

## Disadvantages Connected With the Development of Tourism in the Contemporary World and the Concept of Sustainable Tourism

### Dysfunkcje rozwoju turystyki we współczesnym świecie oraz koncepcja zrównoważonego rozwoju turystyki

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#### Abstract

This article describes the natural, social and economic disadvantages of the development of tourism around the world. A review was also carried out of the basic indices describing volume of tourist traffic including the tourism intensity index, Baretje-Defert's index, Defert's index, and Charvat's index), in terms of their usage in measuring the level of threat of tourism-related disadvantages. Areas that are much more vulnerable to a magnitude of disadvantages associated with the development of tourism are indicated and an attempt is made to determine which of the disadvantages (social, economic or natural) pose the greatest threat to the tourist-receiving area. The concept of sustainable tourism and the possibility of solving the disadvantages problems was presented. In addition, an answer is sought to the question of which indices can describe and monitor the level of tourism development disadvantage in the social, economic and natural spheres.

**Key words:** tourism disadvantages, economic disadvantages, natural threats, social disadvantages

#### Streszczenie

W niniejszym artykule dokonano charakterystyki naturalnych, społecznych oraz ekonomicznych dysfunkcji rozwoju turystyki na świecie. Wykonano także przegląd podstawowych wskaźników opisujących wielkość ruchu turystycznego (m. in. wskaźnik intensywności ruchu turystycznego, Baretje'a-Defereta, Defereta, Chavarata) pod kątem ich wykorzystania do mierzenia poziomu zagrożenia występowania dysfunkcją turystyki. Wskazano obszary, które są znacznie bardziej narażone na ogrom dysfunkcji związanej z rozwojem turystyki oraz podjęto próbę ustalenia, które z dysfunkcji (społeczne, ekonomiczne czy przyrodnicze) stanowią największe zagrożenie dla obszaru recepcji ruchu turystycznego? Ponadto szukano odpowiedzi na pytania: które wskaźniki mogą opisywać i monitorować poziom dysfunkcji rozwoju turystyki w zakresie społecznym, ekonomicznym i przyrodniczym?

**Słowa kluczowe:** dysfunkcje turystyki, niekorzyści ekonomiczne, zagrożenia przyrodnicze, społeczne dysfunkcje

#### Introduction

Many studies have been devoted to the positive impact of the development of the tourism sector on the receiving area in terms of the natural environment, the local community and the economy (Zaei, 2013,

p. 12-21). Researchers A. Mathieson and G. Wall (1982) described the economic, social and natural consequences of tourism development. The impact of tourism on protected areas was presented by K. Andereck (1993). The positive effects of tourism development in the economic sphere have been most

widely reported. These include the significant relationship between tourist expenditure and the economic growth of a given tourist-receiving area (Dritsakis, 2004, p. 305-306).

The natural positive effects of tourism development include the greater tendency of local populations deriving profits from tourism to protect a given area rather than exploit it (Dudek, 2004). This is the case where the local community can participate in guiding tourists around national parks or provide them with various services, rather than hunting animals living in the protected area (Dudek, 2008; Dudek, 2010).

According to A. Balińska and M. Błaszczak (2014, p. 8), mass tourism poses a certain threat to the natural environment. Comparing the threats arising from the development of tourism with other sectors of the economy, damage to the natural environment generated by tourism ranges from 5 to 7%. This is a small figure when compared with the levels of degradation to the natural environment resulting from industry (40%), construction (20%) and agriculture and transport (15%) (Balińska and Błaszczak, 2014, p. 8, after Kamieniecka, 1998).

G. Sinclair-Maragh and D. Gursoy (2015, p. 143-158) analysed the positive and negative effects of the development of tourism on islands. Jamaican residents' perceptions of developing tourism were tainted by imperialism, but nevertheless, the local population supported the development of the island's tourism sector due to its positive economic impact (Sinclair-Maragh and Gursoy, 2015, p. 143-158). According to A. Dłużewska, the development of tourism in North Africa influenced a significant change in the behaviour of the local population and contributed to the reduction of water resources (Dłużewska, 2008, p. 125-141).

The purpose of this article is to seek answers to the questions of which of the natural, economic or social disadvantages are predominant in the development of tourism and which indices can help to better monitor the level of tourism development disadvantages. The following hypotheses were put forward: firstly, the most important disadvantages related to the development of tourism are natural disadvantages, while economic disadvantages are much less important. Furthermore, it was assumed that the majority of available and easily quantifiable indices only allow the monitoring of the natural disadvantages of tourism. Another aim of the article is to find an answer to the question of whether the idea of sustainable development in tourism gives us the opportunity to limit the negative effects of the development of tourism in developing countries.

