DOI: 10.29302/Pangeea 18.04

ASPECTS REGARDING THE IMPACT OF TOURISM ON THE ENVIRONMENT IN PRAID BALNEARY RESORT

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ABSTRACT: *Aspects regarding the impact of tourism on the environment in Praid balneary resort. Tourism, more than any other field of activity, is dependent on the natural and the anthropic environment, which is the object and the field of activity of tourism, being the framework support of its resources. The tourism potential being an integral part of the environment, its existence and development depend directly on its quality.*

The destructive actions of some tourist activities are mainly manifested by the inappropriate exploitation of the recreational environment, amplified by man's brutal intervention on natural resources and last but not at least on the landscape. These destructive practices are mainly encountered in areas with high tourist potential, or in the proximity of urban settlements. The intensification of tourist activities in increasingly varied forms, and the qualitative and quantitative mismatch between the tourism resources and their exploitation, lead to medium and long-term dysfunctions with repercussions both on the environment and on the tourist industry.

Key words: *tourist activity; pollution; sustainable development; environmental protection;*

1. Introduction

Tourism, as any human activity, being a consumer of space and tourism resources, participates implicitly in the degradation and pollution of the environment and tourism potential, either through the direct pressure of the tourists on the landscape, flora and fauna or other tourist attractions that it can damage partly or totally, or by wrongly capitalizing on some areas.

If tourism is well-planned, it can help generate revenue for the local population and may accelerate the development of the region. Natural and cultural heritage attracts visitors and can become the engine of local development, but more attention should be paid to the physical and cultural impacts of tourism, including indirect losses occurring where overcrowding occurs.

2. The touristic potential of the studied area

Praid spa resort lies in the north of the Sovata-Praid depression, at the morphological boundary between the Transylvanian Basin and the eruptive mountain chain of the Eastern Carpathians, in an area of submontane depressions between the internal sub-Carpathian hills on the eastern side of the Transylvanian Depression (Subcarpathians of Transylvania, Mac, 1972) and the volcanic plateau of the Gurghiu Mountains.

Current physiognomy and particular aspects of the relief are dictated by evolution of the relief, but above all its, by geological structure and dominant rock types.

The configuration of the geological structure of the Praid area is an effect of the

compartmentalization of the crystalline foundation of the Transylvanian Basin in the area of contact with the Carpathian Orogene (the laramic and the savic phases), the diapirism of the salt and of the Neogen volcanism, which together with the other elements of the natural framework, gives an high but insufficiently capitalized tourist potential.

The geological potential of the area is due to the presence of salt.

The Badenian-Wilecinian age salt deposits at Praid is part of the continuous salifier layer on the eastern border of the Transylvanian Depression, and presents itself as a cylindrical dome flanked by neogene and quaternary deposits of sedimentary or volcanic origin, with the slight elliptical section - the 1.2 km NE NV-SE, the NE NE SV 1.4 km and the 2.7 km depth.

Exploited since the Roman period, nowadays, the abandoned operating chambers of the saline are used for therapeutic purposes for the treatment of respiratory diseases.

The diapir dome, located in Salt Hill, on the left bank of the river Târnava Mică, is one of the penetration area of the Sovata-Praid-Corund anticline structure. Here, you can admire the "Gorges of Corund River" and the "Salt Mountain" reserve, where on the surface the meteorological processes have developed a specific carsto-saline relief, materialized in small slopes, gutters and small valleys.

Morphologically, the depression area is characterized by the presence of storeied relief: the high volcanic plateau with altitudes above 1000 m, the low altitude volcanic plateau, between 700-900 m, the depression hill, 600-700 m and the complex fluviatil, 400-500 m.

From a climatic point of view, the Praid resort is characterized by a climate specific to the sub-mountain depressions, with average annual temperatures between 8-9°C, the average January temperature being of -6.7°C and July of 18-21°C. Annual average precipitation ranges is between 600-800 mm, with precipitation days ranging from 120-140 days/year. The largest rainfall is recorded in June, with an average of 109 mm, and the smallest quantity is recorded in February, when the average is around 35 mm. The number of snow days is between 30-40 days, and the snow cover lasts 70-90 days a year.

The geological structure gives a high hydrogeological potential to the studied area through the presence of high-concentration chlorinated, sodium (250-300 g/l) mineral waters, sometimes carbonated or thermal.

Underground waters, are detached from other resources through the constant use of two centuries ago, due to the hydrochemical variety, which have complex therapeutical effects and a large number of sources.

The chlorinated-sodium mineral waters, with a degree of mineralization of 300 g/l, appear in auxiliary springs, which accompany the areas of the breccia salt, in Corund valley.

