

“Spatial Model of Tourism in High Mountains: an Example from the High Tatras and the Low Tatras, Slovakia”

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Abstract

Models of tourism have been extensively researched. They have been mainly used in spatial planning of development for recreation centres. Our ambition was to create a spatial tourism model generally applicable to the high mountains in Slovakia. The starting point of our approach was studying of spatial patterns and creating spatial models of tourism in the High Tatras and Low Tatras. The application of the models resulted into new knowledge that were used for formulation of the rules and criteria of creating spatial tourism models.

Key words: spatial model, tourism, high mountains, High Tatras, Low Tatras

Paper Type: Scientific paper

1 Introduction

In a study of the phenomenon of tourism there are many approaches and concepts that seek a comprehensive description of the principle of its behavior, the spatial extension or spatial relationships and linkages between a recreation center and its hinterland.

A systemic approach to the study of tourism can have a graphic dimension in the form of models. Formulation of models represents one of the stages of inductive thought process which leads to the creating of theory that generalizes objective reality and is expressed in the following scheme: observation → data collection → data analysis → **models formulating** → creation of hypotheses → theory (Gregorová, 2012). The model is thus a tool of scientific knowledge, which through symbolic or graphic representation shows the structure and way of functioning of the phenomenon, in this case tourism. The principle of modeling consists in reducing of selected properties of phenomenon and the result is a diagram or concept, simulating the behavior and characteristics of the phenomenon (Gúčík, 2010; Krogmann, 2006).

2 Theoretical overview

Models of tourism are characterized by certain features which are essential for their creation. These include: spatial structure, spatial relationships and linkages, hierarchical development (Dredge, 1999) and functions of space. The first attempts to build tourism models were recognised in 1930s and 1940s in the works of Poser (1939), Hunziker and Krapf (1942). The aim of those schemes was to organise the preconditions of tourism in terms of their impact on the emergence and development of tourism. While Poser used the functional approach,

Hunziker and Krapf identified a human as the centre of their approach that had the greatest influence on its functioning (Gúčík, 2010). Currently, there are several models of tourism, which we tried to group by common properties and characteristics and thus create their universal typology (Table 1).

3 Spatial models of tourism

Spatial, respectively, spatio-temporal models were constructed first, because these were based on the gist of tourism. Its main feature is the different environment of the place of residence of the tourists and the place of their recreation. The movement between two points defines spatial linkages and spatial relations. On the one hand, there is a relatively fixed point (place of residence) and on the other hand, occasionally selected secondary residence (visiting place) and between them exists a spatial dimension couched in the access or the return route (Mariot, 1969).

Thus, the spatial models of different type and extent create three basic elements: 1) the place of residence, 2) the transport area and 3) the destination. In the place of residence the preparing for the journey is enacted, the destination is chosen and the important items for traveling are bought. The distance between the place of residence and the destination is covered by different vehicles depending on the distance and the type of tours. The journey itself can be enlivened by short trips with or without overnight stay. Environment of destination is unknown to the visitors and they are looking for the options of implementation of recreational activities depending on the season (Freyer, 2006 In: Gúčík, 2010). The oldest spatial models are shown on Figure 1 (Jovičič, 1966 In: Mariot, 1969) and Figure 2 (Mariot, 1983).