### **Natural, social and economic problems related to the development of tourism**

Mass tourism constitutes the greatest threat to the natural environment, especially if it is organized in the wrong way. According to Z. Kruczek (2011), all negative consequences associated with tourist traffic in a given area can be referred to as tourism disadvantages (Kruczek, 2011, p. 10-11).

The uncontrolled development of tourism in many regions of the world is associated with major problems, both in terms of threats to the natural environment, and threats to the economy and the social sphere. There are many examples of the huge exploitation of the natural environment by the tourist sector, observed in water pollution, air pollution and the reduction of forest areas stripped to make way for the construction of tourist infrastructure, including the acquisition of new naturally valuable areas for hotel investments<sup>1</sup>.

These investments are accompanied by an increase in noise level, which also reduces the quality of life of residents. Furthermore, there is the problem of the exploitation of coastal and mountain areas that are particularly attractive in terms of nature. This results in the loss of biodiversity in precious natural areas in many regions where the tourist industry is experiencing intensive development.

### **Natural disadvantages related to the development of tourism**

The natural disadvantages of tourism development can be divided into those related to the construction of tourist infrastructure (hotels, gastronomy infrastructure, shops, and so on) and those that result from various tourist activities. The first type of impact is particularly damaging; the construction of each type of infrastructure leads to the reduction of habitat areas as well as erosion, and is often associated with deforestation. The later functioning of tourist resorts is connected with an increased demand for water and the production of sewage and various types of solid waste, including plastic waste, which is hard to break down. In the case of large hotel complexes, a major problem is light pollution – the generation of excessive artificial lighting during the night. This adversely affects flora and fauna that are not adapted to live in such conditions. The excess of artificial light has a particularly negative effect in the case of hotels located in the coastal zone of the tropics. It disturbs the natural reproduction processes of sea turtles, resulting in the animals avoiding heavily lit beaches (Kamrowski, et al. 2012, p. 85-98).

<sup>1</sup> One negative example of the impact of hotel investments on the natural environment comes from Poland, where in Leba in 2016, a prized forest was chopped down for the construction of the Gołębiewski hotel. Pursuant to the

amendment to the Act on Nature Conservation, four hectares of protected forest were felled to enable the implementation of hotel investments (Wyborcza.pl, www.trojmasto.wyborcza.pl).

In many cases, another consequence of high-intensity tourism is the excessive noise caused by means of transport and the organization of mass events (Seweryn, 2002, after Warszyńska and Jackowski, 1978). This is important from both the environmental perspective (interfering with the natural life cycles of organisms, disturbing animals) and the social perspective (disrupting the local life of inhabitants). The natural environment is also made vulnerable due to the practising of specific forms of tourism – especially mass tourism, which is characterized by a high tourism intensity index. Typical leisure tourism is characterized by a very large number of tourists per year staying in a given town, exceeding the number of permanent residents several times over. In addition, active tourism poses an additional threat to the natural environment – for example, when tourists practise mountaineering, scuba diving or snorkelling.

An example of the destruction of the natural environment is the practice of tourists collecting souvenirs from the Petrified Forest National Park in the United States. This involves the illegal removal by visitors of fragments of petrified trees as a memento of their visit to the park, serving to deplete the park's resources.

Marine and ocean areas where coral reefs are located are particularly vulnerable to tourism development disadvantages. Not only does the destruction of these areas involve tourists walking on the reef and demolishing it, but there is also the issue of unintentional destruction, for example, due to mooring boat. On the global scale, such areas with a very high tourism intensity that have unique tourist attractions include island areas such as the Cayman Islands, the British Virgin Islands, the American Virgin Islands, the Bahamas, Aruba, and Antigua and Barbuda.

An example of negative effects on the natural environment is presented on the island of Thilafushi in the Maldives, which has been dubbed the rubbish island. It is one of the fastest growing rubbish islands in the region. Tourists produce three times more rubbish than the local population, and the number of tourists per year is almost four times the number of residents<sup>2</sup>. Since 1999, Thilafushi has become a huge rubbish dump.

