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## Article

# Investigating the influence of tourism on economic growth and climate change: The case of Croatia

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# Investigating the Influence of Tourism on Economic Growth and Climate Change – The Case of Croatia

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## ABSTRACT

In Croatia, tourism is one of the most important economic activities, accounting for 2.1% of total tourist flows in the European Union and 18% of the total Croatian gross domestic product. Economic development and tourism flows are influenced by the increasing intensity of climate change, leading to a need to adapt to new business conditions to minimize the negative and maximize the positive effects. The objective of the current study is to empirically research the role of tourism in the Croatian economy for the period 2004-2015 and the impact of climate change on tourist flows. To investigate experts' opinions on the impact of climate change on Croatian tourism, this study employs a qualitative approach to obtain comprehensive insights into tourism, climate change and scientific research. By conducting in-depth interviews with experts and identifying the challenges posed by the current impact of climate change on Croatian tourism, the authors gain deeper insights into tourism development and climate change that reflect the current situation in Croatia. The results indicate that climate change will not have a negative impact on Croatian tourism in the near future. However, after 2050, a number of adaptation measures will be required to maintain the current tourism status.

**KEY WORDS:** economic development, tourism, climate change, Croatia

**JEL Classification:** A10, O20, Q50, Q58

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## Literature Review

The overall complexity of connections among tourism development, economic growth and climate change has been examined by only a small number of studies (Dell, Jones, & Olken, 2012), either in quantitative or in qualitative terms (Eboli, Parrado, & Roson, 2010). However, separate studies on the impact of tourism on economic development and of climate change on

tourism development are conducted in great numbers. Many of those studies indicate a positive correlation between tourism development and economic welfare (Lee & Brahmašrene, 2013; Schubert, Brida, & Risso, 2011) and a correlation, either positive or negative, between tourism flows and climate change (Amelung, Nicholls, & Viner, 2007; Gössling, Hall, Peeters, & Scott, 2010; Hamilton & Tol, 2007; Pickering, 2011).

Tourism has made a significant contribution to the economies of many communities around the world because of its ability to create government revenue income, taxes, employment, opportunities, and infrastructure (Lee & Brahmašrene, 2013; Payne & Mervar,

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2010). Tourism is considered an important factor that promotes economic development and contributes to the welfare of the local population (Webster & Ivanov, 2014). Lee and Brahmasrene have proposed a tourism-led economic growth hypothesis that assumes tourism as a major factor in overall long-run economic growth (Lee & Brahmasrene, 2013). A data analysis for 143 countries over the last 20 years has shown that small tourism countries achieved a faster rate of economic growth than nontourist countries, suggesting that tourism specialization was beneficial for growth (Brau, Lanza, & Pigliaru, 2007). Theoretical analysis tends to posit that tourism expansion should contribute positively to economic growth, but some authors also claim that the opposite is true (Balaguer & Cantavella-Jorda, 2002; Dritsakis, 2004; Figini & Vinci, 2009; Seetanah, 2011). Some economists have emphasized that an economic approach to climate policy must compare the entire set of measures to choose a portfolio of cost-effective measures (Konrad & Thum, 2013). As climate resilience emerges as an equally important development concern, it is worth asking which of the existing growth policies are compatible with adaptation and mitigation needs (Bowen, Cochrane, & Fankhauser, 2012).

Public and political interest in climate change has increased considerably in recent years, especially after the United Nations Climate Change Conference in Copenhagen in December 2009 (Scott & Becken, 2010). Climate change is a global challenge that requires a long-term global solution to avoid environmental, social, and economic dislocation (Dwyer, Forsyth, Spurr, & Hoque, 2012). Tourism and tourism-related activities (transportation, accommodation and other activities) contribute to the emission of greenhouse gases into the atmosphere, which causes climate change. As a result, the industry has been targeted by the environmental movement, which advocates considerably reducing tourism activities and embracing measures to reduce greenhouse gas emissions, with some environmentalists going as far as to urge tourists to forsake travel away due to its discretionary nature and above-mentioned impacts on climate change (Shani & Arad, 2014). The World Tourism Organisation (UNWTO) and United Nations Environment Programme (UNEP) projections for 2005 have calculated that the total contribution of global tourism to climate change is signifi-

