Australia provided two programmes and Switzerland one.

An examination of these programmes indicates that almost all consist of trainings and courses on topical IP issues (with the rest being events or activities dedicated for raising awareness about IP).

It should be noted that Members may each hold different interpretation as to the applicability of IP-related programmes to Article 66.2. Furthermore, discussions between Members on IP as a field of technology for the purpose of "technology transfer" under this Article has so far eluded consensus.¹⁰⁸

Against this background, this overview does not and should not be viewed as advancing any form of legal interpretation or policy position with regard to the inclusion of these programmes under the implementation of Article 66.2¹⁰⁹

Figure 23: IP-related programmes by reporting Member



Source: Authors' calculations based on the reports submitted.

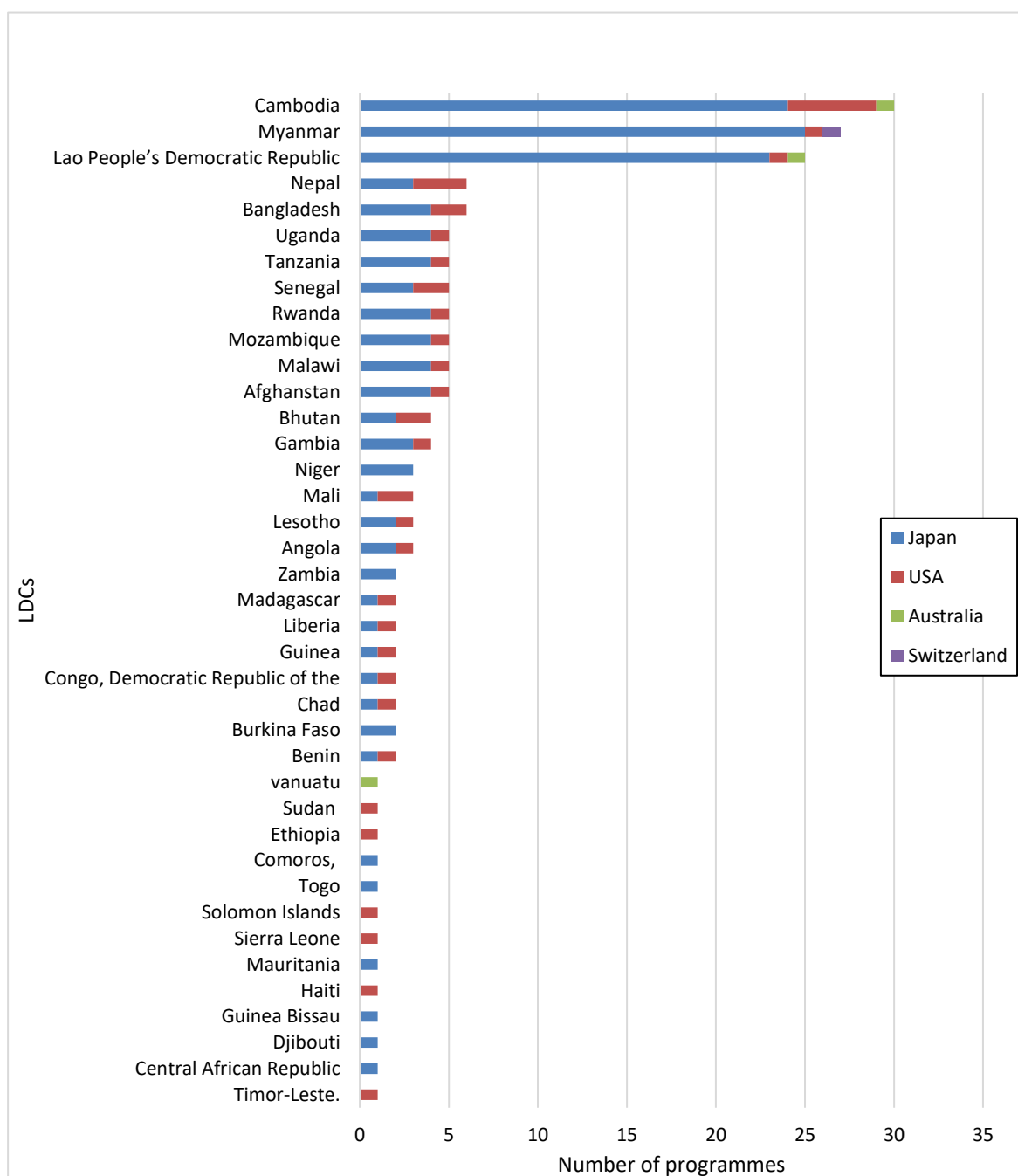
A total of 39 LDCs benefitted from at least one IP-related programme. As depicted in Figure 24, the leading beneficiaries were Cambodia, Myanmar and Lao PDR. Collectively, these three beneficiaries benefitted from 82 programmes. Five LDCs did not benefit from any IP-related programme: Burundi, Yemen, Sao Tomé and Príncipe, Somalia, South Sudan and Timor-Leste.

¹⁰⁷ Canada, EU, New Zealand, Norway, and UK have not reported on any programme.

¹⁰⁸ For more about this lack of consensus between Members, see Watal J, Caminero L (n 5).

¹⁰⁹ It is WTO Members, through the Ministerial Conference and the General Council, that have the exclusive authority to adopt authoritative interpretations of the TRIPS Agreement, and it is the responsibility of dispute settlement panels to clarify provisions of the Agreement in the case of disputes in this area.

Figure 24: IP-related programmes by LDC beneficiary



Source: Authors' calculations based on the reports submitted.

As mentioned, these 51 IP-related programmes all involve courses and training on topical IP issues.¹¹⁰ These programmes are normally offered by the reporting Member's national IP office such as the Japan Patent Office (JPO) or the United States Patent and Trademark Office (USPTO), and have at times been conducted in collaboration with the World Intellectual Property Organization (WIPO), such as through WIPO Funds-in-Trust.¹¹¹ The programmes were predominantly offered to beneficiary countries on a regional basis, in physical or distance learning

¹¹⁰ Because of the general simplicity of these programmes, the authors chose to suffice by simply describing them (in seen the following paragraphs) rather than diving them into categories which and producing charts, as done elsewhere in this paper.

¹¹¹ According to WIPO's website, WIPO Funds-in-Trust (FIT) refers to relationships between WIPO and a number of key donors who provide (FIT) to finance technical assistance and human capacity building projects to developing countries and countries with economies in transition.

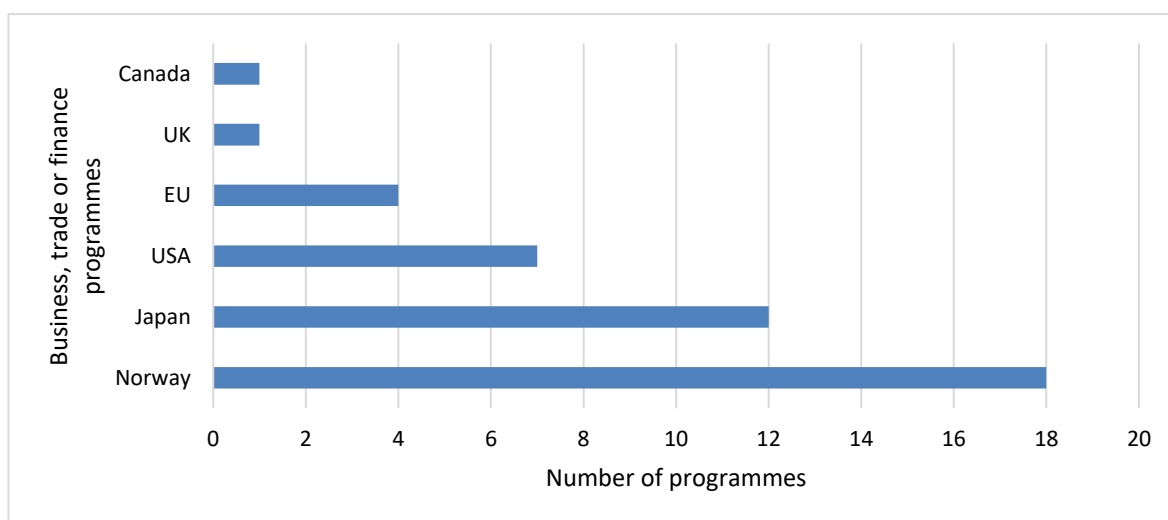
format, and offered to either private sector participants, government employees or members of the judicial branch.

These programmes often focus on specific themes, such as "JPO/IPR Training Course for Practitioners Specializing in Patents" offered to private sector practitioners in Myanmar, or "JPO/IPR Training Course on Anti-Counterfeiting Measures for Practitioners" offered to government officials of Cambodia, Myanmar, and Lao PDR.¹¹² Another example is a general distant learning training activity offered by USPTO's Global Intellectual Property Academy (GIPA) to around 30 LDCs.

2.2.5.2 Business, trade and finance

This section provides an overview of the 44 programmes related to trade, business and finance¹¹³ reported by six reporting Members. As shown in Figure 25, Norway was the leading provider, with 19 programmes, followed by Japan with 12, and US with seven. The EU reported four programmes. Canada and UK each reported one programme.