An example of the adverse impact of the tourism sector on the natural environment is the Ras Muhammad National Park in Egypt. At the end of the 1990s, half a million tourists visited this park every year, of which over 20,000 practised deep diving. As a result, the coral reefs in the park and adjacent areas were at risk. The anchoring and mooring of ships had a particularly negative impact on the environment. The rate of coral reef death was notably higher in the area where tourism was occurring than in the area without tourist traffic. A huge problem has been caused by

tourists taking fragments of the coral reef, sea shells and other sea specimens of life as souvenirs of their stay. A relatively new research topic is the impact of tourists' usage of cosmetics – especially sunscreens. The chemical compounds contained in these cosmetics have a negative effect on the degeneration of coral reefs and other forms of marine life. According to estimates, in areas of coral reef, between 4,000 and 14,000 tons of sunscreen lotion are released into the environment every year (Wood, 2018, p. 1-21). Specific threats can be associated with specific types of tourism; for example, ski tourism involves the preparation and maintenance of ski trails – that is, the removal of forests – resulting in soil erosion, avalanches and landslides. In terms of water tourism, motorboat tourists scare animals using boats with engines, and in terms of high-altitude tourism – which takes place in the Himalayas, for example – tourists fail to throw rubbish in the appropriate places and leave it instead on their trekking route. Even regular hiking and trekking tourism involves stunting vegetation, uncovering tree roots, erosion and disturbing animals. If campsites or picnic areas emerge alongside tourist trails, the acquisition of firewood and water increases, as does the risk of fire.

The negative consequences of the presence of tourists in natural areas are related to their casual interactions with wild animals. Animals become used to the presence of people and to the new sources of food provided, whether intentionally or not, by tourists. The influence of the presence and activity of safari tourists on the behaviour of animals on African savannahs has been described extensively (Hayward and Hayward, 2009, p. 219-224).

A separate, very broad topic is the impact of hunting tourism on animal populations. This type of tourism usually takes place in hunting reserves under strict conditions and according to strict rules. While it is usually the positive impact of this form of tourism on the economy of local communities which is emphasized, there is also a discussion about the ethics of the phenomenon and its actual impact on the number of animals (Dickson, Hutton and Adams, 2009). In recent years, great attention has been paid to the negative aspects of tourism activities that are based on interactions with animals, both those kept in captivity (taking pictures with tigers in sanctuaries, visiting crocodile farms, elephant rides, visiting civet coffee plantations) and those in their natural environment (swimming with dolphins, cage diving to observe sharks, touching sea turtles). Reference is made to the fatigue of animals during these activities and the often inhumane conditions in which the animals are kept in such places, even if they are officially sanctuaries which are meant to contribute to their protection. Often, the habituation of animals to behaving in a certain way towards visitors is associ-

<sup>2</sup> The number of tourists visiting the Maldives in 2015 was 1,234,000 (World Tourism Organization, [www.unwto.org](http://www.unwto.org)), while the number of residents was 392,700.

ated with a long, cruel training period and the suffering of the animals. Such practices are particularly widespread in less developed countries, where animal rights are not respected and there are no institutions fighting to protect them. It is not uncommon to observe monkeys or trained bears kept on chains to provide entertainment to visitors (Tourism Concern, [www.tourismconcern.org.uk](http://www.tourismconcern.org.uk)).

An example of the irrational exploitation of the natural environment due to tourism is the construction of golf courses and the introduction of different species of plants, mainly grasses, which require intensive irrigation (Balińska and Błaszczak, 2014, p. 9, after Zaręba, 2008, p. 18; Holden, 2005, p. 167). Often, golf courses are set up in climatic zones where low rainfall is recorded, and irrigation deprives other areas of valuable resources in the form of water resources.

The increasing global number of tourists contributes to increased greenhouse gas emissions through various forms of transport, especially aeroplanes. This has various environmental consequences, both on a global and a local scale.

With growing tourist traffic, tourists are more frequently reaching remote, isolated places. This is connected with another negative effect of tourism development – the introduction of foreign, invasive plant and animal species to new environments. Exotic, invasive species displace native species from their habitats, occupy their ecological niches, compete with them, change the environmental conditions, and may feed on local species or interbreed with them – the spectrum of ecological consequences of the appearance of a new species is therefore very broad. Tourism contributes to the spread of alien species in a way that is unintentional (accidental introduction by tourists) or intentional (for example, the introduction of foreign plant species into hotel gardens) (Anderson et al., 2015). The presence of exotic species may have particularly negative consequences for island environments, which are characterized by a high level of endemism of flora and fauna and are also extremely attractive from the tourist point of view. Areas that are particularly sensitive to the loss of biodiversity are subject to special baggage checks for people arriving on the island, but these checks are not always effective. The spread of invasive species generates enormous costs not only for the environment, but also for the economy and public health.

### **Economic problems related to the development of tourism**

There is much talk about the positive effects of tourism on the economy of the receiving area; certainly, these effects are indisputable. B. Archer and J. Fletcher (1996) analysed the impact of the tourist sector on the labour market of the Seychelles and estimated how many tourists it takes to create a single job in tourism (Archer and Fletcher, 1996, p. 43).

