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Institute of Philosophy
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STUDIA
ECOLOGIAE
ET BIOETHICAE



20/2 (2022)

Overtourism: The Impact of Tourism on Madeira's Social and Economic Environment

Overtourism: wpływ turystyki na środowisko społeczne i gospodarcze Madery

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Received: 16 Mar, 2022; Revised: 26 Apr, 2022; Accepted: 27 Apr, 2022

Abstract: The main goal of the analyses presented in the article is to identify the phenomena and consequences concomitant with the phenomenon of overtourism in the economic (with particular emphasis on energy) and social dimensions, regarding the Portuguese island of Madeira. The starting point for considerations includes a review of the issues that define the theoretical framework of "excessive tourism", as well as a discussion of the most important determinants of the socio-economic development of Madeira. Then, the results of own research are presented, including the original analysis of existing data on electricity production, population growth and the number of overnight stays, as well as the results of a survey conducted in April 2021¹, among both permanent residents and tourists visiting the island. The obtained results indicate, among others, that for each increase in the number of overnight stays by 1%, the production of electricity increases by 0.597%; and for every 1% increase in the number of inhabitants, there is a 5.617% increase in electricity production. At the same time, the data on the number of inhabitants indicates a population growth rate close to zero, and thus a higher level of consumption will come from the tourist sector. Based on the results of the survey, key problem areas have been identified (including, for example, issues related to the sense of local identity, security or relations between tourists and residents). The volume of tourist traffic has also been assessed, and a number of reflections and recommendations have been formulated to limit the negative effects of "excessive tourism".

Keywords: tourism, overtourism, Madeira, sustainable development

Streszczenie: Zasadniczy cel prezentowanych w artykule analiz stanowi identyfikacja zjawisk i konsekwencji towarzyszących zjawisku *overtourismu* w wymiarze gospodarczym (ze szczególnym uwzględnieniem problematyki energetycznej) oraz społecznym, w odniesieniu do portugalskiej wyspy Madera. Punkt wyjścia do rozważań obejmuje przegląd zagadnień określających ramy teoretyczne „nadmiernej turystyki”, a także omówienie najważniejszych uwarunkowań determinujących rozwój społeczno-gospodarczy Madery. Następnie zaprezentowano wyniki badań własnych obejmujących autorską analizę danych zastanych dotyczących produkcji energii elektrycznej, przyrostu populacji i liczby udzielonych noclegów oraz wyniki badań ankietowych przeprowadzonych w kwietniu 2021², zarówno wśród stałych mieszkańców, jak

¹ More information about research and obtained results are available in the following publications (Majdak et al. 2021a; Majdak et al. 2021b).

² Więcej informacji o badaniach i uzyskanych wynikach zawarto w publikacjach (Majdak et al. 2021a; Majdak et al. 2021b).

i turystów odwiedzających wyspę. Uzyskane wyniki wskazują m.in., że na każdy wzrost liczby noclegów o 1% wzrasta produkcja energii elektrycznej o 0,597%; każdemu wzrostowi liczby mieszkańców o 1% odpowiada wzrost produkcji energii elektrycznej o 5,617%. Jednocześnie dane o liczbie mieszkańców wskazują na zbliżone do zera tempo wzrostu populacji, a co za tym idzie wyższy poziom konsumpcji będzie pochodził z sektora turystycznego. W oparciu o uzyskane wyniki badań ankietowych zidentyfikowano natomiast kluczowe obszary problemowe (obejmujące chociażby zagadnienia związane z poczuciem lokalnej tożsamości, bezpieczeństwem czy relacjami turystów i mieszkańców), dokonano oceny wielkości ruchu turystycznego, a także sformułowano szereg refleksji i rekomendacji pozwalających na ograniczanie negatywnych skutków „nadmiernej turystyki”.

Słowa kluczowe: turystyka, overtourism, Madera, rozwój zrównoważony

Introduction

The term “overtourism” is most often defined as a phenomenon in which an excessive number of tourists has a destructive effect on both the space of everyday life of the local community and the quality of tourist experiences among visitors to a given place. However, under the influence of “excessive tourism”, not only social relations, but also various spheres of the natural, cultural and economic environment of a given area may be disturbed. The impact of overtourism is much more complex and is not limited only to the individual, subjective sphere of the feeling of discomfort.