cant, amounting to 5% of total CO<sub>2</sub> emissions (Scott & Becken, 2010). Transport is the dominant component of the tourism contribution, with air transport accounting for 40% of tourism's emissions (Dickinson, Robbins, Tilimonau, Hares, & Mika, 2013). Emissions due to tourism are expected to grow because of several trends, including the following: growth in the number of people traveling for employment, business, leisure, education, and health services; continuing declines in the real cost of travel; increases in per capita disposable incomes leading to a growing number of trips made per capita; and growth in the average length of trips made, due to the greater speed of the transport modes used (Gössling, Scott, & Hall, 2013). On the other hand, tourism depends on a favorable climate, a preserved environment and a richness of flora and fauna (Buckley, 2011; Müller & Weber, 2008). Climatic factors, such as temperature, sunshine hours and rain, determine a large share of the international tourism flows within Europe (Amelung & Viner, 2006; Jopp, Mair, DeLacy, & Fluker, 2015). Thus, tourism is both a potential victim of and a significant contributor to climate change (Han, Lee, & Hwang, 2016).

## Methods and Materials

This paper analyses the importance of tourism for the Croatian economy, the impact of climate change on tourism and the necessity of an adjustment process. The conceptual part of the research relies on financial and nonfinancial secondary international data, publicly available on the websites of the World Travel and Tourism Council (WTTC) and the Croatian Bureau of Statistics, and the Croatian Meteorological and Hydrological Service. The paper analyzes and compares the number of arrivals, the number of overnight stays, tourism income, gross domestic product and exports. To investigate what the experts involved in tourism think about the impact of climate change on Croatian tourism, this study employed a qualitative approach to obtain comprehensive insights into tourism and climate change impacts. A team of experts on adaptation to climate change convened a workshop entitled "Modelling Climate Scenarios, Assessing the Impact of Climate Change on the Basis of the Results Obtained by Modelling and Evaluating Climate Change Adaptation Measures, and Introduction to the Existing Adaptation Solutions and Technologies", which was held in Zagreb

in October 2016. The workshop was held as part of the project on “Strengthening the Capacity of the Ministry of Environment and Energy for Climate Change Adaptation and Development of the Draft Strategy for Climate Change Adaptation”, in which one of the authors of this paper was a participant. The workshop gathered various members of the scientific and professional community and was followed by in-depth interviews with 15 experts from the scientific community: universities and institutes, ministries, various departments, agencies and associations. By conducting in-depth interviews with the experts and identifying the challenges posed by the current impact of climate change on Croatian tourism, the authors gained deeper insights into tourism development and climate change that reflect the current situation in Croatia.

### *The Importance of Tourism for the Croatian Economy*

The process of Croatian accession to the European Union was marked by the harmonization of law, liberalization and free trade, representing the basis for the integration of the Croatian economy into the European and global markets. Although badly affected by the global financial crisis in 2009, Croatia remained one of the strongest economies in South East Europe, with a €10,152 gross domestic product per capita (for 2015). The main economic activities in 2015 were tourism, industry, construction, and agriculture. A six-year recession in Croatia has affected almost every sector of the economy, with one exception: tourism.