Figure 25: Programmes related to trade, business and finance by reporting Member



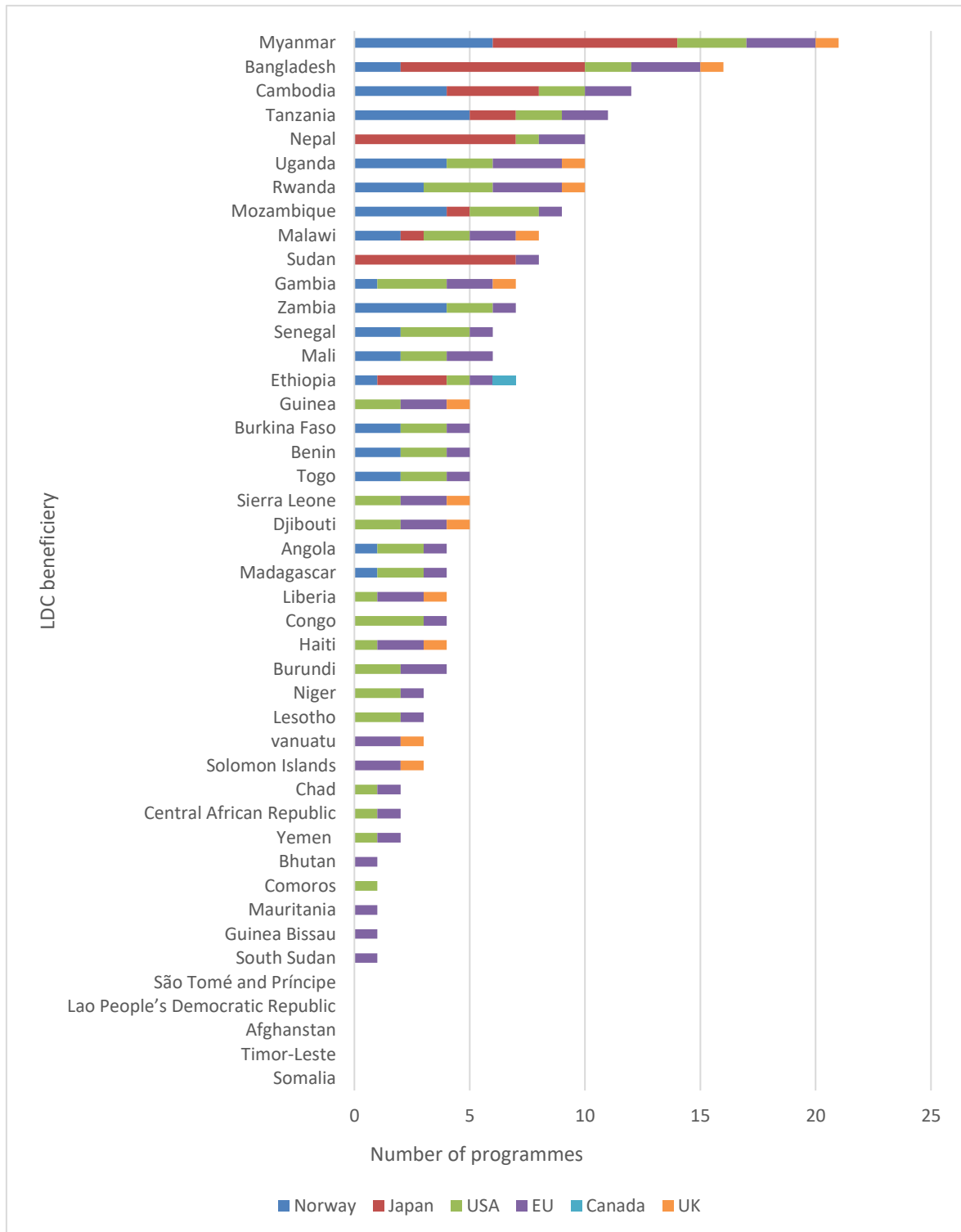
Source: Authors' calculations based on the reports submitted.

A total of 40 LDCs benefitted from at least one programme. As depicted in Figure 26, the leading beneficiaries were Myanmar, Bangladesh, Cambodia and Tanzania, with each benefiting from 11 to 21 programmes, whereas Rwanda, Uganda and Nepal benefitted from 10 programmes each. Four LDCs did not benefit from any programme: Afghanistan, Lao PDR, Somalia and Timor-Leste.

¹¹² WTO IP/C/W/656/Add.1 (n 23) p. 7.

¹¹³ Programmes falling within these three areas are discussed together because of the natural proximity between these areas as well as the fact that these programmes on the whole address more than one of these three areas at once.

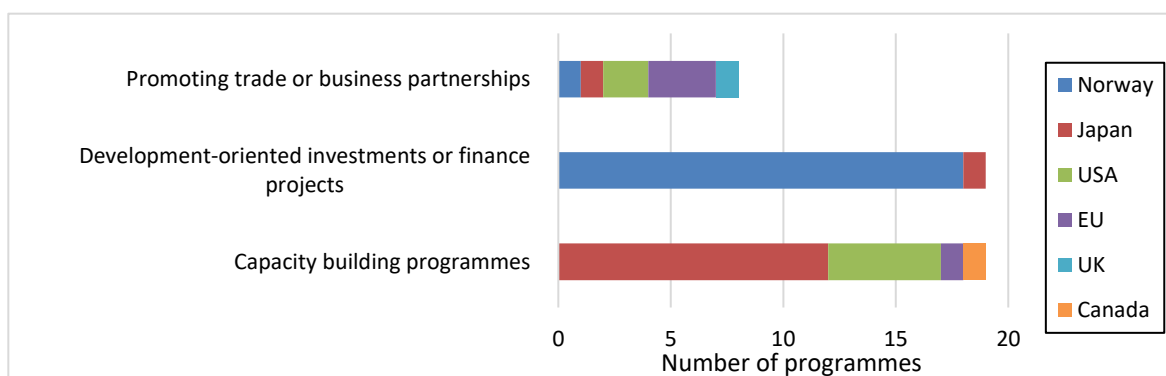
Figure 26: Programmes related to business, trade and finance by LDC beneficiary



Source: Authors' calculations based on the reports submitted.

As showed in Figure 27, these 44 programmes can be grouped in three categories: capacity building programmes; programmes encouraging private sector development projects (i.e. development-oriented investments or finance projects); and programmes predominantly focusing on promoting trade, public-private dialogue and partnerships, and/or creating business linkages between those based in reporting countries and beneficiary countries.

Figure 27: Programmes related to business, trade and finance by category



Source: Authors' calculations based on the reports submitted.

Capacity building programmes for awareness raising include events and summits. Programmes for private sector development-oriented finance and investments that include capacity building are counted as development-oriented finance and investments. Programmes for promoting trade and/or business partnerships which include grant or capacity building are counted under promoting trade and/or business partnerships.

Examples of programmes that focus on promoting state-level trade or business partnerships include the UK programme on Supporting Indian Trade and Investment for Africa (SITA Africa), funded by the Department for International Development (DFID) and implemented by the International Trade Centre (ITC).¹¹⁴ Other programmes and state-level frameworks for enhancing trade relations and/or supporting and facilitating trade and investment with beneficiary countries include the US Trade and Investment Framework Agreements (TIFA) reported – along with the Trade, Investment, and Development Cooperative Agreement with the five countries of the Southern African Customs Union (SACU) and bilateral agreements with several LDCs outside of Sub-Saharan Africa – to be collectively covering more than two dozen LDC beneficiaries.¹¹⁵

Examples of programmes for encouraging development-oriented investments or finance include Norway's Development Finance Institution-backed programmes. These are conducted in collaboration with companies or platforms dealing with development-oriented finance (such as AfricInvest Financial Inclusion Vehicle (FIVE) and ARISe-Norfinance AS). Said programmes offer assistance including in the form of risk capital and expertise in both microfinance and banking to a large number of LDC beneficiaries, including Angola, Zambia, Tanzania, Mozambique, Malawi, Madagascar, Rwanda, The Gambia, Uganda, Burkina Faso, Benin, Mali, Senegal, Togo, Cambodia, Bangladesh and Myanmar.¹¹⁶

Examples of capacity building programmes are Japan's Management training programmes for LDCs on Quality Problem Solving, Business Innovation and Organization Development, Management – including Corporate Management and Design Management – Eco Business Innovation, and Operational Management in the Service Industries. LDC beneficiaries to these programmes included Bangladesh, Cambodia, Myanmar, Nepal, Sudan, Tanzania, Ethiopia, Malawi, and Lao PDR.

