

Destination calibration process for tourism management of defined regions

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ABSTRACT

Successful development of a destination depends also on the right calibration at the commencement of strategic planning. Calibration is a process, where a well defined area is being assessed as regards its potentials, its existing infrastructure, social structure, and carrying capacity of the environment, impact assessment of the envisaged extent of tourism development on the local communities and on the environment as well as risk assessment. The paper also outlines preliminary results in the calibration of a group of villages in the Slovak Karst area.

Keywords: destination calibration, carrying capacity, resource management, environmental protection, tourism

INTRODUCTION

When the need for designing the tourism development of a region, micro-region or a city arises, the first step is usually to assess the existing attractions and services. This includes the calibration of a number of systemic elements. Thus, it is necessary also to calibrate the studied unit as regards the capacity to accommodate tourists. This is understood not so much from the point of view of net lodging and catering capacity, but as regards impact of the increased flow of tourists on the given unit and the sustainability of a new level of tourism development. Then important factors like safety (criminal, health) are to be assessed. Finally the marketability should be assessed. As shown below, these processes have been described, but the cited processes are quite expensive and thus for smaller localities a simpler procedure is needed.

Tourism has an impact on the social structure, on the local culture as well as on the natural resources. The calibration is thus the first step to aid a sustainability dimension to the design of the tourism

development of the area.

Standard publications (e.g. Horner, Swarbrooke 2003, Lengyel 2004) on tourism do not deal with this problems in details, but Dávid et al. (2007) devoted great attention to the relationship of natural resources and their use/misuse in tourism. Tourism development should define the carrying capacity (Fig.1), as otherwise the resources will be depleted. This is stressed also in destination management (Kiráľová 2003).

Tourism development in an area happens for various reasons. It may happen due to an effort to enable communities considered to be disadvantaged to increase their earning (cf. WTO 2002, Dixit 2006), by a central decision of the government to develop tourism (like in Slovakia, where a government programme for tourism development was defined), through some local or regional initiative (cf. Pedersen 2002) or in a demand driven way – when tourists are attracted to a locality and the local community starts to develop facilities in order to serve their needs.

The ways, how to assess the carrying

capacity or sustainable mode of tourism vary. Below, a strategy is outlined that could be used under Slovakian conditions.

NATURAL RESOURCES

Natural resources consist of inanimate and animate systems. Thus they include rocks of various types and morphology (cf.e.g. Timčák 2010, Jablonská et al. 2009)), as well as various biological systems. Air and water resources are of utmost importance in tourism. Climatic health spas are based on natural or man made composition of vegetal assemblies that enrich the air with phytoncides – aromatic substances with therapeutic effect. Some caves have unique climatic conditions that can be used for therapy, just like areas around great waterfalls. Lakes provide scope for sports and help to maintain favourable climatic conditions.

The type of vegetation can be original (under the prevailing climatic conditions) or “imported” through land and forest management activities as well as through tourism. The animal societies (from

microorganisms to animals) can be also autochthonous or imported (e.g. through introduction of species not naturally occurring in the region) and are an important factor in tourism development. This factor affects the attractiveness of the area as well as its safety (malefic microorganisms, poisonous invertebrates and vertebrates, large carnivorous animals, etc. – cf. Jablonská, Strajňák, 2010).

Overuse of any particular terrain (be it a forest, mountain or lake, etc.) reduces the usability for tourism due to social, psychological and ecological reasons (cf. Dávid et al. 2007).

The calibration of a natural habitat as regards the optimal number of visitors is demanding. Barančok and Barančoková (2008) have shown that a set of complex factors have to be considered in order to calculate the threshold values for the number of tourists per day for the selected tourist trails. It does not consider other factors like tourism induced stress to wild animals or spatial distribution of tourists (cf. Diedrich et al. 2009) along a trail or impact of tourism and tourism demand on local economy and society.