Following the declaration of Croatian independence, Croatian tourism entered a twenty-year transitional process fraught with all the problems and contradictions of economic and social development. Despite carrying the burden of an inherited, relatively inefficient business structure, facing the consequences of war and the effects of different and often inefficient models of privatization, Croatian tourism has still demonstrated vitality thanks to the strength and interest of foreign markets, the attractiveness of the country and, in particular, the resistance of tourism to occasional global disorders. After decreasing in 2009 and 2010, Croatian tourism began to recover, as is clearly indicated by the growth of physical tourist traffic (Galičić, 2015). Recently, Croatian tourism has significantly improved its business results and

has shown high resistance to economic crises. This is confirmed by the growth rates, which are higher than those achieved by other countries in the competitive Mediterranean environment. Tourism is a significant source of foreign assets, representing an export activity that generates income through “invisible exports” or “exports on the spot”, but it is also one of the few activities that allows Croatian goods and services to be sold to foreign buyers without ever leaving the country. In the period from 2004 to 2015, the share of tourism in the total gross domestic product was between 13.6% and 20.1%, depending on the year (except for specific years). The data are shown in the Table 1. Although almost all years reported annual growth rates in the table, the year 2010 shows negative trends.

Today’s government has realized the importance of foreign investment and thus the contribution of tourism to economic development. Accordingly, the government has taken appropriate measures and provided incentives for the most favorable development of foreign tourism. To obtain a complete picture of the importance of tourism revenues, it is necessary to analyze the competitive countries’ basic economic indicators, as shown in the Table 2.

When comparing Croatia to other countries, it is evident that the Croatian tourism sector has the greatest importance for the overall economy. In its broadest sense, tourism includes economic activities and implies sector networks and the establishment of relationships between different areas. Tourism, as a complex economic and social system, can play a key role in the economic processes of every country (Blažević, 2007). With a share of 2.1% of the total international arrivals in Europe, Croatia’s tourism revenue share of the total gross domestic product amounts to 18%. On the other hand, Spain (11.2% of the total arrivals in Europe), France (13.9%) and Italy (8.3%) have a significantly smaller share of tourism revenues in their total gross domestic products. Of all the observed countries, Croatia has the largest share of tourism revenues in the total gross domestic product and of tourism-generated revenues in total exports, which leads to the conclusion that other Croatian sectors are less developed. Croatian tourism is already positioned on the global market; it meets the fundamental prerequisites for development, which are primarily reflected by the attractiveness of the area and its biodiversity, hospitality, transport in-

**Table 1.** Economic Contribution of Tourism in Croatia for the period 2004-2015

Year	Numerical indicators – in 000		Tourism revenue in million EUR	GDP in million EUR	Tourism share in GDP
	Number of arrivals	Number of overnight stays			
2004	9,412	47,797	5,505	27,379	20.1
2005	9,995	41,421	5,998	30,950	19.4
2006	10,385	53,007	6,293	34,234	18.3
2007	11,162	56,005	6,752	42,810	15.7
2008	11,261	57,103	7,449	47,390	15.7
2009	10,935	56,301	6,379	45,093	14.1
2010	10,604	56,416	6,236	45,917	13.6
2011	11,456	60,354	6,598	45,894	14.4
2012	11,835	62,743	6,843	44,223	15.5
2013	12,434	64,818	7,188	43,478	16.5
2014	13,128	66,484	7,402	43,002	17.2
2015	14,343	71,605	8,115	43,846	18.5
Descriptive Statistics					
Standard Deviation	1,374	8,231	693,2	6,533.2	2.09
Minimum	9,412	41,421	5,505	27,239	13.6
Maximum	14,343	71,605	8,115	47,390	20.1
Mean	11,412	57,837	6,716	41,184	16.5

Source: Adapted from „Tourism in figures 2017“ by the Republic of Croatia (2018). Zagreb: The Ministry of Tourism. Retrieved from [https://mint.gov.hr/UserDocImages//AA\\_2018\\_c-dokumenti//180608\\_HTZTUBENG\\_2017.PDF](https://mint.gov.hr/UserDocImages//AA_2018_c-dokumenti//180608_HTZTUBENG_2017.PDF)

frastructure, rich cultural and historical heritage and other important segments of tourist services (Institute for Tourism, 2013). It is expected that Croatian tourism will increase its diversity, offer a whole new range of products and services, significantly raise the quality of it services and identify new trends in the behavior of modern tourists (e.g., greater use of closer and safer destinations, increase in short and frequent travel, increased interest in cultural events, focus on active holidays, environmental awareness, and value-based pricing). This, in turn, might result in the achievement of the very optimistic results estimated by the WTTC (Institute for Tourism, 2013).