Tourism is a very labour-intensive field of the economy and offers great employment opportunities for low-skilled workers, especially in developing countries. Indeed, it is in developing countries that jobs for low-skilled workers are needed (Szivas and Riley, 1999, p. 751). However, in highly developed countries, cheap labour is usually imported from abroad to maintain the low cost of tourist services.

M. Kryczka-Habina and J. Sala (2006, p. 228) studied the influence of tourism in Cracow and showed the benefits of investments in infrastructure and an increase in sales revenues, which also increases the standard of living of the local population. It should be noted that a very large number of tourists arriving in a given area per year certainly transforms the economy of the receiving area.

Negative effects of tourist traffic on the economy arise from the excessive demand generated by tourists. In places where there is a lot of tourist traffic, shops and catering establishments raise their prices significantly. There is a high inflationary pressure, which is paid for not only by tourists but also by the local population. For example, in small island areas such as the Cayman Islands, huge inflations have been recorded in the real estate market due to major investments in the hotel industry and individual investments in private apartments. This is a big obstacle for local residents who, after a certain point, can no longer afford to buy real estate due to the high prices. Another example is the Balearic Islands, where local authorities limited the possibilities of private investment in apartments to protect the population from price increases, and introduced a universal tourist tax.

Small tourist economies must constantly increase imports in order to serve tourists (tourists from highly developed countries are accustomed to certain food products). Products also need to be imported for hotels, especially if the hotels belong to international networks and they want to meet set standards. In addition, an area which is dependent on tourism creates a tourist monoculture, which was described in depth by M. Jasiński (2006). Tourist monocultures can be highly susceptible to so-called external shocks in the form of economic crisis, political crisis, natural disaster or an epidemic in the region, which may lead to the collapse of tourism in the area, followed by a sharp rise in unemployment. It has been said that tourist monocultures are more dangerous than other monocultures, such as raw material or agricultural monocultures. This is due to the specificity of tourist services related to a lack of storage capacity (Seweryn, 2002, p. 90, after Gieźgała, 1977, p. 345).

Another problem connected with spatial planning is the formation of traffic jams during the tourist season. Examples of this issue include micro-states such as Andorra, and tourist resorts such as Zakopane and Szczyrk. In some mountain towns, a fee has been considered for people who live outside the city and

travel into the city<sup>3</sup>. This idea was not received favourably by tourists, nor by residents earning a living from tourism. Another economic problem relates to spatial development, especially in developing countries, where modern hotel buildings do not always adapt their architecture to the surrounding structures. This can lead to the formation of so-called architectural chaos. In addition, poorly thought out settlement – for example, the construction of holiday homes in unsuitable places – may often lead to the destruction of the landscape in architectural terms. In many tourist-receiving areas, there have been terrorist threats and even terror attacks aimed directly or indirectly at tourists. Examples include the terrorist attacks in Bali in 2002 and 2005, the attacks in Ankara in 2015 and 2016, in Tunis in 2015, in Marrakesh in 2011, and in Bombay in 2008 (Newsweek, [www.newsweek.pl](http://www.newsweek.pl)).

Global companies also participate in the expansion of tourism. They transfer their profits from the tourism sector abroad, resulting in the phenomenon of foreign exchange losses from tourism, also known as tourism leakage. Huge transfers of profits from tourism are an example of the phenomenon known as tourist neo-colonialism. This form is implemented in many third world countries which develop tourism in their area. By exploiting the natural environment, foreign investors earn money from tourism and transfer a large proportion of the profits to their countries or tax havens. P. Cywiński (2015, p. 21-24) wrote about the effects of tourist neo-colonialism on local cultures and communities. According to M. Jakubowska (2014), tourism can cause the polarization of income, which is a derivative of the structure of employment or property (Jakubowska, 2014, p. 205). Meanwhile, according to L. Pender and R. Sharpley, the policy of local authorities and the quality of decisions made by managers of the tourism industry are very important. This determines the contribution of tourism to the overall economic development of the tourist region (Jakubowska, 2014, p. 205, after Pender and Sharpley, 2008).

### **Social problems related to the development of tourism in the modern world**

The social disadvantages of tourism differ depending on the magnitude of the cultural differences between the tourist-receiving area and the area tourists come from (Dłużewska, 2008, p. 52, after Przeclawski, 1997; Gursoy and Rutherford, 2004).

The most important social problem related to the development of tourism is the collision of different cultures. Tourists usually represent Western culture, which does not always correspond to the local population. This is particularly evident in Muslim countries, where tourists need to adapt to certain social

and cultural norms. It often turns out that, for their comfort and convenience, tourists do not have to follow these standards – for example, they can consume alcohol in holiday resorts, despite the fact that the local population must comply with the ban on alcohol consumption in their country. This can be a cause of frustration for the local population. Another example is the Maldives, where local people are isolated from tourists due to the creation of special tourist enclaves – specific islands for tourists and separate islands for the local population (Jędrusik, 2005). During the day, cleaning staff (mainly women) are present on the tourist islands, but only until the early evening hours when they have to leave the island. They are not allowed to stay on an island with tourists overnight.