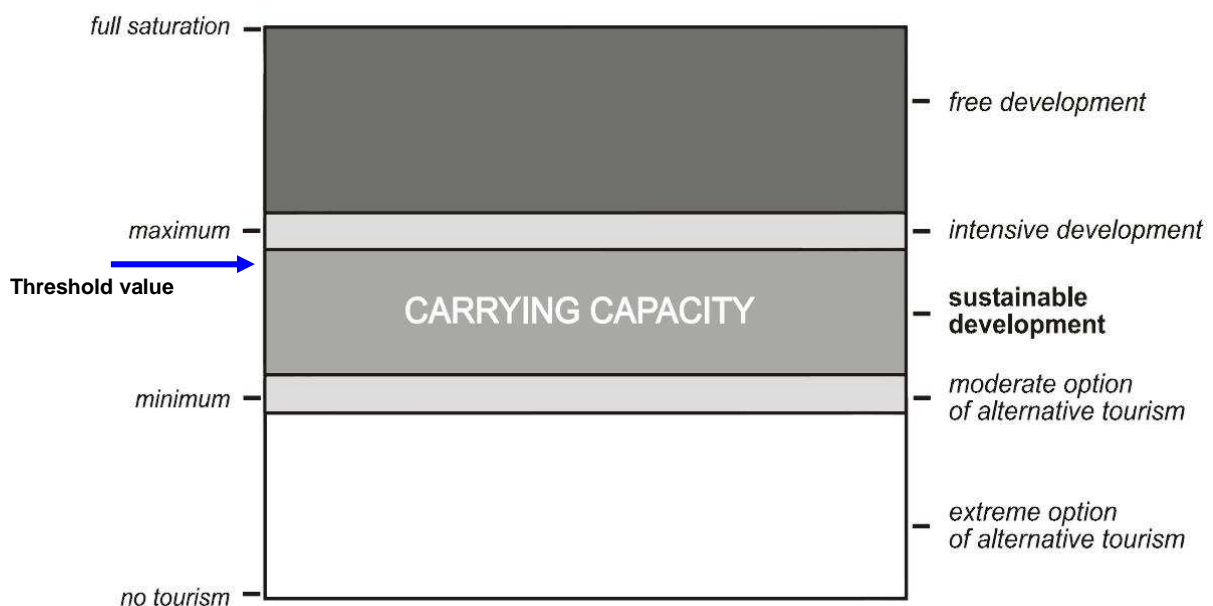


Fig. 1 Carrying capacity and the various modes of development of a region (Team 1999). The blue arrow shows the threshold value, above which the development would be undesirable.

BUILT RESOURCES

A part of the force of attraction of an area comes from built resources. Built resources are man made structures that may be contemporary or historic. Here we do not consider the artefacts (statues, murals, etc.), only buildings, constructions (including e.g. dams, mines – cf. e.g. Lóránt 2008) and parts of infrastructure (like roads, railroads, air fields). The contemporary buildings are usually built as dwelling places, administrative buildings (*sensu lato*), or service related buildings (shops, hotels, restaurants, clubs, financial institutions, parking facilities, railway or bus stations, taxi stations, play-grounds, stadiums, etc.). Historic buildings may have archaeological, historical or cultural value, depending on the period of their establishment and historic context. They may be habitable or inhabitable, serving to original intentions or serving other, e.g. tourism related aims (museums, hotels, etc.).

The spatial distribution type, architecture and spatial density of man made buildings, together with the way as they are integrated into the natural environment influence considerably the attractiveness of the area in question.

The calibration process has to assess the present capacity of the studied items that serve tourism purposes and the present impact of tourism. Then the maximum capacity is usually assessed by assuming e.g. a 90% utilization of the existing capacities. After assessing the other factors given below, a tourism related future capacity need is defined that would then serve as a basis for the development design.

THE CALIBRATION PROCESS

The calibration as given by Pedersen (2002), Coccosis et al. (2001), Team (1999) or MRG (2007) is a multistage process. The characteristic parts of a calibration are given below.

Calibration of natural resources and quality of environment

Pedersen (2002), Coccosis et al. (2001), MRG (2007) give an analysis of factors that have to be taken into consideration. In respect to natural conditions, factors like resistance and resilience of vegetation, soil compaction, water turbidity, water quality, then wildlife tolerance towards visitors, etc. have to be assessed when calibrating the resources. The authors developed a complex system that enables an effective management important sites (like World Heritage Sites). This can be employed also in less recognized areas, too, but under Slovakian conditions, the survey itself would require more financial resources than typically available.

The key issues, when the tourist interacts with the natural and built environment are his requirements and his tourism related culture. Thus visitors can pose a number of problems. Negative impacts of visitor use, that must be considered when setting visitor carrying capacity include:

- human overcrowding resulting in environmental stress;
- animals showing changes in behaviour;
- erosion of trails or beaches;
- increased pollution, noise, litter, or resource extraction,
- harm of natural and culturally important features of the area (Brandon, 1996).

Any activity contrary to a set standard (e.g. zero tolerance for chipping off parts of fossils or collecting protected herbs) should evoke a response. The response task force has to be in place and have the means of monitoring any trespassing. Without such a task force and without a monitoring system, the regulative cannot be implemented.