In this context, it is worth noting that this phenomenon may be a challenge for both entities responsible for what can be viewed as traditional local government’s responsibilities (including, among others, public transport, waste management, management of public spaces) and organizations related to health protection and safety, because they face the necessity of handling a rapidly growing number of people in a short time. On the other hand, they must also function in normal operating conditions in the low tourist season, i.e., with minimum demand for the service, which also implies specific problems. Entities dealing with transport and water management or industry sectors responsible for the so-called energy security, which also must be prepared for periodic fluctuations in demand for the products and services they provide.

In the face of complexity and multidimensionality of “excessive tourism” in the scientific literature, the development of the various influence of overtourism on the economy, society or the natural environment can be found in the scientific literature. Most often, however, they limit testing, and it is difficult to find a study that would attempt a more comprehensive view of the problems discussed. Analyses contained in this study may fill this research gap because they refer to one of the two outlined spheres: the first associated with the “social layer” (discussed in the context of surveys) and the second “industrial”, presented in relation to the original data analysis Chambers regarding energy consumption on the Portuguese island of Madeira.

1. Overtourism: theoretical contexts

The term “overtourism” has been used in both popular and scientific literature for a relatively short time. According to Dodds, the first searches for the term overtourism in the Google search engine appeared in 2006 (Dodds 2019, 1-5), while in the scientific literature this term was used in 2008 and was used in the context of coastal resource management in Vietnam (Weissmann 2021, 11). Since 2012, the growing popularity of the term in the application Twitter has been noticeable (Weissmann 2021, 11), while in 2016 the analytical and consulting company Skift branded the word “overtourism” (UNWTO 2018, 4). What is worth emphasizing, the first extensive report of the World

Tourism Organization (UNWTO) devoted to overtourism was first published in 2019 (UNWTO 2019), at the same time the first comprehensive studies focused on the issue of overtourism appeared on the publishing market. The term overtourism also began to penetrate the media, especially in the context of cities besieged by tourists, such as Dubrovnik, Barcelona or Venice, and angry residents sending tourists “home” (Colomb and Novy 2016; Milano 2018, 551-564). At the same time, in scientific studies, we can find opinions that overtourism is not a new phenomenon, because negative effects of tourism were investigated in the 1970's (Dredge, 2017; Pasquinelli and Trunfio, 2020).

Functioning definitions most often define overtourism as “the excessive growth of visitors leading to overcrowding in areas where residents suffer the consequences of temporary and seasonal tourism peaks, which have enforced permanent changes to their lifestyles, access to amenities and general well-being” (Milano et al. 2018, 1). The cited definition indicates two basic elements characterizing the described phenomenon: a significant, excessive increase in the number of people visiting a given place (temporarily or permanently) and the related reduction in the quality of life of the local community.

A similar definition is formulated by the World Tourism Organization (UNWTO), pointing out that overtourism can be defined as a situation in which “the impact of tourism on a destination, or parts thereof, that excessively influences the perceived quality of life of citizens and/or quality of visitors experiences in a negative way” (UNWTO 2018, 4). In this context, it is also worth noting that negative feelings may be felt not only by the hosts of the reception areas (residents), but also by the tourists themselves, who make their trips under conditions of increased tourist pressure.

Volo offers a slightly broader perspective, pointing out that “quantification of overtourism is subjective and relative to each destination with respect to its number

of residents, tourists, and tourism businesses. While the number of tourists is certainly a significant factor in the definition of overtourism, an analysis of the literature offers a view that goes beyond the mere numbers, portraying improper behaviour and actions done by visitors that undermine the quality of life of residents and often undermine the experience of other tourists” (Volo 2020, 13).

As can be seen, the phenomenon of overtourism may also appear in a situation where the thresholds of absorption or tourist capacity are not exceeded, but a reduction in the level of quality of life and the value of tourist experiences both among residents and visitors can be observed, which clearly contradicts the assumptions of sustainable development (Majdak 2019, 25). Thus, the essence of overtourism can be considered to be two basic, intertwined phenomena: the unacceptable and politically problematic decrease in the quality of life of the inhabitants and the deterioration of the quality of the tourist experience (Majdak and Almeida 2022, 2), but at the same time the phenomenon of “excessive tourism” is very complex and may affect various industries and economy (Martín-Martín et al. 2018, 3; Higgins-Desbiolles et al. 2019; Milano and Novelli 2019, 353-357; Velasco and Ruano 2021, 2-16).

