

ECOLOGICALLY FRIENDLY TOURISM MANAGEMENT: KRKONOŠE BIOSPHERE RESERVE VISIT RATE AND ITS DYNAMICS

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Abstract

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This paper deals with the documentation and analysis in the biosphere reserve in 1995–2005. The main determining figures for this research are the territorial differentiation of visitors' interest, the time periods in the number and the behavior of tourists and finally the structure of guest groups. It contains a survey of visit rate in Krkonoše in different months, in different parts of the region and it also brings a segmentation of different target groups with their behavior and preferences.

Key words: tourism, Krkonoše, regional development, traffic, environment

Introduction

The past fifty years characterize the important political-social and economic phases of the tourism development in the territory of the Krkonoše National Park and the Krkonoše Biosphere Reserve. Many important changes occurred during its existence and even in reduction of industry and agricultural production, as well as social area, transport infrastructure, etc. The declaration of the National Park area of interest and the performance of nature and landscape protection in caring for this territory, brought a significant effect. Tourism and its impact on Krkonoše nature and landscape acquired high importance during the last years. Individual motoring has an undisputable effect in connection with the tourism development. In accordance with the European Charter of Sustainable Development of Tourism and the National Strategy of Biological Diversity Protection, being in preparation, this paper intends to complement the current tourism management in the Krkonoše Biosphere Reserve area of interest so as to work to gradual implementation of modern, ecologically

friendly but at the same time socio-economically acceptable development of tourism within the Krkonoše Biosphere Reserve area.

For objective and in real life usable formulation of the proposal of tourism ecologically friendly development management, it is required to obtain sufficient amount of relevant knowledge and data and, on the basis of them, to define the objective rate and scope of influences, to compare them with the actual durability of the interest area (Nováková et al., 1997) and then to define the current and the future development limits.

Methods

The basic supporting documents for this paper were the results and conclusions obtained from the GEF Krkonoše Biodiversity Program – Development of a Sustainable Development Strategy and Investigation of Carrying Capacity and Recurrent Funding Mechanisms for Krkonoše Biosphere Reserve (GEF Biodiversity Protection/World Bank – GETF) elaborated in the years 1995 to 1997 by the Applied Ecology Institute of Environmental and Forestry Faculty of the Czech University of Agriculture in Prague. Attention was focused predominantly on the visit rate in the central core part of the National Park and Biosphere Reserve, which is most vulnerable due to tourism.

The results of regular and after five years repeated counts of motor vehicles carried out by the enterprise “Silnice a dálnice ČR” in 2000 and 2005 were used to evaluate the intensity of individual road traffic (Suchý et al., 2002). Fixed data collection points and regular research periods (from 6:00 a.m. to 9:00 p.m. from May to September) were determined to establish the average occupation of individual vehicles.

The May to September period was chosen for the reason of more favorable weather conditions including good visibility in morning and evening hours and that these months are spread into the spring and autumn seasons, being considerably different with their visit rate character. For already a long period of time, the summer tourist season shows higher traffic intensity on many access roads and, therefore, higher rate of vehicles passing through selected points in comparison with the winter season.

The points for the monitored research were based on well-tried check points used by the enterprise Silnice a dálnice ČR, as well as the two automatic stations Horní Maršov and at Horní Vrchlabí, which have been providing continuous records (hour/day) about all vehicles passing in both directions for already more than twenty years. The statistical variance of results from both researches above is surprisingly small when comparing the independently collected data. The total number of data collection points was determined to be five (Table 1).

Pec pod Sněžkou where, through the public water mains, more than 80% of inhabitants are supplied with water, was chosen for the model calculation. Different types of holiday resorts which, always in a number of two or three, represent the concrete level and scope of services provided as a standard, were selected under the approvals of their owners and/or operators. The buildings range from the level of guest houses to chalets providing accommodation with common social and hygienic facilities and boarding in the form of bed & breakfast, half-board, and full-board. Chalets and boarding houses providing separate social and hygienic facilities in rooms, with or without boarding in the premises or in public restaurants via time reservation for guests, were set

Table 1. Overview of data collection points and predominant directions of visitors' movements

Data collection point	Predominant directions of visitors' movements
Harrachov – by-pass road	Harrachov
Rokytnice nad Jizerou – road fork	Rokytnice nad Jizerou, Františkov, Rezek, Mísečky
Hořejší Vrchlabí – crossroads I	Špindlerův Mlýn incl. direction to Strážné
Horní Maršov – Na Kopečku car park	Horní Maršov, incl. direction to Malá Úpa and the border crossing
Temný Důl – Barrandov boarding house	Pec pod Sněžkou (Malá Úpa)

apart, as were the boarding houses of the apartment type providing facilities for individual cooking, as well as hotels and family houses offering accommodation and the scope of services specified further.