Calibration of social and communal resources

A frequently applied method for assessing the measure of acceptable changes at

a tourist destination is the method of establishing the *Limits of acceptable changes* (Stankey et al. 1985). The limits of acceptable change are broadly established by the following steps: 1. Identify area concerns and issues. 2. Define and describe opportunity classes (based on the concept of Recreation opportunity spectrum – see Clark, Stankey 1979, MRG 2007). 3. Select indicators of resource and social conditions. 4. Inventory existing resource and social conditions. 5. Specify standards for resource and social indicators for each opportunity class. 6. Identify alternative opportunity class allocations. 7. Identify management actions for each alternative. 8. Evaluate and select preferred alternatives. 9. Implement actions and monitor conditions (MRG 2007). Such a study is extensive and its implementation under Slovakian conditions would be difficult due to lack of a proper system of implementation.

CALIBRATION OF AN AREA IN RESPECT TO ATTRACTIVITY AND POSSIBLE DEVELOPMENT OF A DESTINATION

As indicated above, the calibration of a would-be destination or other well defined region is a process that involves a number of steps. According to Coccossis (2001), the parameters to be examined when assessing tourist carrying capacity are: Characteristics of the locality from tourism point of view, type of tourism and tourism behaviour, the tourism/environment interface. The evaluation may or may not lead to a single threshold value (cf. Fig.1). Thus it has a tendency to change with time. Fig.2 shows the flow diagram of such a process. The study has to define constraints, bottlenecks and impacts. The evaluation should be setting the goals and evaluation criteria. The impact of tourism in an area has to be analysed in 3 areas: physical - ecological component, socio-demographic component and political-

economic component (MRG 2007).

Physical and ecological component

The physical components include the capacity of the natural systems (static components) and the infrastructure (flexible components) – like water supply, roads, transport, etc. Thus here we would analyse:

- Acceptable level of congestion in key areas (trails, streets, parks, museums, restaurants etc.)
- Maximum acceptable loss of natural resources (e.g. fauna, vegetation, land, water) without deterioration of the ecosystem
- Acceptable level of air, water and noise pollution (limited by the tolerance of the eco system)
- Intensity of use of transport infrastructure, facilities and services
- Use and congestion of utility facilities and services (water supply, electric power, waste management, etc.)
- Adequate availability of other communal facilities and services (public health, safety, housing, etc.)

Social and demographic component

It refers to those social aspects that are important for local communities in relation to tourism development. This includes available human resources, sense of identity of the local community, the tourist experience, the impact of tourism on local culture. Thus in this case we would have to analyse:

- Number of tourists activities that can be absorbed without affecting the identity, lifestyle, social patterns etc. of local communities¹,
- Level and type of tourism which does not alter significantly local culture,

¹ This is in fact impossible, as tourism development always influences the local communities. As it is stated in WTO (2002) e.g. commodisation is almost inevitable if tourism develops. Also cultural habits necessarily change with time due to tourism (cf. Timcak 2010).

- Level of tourism that will not be resented by local population,
- Level of tourism ensuring that there will not be an unacceptable decline of experience of visitors.

Political and economic component

This relates to the impact of tourism on local economic structure etc. including competition of other structures. It has also address the divergence in values within the local communities regarding tourism. In this case we would have to analyse:

- Level of specialization in tourism,
- Loss of workforce in other sectors due to tourism,
- Revenue from tourism and its distribution at local level,
- Level of employment in tourism in relation to local human resources.

PROCESS OF CALIBRATION OF A CLUSTER OF FIVE VILLAGES IN SLOVAKIAN KARST

In the cluster of 5 villages: Jablonov nad Turňou, Hrhov, Zádiel, Turňa nad Bodvou, Dvorníky- Včeláre (Fig.3), first steps were made to calibrate this area for tourism carrying capacity (Panáková 2007, Ťapák, Bránska 2008, Pápayová 2009, Jurkasova 2010). In the following paragraphs, the preliminary results will be given.

The analysed area and its basic description

The villages of Jablonov nad Turňou, Hrhov, Zádiel, Turňa nad Bodvou and Dvorníky- Včeláre are situated in the Slovakian Karst, near the border of Slovakia and Hungary.

Historically, the villages were established in the 13th to 14th Century. The number of inhabitants varies from 180 to 3460. Man made objects of tourist interest are shown in Tab. 1.

In Jurkasova (2010) the geological,

geomorphological and biogeographical settings were described, together with the description of the Slovak Karst National Park. The main tourist attractions are: 1. Horný vrch (Upper Mt.) with a karst plateau and the famous Zádiel gorge and a number of caves and archaeological sites. The Dolný vrch (Lower Mt.) historically used to be a tourist attraction, but first it was inaccessible to tourism because the Slovak-Hungarian border ran along it, then the open pit mining of limestone was started and thus it became unattractive for tourists. 2. Silica karst plateau with a number of caves and chasms; 3. The Turňa fortress; 4. Sacral buildings.

