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INTERDEPENDENCE OF SUSTAINABILITY FACTORS IN TOURISM IN THE CONTEXT OF SUSTAINABILITY REPORTING

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Abstract
Purpose – The purpose of the paper is to determine the interdependence of factors that affect sustainability in the EU Mediterranean tourist countries with regards to priorities and requirements for tourism businesses in the context of sustainable reporting, improving the economic conditions and quality of life of the local residents and, respectively, sustainable tourism development.
Methodology – On a sample of 9 countries, 16 essential Eurostat parameters of sustainability and quality of life in tourist countries were connected using method of hierarchical clustering or dendrograms to create a model for analyzing their interdependence.
Findings – The main cluster that connects the share of Tourism in GDP and Share of renewable energy in gross final energy consumption is dependent on two other large clusters. In the first are Share of people with good or very good perceived health and Gender employment gap, People at risk of poverty or social exclusion and General government gross debt. The second cluster consists of Circular material use rate which depends on Gross domestic expenditure on R&D by sector and Recycling rate of municipal waste.
Contribution – The scientific contribution of the paper is manifested in an innovative approach to the observation of important factors that affect the sustainable development of tourist countries in order to achieve the quality goals of reporting by tourism businesses, and in order to ensure the essential assumptions of the quality of life of the local population in these countries.
Keywords: sustainability reporting, tourism, sustainability factors, sustainable development.

INTRODUCTION

Tourism is a large economic branch that has a significant impact on the environment, local communities and the economy. Sustainability reporting shows how tourism businesses measure and communicate their sustainability performance and demonstrate their commitment to reducing their impact on the environment and local communities.

It is a voluntary, transparent process that allows organizations to communicate how they are managing their impacts and creating value. This kind of reporting can help tourism businesses understand the social and environmental impacts of their operations, identify areas for improvement and take steps to reduce their environmental impact. It can also help tourism businesses better understand the needs and preferences of their customers and ensure that their products and services are more responsible and sustainable.

WTTC in 2017 published their findings about sustainability reporting among its membership and the Travel & Tourism sector as a whole (WTTC 2017). WTTC stated

in the report that many organizations began sustainability reporting by using the indicators as a base for defining what information they will report, without fully considering or applying the methodology put forth by GRI which let to a wider distribution of the indicators found among reports. But just because reporting of certain indicators is not prevalent does not imply the topic is irrelevant. The majority Travel & Tourism reporters did not include a materiality matrix in the report, or outline a clear process of defining issues that resulted in the information actually being reported.

The purpose of the paper is to determine the interdependence of factors that affect sustainability in the EU Mediterranean tourist countries with regards to the priorities and requirements for tourism businesses in the context of reporting, with the ultimate goal of improving the economic conditions and quality of life of the local residents, respectively sustainable tourism development. Closely related to the mentioned purpose, a research question arises: Which parameters, and in what way, should be observed in order for sustainable reporting to be effective in planning the well-being of tourism-oriented countries?

On a sample of 9 countries, 16 essential parameters of sustainability and quality of life (according to Eurostat) in tourist countries were connected using method of hierarchical clustering or dendrograms to create a model for analyzing their interdependence. Countries were selected for observation in this research because authors aimed for EU tourism countries that are under the pressure of mass tourism for decades and have significant share of tourism in total GDP, since mass tourism can implicate pressure on sustainable development and quality of life in such destinations.

1. LITERATURE REVIEW

Share of tourism in countries' BDP was used in this research as a basic indicator of the level of tourism development and its significance in analyzed countries. Tourism has the potential to contribute to economic growth and poverty reduction, in particular in low-income developing countries, but the link between tourism and economic growth and poverty reduction is not automatic. It depends on whether tourism generates employment opportunities, creates linkages with agriculture and service-providing sectors and stimulates the development of basic infrastructure through the construction of roads, port and airport facilities and the provision of financial services from which the economy as a whole can benefit (UN 2013).