The agreements with the owners and/or operators of the resorts of individual categories were based on their willingness to make regular, careful and true records in prepared forms of daily, weekly and monthly drinking water consumption, as well as the visitors' age structure (adults, children) and citizenship. In the past, all this data proved to be very important and necessary for the research objectiveness.

An initial questionnaire was filled in always at the beginning research based on an interview with the person responsible for resort operation, to specify the number of persons living in the building permanently or for a long period of time, and any other drinking water consumption appliances (washing machines, dishwashers and the frequency of their use, as well as other above-standard equipment of the premises, such as saunas, swimming pools, relaxing whirlpool baths, etc.). In the summer, the consumption of drinking water used to water flower and vegetable beds or to operate outdoor swimming pools was also verified.

The prerequisite of this research was an agreement with the owner and operator of the public water mains which, on the basis of the rules agreed in advance with individual consumers, made regular drinking water consumption readings in individual resorts not only to verify the objectiveness of the progressively obtained data from the operators but also the ideas of visitor numbers from water consumption data in similarly defined resorts.

Results

The data which form the basis for future strategic decision-making in environmental protection symbiosis with tourism in Krkonoše BR was collected and analyzed during the subject period. The results can be summarized and used for both areas of interest.

The field research using the available data provided the following overall results:

- The total yearly number of visitors to Krkonoše reaches approximately 5.4 million.
- The strongest season is winter (approx. 300 000 people/10 days), followed by summer (approx. 200 000 people/10 days); the number of visitors is a little lower during the peaks of side seasons (approx. 150 000 people/10 days).
- The two main groups of visitors are Czechs and Germans. While the former is dominant in summer, the proportion of German tourists grows during side seasons, namely in spring. Other nationalities are represented considerably less.
- While the domestic visitors focus rather on the eastern sector of Krkonoše (Pec pod Sněžkou), the foreign tourists favor the central part of the mountains (Špindlerův Mlýn).
- The domestic visitors are dominated by those coming from Prague, most prominently in winter. During the winter seasons, they travel especially to the eastern and central sectors. A large proportion of tourists come also from the Hradec Králové Region, but rather in the side seasons and to the eastern sector of Krkonoše.
- Approximately 10% of visitors come to Krkonoše for one day, i.e. they do not have to seek accommodation. Their proportion is higher in the side seasons and drops considerably in the winter.
- The most frequent length of stay is 5–7 days, and the focus lays on weekly hotel-based holidays undertaken especially during the main seasons.
- Most frequently, tourists accommodate in hotels and boarding houses; boarding houses are preferred during the main seasons, while hotels dominate during the side seasons.

- The central sector is characteristic for the hotel-type accommodation, while boarding houses dominate in the eastern sector; in the western part of Krkonoše, people frequently stay in individual holiday resorts (namely in Rokytnice nad Jizerou).
- Camps and boarding houses are most frequently used for shorter stays; weekly stays are characteristic for company chalets; and hotels are predominantly used for longer periods of accommodation.
- While foreign visitors choose almost exclusively accommodation in hotels and boarding houses, favoring the former, company chalets are of great significance for the domestic tourists.
- In winter, the main target of the majority of visitors is downhill skiing (the number of downhill skiers reaches approximately 150–200 000 people/10 days), or shorter walks around the resorts and their immediate vicinity.
- In other seasons, approximately 10–20% of visitors undertake longer mountaineering trips, and trips to the lower mountain parts dominate over high-mountain hiking. An average number of 30 000 tourists aim at the tops during the ten-day periods (the highest number was 46 000), while 35 000 tourists in average make their trips in the lower parts of the mountains during the ten-day periods (max. number 60 000). Sněžka, which was evaluated as a separate route, is visited by approximately 10% of the tourists, i.e. 20 000 in ten days (max. number 28 000).
- The high proportion of visitors who stay in the resort is characteristic for Harrachov; when they undertake a longer trip, then rather to the lower parts of the mountains.
- The visitors to Rokytnice nad Jizerou, quite frequently, undertake trips to other resorts (Harrachov, which is situated nearby) but also out of the Krkonoše territory. Longer trips are evenly spread between the lower and higher parts of the mountains.
- Trips to the mountain tops are typical for the central sector (Špindlerův Mlýn).
- From the eastern sector (Pec pod Sněžkou), tourists undertake trips to nearby Sněžka; on the other hand, the proportion of visitors who stay in the resort is the lowest of all the monitored areas.
- If Czech tourists undertake longer trips, they more frequently choose the lower parts of the mountains, while foreign visitors are most likely to climb to Sněžka. Also, foreigners more frequently travel among resorts and/or out of the Krkonoše Mountains territory.