Physical and ecological component

As regards the natural environment it was found, that stationary sources like industry (US Steel, a limestone quarry (Dolný Vrch), a cement factory near Dvorníky-Včeláre as well as the Slovak Gas Industry in Jablonov nad Turňou (Slovtransgaz facility managing an oil pipeline from Ukraine and EUSTREAM facility through gas turbines) and home heating appliances are contributing to a decrease of environmental quality. The mobile sources of contamination have an added impact (mainly road and rail transport). The villages have communal water supply. The underground water - as it is mainly of karst origin - is of good quality. Waste management is managed in each village on a central basis. At present, however the volume of litter caused by tourism is a problem (Pápayová 2009). The air quality (cf. Jablonská, Carach, Timčák, 2010) is critical in some of the villages in the area, but in case of the studied localities, it is satisfactory. Other factors are detailed in Jurkasová (2010).

Here, it would be also necessary to define the number of tourists that comply with the carrying capacity of the region and that comply with the level of acceptable changes. In case of the Zádiel gorge, during a weekend, 75-100 cars park in the Zádiel

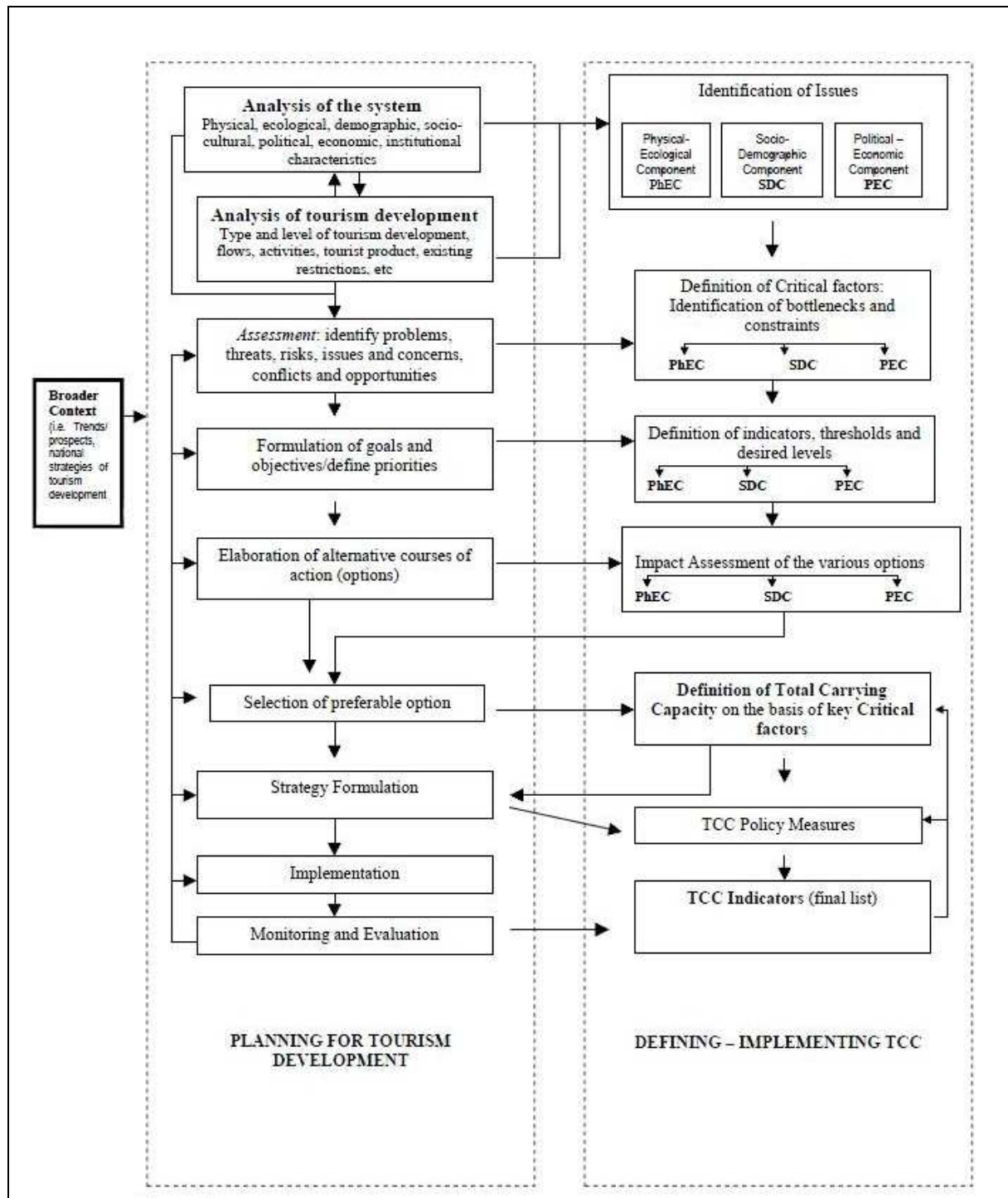


Fig. 2 Steps needed for preparing tourist carrying capacity definition (Coccosis 2001)