Sustainable development is supposed to ensure that the needs of the present generation are met without compromising the ability of future generations to meet their own needs. Therefore poverty reduction and counteracting social exclusion are among the key Millennium Development Goals. According to studies, one in four inhabitants of EU rural areas is at risk of poverty or social exclusion. This includes restricted education opportunities, less labor market opportunities and restricted consumption of goods and services. The level of social inequalities itself is conditioned by the smaller scale of sustainable development (Kalinowski and Kielbasa 2017). Similar, in his research from 2017, Balvociute concluded that substantial differences are related to changes in income inequality, which determine different poverty risk. The study allows denying assumption

that poverty risk always moves in the same direction as the income inequality (Balvociute 2017).

Social exclusion is complex, intractable, and devastating. It occurs where individuals or groups cannot fully participate in the typical activities of the societies in which they live, whether they are excluded economically, politically, or live in segregation (Bracic 2022).

Agricultural research and development will be crucial to maintaining and increasing yields in the face of climate change, both diminishing the risk of climate-related food insecurity and reducing the overall greenhouse gas and land-use footprint of the global food system (The Breakthrough Institute 2022). Chaminuka et al. in their paper stated that in developing countries, where few incentives exist for private sector investment in research, public investment in agricultural research and development (R&D) is critical for technological change that stimulates agricultural development, food security and poverty alleviation (Chaminuka et. al. 2019).

Weech-Maldonado et al. in their research of quality of life from 2017 concluded that public policies aimed at increasing health literacy, promoting health, and reducing income disparities may be associated with greater happiness. Also, adequate health literacy and better perceived health are associated with an increase in the likelihood of happiness (Weech-Maldonado et al. 2017).

Early school leaving is linked to unemployment, social exclusion, poverty and poor health. Since there are often complex, interconnected reasons for children not completing secondary schooling, policies to reduce early school leaving must address a range of issues and combine education and social policy, youth work and health-related aspects. EC study shows that the impact of EU policy instruments is largely positive across the countries examined. On average, the rate of early school leaving decreased from 13.4% in 2011 to 10.2% in 2019 across Europe (European Commission 2019).

Berloffa et al. conducted a research on gender gap in employment and earnings security in Europe and results suggest that women might be discriminated against because of the motherhood risk. The extent of gender gaps in employment security is more pronounced in countries where it is more difficult for firms to fire, while gaps in earnings security appear larger where part-time is more widespread. Policies addressing the redistribution across women and men of parenthood costs for firms (both actual and potential), and incentives to hire women to balance stricter employment regulations should be encouraged (Berloffa et al. 2020).

Jozic et al. in their research from 2021 summarize and analyze the water quality of inland and coastal bathing sites of Croatia, closer regions (non-EU Member States) and in the EU for the last decade. They stated that the share of excellent water quality in EU Member States increased by 10.1% and 6.6% for inland and coastal waters, respectively (2011-2020). Germany recorded the highest proportion of excellent water quality for inland waters (92.2%) and Cyprus for coastal waters (99.3%), therefore additional efforts should be made to improve the management and monitoring of inland waters (Jozic et al. 2021).

The consumption of primary energy sources has been increasing steadily for many decades, due to the growth of the world population and the aspirations of developing countries to raise the standard of living of their citizens. In the EU, the opposite trend, i.e., a decrease in primary energy consumption, has been observed since 2007 (Olkuski et al. 2021).

From the United Nations point of view, the priority is to pursue an increase in the quality of life (welfare) of the population by achieving a high value of gross domestic product, total and per capita. The indicator that best describes the quality of life (welfare) is the Gross Domestic Product per capita, highlighting the concrete result obtained within a national economy, taking into account the two factors that are conducive to economic growth (Anghelache and Anghel 2018).

In order to identify the factors influencing the amount of government expenditure on R&D in the European Union states, Ignasiak-Szulc et al. in 2018 created an econometric model for panel data and positive impact on the amount of public spending on R&D in the EU was discovered in the case of variables referring to the countries' economic growth, i.e. nominal gross domestic product and GDP per capita (Ignasiak-Szulc et al 2018).