A particular challenge is the organization of tourism in countries where tourism develops very quickly while the community maintains a traditional, closed nature. This is the case in the Persian Gulf countries, which have opened up to tourists from Western countries in recent years. However, there are still very restrictive laws regulating the moral sphere; some elements of the legal system are still based on Sharia law. This generates potential conflicts between tourists and the citizens of the country. The Emirate of Dubai in the United Arab Emirates, which in recent years has become the tourist capital of the region, is a special case. The organization of space there ensures the separate functioning of different segments of society; however, for example, in public spaces where tourists and locals meet, there are shopping centres which are visited by both groups. In order to avoid unwanted situations in shopping malls, a restrictive policy was introduced regarding appropriate dress and behaviour (banning public displays of affection). The issue of eating meals during Ramadan was also resolved in an interesting way. A part of the shopping centre was isolated, separated by sealed screens behind which non-Muslims can dine in peace during the day, while the locals, who are obliged to obey the fast, are not confronted with these scenes. Similarly, the issue of alcohol consumption was resolved by way of a compromise. It can easily be purchased in restaurants, hotel bars and discos, but it can only be consumed on these premises. Drinking alcohol in public – for example, on a beach or in a park – is forbidden. Therefore, tourists cannot buy alcohol in shops, because it is sold only at special points and only to owners of a so-called alcohol licence. This licence is available to immigrants who live and work in Dubai, but not to tourists.

Other areas, such as the Caribbean, face problems related to prostitution (for example, Jamaica, the Dominican Republic). L. Yan, J. B. Xu and Y. Zhou, (2018, p. 205-220) analysed the negative opinions of

jams and high air pollution generated by road traffic in the town.

<sup>3</sup> The town of Zakopane analysed the possibility of introducing a fee for people who live outside the city and travel into the city. The aim was to solve the problem of traffic

the local population living in Macao relating to the phenomenon of prostitution associated with tourism in the area.

There are also areas famous for selling drugs to tourists, such as Northern Thailand, Myanmar and Laos. This is despite the very high penalties for possession of drugs (one year in prison for every gram) and even the death penalty for certain people possessing and dealing drugs. Where there is large tourist traffic, there is also an increase in petty crime (mainly theft). Tourists are an easy target for criminals because they mostly come from highly developed countries with a high level of security, which means that they are less careful during their trip and often leave valuable items unprotected.

Social disadvantages also apply to members of local communities, especially young people, who are susceptible to outside influences. Local youth observe the behaviour and lifestyle of visitors and want to imitate them. This is particularly relevant due to the fact that many tourists behave completely differently on holiday than in their day-to-day lives – they live beyond their means, abuse alcohol, and are more unhindered and open. This may arouse the jealousy of the local community. As a result, local values are eroded, the Western lifestyle is adopted, consumerism is popularized and stereotypes are strengthened. In the literature, this phenomenon has been labelled the demonstration effect and is the subject of extensive discussion (Fisher, 2004). The critics of this approach indicate that the adoption of Western ways may occur not only as a result of observing the behaviour of tourists, but also as a result of watching films and advertisements, and reading magazines. In addition, the adoption of foreign behaviour can take place in both directions; visitors (tourists) can also imitate the local lifestyle. It has also been noted that the demonstration effect is often erroneously described only in negative categories. Cultures are, after all, dynamic creatures that are subject to changes and influences; this is a natural consequence of the interpenetration of cultural patterns which can also bring positive changes.

Another social problem is the fact that work in tourism consists mainly of jobs for low-skilled workers. Even if managerial positions appear, they are inaccessible to the local population. It often happens, as in the Caribbean region, that the local population is no longer willing to take the low-paid jobs and workers need to be brought in from developing countries (for example, the Philippines or India); in any case, work in tourism is usually seasonal.

Social disadvantages of tourism may also manifest in reductions in the quality of life among the local community as a result of congestion, excessive road and motorboat traffic, and pervasive noise.

If tourists visit national parks, this also impacts on the forms of economic activity of the local population living around the protected areas. The employment structure in the areas around the national park

changes. This is often accompanied by the increased migration of people lured by the prospects of jobs in tourism. Due to the legal regulations of national parks, local people cannot practice traditional ways of using the environment, such as hunting for animals, agriculture and foraging, but they can earn money by guiding tourists around the park, selling them souvenirs or working in local hotels (Dudek, 2010).