village and 790-1000 tourists visit it in the summer period. The configuration of the terrain does not allow much “freedom” in movement in the gorge, thus the number of “off trail” tracks is relatively small. The gorge is 2200m long. If we assume groups of 2-6 people walking together, and if we assume that at least a 30m distance

between groups is necessary to have a feeling of comfort (sound isolation from the group before and behind, sight isolation), then at one time 146-440 people should be walking in the gorge (one direction) at most (cf. Diedrich et al. 2009). As the traffic is a two-way one, the feeling of comfort is decreased at the time when two groups

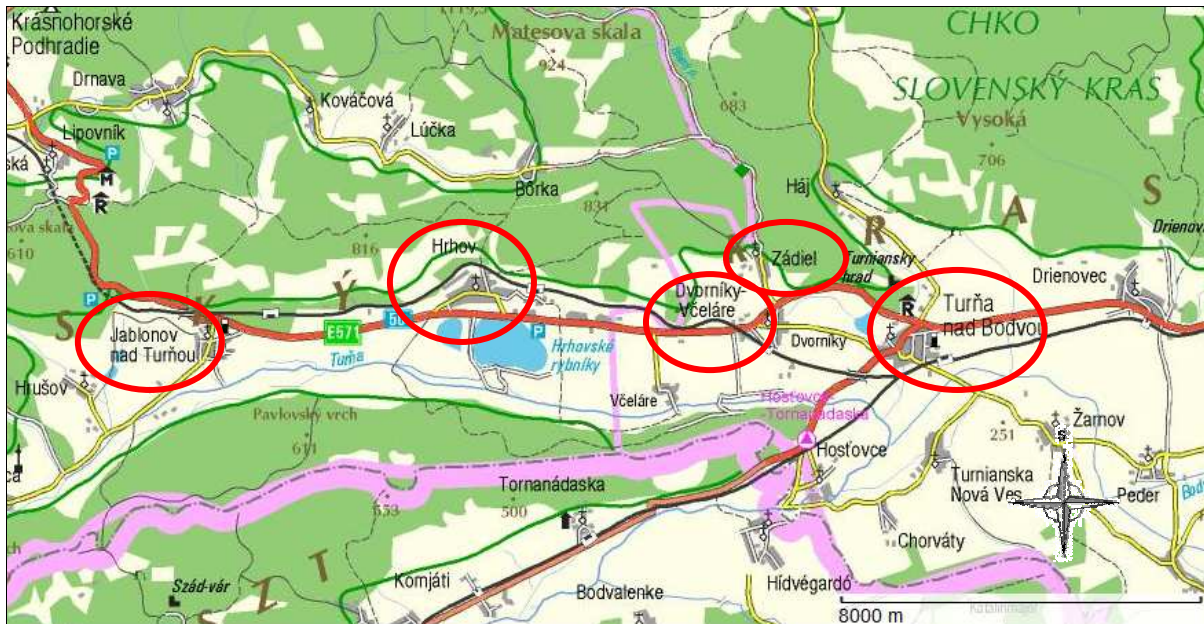


Fig. 3 Geographical positioning of the studied villages. The violet colour represents the interstate boundary (Jurkasová 2010).

Tab. 1 Man made objects of interest in the studied area (Jurkasová 2010, Ľapák, Bránska 2008, Pápayová 2009)

Village	Sacral object	Heritage objects
Jablonov nad Turňou	Roman Catholic church of Holy Trinity (14 th Cent.) Evangelistic church	St. Anne chapel (between Jablonov n. Turňou and Hrušov) (14 th Cent.) Esterházy grainery with wine cellar (18 th Cent.)
Hrňov	Fortified Roman catholic church of St. John the Baptist (17 th Cent.) Evangelistic church (18 th Cent.) Chapel (18 th Cent.)	Water mill (19 th Cent.)
Zádiel	Evangelistic church	Bronze age fortifications, Caves inhabited in prehistoric times
Turňa nad Bodvou	Roman catholic church of Virgin Mary's Ascension	County governance house Turňa fortress
Dvorníky	Roman catholic church of the birth of Virgin Mary Calvinist church	Manor house Memorial of victims of the 1 st and 2 nd WW Museum House of rural architecture

walking in opposite directions meet. When assessing the acceptable changes, one has to define the objectives of the area management (how much changes are acceptable in relation to the recreation experience that the area has to provide, the feel of naturalness of environmental conditions and the intensity of management

practices). Without monitoring no professional management is possible. In the process of decision-making it is necessary to separate technical decisions from value judgements. A consensus among the affected groups (local inhabitants, local government, Environmental Protection Agency, Tourism entrepreneurs, etc.) about



Fig. 4 The chapel of St. Anne near Jablonov nad Turňou, first renovated in 1940, **Photo by:** Jurkasová

Tab. 2 Age distribution of the inhabitants of Jablonov nad Turňou (Jurkasová 2010)

Predproductive age (0-14)	158
Productive age- male (15-59)	248
Productive age- females (15-54)	225
Postproductive age- males (60 and more)	78
Postproductive age- - females (55 and more)	149
Not determined	2

the proposed actions is needed for successful implementation of area management strategies (McCool, 1996).