Siddiqi found out in his research from 1994 that there is a correlation between energy use and GDP and also that the larger developing countries of the world are not, when viewed overall, less energy-efficient than their industrialized country counterparts. This result may have major implications for future energy requirements of the developing countries, associated emissions of CO2, and formulation of policies for addressing global climate change (Siddiqi 1994).

Dogan, analyzing the impacts of real GDP, renewable energy and tourism on the level of CO_2 emissions for the top 10 most visited countries, found out that renewable energy mitigates the pollution whereas real GDP and tourism contribute to the level of emissions. Also, he stated that the use of renewable energy and the adoption of clean technologies in tourism sector as well as in producing goods and services play a significant role in CO_2 mitigation (Dogan 2017, 63). Similar to Dogan, Shang et al. investigated the nexus of CO_2 emissions, tourism, fossil fuels, and GDP growth using China's data from 1970 to 2019. and concluded that the development of tourism, use of fossil fuels (coal and oil), and population growth show an important influence on CO_2 emissions but the use of gas and electricity has little effect on CO_2 emissions. Improving the green tourism business is excellent way to reduce environmental degradation in China (Shang et al. 2022).

2. SAMPLE AND METHODOLOGY

On a sample of 9 countries: Cyprus, Croatia, France, Greece, Italy, Malta, Portugal, Slovenia and Spain, 16 essential parameters of sustainability and quality of life (according to Eurostat) in tourist countries, shown in Table 1, were connected using method of hierarchical clustering or dendrograms to create a model for analyzing their

interdependence. The analysis was performed in the MATLAB software package. The observed data refer to the period from 2017 to 2021. (Apendix 1)

Hierarchical cluster analysis is a type of clustering technique that groups data points into clusters based on their similarity (Šulc et al. 2013). It is a bottom-up approach that starts with each data point as its own cluster, then groups data points together in increasingly larger clusters. These clusters can be visualized in a dendrogram, which shows how the clusters are related to each other, even when the data is not linearly separable. It can also be used to identify clusters of any shape or size.

Table 1: **The list of the data observed**

No.	Selected sustainable development indicators (Eurostat)
1	% of Tourism in GDP
2	People at risk of poverty or social exclusion (% of total population)
3	Government support to agricultural research and development (in million euro)
4	Share of people with good or very good perceived health (% of total population 16 years and over)
5	Early leavers from education and training
6	Gender employment gap
7	Bathing sites with excellent water quality
8	Primary energy consumption (Million tonnes of oil equivalent)
9	Real GDP per capita (in euro)
10	Gross domestic expenditure on R&D (GERD) by sector (% of GDP)
11	Purchasing power adjusted GDP per capita
12	Recycling rate of municipal waste
13	Circular material use rate
14	Share of renewable energy in gross final energy consumption
15	Corruption Perceptions Index
16	General government gross debt (% of GDP)

Source: Authors

Dendrograms can be used to analyze social problems by grouping problems into related categories, or clusters, which can then be further examined to identify possible solutions. It can also be distinguished as powerful tool that can be used to identify patterns and relationships in economic data or to identify hidden clusters of data points that may not be visible in traditional statistical analysis (Řezanková 2014). This technique can be used to uncover meaningful trends in economic data that would otherwise be overlooked (Brlečić Valčić et al. 2022).