Table 1 Typology of selected models of tourism

Model type	Name	Description	Reference
Spatio-temporal	Christaller's Central place theory – Centre-periphery model	Divides the space into the central core - city and periphery - an area of recreation centres and tourism development	Prosser (1994) In: Kurek et al. (2007)
	Tourism area life cycle	Depicts evolution of destinations – exploration stage, involvement stage, development stage, consolidation stage, stagnation stage and rejuvenation or decline stage	Butler (1980)
	Forming of recreational areas	Defines 3 types of recreational areas – real or formal, functional and perceptual, perceptual-mental	Liszewski (1995) In: Kurek et al. (2007)
	Concept of functions in tourism	Functions in tourism are measured by 3 indicators – the number of beds to 100 residents, the number of tourists to 100 residents and the number of employed in tourism	Liszewski (2012); Warszńska (1985) In: Kurek et al. (2007); Warszńska, Jackowski (1978)
	Recreation centres concept	Includes these models – model of tourism business district and model of functional tourism region – metropolitan tourism region, destination region, region of cognitive tourism and region of religious tourism	Kowalczyk (2000); Liszewski, Włodarczyk (2012)
	Spatial model of tourism	Consists of 5 elements – place of residence, access route, recreation route, return route and recreation centre	Jovičić (1966) In: Mariot (1969)
	Spatial attraction model	Proposes 3-part model of tourist attraction: nucleus, zone of closure and inviolate belt	Gunn (1965) In: Dredge (1999)
	Spatial-temporal evolution of destination regions	Depicts evolution of destinations over time emphasizing 4 aspects: spatial characteristics, transport, tourist behaviour and attitude of decision-makers	Miossec (1976, 1977) In: Dredge (1999)
	Destination zone planning concept	Proposes a regional destination zone comprising 5 basic elements: definable regional boundary, access from markets and internal circulation corridor, community attraction complexes, non-attraction hinterland and entrances to region	Gunn (1965, 1972, 1988, 1993) In: Dredge (1999)
	Model of territorial recreation systems	Consists of 4 subsystems: visitors, natural and cultural-historical complexes, technical subsystems, service staff and superior element of these subsystems is institution with coordination function	Preobraženskij, Zorin, Venedin (1972) In: Mariot (1983)
	Model of territorial recreation systems	Main element are visitors, the others subsystems are: natural preconditions, the image of landscape, cultural-historical preconditions, socio-economic conditions, organizational conditions and technical conditions	Kostrowicki (1975) In: Mariot (1983)
	Perceptual-behavioural	Spatial model of destination tourism	Consists of 4 basic elements: place of residence, stage centre, transit centre, recreation centre, also access route and return route
Temporal model		Divides time into 3 types: everyday time (lived in the place of living), transport time and time spent in recreation centre	Freyer (2006) In: Gúčík (2010)
Tourist model		Model describes evolution of person into tourist – corporation, emancipation, animation, repatriation, incorporation and omission	Jafari (1987) In: Kurek et al. (2007)
Model of spatial behaviour of tourist		Consists of 2 models – model of recreational attraction and destination choice model	Mazurkiewicz (2007)
Conception of perception of recreational space		Perceptual-behavioural model forms: value system, perception of recreational space, restrictions, decisions, recreational behaviour, attributes of recreational space, information and perception	Kowalczyk (2000); Richling, Solon (1994) In: Kurek et al. (2007)

Economical	Tourism product model	Model of development of tourism product has the following phases: discovery, launch, stagnation, decline	Čuka, Zimmermann (1995); Kaczmarek, Stasiak, Włodarczyk (2005); Jakubíková (2009) In: Čuka (2011)
	Economic model of tourism system	System of tourism forms 2 subsystems – object of tourism and tourism subject; or 4 subsystems – destination, transport, agents, demand	Kaspar (1975) In: Gúčík (2010); Bieger (2004) In: Gúčík (2010)
	Model of tourism management	Model determines as the main functions of management - planning, organizing, selection and deployment of employee, leadership, check	Gúčík et al. (2006)
Cultural	Socio-cultural model of tourism	Model is characteristic by 2 subsystems: ordinary (home) world (typical by daily life) and nonordinary (touristic) world (typical by recreational time)	Jafari (1987) In: Kurek et al. (2007)
	Cultural model of tourism	Tourism is the process of penetration of cultures –destination culture and culture of visitors; model distinguishes 3 types of culture – tourists' culture, corporate culture and local culture	Jafari (1982) In: Gúčík (2010)
	Conception of religious tourism	Model of evolution of religion – primitive religion, archaic religion, historical pre-modern religion and modern religion	Jackowski (2003), Matlovič (2001)
	Concept of tourism as a meeting of communities and cultures	Model describes the evolution of a conflict of tourists with local cultures; has 4 phases – euphoria, apathy, irritation, antagonism	Ćwiklińska (2009) In: Čuka (2011)

Source: author

Models also represent spatial functional tourism schemes indicating the direction of relations between the place of residence (dispersion zone) and the place for recreation (concentration zone). These form two opposite poles of the scheme and identify the spatial dimensions type core and the periphery, in which the opposite directions of flows are functioning (Fig. 3).

Another characteristic of the spatial scheme is the emphasis on transport relations. While Jovičič (1966 In: Mariot, 1969) and Mariot (1983) recognise three types of routes – access, recreational and return, Lue et al. (1993 In: Dredge, 1999) describe five types which is related to their widespread understanding of multinodal recreational regions. These are: the single destination pattern, en-route pattern, pattern base-camp, regional tour pattern and chaining pattern.