Chlorinated carbon-rich mineral watters, with a mineralization of 1,831-3,539 g/l and with the amount of CO2 dissolved between 1,010-1,452 g/l, are the result of the very low circulation of the water, to which is added a mofetic origin CO2.

Thermomineral waters with a chlorosodic, bromo-iodic, boric, feruginic character have a total mineralization of 250 g/l and a temperature of 42°C being used in the external cure of some diseases.

Biogeographical resources present a great diversity in the aspect of the association of the components, which gives to the area, together with the other elements of the environment, a great diversity of landscapes. The touristic potential of vegetation is conferred by: the composition of plant associations, the presence of endemic and relict plants, the presence of plants with teratological changes, the size and age of plants, the edge effect and the effect of the

island. Among the plants protected by law are Taxus bacata, Angelica archangelica, Fritillaria meleagris, Narcissus stellaris, Cypripedium calceolus.

The touristic value of the resort is complemented by numerous attractions - the Áprily Lajos Memorial House, the ruins of Rapsóné Fortress, the Tropical Butterflies House, the Wellness Center, the Saltwater swimming pool (the largest in Europe) - and a series of events organized annually.

The Praid Saline by specific microclimate is the main touristic destination of the resort. Saline microclimate, expressed by specific physicochemical characteristics such as air purity, humidity and constant air temperature, airflow velocity, CO2 concentration in saline air, negative saline air ionization, ozone creates favorable conditions for saline therapy (Table 1.)

treatment base with 40 beds. Since 1980, the treatment and visitation base has been arranged at 50 horizon, at a depth of 120 m from the surface, where it still works. The treatment rooms are arranged resting places and playgrounds, wine gallery, bar, souvenir shops, an ecumenical chapel, billiard tables, all of which to diversify the activities of visitors and patients. Increasing the quality and diversity of tourism and treatment facilities and services over the last decade has generated an increase in tourist flow, Praid besides spa tourism, becoming a destination for weekend tourism for residents of nearby towns, Reghin, Tg. Mures, Odorheiu Secuiesc. Thus, if in 2007 the number of patients was 208.780 and the number of visitors was 190.300 persons, in 2017 the number of patients increased to 281,000 and the number of visitors to 360,000. The development of tourist

Table 1. Characteristics of the Praid Saline microclimate
(Source S.N.S. Praid)

No	Parameters	Values
1	Temperature	15,4-16,4 ˚C
2	Sterility	180-270 germs /cm^3
3	Humidity	71%
4	Atmospheric pressure	726 mmHg (iunie)-734 mmHg (October)
5	Partial oxygen pressure	2,07% > pres.atm.
6	Speed of air currents	0,2-0,3 m/s
7	CO_2	611-799 mg/m^3
8	Radioactivity Ra_{222}	1,5-1,9x10^{-13} Curie/l
9	Ionization	413-580 ion/ m^3
10	O^{3+}	0
11	pH	6,5-6,9

The tourism exploitation of the Praid Saline began in 1960 in the old Gheorghe Doja mine, where the director of the mine, Telegdy Károly and district doctor Dr. Veres Árpád tried to use saline therapy for the treatment of respiratory diseases. For the permanent exploitation of abandoned operating rooms, in 1974 was established a

activities in the resort is related both to the presence of tourist resources and to the existence of a material technical basis.

The accommodation of tourists and patients arriving at treatment is done in hotels, hostels, campsites and private houses.

According to the data provided by the Ministry of Tourism in 2017, the

accommodation capacity of the Praid resort was 90 classified units, with a total of 1354 seats.

In terms of comfort, of the total number of accommodation places in the classified structures, 8 places are classified as 4 stars (0.59%), 784 are classified as 3 stars (57.91%) , 502 are classified as 2 stars/flowers (37.08%), and 53 seats are classified as 1 star (3.92%). Regarding the type of tourist accommodation structure, the category of tourist pensions dominates with 61 units.

The resort is served by 8 classified public catering establishments, including 6 restaurants classified as 2 or 3 stars and two pizzerias, classified as 2 stars.