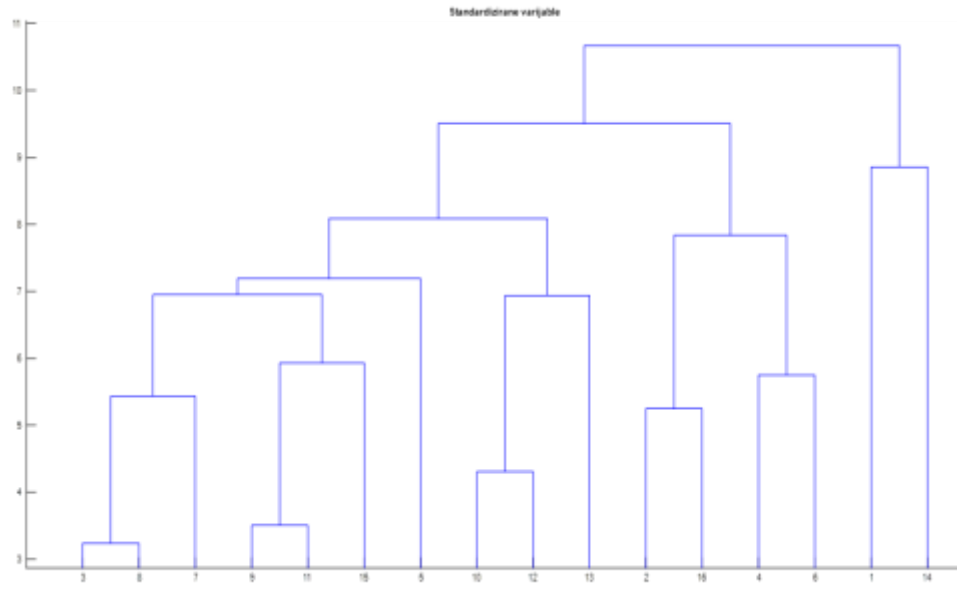
For the purposes of analysis, all data were standardized beforehand.

3. FINDINGS

Figure 1 shows the dendrogram of the hierarchical analysis conducted based on the data from Apendix 1. From the analysis carried out, it can be concluded that with the problem posed in this way, it is necessary to observe the interdependence of sustainability factors in tourism within five clusters.

At the center of the observation is the Cluster 1 that connects percentage of Tourism in GDP and Share of renewable energy in gross final energy consumption (1 – 14, Table 1, Figure 1). The relationship between these two parameters can be interpreted in two ways. On the one hand, tourism can often be a major driver of economic growth in many countries and can therefore lead to an increase in the demand for energy, which can lead to an increased share of renewable energy in the gross final energy consumption. On the other hand, the development of renewable energy can also lead to an increase in tourism, as the lower cost of energy can lead to a more affordable travel experience. Therefore, renewable energy can have a positive impact on both the tourism and the energy sectors, creating a stronger connection between the two. The use of renewable energy sources can reduce the impact of tourism on the environment and provide a more sustainable source of energy to meet the growing energy needs of the tourism industry. In addition, renewable energy sources can be more profitable for tourism businesses, which can lead to greater investment in renewable energy sources.

Figure 1: **Dendogram**



Source: Authors, using MATLAB

Cluster 1 depends on two other large clusters that are interconnected.

Cluster 2 on the one hand connects (4 – 6, Table 1, Figure 1) i.e., Share of people with good or very good perceived health (% of total population 16 years and over) and Gender employment gap. The connection between the share of people with good or very good perceived health and the gender employment gap may lead to the conclusion that the gender employment gap is likely to lead to health disparities among different genders. Women are more likely to face economic insecurity due to the gender employment gap, which can lead to poorer physical and mental health. For example, women may be more likely to experience depression due to financial strain and other stressors, leading to a lower perceived health score. On the other hand, men may have better economic security due to the gender employment gap, leading to better mental and physical health and a higher perceived health score.

Generally, there is a positive relationship between tourism and the proportion of people with perceived good or very good health. Tourism activities such as visiting natural parks, exploring historical sites and outdoor activities can lead to improved physical and mental health outcomes. Furthermore, the increased access to medical care and health services that often accompany increased tourism activity may also lead to improved health outcomes. Tourism can also stimulate economic activity, which can lead to increased living standards and improved access to health services. Finally, increased tourism can lead to increased awareness of health issues, which can lead to greater health knowledge and improved health outcomes.