Tourists visiting certain areas are often given access to folklore which has been adapted to their needs. It is often a significantly distorted or simplified version of folklore and culture customized to the needs of tourists, intended above all to provide them with entertainment (Seweryn, 2002; Gaworecki, 1994). This also has negative consequences for local cultures, leading to their misrepresentation, disappearance and, ultimately, the loss of local identity and the standardization of cultures.

When cultural institutions and places of worship become tourist attractions, they lose their traditional significance for the local population (Seweryn, 2002, after Przeclawski, 1986; Przeclawski, 1994) and are subject to intense commercialization. P. Cywiński highlighted the process of appropriation of a public sacred space for the benefit of tourist functions (2015, p. 21-24).

Figure 1 presents the social, economic and natural disadvantages of tourism.

Although the majority of disadvantages can be seen in the economic sphere, the disadvantages related to the natural environment are the most severe. They could lead to the permanent loss of the function of tourism, thus contributing to the disappearance of this function in accordance with the final phase of the Butler model (1980, p. 5-12).

### Indices describing the level of tourism disadvantage

The tourism intensity index can be considered as a measure used to calculate the threat level of the disadvantage of tourism in terms of economy, society and nature. The sheer volume of tourist traffic does not provide us with information on its size in relation to the population. On the other hand, the tourism intensity index makes reference to the number of inhabitants in a given area.

$$\text{Tourism intensity ratio} = \frac{\text{number of tourists}}{\text{number of permanent residents}}$$

The number of countries for which data was available and where it was possible to calculate the tourism intensity index is given below. There were 230 countries and dependent territories. In six countries, the index was above 10, which means that, in 2015, the number of tourists during the year was 10 times greater than the population. These countries were Andorra (34.2), Macau (23.8), the British Virgin Islands (13), Saint Martin (13), Aruba (11), and Turks

Figure 1. Social, economic and natural disadvantages of tourism, source: own elaboration

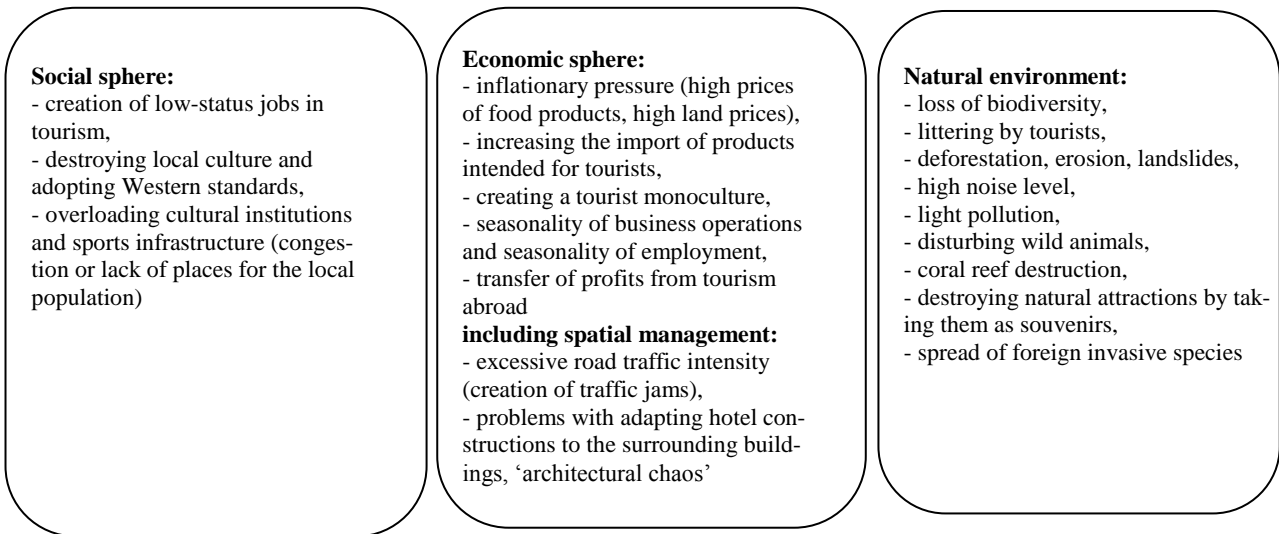


Table 1. Countries and dependent territories according to the tourism intensity index in 2015, source: own elaboration

Tourism intensity index	Number of countries and dependent territories	Description
above 10	6	Very endangered
3-10	15	Moderately endangered
1-2	11	Neutral
1-0.1	75	Not endangered
below 0.1	123	Definitely not endangered

and Caicos (11). A tourism intensity index in the range of 3 to 10 was recorded for 15 countries and dependent territories; between 1 and 2 for 11 countries; between 0.1 and 1 for 75 countries; and below 0.1 for 123 countries. This means that areas with a tourism intensity index at the national level below 0.1 are not threatened by the disadvantages of tourism development, although this threat may appear at the level of a specific tourist resort.