Social and demographic component

The population of the studied cluster of villages, their distribution by age, nationality, religion, education, employment and other criteria are given in Pápayová (2009), Jurkasová (2010). Some of the villages have a stabilised number of inhabitants (e.g. Jablonov nad Turňou),

some an increasing trend (e.g. Hrhov) – cf. Fig. 5 and Tab. 2.

The available services are given in Tab. 3. As regards lodging Tab. 4 shows the available services.

Transport infrastructure includes railway and roads. The region has one transregional road E 571 I/50. One air transport corridor leads through the studied area. For cyclotourists there is the Slovak Karts cyclo-highway that is about 195km long. There is a number of well marked educational trails and trekking trails.

Tab. 3 Available services in the studied villages

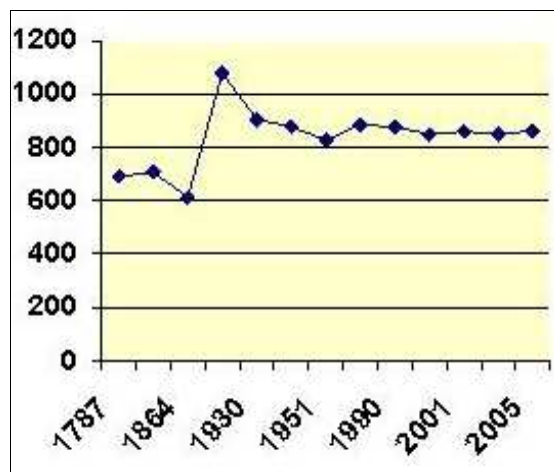
Services/ villages	Jablonov nad Turňou	Hrhov	Zádiel	Turňa nad Bodvou	Dvorníky – Včeláre
Groceries					
Shops with mixed goods					
Pubs					
Petrol pumps					
Car services					
Post Office					
Cable TV					
Library					
Gym hall					
Football play ground					
Communal water supply					
Sewage					
Gas supply					
Railway station					
Kindergarten					
Primary school					
Public parking places					

Tab. 4 Lodging capacity in the studied villages

Village	Lodging facility	Capacity
Jablonov nad Turňou	Villa Sisi	12
	Bungalow Jablonka	20
	Bungalow Porlak	7
Hrhov	Bungalow Pitón	5
	Lodging with families	5
	Lodging with families	5
Zádiel	Farmer's yard (Gazdovský dvor)	10
	Flachbart family hotel	22
Turňa nad Bodvou	family hotel „Pod hradom“	10
Dvorníky	Bungalow „U Mlyna“	16
	Lodging with families „Daniel Zelený“	11

Tab. 5 Employment types of the inhabitants of Jablonov nad Turňou (for 2008, in: Pápayová 2009)

Employment sector	Employed people
Agriculture, including hunting	33
Forestry, wood production	2
Industry	23
Construction industry	17
Business	59
Lodging and catering	10
Transport, storage and telecommunications	20
Public service, defence	44
Education	16
Health and social services	18
Other services	143
Total	385

**Fig. 5** Demographical development of Jablonov nad Turňou. Y – axis: No. of inhabitants, X – axis: years (Jurkasová 2010)

Political and economic component

The employment status of inhabitants in the studied area is shown in Tab. 5. The level of unemployment is relatively high. Thus e.g. in Jablonov nad Turňou, in 2008, from 841 inhabitants 385 were employed, 75 unemployed, the rest (456) was self employed or without a registered status. It has to be noted that the seekers of employment in this area sometimes represent more than 25% of a village population (Pápayová 2009).

The local government is interested in tourism related development plans (cf.

Kovácsn 2008; Ľapák, Bránska, 2008). The tourism related income is relatively low, as it is obtained mostly from items like lodging, catering or parking fees. In case of events, the fee is low p/a as the events are relatively rare. One example is the Wine Fest in Jablonov nad Turňou, which is held annually. The fee is nominal and the gain of the exhibitors is the information on the competitors and publicity. Usually about 50 wine types are exhibited and 500 people participate. Similar activities are held also in Turňa nad Bodvou (Sztásová, 2008). The natural attractors like the Zádiel gorge – in spite of its being a National Park – or the Turňa fortress have no entrance fee and no tourist flow management. The available tourism related services are given in Tab. 3.