2.2.5.3 Education and social Sciences

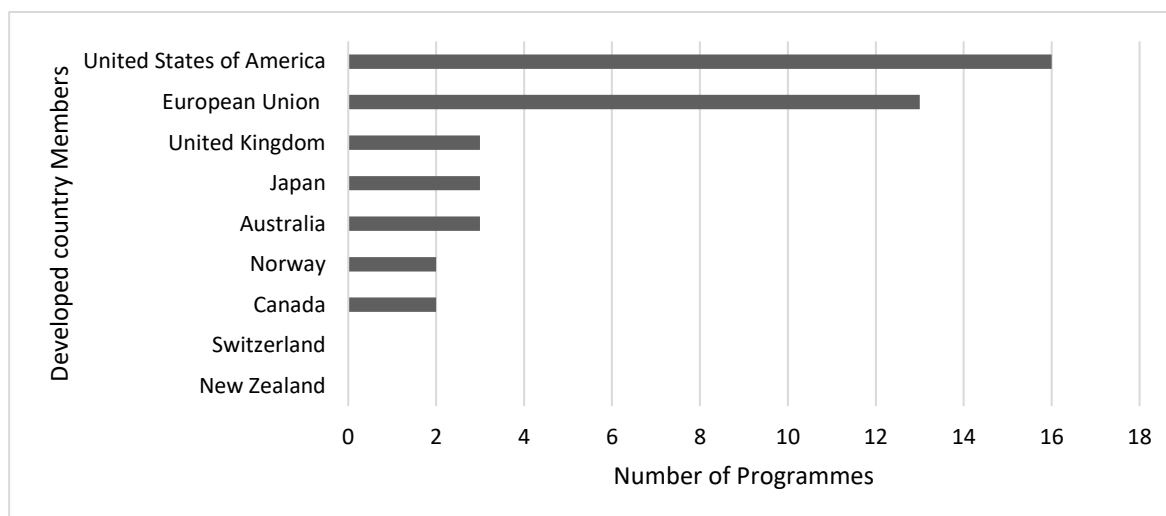
A total of 42 programmes were reported in the field of education and social sciences. As shown in Figure 28, the US (16) and EU (13) together account for two third or 69% of this total, while no programme was reported by Switzerland and New Zealand.

¹¹⁴ WTO IP/C/R/TTI/GBR/1 (n 38) p. 23.

¹¹⁵ WTO IP/C/R/TTI/USA/1 (n 21) p. 21.

¹¹⁶ WTO, Report on The Implementation of Article 66.2 of The TRIPS Agreement – Norway (10 October 2019), IP/C/W/656/Add.6, p. 13.

Figure 28: Programmes related to education and social sciences by reporting Member



Source: Authors' calculations based on the reports submitted.

For the purpose of this paper, these programmes were divided into five categories: technical and vocational education and training (TVET), educational projects, governance, migration and equal opportunities. Whereas TVET and educational projects belong to the education area, governance, migration and equal opportunities fall under the social sciences area.

Under TVET, programmes related to higher education, fellowships and other technical and vocational education were included. Under educational projects, programmes mainly included research projects. The category governance comprised programmes related to law enforcement, rule of law, and social justice, whereas the category migration included programmes related to trafficking and displacement of persons. The equal opportunities category focused on programmes related to diversity and labour conditions.

Figure 29 provides a breakdown of the programmes according to these categories. TVET leads with 40% of the programmes reported. Among the 17 TVET programmes, more than half (9 out of 17) were provided by the EU. One example is the EU Programme for Basic and Technical Education and Vocational Training in Mozambique, a labour market oriented vocational education targeting youth and women.¹¹⁷ Another example more focused on higher education is the Australia Awards scholarships funded by the Australian government to undertake study and research for the purpose of strengthening human resource development capacity, which benefitted at least 22 LDCs.¹¹⁸

Educational projects constitute the second largest category, comprising 21% of the reported programmes. Although the US provided most programmes in this category, one notable example is the Global Challenges Research Fund (GCRF) projects funded by the Engineering and Physical Sciences Research Council (EPSRC) reported by the UK.¹¹⁹ At least five LDCs benefitted from this programme.

Governance covers 17% of the programmes provided, of which with the US reporting most. The SAVABE project funded by the US Department of Labour (DOL) is a good example, offering educational and vocational training opportunities for the youth in Madagascar while addressing child labour issues.¹²⁰

Migration and equal opportunities cover 12% and 10% respectively of the programmes reported. Whereas the EU leads in the number of programmes related to migration, the US reported the majority of programmes related to equal opportunities. One migration programme example is the

¹¹⁷ WTO IP/C/W/646/Add.7 (n 26) p. 91.

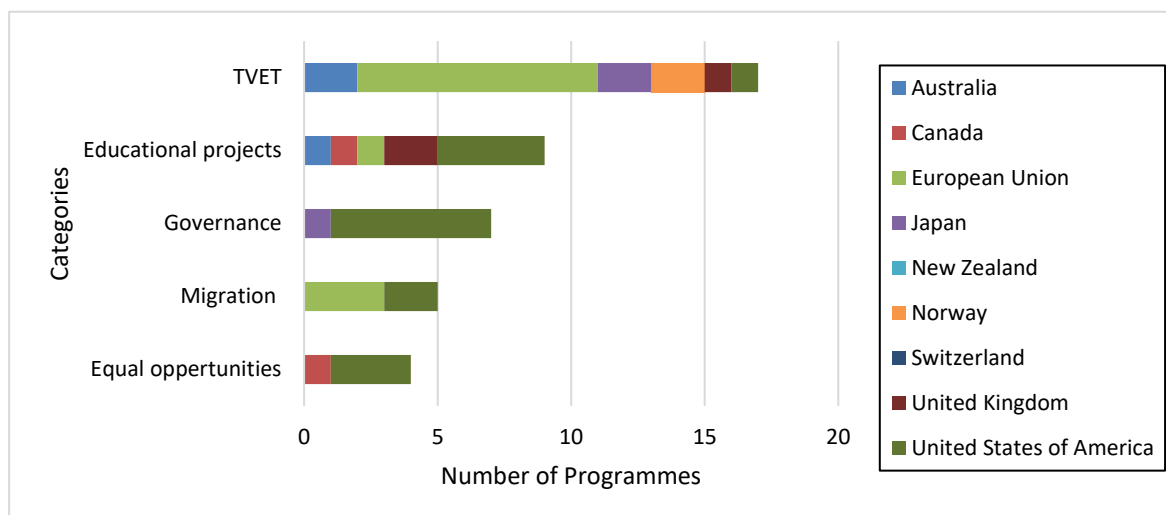
¹¹⁸ WTO IP/C/R/TTI/AUS/1 (n 27) p. 3. In addition to the 22 LDCs, two non-WTO affiliated LDCs, Kiribati and Tuvalu, were reported to also have benefitted from this programme.

¹¹⁹ WTO IP/C/R/TTI/GBR/1 (n 38) p. 34.

¹²⁰ WTO IP/C/R/TTI/USA/1 (n 21) p. 58.

Transnational Figurations of Displacement (TRAFIG), which is an EU-funded 2020 Horizon research and innovation project for developing tailored solutions to improve the living conditions of people affected by displacement.¹²¹ At least two LDCs benefitted from this programme.¹²² Canada's Empowerment of the Young Women of Ouagadougou and Guédiawaye programme is a notable example for creating equal opportunities in the labour market for women in Burkina Faso and Senegal.¹²³

Figure 29: Programmes related to education and social sciences by category



Source: Authors' calculations based on the reports submitted.

Figure 30 provides an overview of the number of programmes related to education and social sciences by LDC beneficiary as reported.

Three LDCs benefitted from 10 or more programmes: Myanmar (13), Nepal (10) and Ethiopia (10). These LDCs have each benefitted from programmes offered by six reporting Members.

At the other end of the scale, 25 LDCs benefitted from fewer than five programmes, and three LDCs, Sao Tome and Principe, Somalia and Timor-Leste, were not a beneficiary of any programmes.

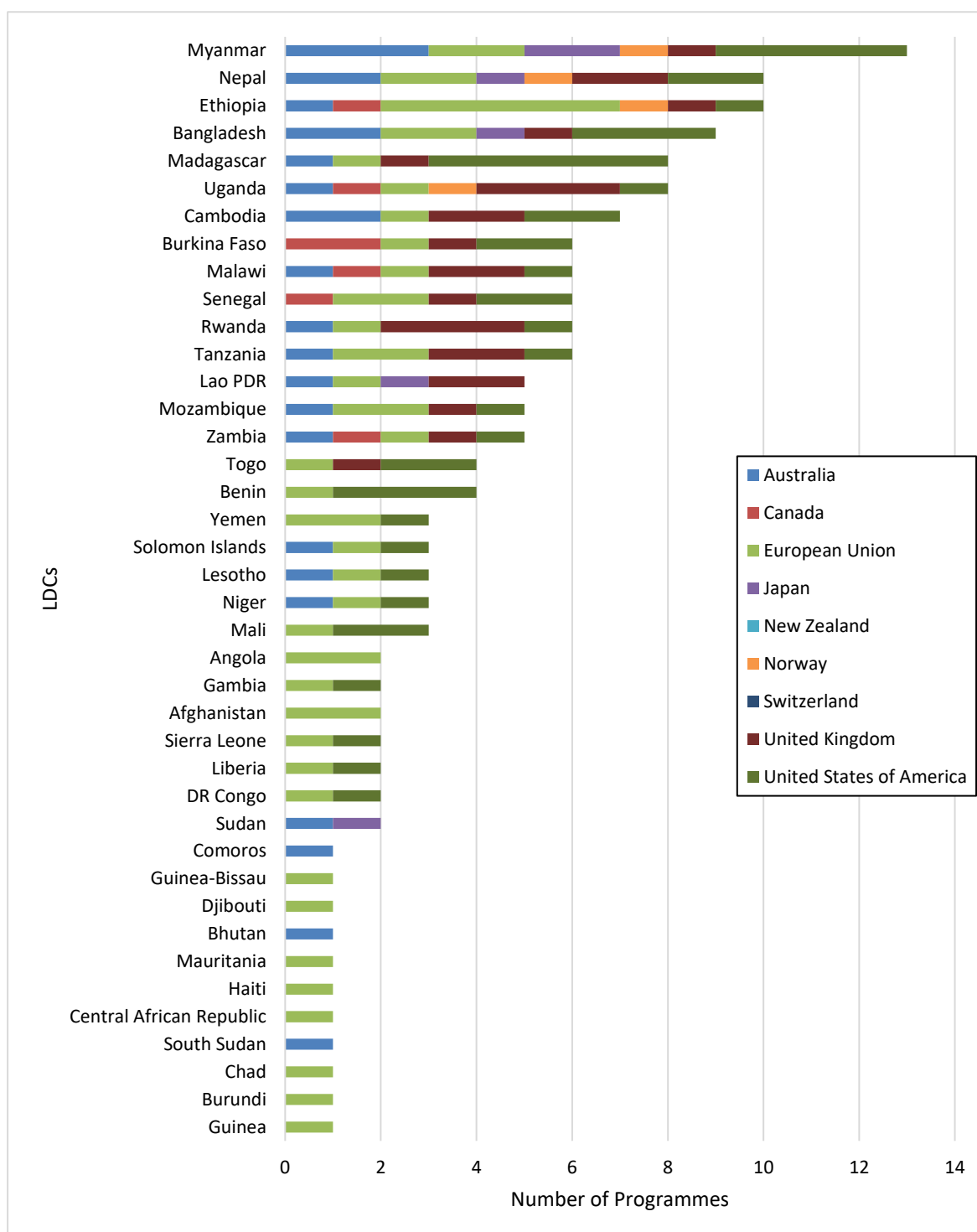
On geographical distribution, as can be seen in Figure 30, the programmes provided by Australia, EU and US were generally available across different continents. Canada's programmes mainly targeted the African region, whereas Japan's, Norway's and UK's programmes focused on both Southeast Asia and African region.