***Expected Climate Change and Guidelines for Future Tourism Development***

Climate change is already being recognized by a majority of governments and scientists throughout the world as a significant social and environmental issue facing the global population and its resources (Wise et al., 2014). Climate change is expected to bring substantially higher temperatures (Intergovernmental Panel on Climate Change [IPCC], 2014) and to specifically impact the coastal Mediterranean region (Filipe, Lawrence, & Bonada, 2013). The vulnerability of tourism in coastal areas will depend on the levels of exposure, sensitivity and the adaptive capacity of the destination

**Table 2.** Significant Economic Variables in Selected Mediterranean Countries in 2015

Country	Tourism revenues (in million EUR)	GDP (in million EUR)	Export (in million EUR)	Export share in total GDP (in %)	Tourism revenues share in total GDP (in %)	Tourism revenues share in total export (in %)
Greece	14,398	175,697	56,073	32	8	26
Spain	51,930	1,075,639	356,873	33	5	14
France	36,242	2,181,064	654,922	30	2	5
Italy	42,186	1,642,443	493,679	30	3	9
Cyprus	2,277	17,637	10,797	61	13	21
Malta	1,257	9,250	13,264	43	13	9
Portugal	11,581	179,539	72,812	40	7	16
Croatia	8,115	43,846	21,912	50	18	37

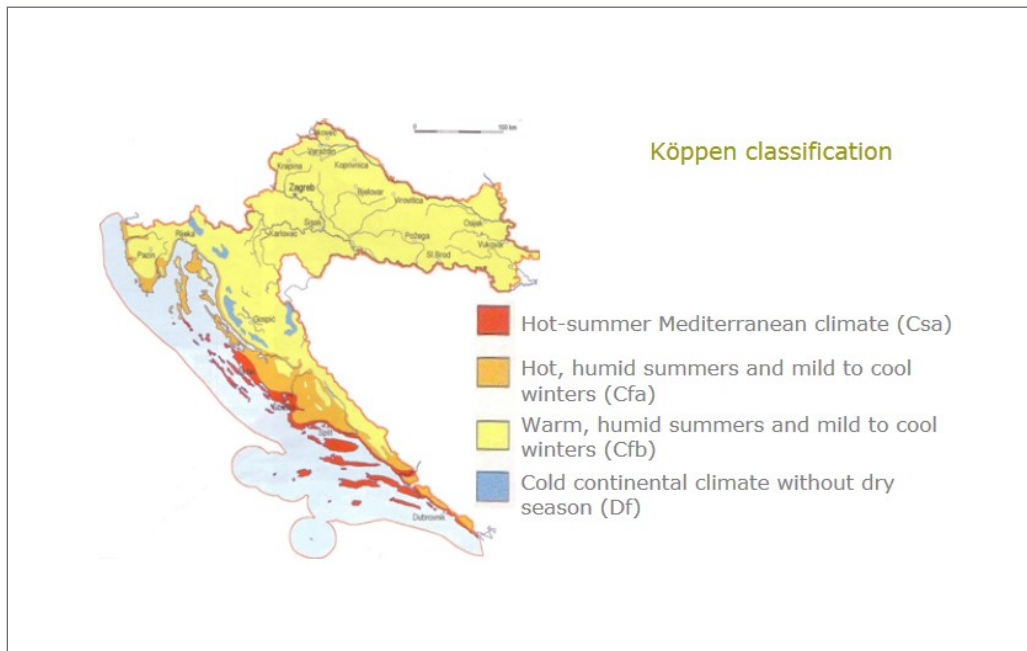
Source: Adapted from "UNWTO Tourism Highlights" by WTO (2016). Retrieved from <https://www.e-unwto.org/doi/pdf/10.18111/9789284418145>

(Schliephack & Dickinson, 2017). Weather and climate can therefore act as both push and pull factors, and there is also a strong relationship between weather and travel (Becken & Wilson, 2013). Thus, tourism business, destinations, transit routes and tourists are all sensitive to the variability and change in climate and weather parameters, which affect the length and quality of tourism seasons and tourist experiences as well as the sustainability of tourism resources (Gössling, et al., 2010).