CONCLUSIONS

Often, the state- and local authorities develop planning strategies that do not contain the calibration process and are concentrated on achieving an increased level of tourism (e.g. Ľapák, Bránska 2008). Without a calibration this may lead to conflict of interest. Thus the calibration as described above, could aid a sustainable tourism development. The calibration of a region has a great number of components.

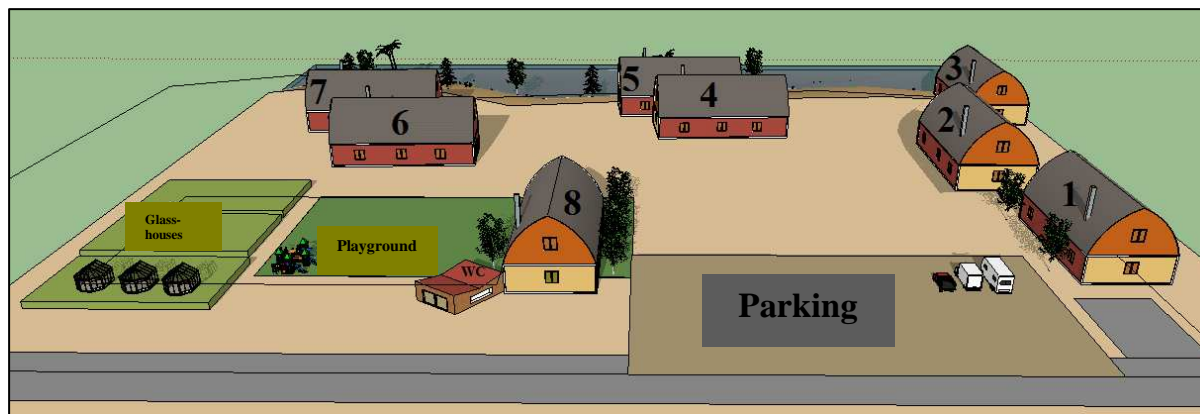


Fig. 6 The proposed Community Centre in Dvorníky – Zádiel area with tourist attractions. 1-3 animal stables, 4 – shops, 5 - sportive entertainment areas, 6 virtual reality show of the Zádiel area, 7 - lodging facility and 8 – administration and catering facility. There are agricultural and botanical facilities, too as well as an open playground.

The described way of assessing the carrying capacity and acceptable change/impact can impact management, visitor experience and resource protection, visitor activity management process, the recreation opportunity spectrum and the tourism optimisation management model (Market Research Group 2007). For the selected village cluster the basic analytical data were obtained. The aim was – in order to keep the ecological load low - to find an acceptable number of visitors in the areas of the Slovak Karst National Park that are in the vicinity of the studied village cluster. In Jurkasová (2010) it was proposed that a regulation of the visitors could be achieved through a Community Centre built from a partly abandoned Agricultural cooperative complex near Dvorníky and Zádiel (Fig.6). Here attractions through entertainment would bind a part of the visitors at this location and to generate income for the local community. From the parking lot, ecological transport would be provided to the Zádiel gorge (electrobus or aircar), thus reducing transport impact. In spite of this, the number of ad hoc visitors in the protected area would decrease due to the entertainment offer.

Further work is needed in establishing all the rest of data needed for calibration and for designing a full range of recommendations for tourism development in the studied area.

REFERENCES

- Barančok P., Barančoková M., 2008:** Evaluation of the tourist path carrying capacity in the Belianske Tatry Mts., *Ekológia*, vo.27, No.4, pp. 401-420
- Barančok P., Barančoková M., 2008:** Evaluation of the tourist path carrying capacity in the Belianske Tatry Mts, *Ekológia*. Vol.27, No.4, pp.401-420
- Brandon B. 1996: *Ecotourism and conservation*, ESSD, The World Bank, 80pp
- Carach V., Jablonská J., Cserey v. P., 2010:** *Vidiecky turizmus a kvalita ovzdušia v zimnom období (Rural tourism and air quality in winter)* manuscript, 5pp
- Clark R.N., Stankey G.H., 1979:** *The recreation opportunity spectrum*, US DA, Forest service
- Coccosis H., et al., 2001:** *Defining, measuring and evaluating carrying capacity in European tourism destinations*, Final Rept., EU project B4-3040/2000/294577/MAR/D2 Athens, 52pp.
- Dávid L., Jancsik A., Rátz T., 2007:** *Turisztikai erőforrások, Perfekt Gazdassági Tanácsadó*, Budapest.
- Dávid, L., 2008:** *Quarrying: an anthropogenic geomorphological approach*, *Acta Montanistica Slovaca*, No.1, vol. 13, pp. pp.66-74
- Diedrich A. et al. 2009:** *Shifting the carrying capacity concept from theory to practical application: an example using recreational boats in Mallorca, Balearic Islands, Spain*, Working Papers of Coastal and Marine Tourism Conference 2009, Nelson Mandela Bay, S. Africa, 4pp.
- Dietrich, A. et al., 2009:** *Shifting the carrying capacity concept from theory into practical application: An example using recreational boats in Mallorca, Balearic islands, Spain*, Proc. CMT 2009, pp. 264-267
- Dixit, S.K. (Ed.):** *Promises and perils in hospitality and tourism management*, Aman Pc, N. Delhi
- Gajdos, L., 2004:** *Turizmus a jeho vplyv na životné*