¹²¹ See <<https://trafig.eu/>>.

¹²² WTO IP/C/R/TTI/EU/1 (n 44) p. 38 and 48.

¹²³ WTO IP/C/R/TTI/CAN/1 (n 85) p. 4.

Figure 30: Education and social sciences programmes by LDC beneficiary



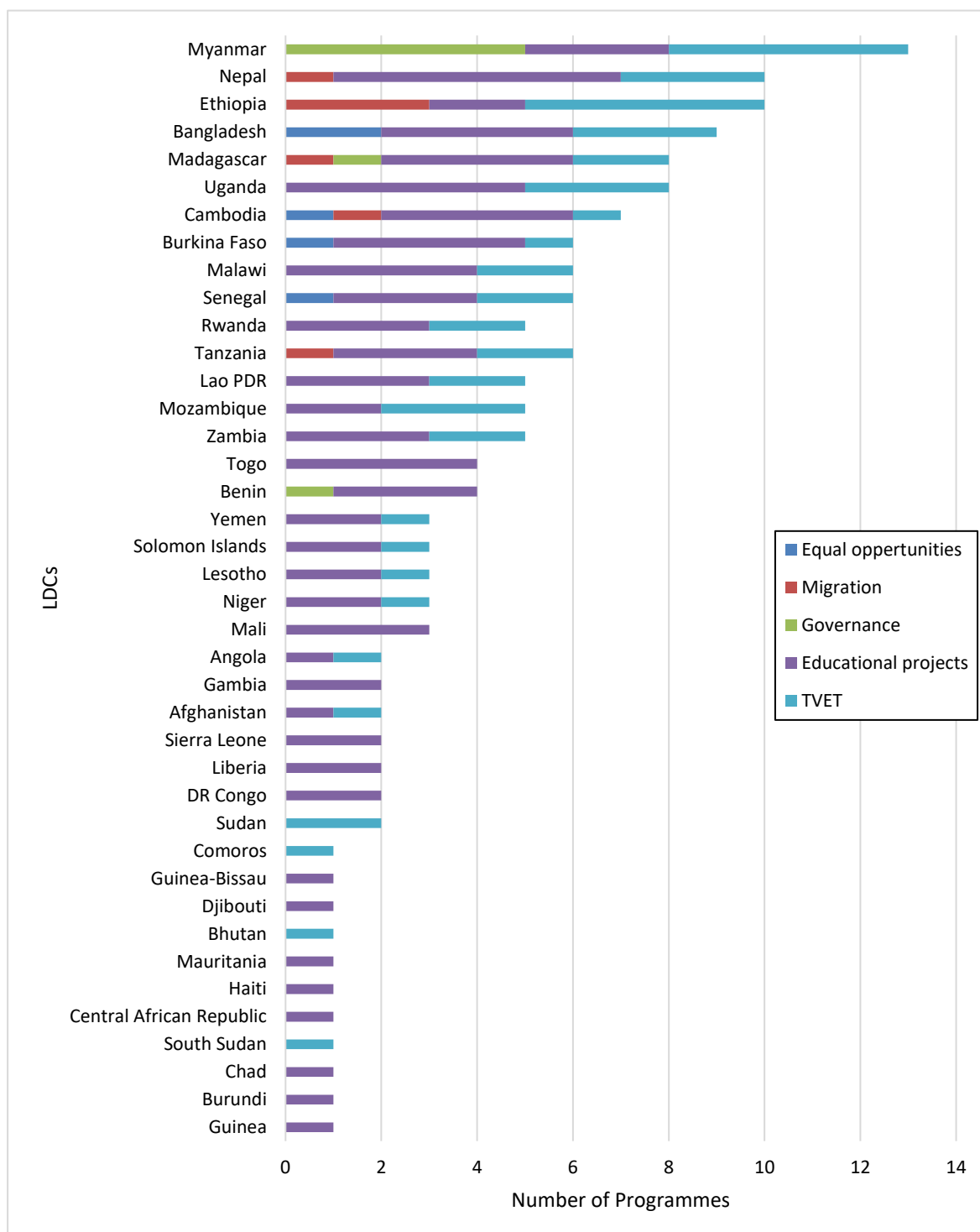
Source: Authors' calculations based on the reports submitted.

Figure 31 provides an overview of the number of programmes benefitted by each LDC in the five categories. Nepal has the highest number of programmes in the educational projects category, whereas Myanmar is the leading beneficiary in the governance category.

12 LDCs only benefitted from programmes in the educational projects category, four LDCs only benefitted from programmes in the TVET¹²⁴ category.

¹²⁴ Ethiopia and Myanmar each have five programmes in the TVET category.

Figure 31: Educational and social science programmes by category and LDC beneficiary



Source: Authors' calculations based on the reports submitted.

3 TRIPS COUNCIL'S ANNUAL REVIEW OF THE IMPLEMENTATION OF ARTICLE 66.2

From the adoption of the 2003 Decision to 2020, the TRIPS Council conducted a total of 18 reviews of the implementation of Article 66.2. These reviews continued to focus on two longstanding substantive issues, namely the lack of common understanding of the concepts of 'technology

transfer' and 'incentive',¹²⁵ and one procedural issue, namely the reporting format or template that developed country Members should use.

3.1 Concept of incentive

An "incentive" can be defined as "a reason that persuades parties to engage in certain conduct".¹²⁶ In the context of Article 66.2, such "conduct" would be the transfer of technology by enterprises and institutions in the territories of developed country Members. The "reason" however may potentially take on diverse forms, and Members have expressed a range of views on this point.

The EU argued that "[i]ncentives can [...] only take the form of encouragement, promotion and facilitation of projects which are part of a global and comprehensive approach to development."¹²⁷ Australia¹²⁸, Canada¹²⁹, New Zealand¹³⁰ and Switzerland¹³¹ indicated that incentives for technology and knowledge transfer as well as government funded research are usually provided in the form of official development assistance (ODA).

In addition to this, Canada recognized that "a variety of financial and non-financial incentives can exist [...] to facilitate the transfer of technology."¹³² When considering these two types of incentives, it should be noted that each type, by itself, can be provided in multiple forms.

Switzerland provided financial incentives through loans¹³³, financial assistance (grants) and export risk guarantees¹³⁴. Canada's financial incentives take the form of co-financing, tax incentives, insurance, as well as aid grant and loans.¹³⁵ Norway's financial incentives are presented in the form of pre-investment support¹³⁶ as well as equity investment.¹³⁷ Japan named financial and business environment support as incentive measures.¹³⁸

Capacity-building seems to be the most common form of non-financial incentives, but Canada¹³⁹ and Switzerland¹⁴⁰ also cite technical advice.

In 2018, the LDC Group circulated an illustrative list of possible incentives, including government funds, investment, risk insurance and tax exemption.¹⁴¹ Particularly, LDC Members identified foreign direct investment (FDI) as an incentive for technology transfer.¹⁴² Existing literature deemed particularly R&D related FDI as most effective for cross border knowledge transfer.¹⁴³

While Members shared their own understanding of what constitutes incentives, there was still little substantive discussion among Members in the TRIPS Council's review process over the years. Recently, the LDC Group raised concern over the lack of information on specific incentives introduced

¹²⁵ In their respective reports, a number of developed country Members have provided their own interpretation and understanding of the two concepts.