Motor Traffic Load

The results of the regular and after five years repeated counts of motor vehicles made by Silnice a dálnice ČR (in 2000 and, partially also, in 2005) showed that individual motoring represents 90 to 93% of the entire load in Krkonoše BR. The proportion of 6–10% falls to transportation means over 2.5 tons including coaches, and 1% only is the proportion of two-wheeled vehicles in summer (Flousek et al., 1994).

On the basis of the collected and subsequently evaluated data, it can be stated that the average (mean) rate of occupation of individual transportation means, i.e. passenger vehi-

cles exclusively, ranges from 2.4 to 3.2 per vehicle. This knowledge is much favorable for the overall importance and impacts of the motor traffic.

The ever increasing popularity of high-capacity vehicles has a provable effect on the rate of occupation of passenger vehicles. These not only provide the traveling people with higher standard during longer trips but also make it possible to transport more passengers at a time, with only an insignificant increase in fuel consumption. This trend is apparent predominantly in foreign visitors. The capacity of one vehicle is usually utilized by two complete or incomplete families. Records showing occupation of a single passenger vehicle with 5 and more people are quite frequent.

This trend of utilization of these more favored vehicles is not typical for young families with children only, but their advantages are still more frequently used by older people in small groups.

Not all transportation means passing through the monitored sectors are used by visitors of the interest area. A considerable proportion of transportation means relates to the living of the local people, the operation of holiday facilities, and other activities in the area. Here also, an increase in motor traffic is apparent, especially in the number of vehicles intended for transport the people and materials at the load capacity level of 2.5 tons.

It can be also generally stated that the frequency of vehicles used to ensure the operation and life in individual tourist resorts during the main (winter and summer) seasons reaches up to the maximum proportion of 5–10%. This number is influenced by the number of visitors in every resort and other factors including weather, the limited operation of the greatest attraction, the Pec pod Sněžkou holiday resort, including the cableway, etc. Especially owing to this, the one-day visitors dominated over the ones staying for more days in the summer season, and the frequencies of vehicles passing in summer were higher than those in winter.

This data, however, is not valid in general, since the proportion of vehicles used to ensure operation of and supply to the resorts of Pec pod Sněžkou and Špindlerův Mlýn in view of the business network (Trutnov, Vrchlabí) is quite different from such resorts as Harrachov and Rokytnice n. J. Here, the number of drives of the local entrepreneurs for supplies beyond the limits of their municipalities through the check points is considerably lower than those from Špindlerův Mlýn and Pec pod Sněžkou.

At the same time, the frequencies of all vehicles change in view of traffic during individual days. If we sum up all passing vehicles in the first or in the second case, we will get an absolute number of all average passages during the monitored period. In both cases, however, the totals are identical, namely 111 669. The data provided above shows that passenger traffic represents 93% of all passages, i.e. 103 853, and not only at this point. As it follows from the research results, the average rate of occupation of all passenger vehicles ranges from 2.6 to 3.2. One can reasonably assume that from 270 018 to 332 330 people in passenger vehicles passed through Horní Maršov in both directions in August 2004.

Water consumption interpretation

As the results of the initial researches already showed and confirmed, the differences in water consumption in some premises was not only in connection with the consistent research in their consumption, but that water is also likely to be used in other ways and that the numbers of “admitted” and recorded beds for visitors are incorrect, and always higher in most of these cases. The principal objective of these researches was to establish the objective quantity of drinking water consumed per capita per day, not only by categories of holiday resorts, but also by the seasons, and subsequently, to estimate objectively the actual visit rate within this pilot resort and also in other holiday resorts on the Biosphere Reserve territory.

Out of the available results, the detailed records of drinking water consumption by months made by a standing cooperator (family house owner) during a period of several years can be used (see the set of Fig. 1). At the same time, the current results (2005) of verification of water consumption per capita per day during the winter and summer seasons are evaluated.

We summarized drinking water consumption by quarters during the last four years in a part of the Pec pod Sněžkou municipality. This, with not only the water consumption totals for all premises in the particular town parts but also with other relevant data, is the first visit rate estimate in this resort. If these results are validated in the following research phase, it will be obvious that, in spite of the incessant “lamentations” of the local businessmen concerning the decreasing numbers of visitors, the numbers are not only decreasing but growing gradually.

Discussion

The issue of the environmental load due to increased traffic during seasons is referred also in the SWOT analysis of tourism included in the Proposal of the State Tourism Policy Concept for the Years 2007–2013 elaborated by the Ministry for Regional Development. The threats specified here concern, on one hand, underestimation of the care for the natural riches and landscape, as the preconditions of the area attractiveness for tourism, and underestimation of the importance of providing for transport services in the areas attractive for tourism, as well as environment deterioration in residential areas and water pollution on the other. In our view, the positive knowledge is that visitors use more frequently high-capacity vehicles where the pollution rate is lower (with adequate capacity utilization).