Spatial models based on the emphasis on transport links are blamed with their low applicability. To be used when describing other types of destination regions the models must be designed in coherence with physical-geographical characteristics of the area and must take into the consideration for example the accessibility of tourism centres, transport costs, distances and other conditions (e. g. road conditions between the two points of interest). Physical-geographical characteristics tend to be generalised to an acceptable form and by means of inductive logic procedures then explain the historical process of their creation and development. The development of destinations is studied through spatial characteristics, transport, behaviour of tourists and attitude of decision-makers (Dredge, 1999).

In this paper, we consider in the developing of tourism models of the High Tatras and the Low Tatras all the above mentioned factors, so that we formulate rules for creating schemes generally applicable to the mountainous regions of Slovakia.

4 The research methodology

The aim of this paper is to analyse the spatial relationships in destination regions of high mountains (High Tatras and Low Tatras) and to create a spatial model of tourism functioning in them. Our model is based on Mariot's (1969) and Jovičič's spatial models (1966 In: Mariot, 1969), Christaller's centre-periphery model (Kurek, 2007), Butler's model of the life cycle of recreation centre (Butler, 1980), the model of functional types of tourism regions (Liszewski, Włodarczyk, 2012) and the nodal model of destination regions (Dredge, 1999). The spatial models were used to study relationships between nucleus (tourist centre) and its hinterland (zones and directions of influence). Christaller's model helped us to clarify the relationship of the core (tourist centre) and the periphery (urbanised areas - places of residence of tourists). Based on these two models, we determined the size of the tourist centres (in our studied destination regions) and made their categorisation. Butler's model defines the phases of the recreation centre development, and therefore on its base we construct our classification of tourist centres. Model of functional types of regions became a platform for functional typification of recreational centres and spatial the model of destination regions helped us in clarifying the relationships between node (destination region) and corridor (system of transport links of destination regions).

All the necessary quantitative datas for modeling destination regions and classification of recreational centres we obtained from the Statistical Office of the Slovak Republic, the tourist information office of the town High Tatras and from terrain research. Terrain research we consider as the most important research method, because we created on its basis classification, typification and hierarchy of tourist centres, found out linkages

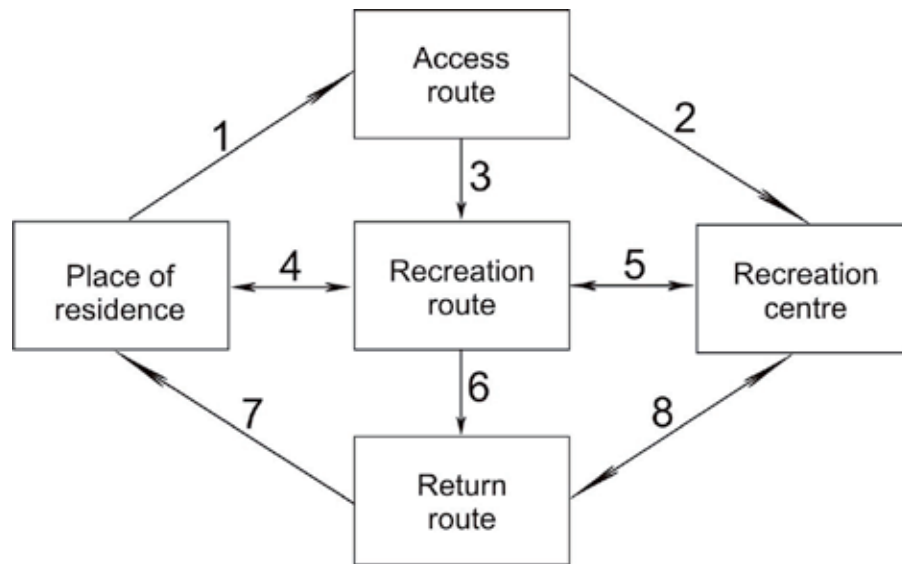


Figure 1 Spatial model of tourism
(Source: Jovičić, 1966 In: Mariot, 1969)