¹²⁶ The Legal Information Institute – [WEX](#).

¹²⁷ WTO IP/C/W/646/Add.7 (n 26) para. 2.5.

¹²⁸ WTO IP/C/R/TTI/AUS/1 (n 27) para. 5.

¹²⁹ WTO IP/C/R/TTI/CAN/1 (n 85) para. 4.

¹³⁰ WTO, 'Report on The Implementation of Article 66.2 of The TRIPS Agreement – New Zealand' (1 February 2021), IP/C/R/TTI/NZL/1, para. 6.

¹³¹ WTO IP/C/R/TTI/CHE/1 (n 28) para. 3.

¹³² WTO IP/C/R/TTI/CAN/1 (n 85) para. 4.

¹³³ To support private sector investments, see WTO IP/C/R/TTI/CHE/1 (n 28) para. 15.

¹³⁴ This is one of the instruments listed by Switzerland in its report, see WTO IP/C/R/TTI/CHE/1 (n 28) section 5.3, para. 22.

¹³⁵ WTO IP/C/R/TTI/CAN/1 (n 85) para. 4.

¹³⁶ This is mainly in the case of Norad. WTO IP/C/R/TTI/NOR/1 (n 25) para. 3.

¹³⁷ This concerns Norfund. WTO IP/C/R/TTI/NOR/1 (n 25) para. 14.

¹³⁸ WTO IP/C/R/TTI/JPN/1 (n 86) para. 2.

¹³⁹ WTO IP/C/R/TTI/CAN/1 (n 85) para. 4.

¹⁴⁰ WTO IP/C/R/TTI/CHE/1 (n 28) para. 14.

¹⁴¹ WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (13 September 2018), IP/C/M/89/Add.1 The LDC Group's draft containing an illustrative list of incentives was circulated to WTO Members as room document [RD/IP/24](#).

¹⁴² For example, FDI was mentioned by Nepal during the discussion at the 2023 Workshop.

¹⁴³ Amendolagine V, Chaminade C, Guimon J, Rabellotti R, 'Cross-Border Knowledge Flows through R&D FDI: Implications for Low- and Middle-Income Countries', in Taubman A and Watal J (Eds.), 'Trade in Knowledge: Intellectual Property, Trade and Development in a Transformed Global Economy' (2022) WTO/Cambridge University Press, p. 353, 356, and 357.

by developed country Members in their reports and the conflation of technical assistance programmes under Article 67 and technology transfer programmes under Article 66.2.¹⁴⁴ The Group also requested developed country Members to include in their respective reports more specific information on the incentives provided and their impact and evaluation as well as concrete contact information and website links for each incentives programme reported.¹⁴⁵ In response, the EU, for example, expressed its willingness to improve their reporting in that regard.¹⁴⁶ South Africa, in particular, has actively called for clarification on this and other related issues.¹⁴⁷

3.2 Concept of technology transfer

The concept of technology transfer contains two elements. The first, "technology", includes "tangible" or "hard" technology, such as hardware, machinery, and equipment, and "intangible" or "soft" technology, such as knowledge, skills, and human capital.¹⁴⁸ The second element, "transfer", concerns how technology is transmitted, for instance by the direct means of foreign direct investment (FDI) and licensing agreements,¹⁴⁹ or by the indirect means of education, training and sharing of know-how.¹⁵⁰

Indeed, the EU recognizes "that there are several types of technologies as well as several channels of transmission"¹⁵¹, and refers technology transfer to "the ways and means through which companies, individuals and organizations acquire technology or know-how from third parties [...]".¹⁵² According to Switzerland, "technology transfer includes a broad set of processes covering the flows of know-how, experience and equipment amongst different stakeholders."¹⁵³

Based on the reports, technology transfer may comprise: (i) the dissemination of knowledge, (technical and) business information, and intellectual property;¹⁵⁴ (ii) training, education and know-how;¹⁵⁵ (iii) the transfer of skills;¹⁵⁶ and (iv) the provision of physical objects or equipment.¹⁵⁷

Thus, technology transfer to LDCs under Article 66.2 is provided in both tangible and intangible form. It is only natural, however, that the transfer of tangible technology may be preferred over the transfer of intangible technology.¹⁵⁸ On the other hand, knowledge, in particular, has the characteristics of being "non-rivalrous"¹⁵⁹, "sticky"¹⁶⁰, and "integral to economic growth"¹⁶¹.

¹⁴⁴ At the March 2022 TRIPS Council meeting, the LDC Group therefore called for the organization of a separate workshop to monitor technical cooperation activities reported under Article 67, which could help avoid any reporting duplication. See WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (28 June 2022), IP/C/M/104/Add.1, para. 161.

¹⁴⁵ WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (17 February 2023), IP/C/M/106/Add.1, para. 172, and WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (25 May 2023), IP/C/M/107/Add.1, para. 153.

¹⁴⁶ WTO IP/C/M/107/Add.1 (n 144) para. 198.

¹⁴⁷ WTO IP/C/M/104/Add.1 (n 143) para. 200, and WTO IP/C/M/107/Add.1 (n 144) para. 213.

¹⁴⁸ Fox DM, '[Technology Transfer and the TRIPS Agreement, are Developed Countries meeting their end of the bargain?](#)' (2019) 10 *Hastings Sci. & Tech. L.J.* 1 accessed 3 December 2021.

¹⁴⁹ *ibid.*

¹⁵⁰ Singh Vishnoi A, Meena R, '[Technology Transfer at the WTO: Old Promises and New Hopes of the Developing World](#)' (2021) *Global Trade and Customs Journal*, Vol. 16, Issue 7&8, p. 344 accessed 3 December 2021.

¹⁵¹ WTO IP/C/W/646/Add.7 (n 26) para. 2.2.

¹⁵² WTO IP/C/W/646/Add.7 (n 26) para. 2.1.

¹⁵³ WTO IP/C/R/TTI/CHE/1 (n 28) para. 3.

¹⁵⁴ WTO IP/C/R/TTI/AUS/1 (n 27) para. 3; WTO IP/C/R/TTI/CAN/1 (n 85) para. 5.

¹⁵⁵ WTO IP/C/R/TTI/AUS/1 (n 27) para. 3; WTO IP/C/R/TTI/NZL/1 (n 129) para. 2.

¹⁵⁶ WTO IP/C/R/TTI/CAN/1 (n 94) para. 5; WTO IP/C/W/646/Add.7 (n 26) para. 2.2; WTO IP/C/R/TTI/NZL/1 (n 129) para. 2.

¹⁵⁷ WTO IP/C/W/646/Add.7 (n 26) para. 2.2; WTO IP/C/R/TTI/NZL/1 (n 129) para. 2.

¹⁵⁸ Taubman A (n 56) p. 786.

¹⁵⁹ Taubman A (n 56) p. 773 and 780.

¹⁶⁰ Branstetter L, Maskus KE, 'Global Knowledge Flows, Absorptive Capacity and Capability Acquisition: Old Ideas, Recent Evidence and New Approaches', in Taubman A and Watal J (Eds.), 'Trade in Knowledge: Intellectual Property, Trade and Development in a Transformed Global Economy' (2022) WTO/Cambridge University Press, p. 406.

¹⁶¹ Taubman A (n 56) p. 775.

3.3 Reporting format

Reporting Members used various formats, including the 2003 Decision, the format proposed by the LDC Group in 2011¹⁶² (which guided the current e-TRIPS submission system), and the format proposed by the LDC Group in 2020¹⁶³. Most reporting Members used the e-TRIPS format between 2018 and 2020.

It should be noted that there are no substantive differences between the information required by the LDC Group in its proposed formats and the information required by the 2003 Decision. The LDC Group pointed out that the new format is aimed at simplifying the reporting process, coordinating the current reporting formats, and acknowledging the substantive contributions of developed country Members.¹⁶⁴

4 WTO ANNUAL WORKSHOPS ON THE IMPLEMENTATION OF ARTICLE 66.2 AND SURVEY ON THE NEEDS AND PRIORITIES OF LDCs FOR TECHNOLOGY TRANSFER

Since 2008, at the request of the LDC Group, the WTO Secretariat has organized annual Workshops on the implementation of Article 66.2 aiming to enable LDC Members to analyse the annual reports submitted by developed country Members and to promote informal dialogue and coordination between developed country and LDC Members. This informal dialogue helps to lay the groundwork for a more productive and focused discussion in the TRIPS Council's review process by uncovering key substantive issues, identifying differing perspectives, and promoting a more inclusive exchange of ideas. Both LDC and developed country Members confirmed the usefulness of these annual Workshops as a unique forum for focused and constructive discussion.¹⁶⁵

For the past five years, one significant groundwork laid in the informal dialogue involves the development of a survey on the needs and priorities of LDCs for technology transfer. During the Council's annual reviews, reporting Members often encouraged LDCs to identify which fields of technology best serve their development needs, suggesting that this would help them carry out their obligations more effectively. In turn, LDCs requested the WTO Secretariat's assistance to help them identify needs and priorities for technology transfer. Hence, a survey on the needs and priorities of LDCs for technology transfer was developed as an optional form of such assistance and as part of the annual Workshops.