2. Madeira: determinants of development and energy situation

A Portuguese island of Madeira, which is the subject of research interests, covers a relatively small area (about 800 km²), but in its territory, you can find landscapes, unique ecosystems, and pretty villages that require protection due to valuable natural and cultural values, small agricultural and industrial areas, as well as places with highly developed infrastructure tourism and tourism-related (hotels, airports, ports adapted to accept cruise ships) (Jankowska et al. 2014). A significant development impulse was brought by the accession of Portugal to the European Union in 1986 and

the funds for the construction of new roads, significant expansion of the airport, creation of a free trade zone to stimulate the economy and investment of substantial funds not only in the capital of Funchal but also in rural areas. Since 2015, thanks to access to the EU funds and subsidies from government agencies, the port has been modernized and adapted to handle large passenger ships. Additionally, the construction of accommodation facilities has been made easier for private entrepreneurs and citizens (Majdak et al. 2021a, 423).

The wide-reaching activities related to the development of the tourism sector are also reflected in the statistical data. According to information provided by the Regional Directorate of Statistics of Madeira (DREM, estatistica.madeira.gov.pt), in 2019 tourism income accounted for 23% of Madeira's gross domestic product (GDP) and 16% of employment. The quoted values indicate a strong dependence of the economy on the tourism sector and at the same time mean high susceptibility to unpredictable phenomena affecting the volume of tourist traffic (e.g., pandemics or catastrophic natural hazards, such as flash floods or forest fires). In the longer term, measures aimed at increasing diversification of income both inside and outside the tourism sector should be considered as justified. At the same time, Madeiran tourism expenditure reached 9.38% of the Portuguese total expenditure for goods and services in tourism.

An analysis of the data on the number of tourist visits indicates the occurrence of a fairly strong phenomenon of tourist seasonality: the largest number of tourists in 2019 was recorded in the months from July to September (39.1% of all arrivals were completed in these months), the fewest visitors are from November to February (27.8% of the total number of arrivals).

Among the visitors to Madeira are Europeans: in 2019, Portuguese tourists accounted for 22.7% of the total number of visitors, among other nationalities: British (30.4% of the total number of visitors), Germany

(23.2%), French (9.3%), Scandinavians (8.7%) and the Dutch (5.3%).

As for the occupancy of the accommodation base, an interesting comment is provided by the Ismeri Europa report: "with 30.000 beds and 1 million visitors, tourism is far from the mass offer of the Canary Islands but also far from the scarce hotel capacities of the Azores: far from the mass approach of the former but far from the 'niche' approach of the latter" (Ismeri 2011, 136), which confirms that the revival in the tourism sector is not a serious problem at the moment. What is more, despite many pro-tourism investments, there are voices that tourism is still far from the assumptions of sustainable development, has not reached the expected level and has not become a brand product. At this point, it should also be noted that, despite the growing number of tourists, the phenomenon of "excessive tourism" occurs in Madeira to a rather minimal extent, at the same time there are some disturbing symptoms of overtourism that should be counteracted in advance. Among the strategic problems, the frequently raised issue concerns, among others, restrictions on the energy supply (dependent on maritime transport) and the lack of access to the EU's energy networks (dependent on transport by sea) and lack the access to the EU energy networks (natural gas and electricity). Not surprisingly, the archipelago is very dependent on the imports of oil and oil-based electricity production predominates because cheaper alternatives are usually not economically feasible on small islands. Moreover, the relatively small dimension of the energy system leads to inability to capture economies of scale, which makes attractive and rational all efforts to pursue a renewable and rational use agenda. In the case of Madeira, the high attractiveness of renewable energy is determined by favorable natural conditions, including wind conditions in the mountainous areas of the island. Moreover, a recent development in terms of hydroelectric power takes advantage of the mountainous orography to channel

water from the ridges via tunnels and canals to collect water in the north to produce electricity and to irrigate the fields in the south. Data corresponding to 2021 indicates that 33.8% of the electricity generated in Madeira came from renewable sources. The local government aims to increase the share of the renewable energy segment to 50% by 2022 in order to get more gains in terms of reduced dependence on fossil fuels (reduction of 92,000 tonnes of fuel oil) (<https://estatistica.madeira.gov.pt/>). Further investments in terms of a pump storage system, modernization of the grid core and existing hydropower stations and advances in the area of electric cars are worth mentioning. Furthermore, the local government wants to democratise the self-production and self-consumption of electricity.