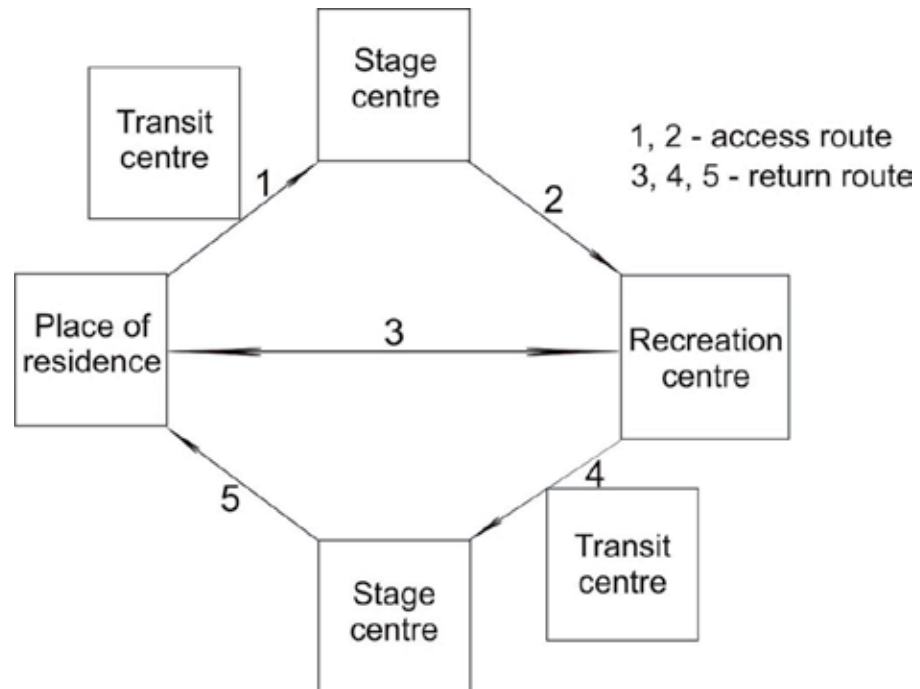


Figure 2 Spatial model of tourism
(Source: Mariot, 1983)

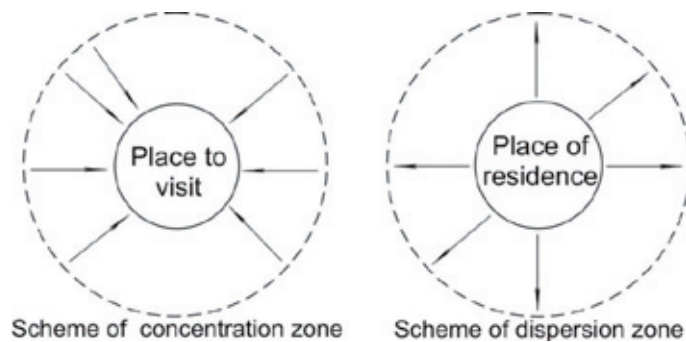


Figure 3 Spatial functional scheme of tourism
(Source: Jovičić, 1966 In: Mariot, 1969)

between centres, explained the traffic conditions in the destination regions and eventually directly verified created spatial models.

Our ambition is to formulate rules for creating general models of tourism of high mountains in Slovakia, as well as general model itself, and therefore we generalised the model of tourism in the High Tatras and the Low Tatras to an applicable form.

5 General geographical characteristic of high mountains in Slovakia

In terms of altitude zonation the mountains in Slovakia are divided into low and high. Low mountains are below of 1500m above sea level and extend to a wide peripheral part of the Carpathians. High mountains are grouped in the central part of the Western Carpathians and their peaks exceed timber-line (above 1500 m in Slovakia). These are the High Tatras (Tatry mountains), the Low Tatras (Nízke Tatry mountains) and the mountains Malá Fatra, Veľká Fatra, Chočské vrchy and peaks Babia Hora and Pilsko in the Oravské Beskydy mountains (see map 1).