It should be noted that the types of countries and dependent territories that are particularly vulnerable to tourism development disadvantages are the micro-countries and small dependent territories. This group includes small island developing states (SIDS), where a great many of the previously mentioned disadvantages occur.

The level of tourism function development can be assessed by means of several indices – for example, Baretje-Defert's index, Schneider's index, Charvat's index, Defert's index, and the accommodation density index (Szromek, 2013, p. 92).

Baretje-Defert's index is a measure of tourism development (Szromek, 2013, p. 91-93). The formula is presented below.

$$\text{Baretje-Defert's index} = \frac{\text{number of beds}}{\text{number of residents}} \times 100$$

Another good index for defining the level of development of the tourist economy, which is also a measure of the tourism function, is P. Defert's index. This is expressed by the number of beds divided by the size of the area and multiplied by 100 for better readability of the index (Defert, 1967).

$$\text{Defert's index} = \frac{\text{number of tourists using accommodation}}{1 \text{ km}^2} \times 100$$

This index may be useful in determining the pressure on the natural environment, especially if it is calculated locally (for example, for the area around a national park or for a municipality at the NUTS 5 level). However, the index does not take into account that a given area may also be visited by one-day visitors who do not pay for accommodation (Michalko, Demková, Buczek-Kowalik and Mitura, 2017, p. 199).

While the tourism intensity index may not show exactly where tourists stay overnight, Defert's index includes this variable. Tourists may pass through a national park area but stay in another town, or even another region. This index describes how the tourist-receiving area could benefit from handling tourism. Schneider's index is also a measure of the tourist function and is described by the formula:

Table 2. Selected indices for monitoring the disadvantages of tourism in the social, economic and natural spheres, source: own elaboration based on Giuliatti 2016

Name of measure	Monitoring natural disadvantages	Monitoring social disadvantages	Monitoring economic disadvantages
Baretje-Defert's index	x	x	x
Defert's index			x
Schneider's index		x	x
Charvat's index		x	x
accommodation density index	x	x	x
environmental pollution associated with tourist transportation <sup>4</sup>	x		
amount of water used by tourist facilities	x		
area utilized by tourist accommodation (km <sup>2</sup> )	x	x	x
changes in the occurrence of fauna and flora in designated areas in relation to tourism	x		
amount of rubbish generated by tourism	x		
area exploited by tourism (km <sup>2</sup> )	x	x	x
proportion of tourist facilities using sewage systems	x		x
bathing water used by tourists	x		
use of land for tourist facilities	x		x
number of visitors to protected areas in a given year and number of guests per km <sup>2</sup>	x		
road traffic intensity in tourist destinations (hours/km)	x		x
average distance of tourist journey per tourist (km)	x		x
contribution of the tourism industry to generating GDP (%)			x
household expenditure on tourism			x
expenditure on the maintenance of protected areas made available to tourists	x		
revenue from tourist taxes (e.g. local tax, climate tax)			x

$$\text{Schneider's index} = \frac{\text{number of tourists using accommodation}}{\text{number of permanent residents}} \times 100$$

The next index is Charvat's index. This is the number of overnight stays in relation to the number of permanent residents, multiplied by 100 for better readability.

$$\text{Charvat's index} = \frac{\text{number of overnight stays}}{\text{number of permanent residents}} \times 100$$

Due to the fact that this index also takes into account the length of stay, it is the most accurate index. Unfortunately, the data used to calculate this index is not available for all areas. A value of this index above 100 is thought to indicate a developed tourist function.

The accommodation density index is an index that refers to the size of the area, and thus to the territory of tourist development. If calculated locally, it can

also say a lot about the congestion of a given area resulting from tourism development.

$$\text{Accommodation density index} = \frac{\text{number of tourist accommodation places}}{1 \text{ km}^2}$$

According to the European Environment Agency (EEA), the negatives of tourism development can be eliminated by preparing appropriate tourism development strategies including ideas for sustainable development and the monitoring of relevant indices. Not all of these indices are available, but these suggestions can be discussed. According to the EEA, the indices can be divided into four groups: indices describing environmental costs, indices relating to the management of demand while preserving natural resources, indices describing tourist demand, and indices describing the costs of tourism (Giuliatti, 2016). Table 2 presents selected indices for monitoring the disadvantages of tourism in the social, economic and natural spheres.

<sup>4</sup> It is estimated that 50% of air transport is tourist transportation.