As of March 2023, the Secretariat conducted a total of three rounds of survey, which eventually rendered responses from 18 LDCs.¹⁶⁶ The responses were compiled and presented to Members in the TRIPS Council's meeting.¹⁶⁷

Surveyed LDCs were first asked to identify priority technology fields and specific technology needs for their countries in developing a sound and viable technological base. They were then asked what incentives presented in the Article 66.2 reports they saw as most relevant to the identified technology fields, and which enterprises and institutions had actually facilitated technology transfer to LDCs. Finally, they were asked to share their overall assessment on technology transfer, including lessons learned and their advice.

¹⁶² WTO, 'Proposed format for reports submitted by the developed country Members under Article 66.2' (6 October 2011), IP/C/W/561.

¹⁶³ WTO, 'Proposed new template for annual reporting under Article 66.2 of the TRIPS Agreement' (17 July 2020), IP/C/W/664.

¹⁶⁴ WTO IP/C/M/94/Add.1 (n 14).

¹⁶⁵ WTO IP/C/M/107/Add.1 (n 144) paras. 145, 159, 163, 193, 199, and 208.

¹⁶⁶ Responses were received from Angola, Bangladesh, Benin, Burkina Faso, Cambodia, Guinea, The Gambia, Haiti, Lao PDR, Lesotho, Liberia, Madagascar, Mali, Myanmar, Nepal, Senegal, Togo and Zambia.

¹⁶⁷ WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (25 May 2023), IP/C/M/107/Add.1. A note is circulated as a room document at the meeting. WTO, 'Summary of Responses to Survey on LDCs Needs and Priorities for Technology Transfer, Note by the Secretariat' (7 March 2023), RD/IP/52.

4.1 LDCs' needs and priorities for technology transfer

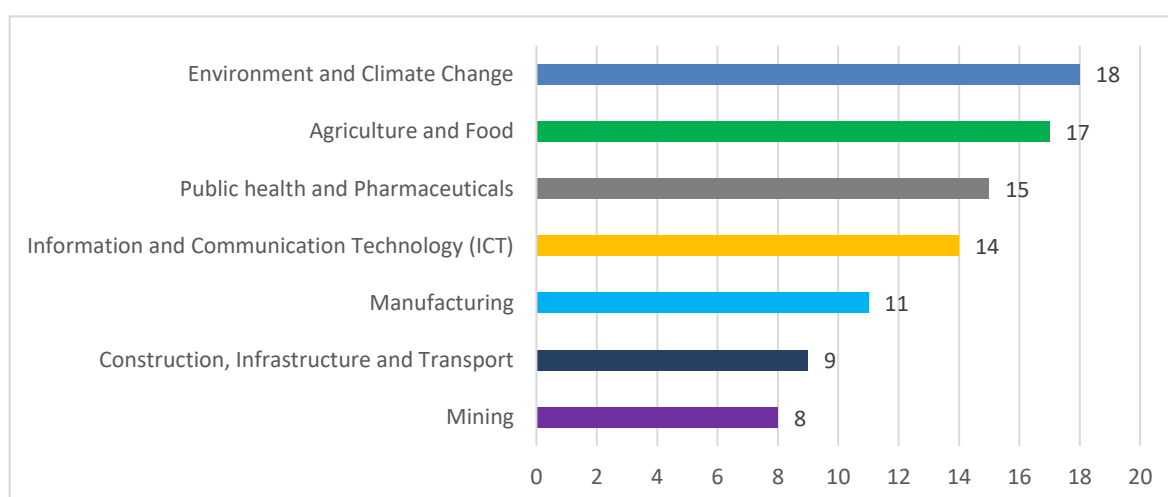
18 LDCs identified environment and climate change as a priority technology field, and out of these, Zambia, Bangladesh, Senegal and Cambodia, were the recipient of 20 or more environment and climate change programmes as noted in section 2.2.2.

The next most frequently cited was agriculture and food, which was identified by 17 LDCs, and among these, four received at least 10 agriculture programmes: Myanmar, Cambodia, Bangladesh and Nepal as highlighted in section 2.2.1.

Public health and pharmaceuticals were identified by 17 surveyed LDCs as a priority field, but only Senegal and Zambia were the beneficiaries of 20 or more health-related programmes as indicated in section 2.2.4.

As for ICT, Zambia was the leading beneficiary among the 14 surveyed LDCs, with 27 programmes as indicated in section 2.2.3. Less common technology fields were manufacturing, construction, infrastructure, and transport, as well as mining (see Figure 32).

Figure 32: Technology needs and priorities (technology field) identified in the survey



Source: Authors' calculations based on the reports submitted.

The top four priority technology fields identified in the survey were therefore consistent with those reported by the LDC Group in February 2020. Such consistency was also apparent in the programmes reported by developed country Members in 2018-2020. To facilitate informal dialogue on these four priority technology fields, the structure and format of the Workshops organized from 2021 to 2023 were tailored accordingly.¹⁶⁸

Surveyed LDCs further indicated their specific technology needs per field. For environment and climate change, these were clean/renewable energy generation, wastewater treatment and biodiversity conservation; for agriculture and food, these were food production/preservation, agriculture infrastructure, and fisheries; for public health, these were the establishment of public health care systems, R&D and health information systems; and for ICT, wireless telecommunications, computer programming and cybersecurity technology were pinpointed as priority needs (see Figure 33).

¹⁶⁸ WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (30 July 2021), IP/C/M/98/Add.1, para. 158.

Figure 33: Technology needs and priorities (specific technology needs) identified in the survey



Source: Authors' calculations based on the reports submitted.

As elaborated in section 2.2, the majority of programmes reported were related to renewable energy, crop productivity/food security, health care systems, and ICT infrastructure. Hence, a correlation does seem to exist between the specific technology needs identified in the survey and the programmes reported by developed country Members, particularly in the fields of public health, agriculture and food, and environment and climate change.

In addition to these technology needs and priorities, LDC Members recognize the importance of human capital and absorptive capacity. For technology transfer to be successful, indeed, it would not only require the active cooperation of Members, but also an investment in absorptive capacity of LDCs.¹⁶⁹ However, such investment poses a challenge for LDCs. In response, Switzerland, for example, confirmed that many of their programmes reported under Article 66.2 address this aspect.¹⁷⁰

¹⁶⁹ Branstetter L, Maskus KE (n 159) p. 406.

¹⁷⁰ WTO IP/C/M/107/Add.1 (n 144) para. 177.

Another aspect is the adaptation of technology to local conditions.¹⁷¹ Due to the diversity of technology transfer needs and priorities, LDC Members called for a more targeted approach, highlighting the importance to understand the domestic circumstance of individual LDCs and to establish a dialogue at national level¹⁷² for coordination and absorption of technology and knowledge flows.

In response, developed country Members insisted that their incentives programmes should be demand-driven¹⁷³ and based on self-identified¹⁷⁴ technology needs of LDCs. One example presented of programmes reported under Article 66.2 that has been tailored and adapted is the US International Visitor Leadership Programme (IVLP).¹⁷⁵ Another example is EU's flagship Horizon framework programme.¹⁷⁶

LDC Members also indicated that follow up is lacking, which is particularly crucial to ensure sustainable development. LDC Members further called for the WTO Secretariat to use the information from the survey as well as discussions at the Workshops and during the TRIPS Council's review, for the development of technical assistance programmes under Article 66.2.¹⁷⁷ These programmes may be developed in collaboration with other relevant international organizations, and interested LDCs could in fact make such request directly to the Secretariat.

4.2 Most relevant incentives for technology transfer

On the types of incentives reported, 15 surveyed LDCs deemed government sponsored and funded joint R&D activities as most relevant (see Figure 34). The illustrative list of possible incentives circulated by the LDC Group also included government funded R&D (alongside the issuance of government technology licenses).¹⁷⁸ As previously observed, this type of incentives was particularly predominant in the field of public health and pharmaceuticals.

Business environment support and official government development cooperation programmes were both deemed most relevant by 13 LDCs. Interestingly, the survey resulted in tax incentives and risk guarantees as ranking lowest, even though both were mentioned as possible incentives in the illustrative list.¹⁷⁹

In addition, some LDCs also highlighted the need for other incentives, including human resource capacity building; transfer of technical knowledge and know-how; sufficient structured assessment of technology transfer and technology needs; establishment of a synergy between private sectors; integration of technology transfer objectives and measures into national strategy and policy; increasing national production capacity; and raising awareness of technology transfer; IP protection of innovations and technical assistance on IP for government and the public; and subsidizing industrial modernization and investing in technology-based medium and large industries.

One specific suggestion is to use databases containing patent documents and non-patent information, such as through WIPO Technology and Innovation Support Centres, as a basis for further research and innovation.

LDCs also cited a range of government agencies, institutions, companies and funds as technology providers, notably from Australia, Canada, EU, Norway, Switzerland, UK and US.¹⁸⁰ Most technology

¹⁷¹ Branstetter L, Maskus KE (n 159) p. 408.

¹⁷² WTO IP/C/M/107/Add.1 (n 144) para. 198.

¹⁷³ WTO IP/C/M/107/Add.1 (n 144) para. 208.

¹⁷⁴ WTO IP/C/M/107/Add.1 (n 144) para. 190.