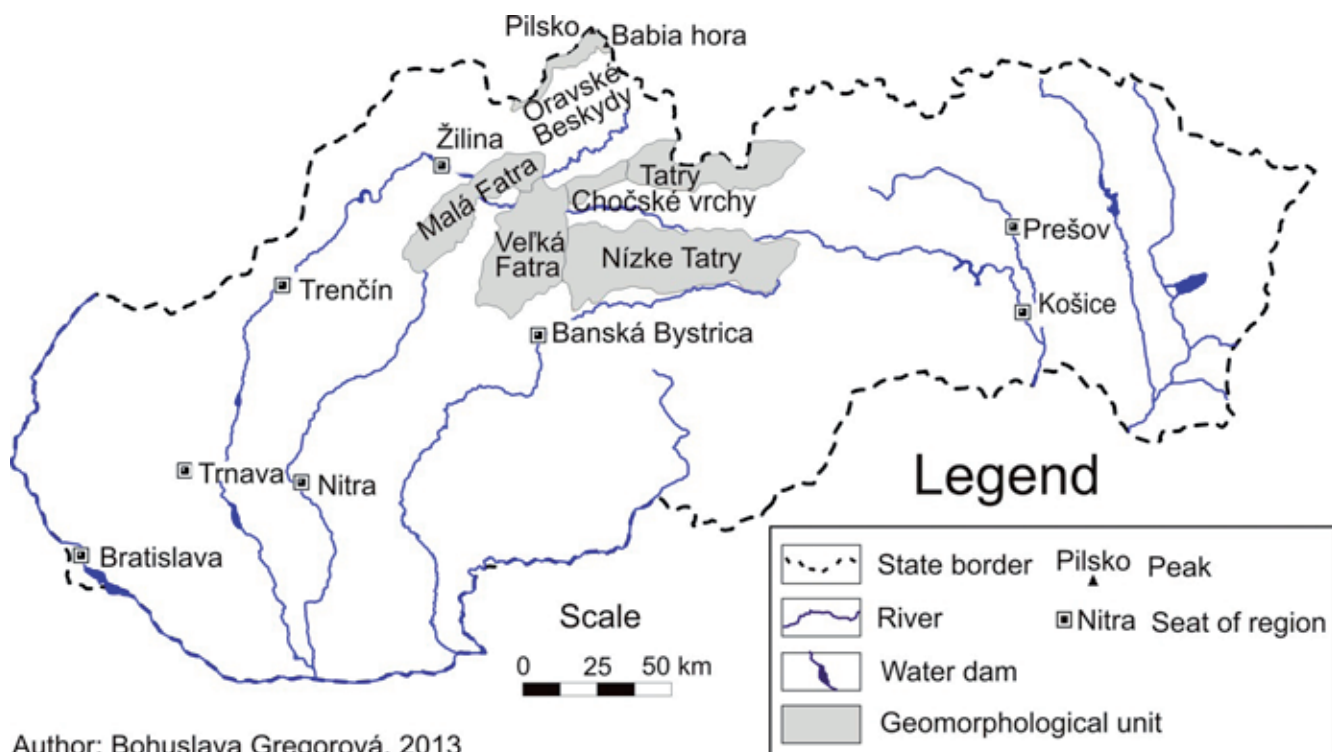
Relief of high mountains is vertically very rugged. The highest part is the main range or ridge. Lateral ridges are separated by deep valleys. The highest mountains – the High Tatras and the Low Tatras – are in the top parts typical by glacial relief which creates beautiful sceneries, other mountains have denuded relief. All belong to the cold climate zone with a long winter period with a minimum number of summer days. Enough snow and rainfall is the source of water for river flows, which are abundant in all seasons.

High vertical zonation causes the arrangement of plants to vegetation zones. Zone of forest is substituting by scrub pines, which became thin then passes into alpine zone typical by oc-

currence of plant communities diversified debris and rocks (Lukniš, Plesník, 1961). High mountains are especially suitable for tourism development thanks to natural conditions - relief, clean air, mineral springs, caves etc., therefore in them can be implemented most of recreational activities.

6 Spatial model of tourism in the High Tatras

When creating a spatial model of tourism in the High Tatras, we applied the all principles and rules used in creating models mentioned above. Core of the model are the tourist centres located at the root of the mountain range (geomorphological subdivision Tatranské podhorie and Ždiarska brázda). Depending on the functions, the number of beds and the number of attractions are the recreation centres categorized to transit centres (Tatranská Lesná, Kežmarské Žľaby), stage centres (Horný and Dolný Smokovec) and destination centres (Štrbské Pleso, Vysoké Tatry). Centres are characterized by a different size of hinterlands and spheres of influence within the hinterland may overlap with the neighboring centre (e. g. Vysoké Tatry – Štrbské Pleso – Tatranská Lomnica). In the hinterland are located holiday villages, cottages, chalets, or another tourist attractions, whether tourist suprastructure in the form of ski-lifts and ski tracks (Štrbské Pleso, Ždiar). All recreation centres are interconnected by Road of Liberty, which begins in Podbanské and ends in Lysá Poľana (roads nr. I/67 and II/537). Local roads inside of the centres lead from the centres to the selected tourist attractions (e. g. Starý Smokovec – Hrebienok; Štrbské Pleso – Chata pod Soliskom) and thus define spheres of influence and size of linkages inside the centre. The southern slopes of the High Tatras and the Western Tatras are connected by Tatra's arterial road – the main tourist path with a length of about 72 km.