It is also worth highlighting that in recent years, the local government has invested in renewable energies in order to reduce the degree of dependence on fossil fuels (around 92% of the energetic bilan). Local recourses, in terms of primary energy, such as electricity from renewable energy sources, accounts for 8% of the total, with imported oil products accounting for 92% (<https://estatistica.madeira.gov.pt/>).

At the same time, data for Madeira show a positive correlation between energy

consumption, economic development (as profiled by the GDP variable) and tourism development (measured both by the number of arrivals and overnight stays). The higher the correlation between electricity consumption and the number of guests is presented in Tab. 1.

The relationship between tourism development and energy production, based on index series – the base year 1994), is clearly seen in Figure 1. The overall evolution was identical to 2000, with varied but widespread development thereafter. By applying simple cointegration tests in STATA, the results of which are not shown, we detected a relationship between electricity production, population growth, and the number of nights. Therefore, we examined more closely the impact of demographic dynamics and tourism development on energy production/consumption. Based on the logarithmic transformations of the analyzed variables, we estimated the following model:

$$\text{Production (electricity)} = \beta_0 + \beta_1 * \text{Population} + \beta_2 * \text{Transfer} + \epsilon$$

The results related to the model $\text{Production (electricity)} = f(\text{Population}; \text{Overnight})$ are structurally similar. The results show that for each 1% increase in overnight stays, electricity production increases by 0.597%;

Table 1. Correlation between energy indicators, tourism and GDP

	ConsumptionE	ProductionE	ConsumptionEI	Guests	Overnights	Population	GDP
ConsumptionE							
ProductionE	.999 **						
ConsumptionEI	.909 **	.904 **					
Guests	.736 **	.733 **	.560 **				
Overnights	.700 **	.696 **	.525 **	.995 **			
Population	.898 **	.903 **	.766 **	.458 *	.406 *		
GDP	.967 **	.967 **	.909 **	.792 **	.752 **	.801 **	

Source: Own calculations based on data from the Regional Directorate of Statistics of Madeira (DREM, estatistica.madeira.gov.pt)

* The correlation was statistically significant at 0.05; ** Correlation statistically significant at 0.01.

Legend: ConsumptionE (electricity consumption); ProductionE (electricity production); EI consumption (electricity consumption in the industrial sector).

for every 1% increase in the number of inhabitants, there is a 5.617% increase in electricity production. The results suggest that electricity consumption will only increase if nothing is done, given the expected growth rates in the tourism sector. The data on the number of inhabitants indicate a pace of population growth close to zero. Therefore, a higher level of consumption will come from the tourism sector. In the years 1994-2019, electricity consumption recorded an average increase of 3.52% / year, while in the same period the number of arrivals increased by 4.19% annually.

3. Overtourism: social effects in a research perspective

Another dimension of the problems related to the phenomenon of overtourism is revealed in the own survey conducted in April 2021³. The survey was addressed to both permanent residents of Madeira and people visiting the island for tourist purposes. The survey was distributed in three languages: Polish, English, and Portuguese through the Google Forms portal. Respondents were invited to participate via Facebook social groups dedicated to Madeira fans and residents. A total of 391 respondents took part in the study, including both Madeira residents (207 people) and tourists of various nationalities (184 people).

The survey included both open and closed questions relating to the following subject categories:

- character and length of the respondents' stay in Madeira;
- consumer behaviour and knowledge of local products and traditions;
- assessment of the volume of tourist traffic, assessment of the impact of tourism on the social, economic and natural environment of Madeira;
- respondents' attitudes towards the principles of sustainable development.

The results showed that the catalogue of problem areas related to overtourism is very extensive and includes phenomena of various nature and intensity. When asked "have you noticed the following problems / negative effects of tourism?" among the list of seven responses, "high prices" (40.10%) were the most frequent item chosen among residents, followed by "environmental pollution" (25.60%) and "garbage" (19.81%). A slightly smaller number of inhabitants indicated overpopulation (17.87%). Traffic jams (10.63%) and "disappearance of Madeira culture" (9.66%) followed, while around 8% of respondents indicated "noise". Tourists answered this question a bit differently. The most frequently indicated answer was that "I did not notice any problems" (40.22%). Next was "homelessness" (32.61%), followed by "rubbish" (20.65%), "traffic jams" and "noise" with the same number of responses (15.76%), followed by "high prices" (15.22%). In the last places, with the lowest number of indications, were "pollution" and "overpopulation" (approx. 12% of indications each) (Majdak et al. 2021b, 516-518).