In Croatia, climate is especially important for tourism (Šverko Grdić & Krstinić Nižić, 2016). This is particularly true of its summer months with mild temperatures, very little rain on the coast, a lot of sunshine and rare extreme weather conditions (Tudor, Ivatek Šahdan, Stanešić, Horvat, & Bajić, 2013). Figure 1 below shows an overview of the types of climate in Croatia according to the Köppen classification used by many scientists dealing with climate change (Teichmann, Eggert et al., 2013).

The warmest area is on the coast, characterized by the lowest temperature differences between the seasons and the highest levels of tourist activity, i.e., Dalmatia and the North (upper) Adriatic. The coldest is the mountainous area, with little tourist activity and the largest differences between winter and summer tem-

peratures. The Pannonian area and the city of Zagreb have colder autumn and winter periods than the areas along the coast. The coldest month is January, with an average temperature of -2°C in the mountainous areas and up to 5°C in the coastal region. The warmest month is July, with an average temperature of 15°C in the mountainous and 24°C in the coastal part of Croatia. Research results indicate that an ideal maximum temperature should be approximately 30°C (Maddison, 2001), while the optimal average daily temperature should be approximately 21°C (Amelung & Viner, 2006). These data clearly show that the temperature of the Croatian coastal area is already higher than the desirable, i.e., optimal, temperature according to tourists. The majority of tourist activity takes place outdoors, and tourists can still count on a large number of sunny days and favorable climate conditions during their holidays. Tourist traffic in Croatia is strongly centered in the Adriatic region, which is to be expected considering that Croatian tourism is a distinctly summer phenomenon, with the June-September period accounting for 75.5% of tourist arrivals and 85.7% of overnight stays (Galičić, 2015). Inland attractions are also associated with outdoor activities, including a substantial amount of ecotourism in the national parks and nature parks. All these features, which make tourist destina-



**Figure 1.** Types of climate in Croatia - the Köppen classification

Source: Adapted from "Climate Change Consequences in Croatia – Grooming Disasters" by N. Holcinger (2011). [Power Point slides]. Retrieved from [http://www.macefdrr.gov.mk/files/prezentacii/climate/CCA\\_CRO.ppt](http://www.macefdrr.gov.mk/files/prezentacii/climate/CCA_CRO.ppt)

tions attractive, are vulnerable to climate change (Patterson, Bastianoni, & Simpson, 2006).

Between now and 2030, the climate in Croatia will remain about the same. This statement is corroborated by in-depth interviews conducted with 15 experts from the research, tourism, education, and decision-making sectors. All of them believe that climate change in the near future will not harm tourism, but that after 2030, a number of adaptation measures will be required to maintain the current tourism status. Their common opinion is that the problem of climate change in Croatia is little discussed and even less known. They find the tourism and hospitality workers insufficiently interested in the problems whose consequences may be felt in 10-15 years. From these interviews, it can also be concluded that in the next ten years, climate change will in no way compromise Croatian tourism. Such a medium-term projection is probably the reason why tourism professionals are not showing a concern. However, in planning larger and longer-term investments, it must be taken into consideration that climate

change may affect the structure of accommodation and extend the tourist season. The interviewed experts stressed the need for the government and ministries dealing with tourism and environmental protection to conduct various educational campaigns to raise climate change awareness.