Looking at the table, the advantages of the indices that monitor the natural function (15 indices) and economic function (14 indices) are notable. There are few indices that monitor the level of social disadvantage (6 indices). The majority of the indices are available at the national level and are difficult to monitor at the local level due to data availability issues.

### Proposed solutions and the concept of sustainable tourism

Faced with the aforementioned problems, scientists created the concept of sustainable tourism, which aims to minimize the negative impact of tourism on the natural, economic and social spheres. Sustainable tourism is a concept that allows us to use assets in such a way that they will not become degraded in the future. This means that tourist attractions can be used by successive generations. This is very important from the tourism point of view, because if we destroy natural assets, we may see tourist destinations being forgotten more quickly and tourists will stop visiting them.

Sustainable tourism is considered to be cultivated by people who respect the natural environment and also care about the welfare of the local community. Responsible types of tourism include ecotourism, involving visits to natural areas that contribute to the protection of environmental resources and the improvement of the local community's standard of living. In addition, ecotourism as sustainable tourism should have an educational aspect (The International Ecotourism Society, [www.ecotourism.org](http://www.ecotourism.org)). Humans should implement the idea of sustainable development in a way that allows future generations to satisfy their needs; sustainable development is a contemporary, global challenge (Fiut, 2012, p. 31-39; *Report of the World Commission...*, 1986, p. 16). An example of the implementation of these ideas in tourism at the local level is found in the various administrative and planning concepts for the management of national parks and reserves based on reconciling the interests of local communities, tourists and nature. These include various ways of zoning protected areas, ideas for deliberately focusing tourism infrastructure in designated places in order to *detract* tourists from the places most susceptible to degradation, and various administrative restrictions on access to places that are particularly valuable in terms of nature.

Responsible tourism is a relatively new concept and a much broader term than ecotourism, because it relates not only to naturally valuable areas, but to all valuable areas. By definition it refers to sustainable tourism, but while sustainable tourism usually defines the characteristics of the tourism sector, responsible tourism refers to the behaviour and attitudes of all parties involved. Responsible tourism is travel for people who are aware of the various types

of tourist disadvantages and want to limit them. During *responsible* travel, tourists and members of the local community learn from one another and exchange knowledge; greater understanding is achieved, both among visitors and hosts. It is also a way of travelling that brings financial benefits to local communities, as well as the possibility of financing various local initiatives.

The idea of sustainable development should guide all activities of local governments and be used to create strategies at the central and regional level (Dragomirescu and Bianco, 2017, p. 31-39; Mierzejewska, 2017, p. 71-78). The aim of this idea is to seek a compromise between economic and social development and the protection of the natural environment (Kowalczyk, 2011, p. 36, after Śleszyński, 2010). It is estimated that ecotourism accounts for 7% of tourist income (*Report on the state of the economy...*, 2013, after *The Ecotourism Statistical Fact Sheet*, 2000). The development of sustainable tourism should take into account the economic, ecological and socio-cultural aspects of equilibrium (Kaźmierczak, 2010, p. 9-18; Kowalczyk, 2010, p. 19-29; Pawilkowska-Piechotka, 2009; Cisneros-Martínez, McCabe and Fernández-Morales, 2018; Ayuso, 2003). Positive experiences in the development of sustainable tourism have been widely discussed in the literature (Scheyvens and Momsen, 2008, p. 491-510; Buckley, 2002, p. 405-424).

### Conclusions

The aim of the article was to find an answer to the question of which of the negative effects of tourism development – social, economic and natural – are dominant around the world. In addition, the article reviews all measures describing the level of tourist traffic and discusses the usefulness of individual indices to measure natural, social and economic disadvantages and the values of these indices that ensure the implementation of the concept of sustainable tourism. The article presents the following hypotheses: firstly, among the many disadvantages of tourism development around the world, the strongest negative effect is the impact of tourism on the natural environment. Although the most disadvantages can be found in the economic aspect, the effects of natural disadvantages are the most severe and the most difficult to compensate for.

The second hypothesis is that the idea of sustainable development offers the possibility of limiting the negative effects of the development of tourism in developing countries, both in the sphere of the natural environment and in terms of social and economic aspects. The article discussed whether the idea of sustainable development in tourism really gives us the opportunity to limit the negative effects of the development of tourism in developing countries. It turned out that the strongest negative effect is the impact of tourism on the natural environment, and the idea of

sustainable tourism development provides opportunities for responsible development both in the realm of the natural environment and in terms of social and economic aspects.

In addition, the article reviews all measures describing the level of tourist traffic and discusses the usefulness of individual indices. The majority of indices monitor the impact of tourism on the environment; far fewer indices focus on the economic sphere, and there is a distinct lack of indices for monitoring the social disadvantages of tourism.

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