The next group of questions concerned issues related to subjective assessment of tourist traffic generated by large cruise liners. Among the inhabitants, the most frequently chosen answer was the option "very favourable" impact (34.78% of responses). The next position was taken by the answer "rather positive" (25.60%) and "neutral" (21.26%). About 20% of respondents assessed the phenomenon negatively. In the group of tourists, the answer "neutral influence" (38.59%) received the most responses. For the answer "rather positive", 22.28% of the votes were cast, 18.48%. She got the answer "very favourable". About 20% of the respondents assessed this phenomenon negatively (1: "very negative" and 2: "negative").

As regards air traffic, residents were asked "whether there should be a restriction on tourist flights to Madeira". 80.68% of the surveyed inhabitants believed that "the arrivals of tourists to the island should not be limited", while 19.32% of the respondents were

³ More information about research and obtained results are available in the following publications (Majdak et al. 2021a; Majdak et al. 2021b).

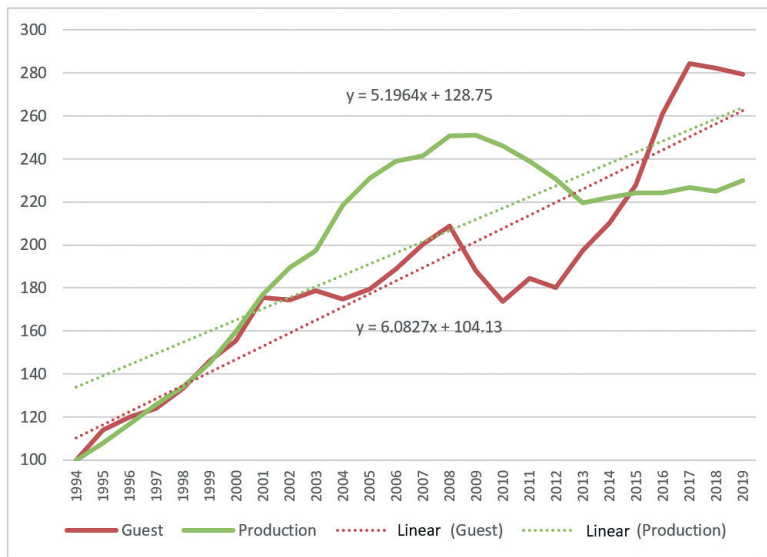


Figure 1. Link Guests / Electricity

Source: Own calculations based on data from the Statistical Office.

“for the limitation”. Moreover, tourists were asked to rate the impact of air traffic on the island on a scale of 1 to 5. Opinions were divided: the most frequently chosen answer was “rather positive” (39.67%), then “neutral” (30.98%) and “Very favourable” (24.46%). Only about 5% of the respondents chose the answer “rather negative”.

During the research, the respondents also formulated additional, complementary opinions, which were a source of valuable information on the effects of overtourism. Below the opinions of residents are presented in a synthetic way, and the opinions of tourists in the second, collected on the basis of answers to open and closed questions from the survey.

One of the most frequently raised issues among the inhabitants of Madeira participating in the survey concerned the rental of accommodation facilities based on the idea of “sharing economy” (e.g., via Airbnb). The participants of the survey complained about the constantly growing rents and the emerging need for the inhabitants of the island to look for cheaper flats, most often outside Funchal. A high number of tourists also is also linked with higher

prices of goods, services and real estate, which are often purchased by wealthy foreign investors. At the same time, people employed in the tourism industry believed that their earnings were relatively low despite the high expectations of employers. A parallel problem is the fact that a narrow group of wealthy people controlling the tourism industry, owners of large hotel facilities and foreign investors continue to gain wealth. At the same time, the development of tourist infrastructure does not translate into an improvement in the living standard of the inhabitants.

Among the negative phenomena accompanying overtourism in Madeira, the inhabitants also mentioned the too large share of foreign entities in the island's economy and the excessively high share of imported goods, which supersede domestic production. A parallel problem is commercialization of local products, homogenization of culture and other negative phenomena accompanying mass tourism, such as domination of foreign cultural patterns or arrogant behaviour of tourists. The problem of huge amounts of pollution and waste generated by tourism and visitors was also signalled,

along with a lack of visible measures to protect the environment.