These considerations agree with the projections of the Croatian Meteorological and Hydrological Service for the period 2041-2070, using several models and predicting the following changes (Republic of Croatia, 2010):

- *Winter:* the temperature in northern Croatia will increase by 2.5°C; in the rest of Croatia, the increase will be 2-2.5°C. Precipitation is likely to increase in the north and decrease in the south. The occurrence of snow in northern Croatia will become uncertain.
- *Spring:* temperature will increase by 1.5°C both inland and along the coast. A slight decrease in precipitation is likely to occur in southern and western Croatia (9 millimeters decrease).

- *Summer*: temperature will increase by 3.5°C in the Northern Adriatic area and by 3-3.5°C in other areas. Precipitation will decrease by 27 millimeters or 10% in the east of the country and by 18 millimeters in the rest of the country. These changes will lead to a greater number of heat waves. The model predicts a 30-50% decrease in summer convective precipitation (downpours and storms).
- *Autumn*: the temperature will rise by 2.5°C across Croatia. Precipitation levels will drop by 27 millimeters in the southern part of the coastal area and by 18 millimeters along the northern coast. The north of the country (including Istria and most of the inland eastern Croatia) will see a decrease in precipitation by 9 millimeters.

Furthermore, the Croatian Meteorological and Hydrological Service compared several models to assess potential climate change in different regions for the period 2080-2100. Since these models are applicable not only to Croatia but to a wider area (Landau, Legro, & Vlačić, 2008), the predicted future average values serve only as a guide, indicating the trends but not the amount of change. According to the models, the temperature rise will be most pronounced in the summer months in the coastal and mountainous areas. The winters will be milder and summers hotter. The number and duration of heat waves will increase during the summer, while other extreme weather events (storms, cyclones, etc.) are likely to become more frequent. Increased temperatures can cause a drastic reduction in annual snowfall and its complete absence at lower altitudes. In addition, snow will start to melt earlier in the year. The greatest amount of precipitation will occur in winter months. The driest parts of the country will be the coast and the islands, followed by the eastern parts of continental Croatia.

From previous European Union studies on the impact of climate change on tourism (Amelung & Moreno, 2012; Hein, Metzger, & Moreno, 2009; Perch Nielsen, Amelung, Knutti, 2010), it can be concluded that the majority of tourists will adapt to these changes by avoiding trips to southern Europe (including Croatia), and especially coastal areas, in the summer months, i.e., places that are currently centers of tourism flows. Such a scenario would be very unfavorable for the local and overall Croatian economy and could lead to losses of local tourism-dependent communi-

ties, increased unemployment and rural-urban migration. To mitigate these adverse circumstances, it is necessary to take a number of measures and implement activities, the most important of which are shown in the Figure 2.

These measures should create a positive environment that will prepare and encourage the stakeholders to adapt their services to the new situation. Adequate and timely adaptation to climate change is likely to be especially crucial in Europe (Casado-Asensio & Steuer, 2014). With climate change becoming more pronounced and climate-induced extreme events more frequent, grassroots action undertaken at the community level will not be enough to reduce vulnerability to current and projected climate change (Dulal, Shah, & Ahmad, 2009). Depending on the impact of climate change on the future of coastal tourism in Croatia, the role of the state sector will be to find new forms of economic activity. The matrix of activities necessary for adapting the tourism and financial sectors to climate change includes all stakeholders associated with tourism and is shown in the Figure 3.

To avoid the negative consequences of climate change, the government, tourism industry and the financial sector will all have to become involved in the adaptation process to make profit and to safeguard wages and taxes lost due to the occurrence of climate change. *Technical* type of adaptation in tourism will require their involvement in addressing the problem of tourist and utility infrastructure, as well as the provision of various forms of assistance and services in the event of a climate disaster. The government will have to be involved in the planning, development and management of public services and transport infrastructure and prepare necessary actions in case of climate disasters. As all these activities need funds, the financial and insurance sectors will be involved with loans to infrastructure development projects and insurance against various natural disasters caused by climate change. *Managerial/ legislative* type of adaptation in tourism will require taking coordinated actions to reduce the emissions of greenhouse gases into the atmosphere, and coordinated financing and environment preservation initiatives. The government will have to ensure law enforcement, and the financial and insurance sectors will have to adjust their insurance premiums and ban high-risk activities approvals. This type of adjust-