The qualitative and quantitative analysis of the tourist fund and of the material base, based on the ideal model of the tourist resort comprising the categories and subcategories and the tourist elements, allowed the estimation of the tourist value of the resort using the formula proposed by Iordan et al. (1971, quoted by Cocean, 1999):

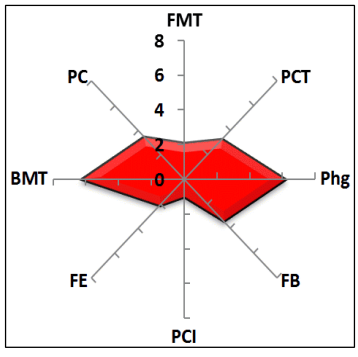
$$\mathbf{Pt} = \frac{\sum_{i=0}^{n} Ti}{n}$$

T1...Tn - elements with touristic values;

3. Environmental impact of tourist activity

The touristic potential of an area is conferred by the quality of the components of the natural and anthropic environment, and the degradation of some elements of the tourisic fund has repercussions on touristic activity, leading to the gradual decrease or disappearance of attraction and tourist flows. The pressure exerted by the tourist activities on the environment leads to the overcoming of thresholds by overloading its structure and implicitly to the occurrence of the risk phenomenon.

The causes of the occurrence of the risk phenomena can be grouped into three distinct categories: natural causes, which are part of the evolutionary matrix of the landscape components - changes of the environment under the impact of natural hazards, anthropogenic causes, stored in the abusive manifestation of human intervention on the natural elements, the tourism fund or the introduction of disturbing elements of the functionality of the tourism subsystems that lead to the overcoming of some thresholds and implicitly to the degradation of the



	FMT	PCT	Phg	FB	FCI	FE	BMT	PC	Σ
Praid Resort	2,1	3,3	6,2	3,4	1,0	2,1	6,3	3,5	**27,9**
The ideal tourist model	16	5	18	8	10	8	24	11	**100**

FMT – morphoturistic fund; PCT – climatoturistic fund;
Phg – hydrogeographic touristic fund; FB – biogeographical touristic fund;
FCI – cultural and historical touristic fund; FE – etnogeographyic fund;

Fig. 1. Estimation of tourist value of Praid Resort

tourist environment and endogenous causes, more difficult to identify, being the result of the erosion of the tourist system, of the stagnation of its evolution, of the permanent imbalances between demand and offer (Cocean, 1999).

The intensity, size and nature of the degradation of the environment depend on the pressure exerted by the number of visitors and the degree of culture, the forms of tourism practiced, the concentration of properties on the spatial and dimensional aspect, as well as the planning and management applied in the enrichment process, development and capitalization of the area (Ciangă, Sorocovschi, 2017).

Negative effects arise when tourism planning, management and development are inadequate, and the lack of well-defined strategies and control over activities may generate the chaotic development of tourism activities, the degradation of natural sites, tourism and commercial overexploitation and the depreciation of the natural, social and cultural heritage (Szilágyi et.al, 2014).

3.1. The air pollution

Praid Resort is located in a poorly industrialized area, air pollution reaches high values during the tourist season, when the tourist traffic is at maximum. In the tourist season, the main sources of air pollution are exhaust gases emitted by the large number of cars (Table 2), the combustion of fuels in the thermal plants of the service units and the storage of the waste in places or in inappropriate conditions that can cause the olfactory pollution of air.

Combustion gases from service stations and exhaust gases of vehicles have a complex composition (carbon gas, CO, CO2 unburned hydrocarbons, solid particles, SOx and NOx which, in the presence of water vapor, is converted into sulfuric acid in nitric acid), which emanate in the atmosphere, disperse more or less depending on weather conditions.

The concentration of pollutants in the atmosphere presents diurnal, weekly and seasonal variations. Daily and weekly variations may be correlated with the intensity of road traffic, while seasonal variations depend to a large extent on occupancy and weather conditions.

Of the meteorological conditions, it is of particular importance the installation of atmospheric calm periods, due to the development of anticyclonic areas, which cause air stagnation, temperature inversions, which record the highest frequencies in the cold season of the year and in the morning, respectively the increase of humidity air, which, in addition to increasing the level of pollutant concentration, favors chemical reactions between different pollutants.

Sulfur and nitrogen oxide acids can accelerate damage to monuments, buildings, targets, and various materials. Marble, limestone, with a wide use in the studied

Table 2. Composition of exhaust gases of motor vehicles (Zamfir, 1974)

Polluting element %	Gasoline engines			Diesel Engines		
	Min.	Max.	Tip	Min.	Max.	Tip
Carbonic anhydride	15	2,7	9	13,8	0,7	9
Carbon dioxide	13,5	0,2	4	7,6	0	0,1
Oxygen	17,4	0	4	20	0,5	9
Hydrogen	5,8	0	2	2,5	2,5	0,03
Hydrocarbons	4	0	0,5	0,5	0	0,02
Aldehydes	0,03	0	0,004	0,004	0	0,02
Nitric oxide	0,2	0	0,06	0,03	0,01	0,02
Sulfuric anhydride	0,008	0	0,006	0,03	0,01	0,02

area, are attacked by acids formed by the interaction of smoke resulting from incomplete burning of fuel and atmospheric humidity.