The situation of the Krkonoše resorts visited predominantly by two groups of guests, namely the domestic clientele and German visitors, is difficult to a certain extent as the offers of tourist services have to oblige both majority groups. It is necessary to offer services meeting the requirements of both cultures. In the event that the demand for accessory services, for instance, is not satisfied with an adequate supply right in the destination where the guest is accommodated, the pressure on transport to those locations where such accessory services are available will increase. In such a case, a system approach can be recommended (Pourová, 2000), where accommodation, boarding and transport services, especially in destinations located in protected areas, must be followed by a wide supply of accessory services consistent with the target segments of visitors (Nováková et al., 1997).

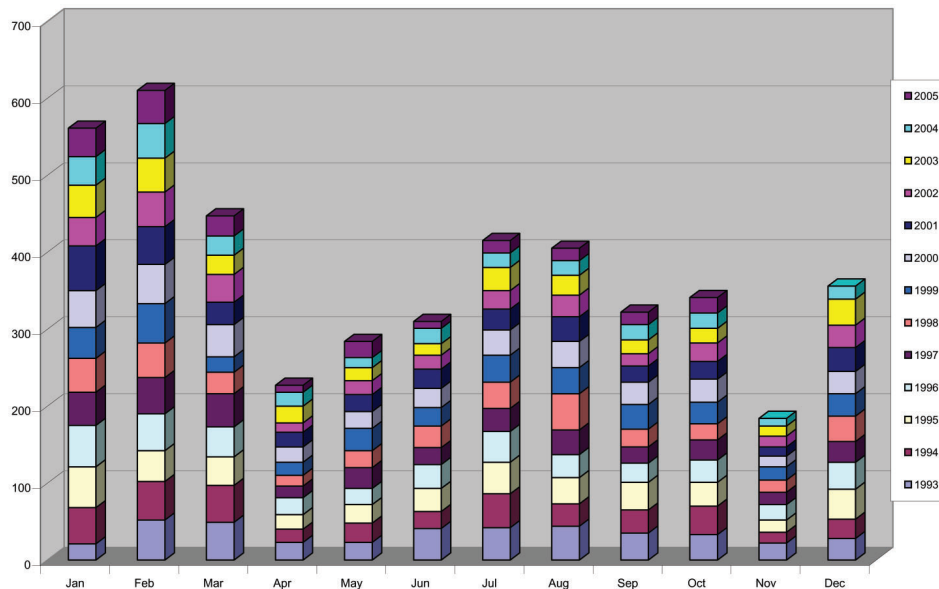


Fig. 1. Drinking water consumption by months from 1993 to October 2005 in a family house offering accommodation.

In terms of the tourism development in the Krkonoše mountains, it is also necessary to mention the proportion of one-day visitors who come here out of the main seasons, having for time reasons no capacity for drawing from a higher number of tourist services. This results in a higher proportion of negative aspects such as traffic load and waste pollution in comparison with the economic benefit for the region. It would be advisable to address also other segments of visitors who can afford longer than one-day stays in the resorts to come in the months out of the main seasons. The prospective groups in this respect are school children and older people who can be offered curative, sporting or wellness stays, for instance. The advantage of these groups is that they are not limited in free time for the main season months only (Parmová, 2003a, b).

The lasting problem in tourism are insufficient records and checks of the number of actually accommodated tourists. The statistical records of accommodation providers are not always identical with the actual numbers due to the fear of higher tax load. For this reason, a research was made in drinking water consumption which corresponds with the seasonal swings in the demand for tourist services and accommodation. It is just this indicator which could complement the results following from the satellite account of tourism in this respect.

Conclusion

Tourism on the territory of Krkonoše National Park and Krkonoše Biosphere Reserve can be considered as a very important factor of economic development, causing consid-

erable changes in industry, primary agricultural production, and social background followed by the impacts on transport infrastructure. The subject of the research was to evaluate the influence of individual motoring on this area and its trends. In the characteristics and customs of their guests, the current tourism management in the interest territory of Krkonoše Biosphere Reserve will find suggestions for future formulation of strategies and objectives to result in progressive implementation of modern, ecologically friendly and socio-economically acceptable development of tourism in the Krkonoše Biosphere Reserve territory.

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Práce dokumentuje a analyzuje návštěvnost BR Krkonoše za období 1995–2005. Mezi určující parametry zpracovávané tematiky patří územní diferenciacie návštěvnosti, dále časové cykly v počtech a chování návštěvníků a konečně samotná struktura návštěvníků. Jedná se o přehled o návštěvnosti Krkonoš v různých ročních obdobích, v různých částech území, různých skupin návštěvníků s různým chováním a preferencemi.