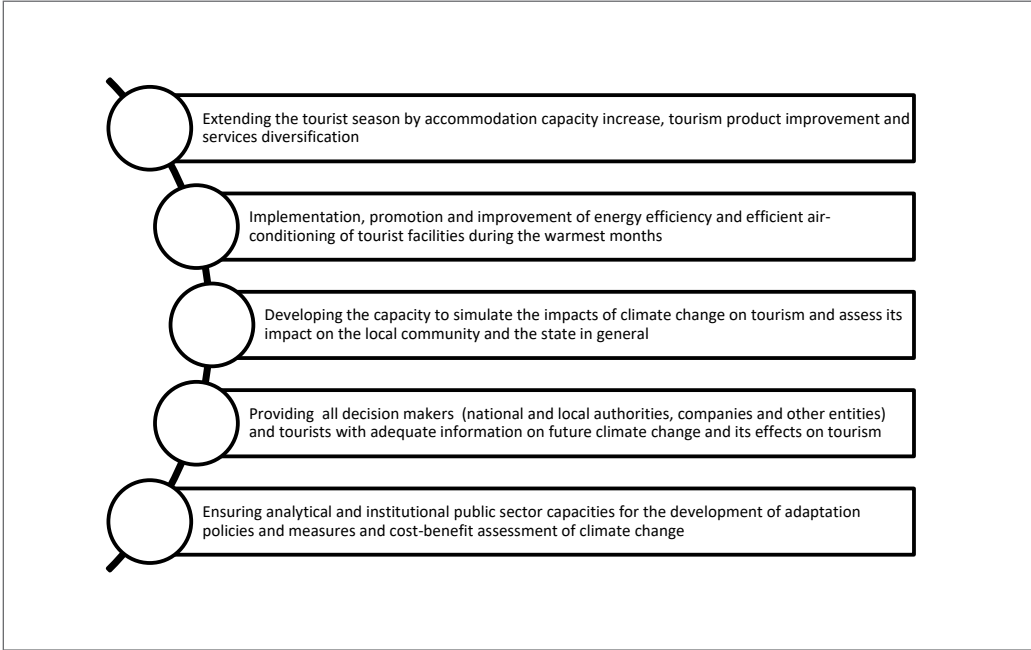


Figure 2. Climate change adaptation measures and activities

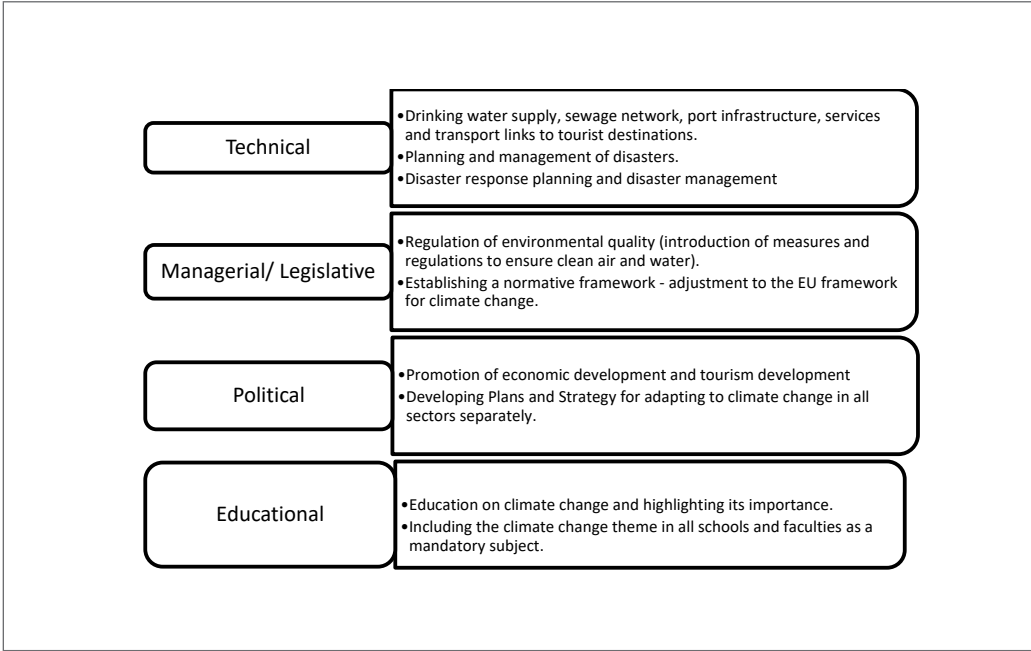


Figure 3. Matrix of stakeholders' activities in the process of adapting the tourism sector to climate change

ment implies the establishment of a normative framework that would allow Croatia to more easily conform to the European Union framework for climate change. The adoption and implementation of the legal framework will establish and regulate environmental quality. *Political* type of adaptation in tourism requires industry strengthening by providing economic incentives, primarily to small businesses in the tourism industry. The government will have to ensure the strengthening of the overall economic development by introducing a series of investment and tax measures that will encourage development. In terms of political activities, the financial and insurance sectors will need to finance various development models in the tourism sector as well as the entire Croatian economy. *Educational* type of adjustment is among the most important forms of measures and actions, since without quality education, it is not possible to take proper measures. This type of adjustment in tourism implies conducting educational campaigns for potential tourists and other stakeholders in the tourism industry, while the government will need to provide the general population with education on the mitigation of and adapting to climate change. The financial and insurance sectors will be involved through the informing and education of potential and existing customers.

These measures should allow Croatian tourism to adapt to new business conditions and facilitate the achievement of a quality performance even in the distant future.

## Conclusion

In this study, the authors investigate the influence of tourism on economic growth and climate change. Croatian tourism in the observed eleven-year period achieved an overall growth for all indicators with the exception of “Tourism share in GDP”, which shows an overall reduction in 2015. As foreign currency inflow affects macroeconomic stability, both the government and tourism professionals need to make the tourism revenue share as high as possible in the total gross domestic product. Tourism represents one of the most important economic activities in Croatia and is therefore crucial for ensuring positive results in the future. However, as tourism in Croatia is extremely seasonal and depends on weather conditions, a stronger impact of climate change could have negative effects on tour-