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Map 1 Location of high mountains in Slovakia

Picks of mountain range and lateral ridges are connected by local hiking paths leading into the valleys and to particular recreation centres. All these elements of the scheme create a destination region which is delimited by conceptual limit. Entrance to the destination region provides gates that constitute places of the direction flows between the region and its recreation hinterland (Fig. 4).

In the creating of tourist model of the High Tatras we deliberate the historical and spatial specificities of this destination region. One is the state border which from the north markedly determines the limit of the destination region and sphere of influence of particular tourist centres. Then it is the historical development of tourism in the area. In the region as the first were built various medical centers and climatic spas with sanatoriums. Later, as the next activity, hiking began to develop thanks to the Ugrian-Carpathian association. In many Tatra settlements during the period of socialism were built sanatoriums for corporate recreation. After 1989, the sanatoriums either transformed into a modern complexes, or were abolished and were built another. A specific of Tatra settlements are that they have been artificially merged into the town called High Tatras in 1947.

7 Spatial model of tourism in the Low Tatras

The Low Tatras are the central mountains in the middle of Slovakia, which have significantly modeled mountain range in the west-east. Along the northern and southern slopes of the

mountains are located almost all recreation centres. The core of recreational space creates massif of Chopok with its northern and southern slopes, where resorts Chopok – north Jasná and Chopok – south Srdiečko are located. The most attractive valleys are Demänovská dolina and Bystrianska dolina which both are also located below Chopok. Valleys are the most urbanised recreational areas, which present destination regions. Their spheres of influence greatly interfere with nearby recreation centres because in their hinterlands are located holiday villages (Tále, Krpáčovo, Demänovská Dolina), suprastructure (ski-lifts and ski tracks in the localities Záhradky, Biela púť, Otupné, Kosodrevina, Srdiečko) and other recreational attractions (caves – Demänovská jaskyňa, Demänovská jaskyňa slobody, Bystrianska jaskyňa, golf course Grey bear). From this concentration area to the west and east the tourist centres change to stage centres (Bystrá, Čertovica, Vyšná Boca), respectively transit centres (Jarabá, Malužiná). The Low Tatras massif from the north and south surrounds two basins – Podtatranská kotlina and Horehronské podolie by which lead the main transit communications (D1 motorway and road nr. I/66) providing entrance into the destination region and its connection with recreational hinterland. The destination region is specifically divided into western and eastern part, at which boundary forms road nr. I/72. Internal communications within the centre and its recreational hinterland can be found in the centres such as Chopok-sever and Chopok - juh.

The highest peaks of the mountains connects SNP heroes path, the most important tourist artery in Slovakia, which has a