¹⁷⁵ At a recent annual Workshop, the US presented the IVLP as an example for adapting and tailoring the programme to LDCs' priority needs. In 2018-2020, the US reported on two IVLPs benefiting four LDCs, see WTO IP/C/R/TTI/USA/1 (n 21) p. 8 and 16.

¹⁷⁶ WTO IP/C/M/107/Add.1 (n 144) para. 196.

¹⁷⁷ WTO IP/C/M/107/Add.1 (n 144) paras. 154 and 168.

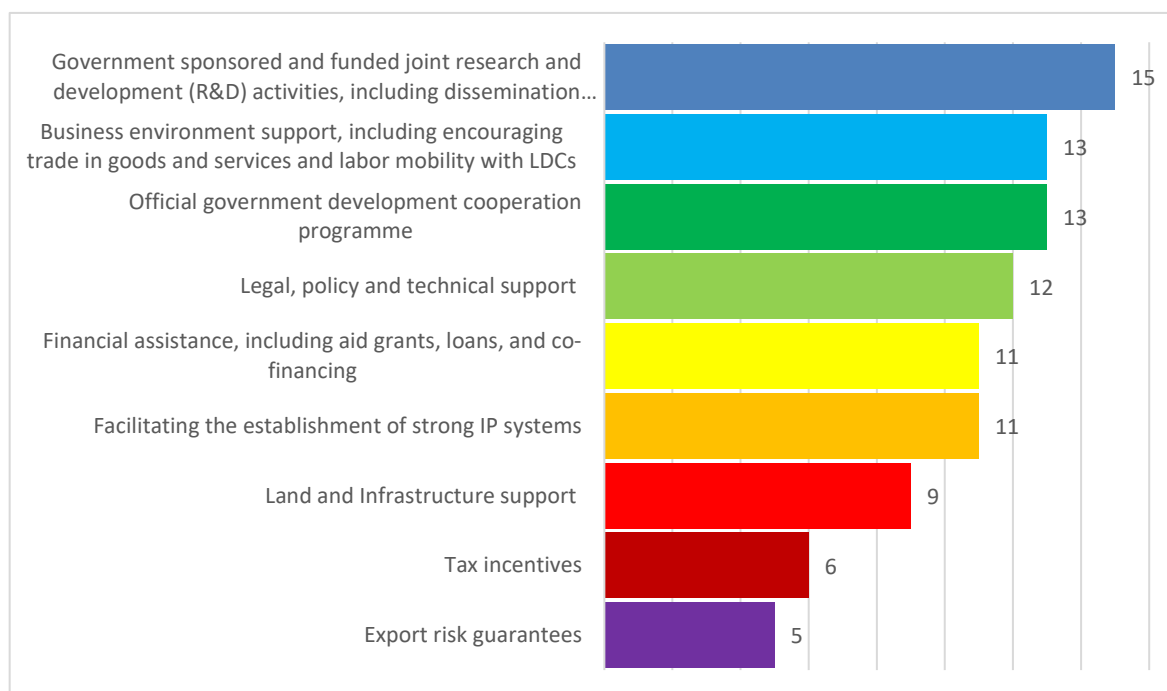
¹⁷⁸ WTO IP/C/M/89/Add.1 (n 141).

¹⁷⁹ WTO IP/C/M/89/Add.1 (n 141).

¹⁸⁰ Australia: Green Climate Fund (GCF), ABA Bank, Department of Foreign Affairs and Trade, Department of Agriculture and Water Resources; Canada: Global Affairs Canada; EU: GIZ, PTB, BGR, EC DG Research and Innovation; Norway: Norwegian Agency for Development Cooperation (Norad), Norwegian Investment Fund for Developing Countries (Norfund); Switzerland: Swiss Agency for Development and Cooperation (SDC), Consultative Group on International Agricultural Research (CGIAR), Private Infrastructure Development Group (PIDG), Swiss Federal Institute of Intellectual Property, World Bank Group (IBRD/IFC),

providers are indeed government agencies that work with numerous partners in various fields to provide development assistance through a range of projects, programmes, and initiatives.¹⁸¹

Figure 34: Types of Incentives deemed most relevant



Source: WTO, 'Minutes of Meeting of the Council for Trade-Related Aspects of Intellectual Property Rights' (25 May 2023), IP/C/M/107/Add.1¹⁸²

5 REFLECTIONS ON FUTURE WORK

Despite the previously mentioned accomplishments, LDCs still have concerns over whether developed country Members are meeting their obligations, and whether the reporting and review mechanisms established in the 2003 Decision are effective enough in monitoring the implementation of the obligation. In particular, the above-mentioned longstanding substantive issues and procedural issue have been repeatedly raised by Members in the TRIPS Council's discussion during the period of 2018 to 2020.

On the substantive issue related to the two concepts, given that there is no common understanding of these concepts even among the reporting Members, it seems unlikely for the reporting Members and LDCs to reach any agreement in the near future. Thus, while acknowledging different views, Members may focus on these common elements, which can constitute a starting point for future discussion.

For example, over the past years, LDCs have provided some positive feedback on several incentives mentioned in the Article 66.2 reports and proposed an illustrative list of "incentives". While discussing these relatively abstract concepts, Members may investigate actual and concrete incentives and technology transfer projects presented in the Article 66.2 reports, particularly those that they believe go in the right direction and can be a good model for future reports.

Further, it may also be helpful for the LDCs to continue to identify areas of priority for technological development, which would best satisfy their development needs. These self-identified technological priorities should help developed country Members in carrying out their obligations more effectively,

Helvetas; UK: Foreign Commonwealth and Development Office; US: USPTO, USTR, USAID, Guinea Bauxites Company (CBG), University of Miami, CDC.

¹⁸¹ WTO IP/C/R/TTI/CAN/1 (n 85) paras. 10-11.

¹⁸² WTO IP/C/M/107/Add.1 (n 167) .

and should ensure a better match between technology transfer incentives and programmes, and the needs and priorities identified by individual LDCs.

On the reporting format issue, reporting Members and LDCs do share a common interest. A well-designed reporting format would facilitate the work of reporting Members as they collect vast amounts of heterogeneous information from numerous government agencies in their jurisdictions, and it would also facilitate the LDCs seeking to absorb and analyse the reported information and to provide timely and effective feedback. Therefore, the reporting Members and LDCs should be able to find a win-win solution to make effective use of the transparency mechanism.

In addition, further work may be needed to update and extend the identification of LDCs' needs and priorities for technology transfer, to reinforce the correspondence between technology transfer programmes provided and these needs and priorities, and to ensure more systematic matching. In particular, LDCs may consider specifying the technical assistance to conduct assessments of the existing level of human capital and absorptive capacity in their identified priority fields of technology, as part of a targeted approach to programmes provided and reported under Article 66.2. The strengthening of human capital and absorptive capacity in a particular technological field as such could enable LDCs to develop a specialization and ensure sustained impact from technology transfer.¹⁸³ LDCs may further reflect on how best to develop a national policy framework most conducive to technology transfer, perhaps in the form of "a combination of financial, regulatory and soft instruments".¹⁸⁴

When looking back at the negotiations and the implementation of Article 66.2, one lesson learnt is that LDCs' active engagement and developed country Members' positive responses to LDCs' concerns are indispensable for delivering on the expectations of the TRIPS negotiators, the effective implementation of the 2003 Decision, and the implementation of Article 66.2 itself in the interests of LDC Members. This active engagement and the development of a positive feedback loop are driven by Members' goodwill and a shared objective of enabling LDCs to establish sound and variable technological bases, facilitated through formal and informal dialogue and the sharing of information in the TRIPS Council itself and in the settings of annual Workshops. These will be all essential ingredients for the successful implementation of the TRIPS Agreement for the economic and social development of LDCs, with the ultimate aim of contributing to the achievement of the UN SDGs by 2030.

At the time of writing, multiple Members have submitted proposals aimed at revitalizing discussions on technology transfer within various WTO bodies. For instance, South Africa, on behalf of the African Group, proposed to reinvigorate the discussions on trade and technology transfer in the Working Group on Trade and Transfer of Technology, Committee on Trade and Development, and the TRIPS Council.¹⁸⁵ India also proposed to discuss the relationship between trade and transfer of environmentally sound technologies to developing countries in the TRIPS Council, Working Group on Trade and Transfer of Technology, and Committee on Trade and Environment.¹⁸⁶ The issues being discussed in the broader context of technology transfer will have relevance for or connect with the discussion on the implementation of Article 66.2. At the same time, the effective implementation of Article 66.2 will not only yield benefits in its own right but also offer valuable insights and experience applicable to ongoing broader discussions on technology transfer in other WTO fora.

¹⁸³ Taubman A (n 56) p. 794.

¹⁸⁴ Amendolagine V, Chaminade C, Guimon J, Rbellotti R (n 56) p. 370.

¹⁸⁵ WTO, 'The Role of Transfer of Technology in Resilience Building: Reinvigorating the Discussions in the WTO on Trade and Transfer of Technology' (5 July 2023), WT/GC/W/883, WT/WGTTT/W/34/Rev.1, WT/COMTD/W/277, IP/C/W/700.