In the cold times of the year, when the concentrations of pollutants and suspended particles are higher, the degree of corrosion is more pronounced.

Recent studies have shown that exposure to vegetation at concentrations of 0.5-0.25 ppm for SOx and NOx derivatives, which have been active for 3 months, have caused necrotic lesions of the leaves and reduced fruit production, the effects being more pronounced in the case of spontaneous vegetation developed in wet environments and on soils with a high salt concentration (Burn, 2016).

The location of the Praid resort in a depression area constitutes an impediment to the process of self-purification of the air. Under conditions of anticyclone activity, atmospheric calm or thermal inversion, the dispersion of pollutants into the atmosphere is blocked.

A particular aspect is the air pollution of treatment rooms, which through specific microclimate is the main tourist destination of the resort. The continuous increase in the flow of tourists can affect the quality of the parameters that define the microclimate of the treatment rooms.

Exceeding the optimal intake capacity can influence the amount of pathogens, causing a reduction in air purity, increase the CO2 content, temperature and relative air humidity, all with repercussions on the therapeutic quality of saline air. Saline air pollution is also due to the overlapping of the truck-carrying truck line to the storage room with access to the buses that transport the tourists into the saline.

3.2. Water polution

Due to demographic growth, urbanization and the development of the economy, water pollution has become more and more acute.

Irrespective of the nature of source, water pollution has negative consequences for tourism, contributing to the degradation of some of the tourism resources with the widest use. This occurs through direct discharges of wastewater from mining, agricultural and domestic activities. Tourism, together with other economic sectors, is a big consumer of water through accommodation and public catering facilities, and a wastewater generator.

In situations where hotel units do not have their own wastewater treatment plants, they are discharged into the sewage and wastewater treatment system of the locality, thus generating the risk of overcapacity of the local wastewater treatment plants, and so partially purified water to reach the Corund and Târnava Mică rivers. In these situations, the greatest danger to aquatic flora and fauna is represented by water polluted with detergents, because the alkylbenzene sulfonate resists all microbial agents and the biological treatment plants fail to purify. Rainwater infiltrated into the soil transports toxic substances resulting from the decomposition of waste contaminating ground and groundwater. Thus, contaminated mineral waters lose their therapeutic effect, becoming a danger to the human body.

Unorganized tourism, the lack of camping sites, are water pollution factors by waste thrown by tourists into rivers and lakes or left on river banks.

3.3. Destruction of flora and fauna

Flora species have the role of protecting environmental quality parameters. Forests have the supremacy by reducing air pollution, mitigating the greenhouse effect, having a recreational role. Natural vegetation, through the variety of species, brings a greater variety of natural landscapes, increasing the attractiveness of the area.

Tourist activity affects the integrity and composition of the flora. Thus, in the process of construction of the access roads and the bases with tourist destination, the vegetation of the areas under the planning will be completely eliminated, which leads to the reduction of the spaces covered with natural vegetation, especially with forests.

Tourism activities can lead to the degradation of existing vegetation through consumer attitudes, by collecting picnic firewood, direct parking on the grass, the breaking of valuable species as souvenirs, the chaotic camping of the tents etc. Another form of impact consists of destruction of rare plants by tourists.

Fauna is an element of the landscape, with a high sensitivity to the tourist impact. Extending tourist facilities, intense tourist traffic, determines the reduction of natural habitats for many wild animals. Poaching, fishing and uncontrolled hunting may lead to a dramatic decline in wildlife. The noisy behavior of tourists, the free camping of tents have a negative impact on the living environment of many animal species, many of which are very sensitive to any change to their habitat.

3.4. Soil pollution

Soil pollution with different pollutants either from rainwater contaminated with pollutants, either directly from discharges of household waste, pesticides, chemical fertilizers, etc., has economic and socio-sanitary consequences as well as consequences for tourism through the degradation of phreatic waters and waters used in the spa and leisure tourism.

Soils are particularly affected by unorganized tourism by depositing scraps resulting from picnics, the expansion of recreational structures, sports grounds, ski slopes, cable transport installations that produce soil compaction, can trigger or accelerate soil erosion processes.

3.5. Sound pollution

It is another form of environmental pollution, that is felt during tourist season periods and is caused by strong noises, that exceed the permissible limit for humans. The hygienic rules, for external noise provide for a maximum admissible limit of 65 dB, and for indoor spaces 35-40 dB. The main source of noise pollution is road traffic - cars, motorcycles, trucks - and the loud music, that has as its source the restaurants and terraces.