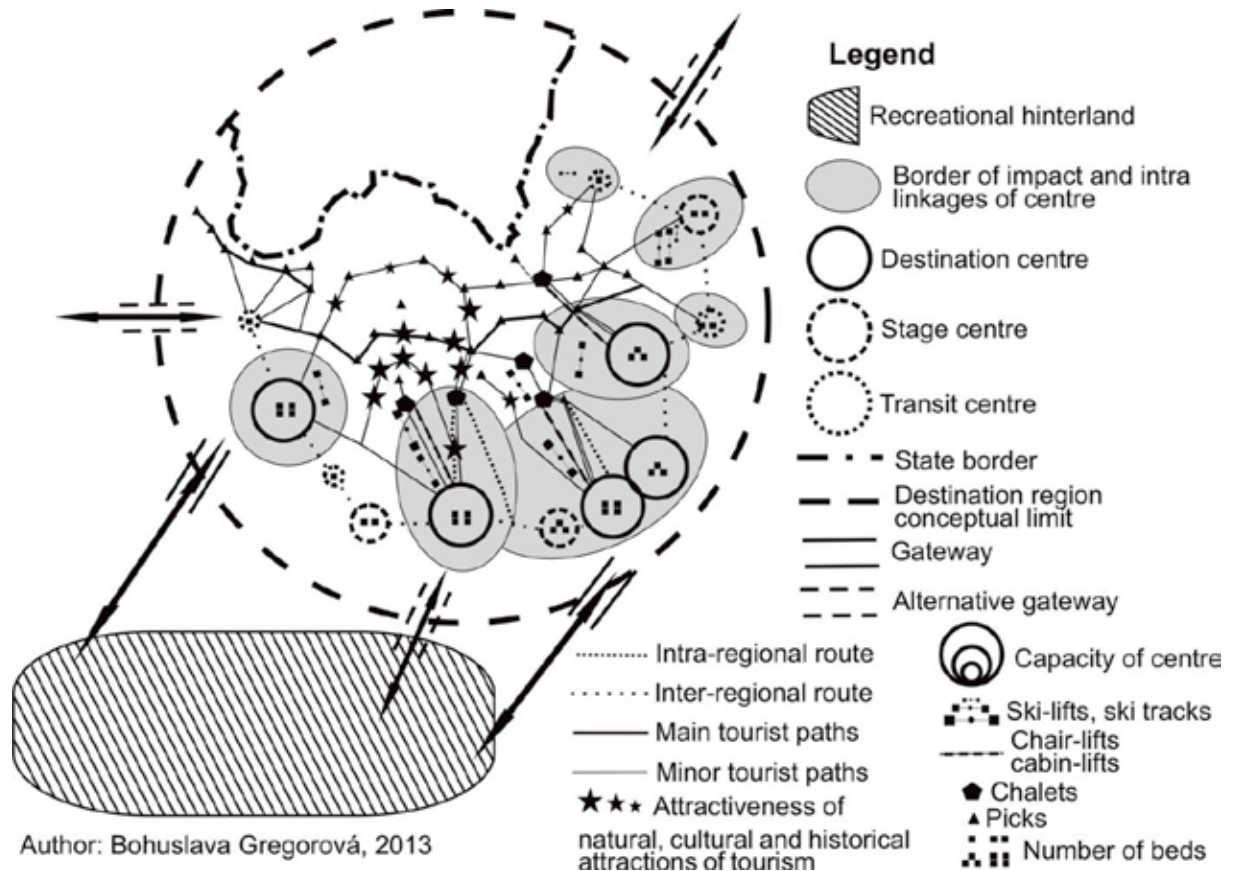
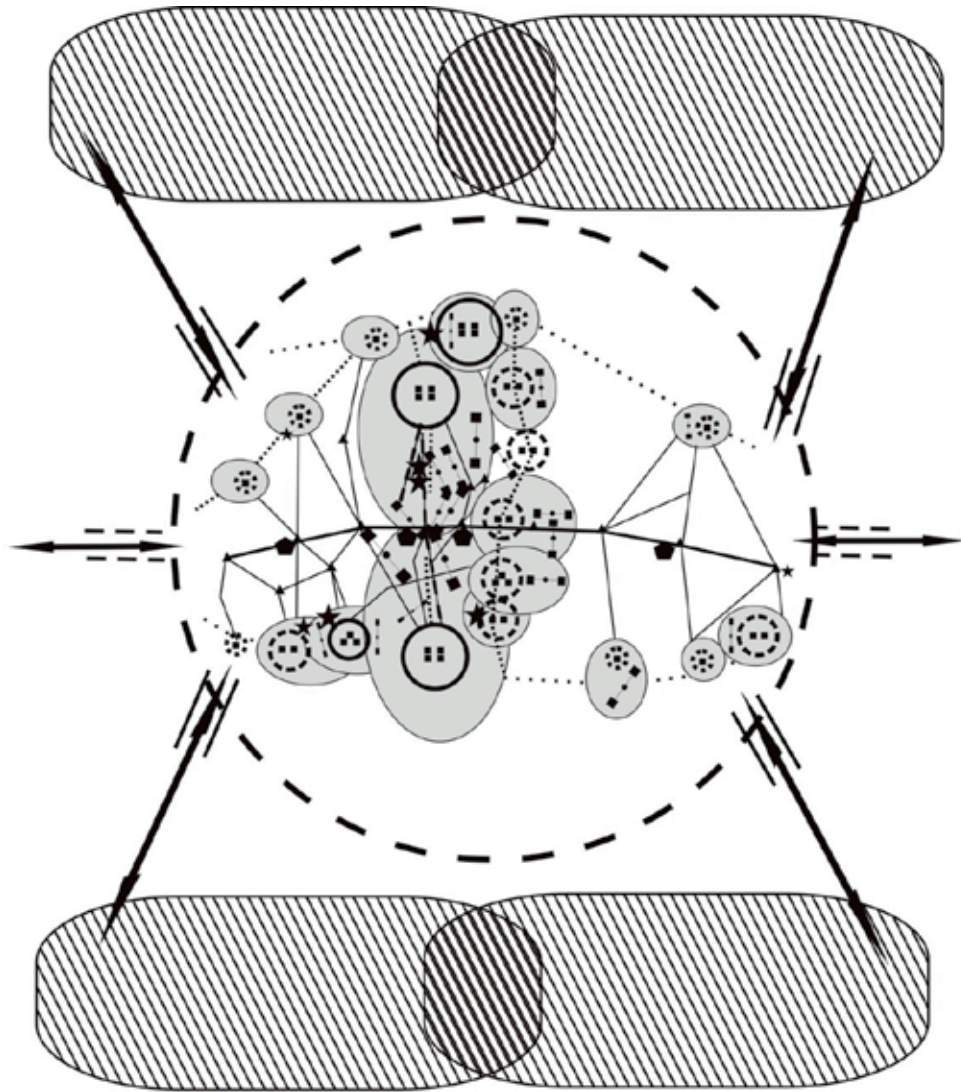