On the other hand, Cluster 2 connects (2 –16, Table 1, Figure 1) i.e. People at risk of poverty or social exclusion (% of total population) and General government gross debt (% of GDP). The two indicators measure different aspects of the economy, and therefore there is no direct correlation between them. However, there may be an indirect relationship between the two variables. For example, if a government has a high level of debt, it may be less able to provide social services, such as welfare, unemployment benefits and housing assistance, to those in need. This could then lead to an increase in the number of people at risk of poverty or social exclusion.

Tourism can have a positive impact on the lives of people at risk of poverty or social exclusion. It can create jobs and bring income to those in poverty-stricken areas. Earnings from tourism can be used for infrastructure and investment in impoverished communities. It can also invest in education, health care and other essential services, it can introduce new skills and knowledge to those living in poverty, helping to reduce the risk of poverty and social exclusion. Tourism can also bring people together, providing a platform for cultural exchange, understanding and appreciation. This can help promote social inclusion and reduce the risk of people living in poverty or social exclusion.

The third cluster consists of three subclusters (3A, 3B and 3C). Subcluster 3A indicates the need to connect the Circular material use rate, which directly depends on (10 – 12, Table 1, Figure 1), that is, Gross domestic expenditure on R&D by sector (% of GDP) and Recycling rate of municipal waste. As the use of circular materials increases, businesses and governments may invest more in research and development to develop new materials and technologies that are more efficient and have a lower environmental

impact. Increased investment in R&D could lead to further innovations in the circular economy, resulting in increased use of circular materials and a further boost to GERD. Circular material use rate is a measure of how much of the materials used in production processes are reused or recycled, while the recycling rate of municipal waste is a measure of how much of the waste generated by households and businesses is recycled or reused. Both measures indicate whether a society is making progress in reducing its impact on the environment and becoming more sustainable. Tourism can help increase recycling rates by creating greater awareness of the importance of recycling and encouraging tourists to recycle while visiting a destination. In addition, tourism can also support the creation of infrastructure such as waste collection and recycling centers, which can help increase municipal waste recycling rates. Finally, tourism can also provide economic incentives for businesses to invest in waste management and recycling initiatives, which can further help increase MSW recycling rates.

In sub-cluster 3B, the analysis shows the importance of the parameter Early leavers from education and training (5, Table 1, Figure 1), which depends on the Corruption Perceptions Index (15, Table 1, Figure 1), which in turn depends on the combination of Real GDP per capita (in euro) and Purchasing power adjusted GDP per capita (9 –11, Table 1, Figure 1). The connection between early leavers from education and training and Corruption Perceptions Index (CPI) is not straightforward. But it can be concluded that early leavers from education and training are more likely to become vulnerable to exploitation, which can lead to increased levels of corruption. For example, those who lack the necessary education and training may not be aware of their rights, making them particularly vulnerable to corruption. In addition, a lack of education and training can also lead to lower wages, which can create incentives for corrupt practices. At the same time, countries with high levels of corruption tend to have weak educational systems and lower levels of investment in education, which can lead to higher rates of early leavers from education and training. Poor educational systems can also lead to a lack of understanding of the importance of transparency and accountability, which can contribute to corruption.

There is a strong correlation between Real GDP per capita and the Corruption Perceptions Index. As Real GDP per capita increases, the Corruption Perceptions Index improves. This is because higher GDP per capita is associated with increased economic growth, which can help reduce corruption. With greater economic development, there is more money available to fund anti-corruption efforts and enforce stronger regulations that prevent corrupt activities. Additionally, increased economic development can lead to better education, which can help reduce the prevalence of corruption.

Tourism has been identified as one of the industries where early leavers are most likely to seek employment. This can be attributed to the fact that tourism is an industry that offers several entry-level low-skilled jobs that require minimal qualifications. The lack of formal qualifications can make these jobs attractive to early leavers from education or training. In addition, there are often career progression opportunities within the industry, meaning that early leavers can develop their skills and knowledge to progress their careers.