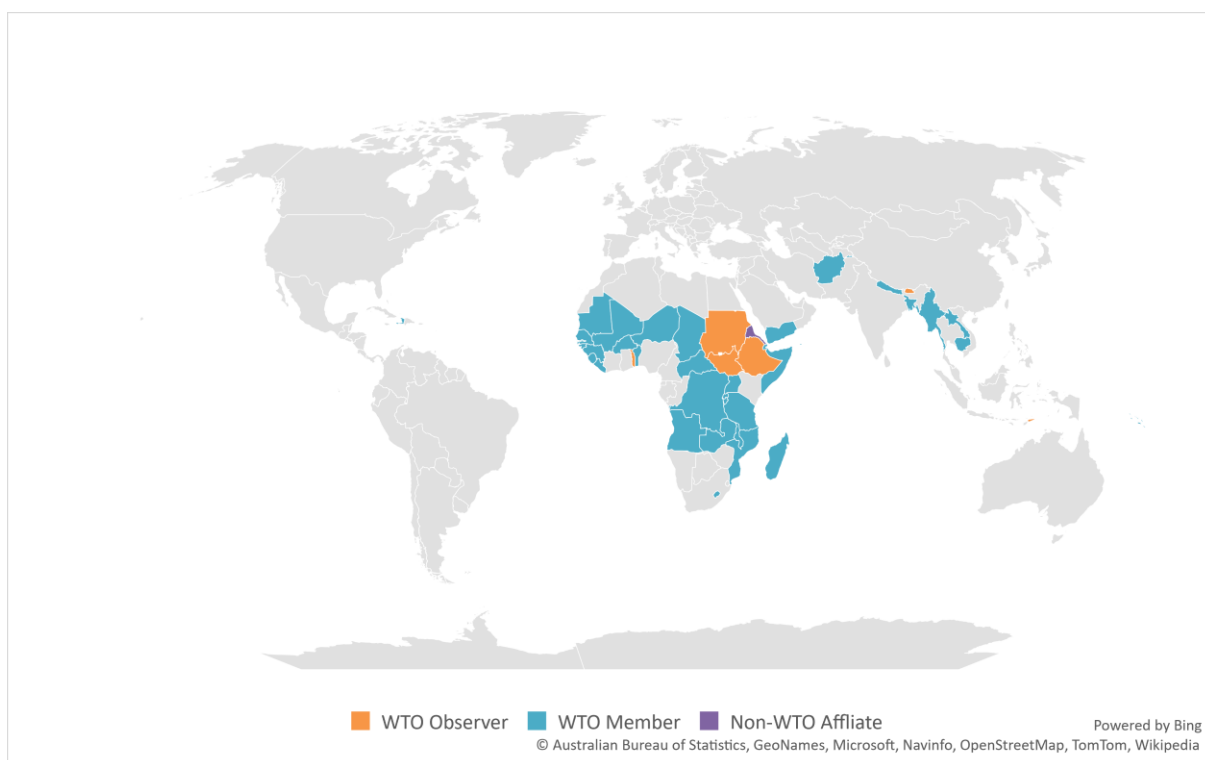
¹⁸⁶ WTO, 'Reinvigorating Discussions on the Relationship between Trade and the Transfer of Environmentally Sound Technologies to Developing Countries to Address Climate Change' (11 October 2023), JOB/WGTTT/2, JOB/IP/70, JOB/TE/82.

ANNEX: LIST OF CURRENT WTO LDC MEMBERS AND OBSERVERS

In 1971, the United Nations (UN) established the LDC category to recognize the special support measures these countries require for their socio-economic development. To be classified as an LDC, a country must meet three criteria related to income, human assets, and vulnerability, as well as agree to such classification. At the time of writing, there are 46 LDCs of which 35 are WTO Members and eight WTO Observers. Three LDCs are not affiliated with the WTO but are full UN Members nonetheless.¹⁸⁷

Figure 35 is a map to reflect the regional distribution of the 46 LDCs as well as their WTO affiliation. There are 33 LDCs in Africa, nine in Asia, three in the Pacific region, and one in the Caribbean region.

Figure 35: Map of LDC Members and Observers



Source: Authors' compilation based on UN and WTO LDC Membership records.

The below table provides a comprehensive overview of these LDCs and identifies the area each LDC has benefitted most from programmes and by which reporting Member.

At the time of writing, seven LDCs are scheduled to graduate from the LDC category as per their respective UN General Assembly resolution. Bhutan, a WTO observer, would be the first to graduate by end of 2023. Angola, Sao Tome and Principe and Solomons Islands are scheduled to graduate in 2024, and Bangladesh, Lao PDR and Nepal in 2026. At the WTO, the LDC Group called for positive action on graduation and put forward several proposals in that regard.¹⁸⁸

LDC	LDC classification (expected graduation)	WTO Affiliation	Field of technology:	Reporting Member:
Afghanistan	1971	Member: 29 July 2016	Environment	EU
Angola	1994 (12 Feb 2024)	Member: 23 Nov 1996 (GATT: 8 April 1994)	ICT	EU
Bangladesh	1975 (24 Nov 2026)	Member: 1 Jan 1995 (GATT: 16 Dec 1972)	Environment	US
Benin	1971	Member: 22 Feb 1996 (GATT: 12 Sep 1963)	Environment, Health	EU

¹⁸⁷ These are Eritrea, Kiribati and Tuvalu.

¹⁸⁸ See https://www.wto.org/english/tratop_e/devel_e/graduation_ldc_status_e.htm.

Bhutan	1971 (13 Dec 2023)	Observer: 6 Oct 1999	Environment, IP	EU
Burkina Faso	1971	Member: 3 June 1995 (GATT: 3 May 1963)	Environment	EU
Burundi	1971	Member: 23 July 1995 (GATT: 13 Mar 1965)	ICT	EU
Cambodia	1991	Member: 13 Oct 2004	IP	Japan
Central African Republic	1975	Member: 31 May 1995 (GATT: 3 May 1963)	ICT	EU
Chad	1971	Member: 19 Oct 1996 (GATT: 12 July 1963)	Health	EU, Switzerland
Comoros	1977	Observer: 9 Oct 2007	Environment	EU
DR Congo	1991	Member: 1 Jan 1997	Health	EU
Djibouti	1982	Member: 31 May 1995 (GATT: 16 Dec 1994)	Business	EU
Eritrea	1994	---	Health	EU, US
Ethiopia	1971	Observer: 10 Feb 2003	Agriculture	EU
The Gambia	1975	Member: 23 Oct 1996 (GATT: 22 Feb 1965)	Health, Business	EU
Guinea	1971	Member: 23 Oct 1995 (GATT: 8 Dec 1994)	ICT	EU
Guinea-Bissau	1981	Member: 31 May 1995 (GATT: 17 Mar 1994)	ICT, Business	EU
Haiti	1971	Member: 30 Jan 1996 (GATT: 1 Jan 1950)	Environment	EU
Kiribati	1986	---	ICT	Australia
Lao PDR	1971 (24 Nov 2026)	Member: 2 Feb 2013	IP	Japan
Lesotho	1971	Member: 31 May 1995 (GATT: 8 Jan 1988)	Environment	EU
Liberia	1990	Member: 14 July 2016	Health	EU
Madagascar	1991	Member: 17 Nov 1995 (GATT: 30 Sep 1963)	Environment	EU
Malawi	1971	Member: 31 May 1995 (GATT: 28 Aug 1964)	Environment	EU
Mali	1971	Member: 31 May 1995 (GATT: 11 Jan 1993)	Health	EU
Mauritania	1986	Member: 31 May 1995 (GATT: 30 Sep 1963)	ICT	EU
Mozambique	1988	Member: 26 Aug 1995 (GATT: 27 July 1992)	Environment	EU
Myanmar	1987	Member: 1 Jan 1995 (GATT: 29 July 1948)	IP	Japan
Nepal	1971 (24 Nov 2026)	Member: 23 April 2004	Environment	Japan
Niger	1971	Member: 13 Dec 1996 (GATT: 31 Dec 1963)	ICT	EU
Rwanda	1971	Member: 22 May 1996 (GATT: 1 Jan 1966)	ICT	EU
São Tomé and Príncipe	1982 (13 Dec 2024)	Observer: 26 May 2005	Health, ICT	EU, Switzerland
Senegal	2000	Member: 1 Jan 1995 (GATT: 27 Sep 1963)	Environment, Health	EU
Sierra Leone	1982	Member: 23 July 1995 (GATT: 19 May 1961)	Health	EU
Solomon Islands	1991 (13 Dec 2024)	Member: 26 July 1996 (GATT: 28 Dec 1994)	ICT	Australia
Somalia	1971	Observer: 7 Dec 2016	Agriculture, Environment, Health	EU, Norway, Switzerland
South Sudan	2012	Observer: 13 Dec 2017	Environment	EU
Sudan	1971	Observer: 25 Oct 1994	ICT	EU
Timor-Leste	2003	Observer: 7 Dec 2016	Health	Australia
Togo	1982	Member: 31 May 1995 (GATT: 20 Mar 1964)	ICT	EU, US
Tuvalu	1986	---	ICT	Australia
Uganda	1971	Member: 1 Jan 1995 (GATT: 23 Oct 1962)	Health	EU
Tanzania	1971	Member: 1 Jan 1995 (GATT: 9 Dec 1961)	Health	EU
Yemen	1971	Member: 26 June 2014	Education	EU, US
Zambia	1991	Member: 1 Jan 1995 (GATT: 10 Feb 1982)	ICT	EU

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