prostredie, Indikátorová sektorová správa, SAŽP, B. Bystrica, 81pp

Goodman, P., S., 2003: Assessing management effectiveness and setting priorities in protected areas in KwaZulu Natal, *BioScience* 53(9), pp.843-850

Horner S., Swarbroke J., 2003: Cestovní ruch, ubytování a stravování, využití volného času, Grada, Praha.

Jablonská, J., Carach, V., Timčák, G.M., 2010: Vplyv lokálnych zdrojov znečistenia na kvalitu ovzdušia Zádielskej doliny. Manuscript, 7pp.

Jablonská, J., Timčák, G.M., Pixová, L., 2009: Geotourism and water quality of river Hornád, *Acta Montanistica Slovaca*, No.3, vol.14, pp. 213-220

Jablonská J., Strajňák J., 2010: Geotourist health risk management in the Balkan countries, manuscript, 11pp.

Jurkasová, Z., 2008: Analýza a návrh stratégie rozvoja CR v oblasti obce Jablonov nad Turňou a okolie, BSc Thesis, ÚGT FBERG TU Košice, 103pp.

Jurkasová, Z., 2010: Analýza a zhodnotenie záťaže cestovným ruchom obcí Jablonov nad Turňou, Hrhov, Zádiel, Turňa nad Bodvou, Dvorníky-Včeláre a ich katastrálneho územia. Návrh udržateľného rozvojového programu cestovného ruchu. Diplomová práca, ÚGT FBERG TU Košice

Kiráľová, A., 2003: Marketing destinace CR (Destination marketing in tourism), Ekopress, Praha.

Kovács, D., 2008: Návrh ÚPN-O Turňa nad Bodvou (Territorial development plan of Turňa nad Bodvou), Arka, Kosice, 53pp

Lengyel, M., 2004: A turizmus általános elmélete, Heller F. GTSzF, Budapest, 2004

Market Research Group, 2007: The Purbeck section of Dorset and East Devon World heritage site carrying capacity evaluation Report, Bournemouth, 127pp.

McCool S., 1996: Limits of Acceptable Change: A framework for managing national protected areas: Experiences from the United States Proc. Workshop

on Impact Management in Marine Parks, Kuala Lumpur, see:

http://juneau.org/tourism2/documents90-99/Limits_of_Accept_Change96.pdf

Panáková, A., 2007: Analýza subjektov regionálneho rozvoja v KSK (Analysis of regional development subjects in Kosice County), VVMZ Bratislava, 2007, 37pp

Pápayová, S., 2009: Integrovaná stratégia rozvoja územia KRAS, o.s. Kras, Plešivec, 169pp

Pedersen A. 2002: Managing tourism at world heritage sites, UNEP/UNESCO Paris

Stankey, G.H. et al., 1985: LAC systems for wilderness planning, See:

<http://www.fs.fed.us/r8/boone/documents/lac/lacsummary.pdf>

Szitásová, H., 2008: Chronicle of the village of Turňa nad Bodvou, verified by the Local government of the village, 22pp

Ľapák P., Bránska, N., 2008: Stratégia rozvoja CR v regióne NP Slovanský Kras, VÚC Košice, 96pp

Team, 1999: Carrying capacity assessment for tourism development, 81pp, UNEP, Split.

Timčák, G.M., 2010: Human nature and the risk of non-sustainable geotourism, paper for Internat. Conf. "Sustainable tourism: issues, debates and challenges, Crete and Santorini", April, submitted in revised form to *Tourism Today*, 11pp

Timčák, G.M., 2010: Iceland as a geotourism learning destination, Manuscript for GEOTOUR 2010, 10pp

WTO 2002: World Ecotourism Summit, Final Report, Québec. Printed in Madrid

Internet:

<http://www.fs.fed.us/r8/boone/documents/lac/ros1.pdf>

http://www.southasiamcpportal.org/toolkit/pdf/J2_CarryingCapacities.pdf