The last subcluster 3C connects Bathing sites with excellent water quality (7, Table 1, Figure 1) which depends on (3 - 8, Table 1, Figure 1), i.e. Government support to agricultural research and development (in million euro) and Primary energy consumption (Million tons of oil equivalent). The connection between these two topics is that both are related to the well-being of the population. Good water quality is essential for a healthy lifestyle, while government support to agricultural research and development increases the availability of safe and nutritious food. With government support, farmers can invest in new technologies and techniques that can improve crop yields and reduce environmental damage. In addition, government support can lead to the development of new agricultural products and markets, which can create jobs and stimulate economic growth.

4. DISCUSSION

The conducted analysis led to the conclusion that the main cluster that connects the share of Tourism in GDP and Share of renewable energy in gross final energy consumption is dependent on two other large clusters. In the first are Share of people with good or very good perceived health (% of total population 16 years and over) and Gender employment gap, People at risk of poverty or social exclusion (% of total population) and General government gross debt (% of GDP). The second cluster consists of two parts - Circular material use rate which depends on Gross domestic expenditure on R&D by sector (% of GDP) and Recycling rate of municipal waste. In addition, in the second cluster, Early leavers from education and training stand out, which in turn depends on two separate clusters. They link the Corruption Perceptions Index, which depends on Real GDP per capita (in euros) and Purchasing power adjusted GDP per capita, and Bathing sites with excellent water quality, which depends on Government support to agricultural research and development (in million euros) and Primary energy consumption (Million tonnes of oil equivalent).

There is no direct connection between bathing sites with excellent water quality and primary energy consumption. However, both are related to environmental sustainability and the management of natural resources. The quality of bathing water is affected by the number of pollutants present in the water, which can be reduced by reducing energy consumption and promoting more efficient energy use. For example, reducing emissions from the burning of fossil fuels can improve air quality, which in turn can reduce pollutants entering bodies of water. Similarly, energy conservation measures can help reduce the amount of energy required to treat and purify water, thus improving water quality.

CONCLUSION

Sustainability reporting is the practice of measuring, disclosing and being accountable for an organization's economic, environmental, and social performance. It is a transparent process that allows organizations to communicate how they are managing their impacts and creating value. Organizations produce sustainability reports to provide stakeholders with information on how they are managing their impacts on the environment, society,

and the economy. Reports also provide an overview of the organization's strategy, performance, and prospects. Organizations such as Tourist destinations need to consider how best to integrate sustainability reporting into their mainstream reporting. How they respond to changing stakeholders' expectations has a great deal to do with their perceived level of accountability.

The scientific contribution of the paper is manifested in an innovative approach to the observation of important factors that affect the sustainability of the development of tourist countries to achieve the quality goals of reporting by tourism businesses, and in order to ensure the essential assumptions of the quality of life of the local population in these countries.

The added value of the article is the presented conceptual model composed of five clusters that should serve more effective sustainable reporting in the context of tourism as an important contributor to GDP, creating new jobs, increasing tax revenues, and contributing to the overall economic growth of a country. The research question was answered by the interpretation of the presented model. According to the analysis made and the model presented, the share of tourism in GDP and the share of renewable energy are directly connected and are the central part from which the presented analysis was made, that is, all other factors were observed in their favor.

This refers to the already mentioned previous research in the introductory part of the paper, in which it was pointed out that tourism has the potential to contribute to economic growth and poverty reduction, in particular in low-income developing countries, but the link between tourism and economic growth and poverty reduction is not automatic.

Closely related to that, poverty reduction and counteracting social exclusion are among the key Millennium Development Goals. On the other hand, restricted education opportunities, less labor market opportunities and restricted consumption of goods and services are an important part of the problem of social sustainability, and are related to tourism-oriented countries. Likewise, the level of social inequalities itself is conditioned by the smaller scale of sustainable development.

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