Residents participating in the research also drew attention to the architecture and aesthetics of tourist cities located in Madeira, pointing to the creation of tourist enclaves inaccessible to outsiders and the too intensive construction of multi-story hotel facilities that introduce permanent, unfavourable changes in the landscape of the island.

Interestingly, with regard to urban and architectural aspects (including the excessive expansion of large-scale hotels and), similar opinions were also expressed by tourists who participated in the study. They drew attention to the disturbed natural landscape and to formation of enclaves resembling, for example, the degraded, highly urbanized European Mediterranean coast. Such a landscape was disappointing for many visitors, especially in the context of the functioning image of Madeira as an island with unique natural values. In the context of overtourism, tourists also pointed to problems with using too crowded public transport, or a scarce offer of companies providing car rental services. Among the frequently mentioned problems there were also crowds in restaurants, the necessity to wait to enter tourist attractions, and too high prices of goods and services.

Conclusion

The considerations presented in the article show that the spectrum of phenomena and consequences related to “excessive tourism” is very broad and is not limited only to the sphere of individual, subjective feelings of people affected by “excessive tourism” (both residents and tourists), but that they also visibly affect various spheres of the economy and industry.

Summarizing the results of the survey discussed above, the main problems related to overtourism indicated by the inhabitants in a slogan manner include:

- rising prices of goods, services, and rents;
- rising property prices becoming unattainable for Madeira residents;

- need to look for cheaper housing;
- problems with jobs (too few jobs, low wages, hiring people from outside Madeira);
- lack of control over websites functioning on the idea of *sharing economy* (e.g., Airbnb);
- excessive expansion of large hotel facilities and degradation of the island's landscape;
- lack of fair access to the benefits of tourism (the greatest income goes to wealthy investors);
- commercialization of local culture;
- conflicts with tourists;
- crowds in shops, restaurants, means of communication;
- overexploitation and destruction of the island's natural and cultural values.

The main problems reported by tourists include the following:

- problems with the accessibility of public transport;
- Madeira's over-urbanized landscape, contradicting the image of an island of outstanding natural beauty;
- continuous construction work and construction of new facilities;
- high prices of goods and services;
- too many visitors at tourist sites and facilities.

Despite the extensive list of problem areas and the growing number of tourists, in the opinion of the authors, the phenomenon of “excessive tourism” occurs in Madeira to a rather minimal extent, because the island still has a wide margin of tourist capacity, as well as various opportunities for the development of tourist infrastructure, for example in rural areas. At the same time, there are some disturbing symptoms of overtourism that should be counteracted in advance. This applies in particular to areas related to the policy of making Madeira available to tourists and the development of infrastructure. With regard to the energy area analysed in this study, in view of the expected increase in the number of tourists in the coming years, it is necessary to increase

the availability of electricity and water to meet the everyday needs of both residents and tourists. Or, alternatively, incorporate energy-saving measures into the daily routine of the tourism sector, based on new investments and business models designed to use renewable and environmentally friendly energy sources. Measures to increase visitor awareness of environmental issues could also be pursued and encouraged in the near future.

To conclude, islands and tourist areas with similar conditions are required to manage in a careful and prospective manner the impact of economic growth, in general, and tourism development, in particular, on a number of environmentally-related issues such as pollution, industrial and household waste, and water and energy consumption. Territories like Madeira need to be even more careful as high levels of population density and over-concentration of hotel facilities in a narrow strip of land tend to highlight all the potentially negative elements of over-consumption and limited resources.

Author contributions: Conceptualization, P.M.; Methodology, P.M. and A.A.; Validation, P.M., Formal Analysis P.M., J.M., and A.A.; Investigation, P.M. and A.A.; Writing – Original Draft Preparation, P.M., J.M., and A.A.; Writing – Review & Editing, P.M. and A.A.; Visualization, A.A.; Supervision, P.M. and J.M. All authors have read and agreed to the published version of the manuscript.

Funding: This paper presents data and information obtained within the project “Innovation in Tourism and Recreational Physical Activity in the Paradigm of Sustainable Development: Implementation – Perception – Effects”, financed within the activity of the Social Sciences and Humanities School of Research on Physical Culture of the Józef Piłsudski University of Physical Education in Warsaw, from the funds of the Ministry of Science and Higher Education.

Institutional Review Board Statement: Not applicable.

Conflicts of Interest: The founding sponsors had no role in the design of the study; in the writing of the manuscript, and in the decision to publish the results.

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