3.6. Aesthetic pollution

A tourist destination becomes attractive not only by the quality of the services offered, but also through the aesthetic ambience, which translates into personalizing any tourist attractions through architecture and landscaping.

Landscape degradation factors are found in all pollutant factors that have destructive actions on its component elements (vegetation, fauna, hydrographic network), plus chaotic deforestation, uncontrolled waste disposal, unconventional or inadequate construction.

In the arrangement and functionality of some tourist arrangements, it is necessary to consider the authentic original element in terms of architecture. The overall picture must be focused on elements of its own identity in constructive and architectural terms. Their lack can lead to aesthetic degradation.

3.7. Degradation of cultural-historical objectives

The degradation of the cultural-historical objectives is due mainly to polluting substances that attack, degrades the most durable materials, resulting the disappearance of some historical, artistic or cultural resonance monuments. Buildings in highly polluted areas deteriorate, wipe or

change their appearance with a dark color. Tourists, through inadequate attitudes, can directly contribute to the deterioration of cultural goods.

3.8. Agglomeration effects

The overcrowding of tourist areas is due to the seasonality of tourist activity, so the largest flow of tourists is recorded between May and September, with the highest intensity in July, August and weekends.

The high number of tourists generates an agglomeration that has repercussions both on the quality of tourism and on the resident population by overloading communication networks, insufficient accommodation, imbalances in the relationship between service applicants and service providers, insufficient public services, insufficiency the number of parking lots, increasing pollution, extending the day and working week.

4. Types of impacts and effects of tourism on the environment

The effects of tourism development on the environment and the local community, may be negative and positive, and can affect the quality of the environment for the short or long term.

4.1. Ecological impact

The negative impact of tourism on the environment, is manifested when the number of tourists is higher than the environmental support capacity, that leads to the destruction of resources.

Among these negative effects can be mentioned: diminishing local resources due to the seasonality of tourism; the depletion of natural resources by increasing consumption in areas where resources are limited; the destruction of some ecosystems and the degradation of the natural landscape, through deforestation to extend the building perimeter, and other specific infrastructure elements; air pollution, noise pollution caused by motor vehicles or recreational vehicles (snowmobiles); waste and garbage pollution produced by tourists who leave behind them garbage; wastewater runoff which pollute groundwater, rivers and lakes; aesthetic pollution, refers to the structure and architecture of some constructions which do not fit into the landscape and the specificity of the area.

4.2. Economic impact

The economic effects of tourism on receiving areas can be positive and negative.

The positive effects are reflected by: creating jobs in tourism especially for young people; revenue growth; stimulating investment in tourism; increased demand for products may facilitate the development of local production. The negative effects can be assessed by: international cuisine may cause unwanted changes in traditional local cuisine; increasing the number of workers in tourism to the detriment of other activities; setting up excess ski areas may harm the landscape and the ecological balance (Bucin Pass);

4.3. Socio-cultural impact

Impact occurs when tourism brings changes in the system of values and behavior, threatening the local identity of residents. These changes can occur both in the community structure and in family and lifestyle relationships.

Among the changes which can be generated by tourism activity, can be mentioned: changes in population structure - the creation of new jobs may reduce the emigration of the local population and attract new workers from other areas, thus affecting both the number of population and the population structure; changes in type of occupations - increasing the number of people employed in services to the detriment of other branches of activity; changes in

social, moral and religious values - locals feel disturbed by the behavior of tourists who do not respect the moral values of the place, but some locals can adopt social values from tourists by altering the traditional values of the local population; changes in traditional life (music, art, folklore) - sometimes, the host population can imitate the lifestyle of the tourists, thus underestimating traditional life. Craftsmen sometimes alter the design of the offered products, articles to satisfy the tastes of tourists.

5. Conclusions

Although tourism has a number of positive effects, such as increasing earnings that allow for the modernization of other sectors, it contributes to creating new jobs, increasing the incomes of those working in tourism, increasing demand for agricultural products, the construction industry, transport and craft production, but can not be neglected the negative effects of its uncontrolled development, especially on the environment.

It is important for negative effects to be identified so that decision-makers find ways to reduce and remove them, because the tourism focuses on what is valuable, beautiful and unique.

In order to reduce the negative effects on the environment,tourism development should be based on rigorous impact studies based on economic, ecological and socio-cultural sustainability indicators and appropriate techniques for maintaining the balance of the environment.

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