ism. If higher temperatures in the summer months result in tourists’ avoidance of the coastal areas of Croatia, this could lead to increased unemployment, the closure of smaller accommodation and catering facilities, population migration and a general decrease in the living standards of the population involved in tourism. The survey results show that by 2030, there will be no significant changes in terms of climate change but that it is also necessary to inform key stakeholders and the public about climate change adaptation measures. As a member of the European Union, Croatia must follow the European Union climate change policies. However, as climate change adaptation is a multilevel problem, government activity cannot remain restricted to the national level; it is particularly important to act at the regional and local levels as well. Climate affects the length as well as the quality of the tourism season, the tourism destination choice and tourism expenditure. This study can help all stakeholders in the tourism industry, especially those involved at the local and regional levels, to interpret global and regional climate change signals and to implement technical, legislative, political and educational measures for climate change adaptation. The contribution of this paper lies in the provision of information to decision makers, helping them diversify/adapt tourism services and products without relying solely on the mild Mediterranean climate and the “sun and sea” as the main product. It is up to the stakeholders to tackle the task of designing and ensuring the extension of the tourism season beyond summer months by designing a variety of new sports and cultural events. Only those that take a long-term view and care about their future today will be able to organize and adapt to new business conditions. A thoughtful approach to climate change adaptation will enable Croatian tourism to remain the leading economic activity.

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