Figure 4 Spatial model of tourism in the High Tatras

length of more than 720 km and extends from the west to the east of the republic. Other hiking trails lead from peaks to valleys and to recreation centres situated on the foothill of the massif (Fig. 5).

In case of the Low Tatras tourist model was also necessary to regard some spatial specifications. E. g. mountain range is

shaped east-west, but the concentration core consisting of the recreation centres Chopok – sever Jasná and Chopok – south Srdiečko, which are located in Demänovská dolina and Bystrianska dolina, is shaped north-south. North and south slopes of the massif Chopok, which form the recreational core, are inter-



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Legend





















- | | | |
|---|---|---|
|  Recreational hinterland |  Intra-regional route |  Capacity of centre |
|  Border of impact and intra linkages of centre |  Inter-regional route |  Ski-lifts, ski tracks |
|  Destination centre |  Main tourist paths |  Chair-lifts |
|  Stage centre |  Minor tourist paths |  Cabin-lifts |
|  Transit centre |  ★★★ Attractiveness of natural, cultural and historical attractions of tourism |  Chalets |
| |  Destination region conceptual limit |  Picks |
| |  Gateway |  Number of beds |
| |  Alternative gateway | |

Figure 5 Spatial model of tourism in the Low Tatras

connected by mountain transport facilities, and therefore the sphere of influences of recreation centres overlap significantly. In general we can say that the eastern part of the mountains is from the point of view of tourism undersized and the vast majority of recreation centres and recreational activities are located in the western part. Even in the Low Tatras was the first type of spa tourism evolved, later recreational tourism and hiking.

8 Results

When creating spatial models of tourism in the High Tatras and the Low Tatras we attained to the formulation of these rules and principles:

- each model consists of points, lines and areas;
- creation of model has hierarchical rules, first are delineated centres, then the areas of internal linkages, communications and at the end the destination region with its conceptual limit and recreational hinterland;
- arrangement of points, lines and areas depend on the shape of mountains and on the location of recreation centres;
- typification of recreation centres should be based on quantitative parameters (e. g. number of visitors, number of beds, etc.);
- each recreation centre has its own sphere of influence where core-periphery linkages are applied;
- hinterland size is determined by the localization of infrastructure, suprastructure and recreational attractions;

- recreation centres create destination region;
- destination region is delineated by conceptual border;
- recreation centres are linked by communications of different levels;
- the most important communications are those that connect the destination region and its recreational hinterland, among which the core and periphery relationship are applied.

Recreation centres are the nodes formed by complex of attractions, services and infrastructure. Their character varies depending on the size of the infrastructure, the number of attractions in the hinterland and from recreational functions. Therefore, we distinguish transit centre (without overnight stay), stage centre (with or without overnight stay) and destination centre (final point of tour). Centres create in the surroundings spheres of influence, in which internal relations type core - periphery are applied and represent recreational subdestinations. All recreation centres together form a destination region which with its environment creates a linkages type core - periphery. Periphery is characterised by urbanised areas, which are the places of residence of visitors. The destination region is delineated by conceptual limit. Communications interconnect centres themselves, these may have different hierarchical levels. Main roads (highways) connect destination region with its hinterland and include the gateways, which are the entrances to the destination region (Fig. 6).

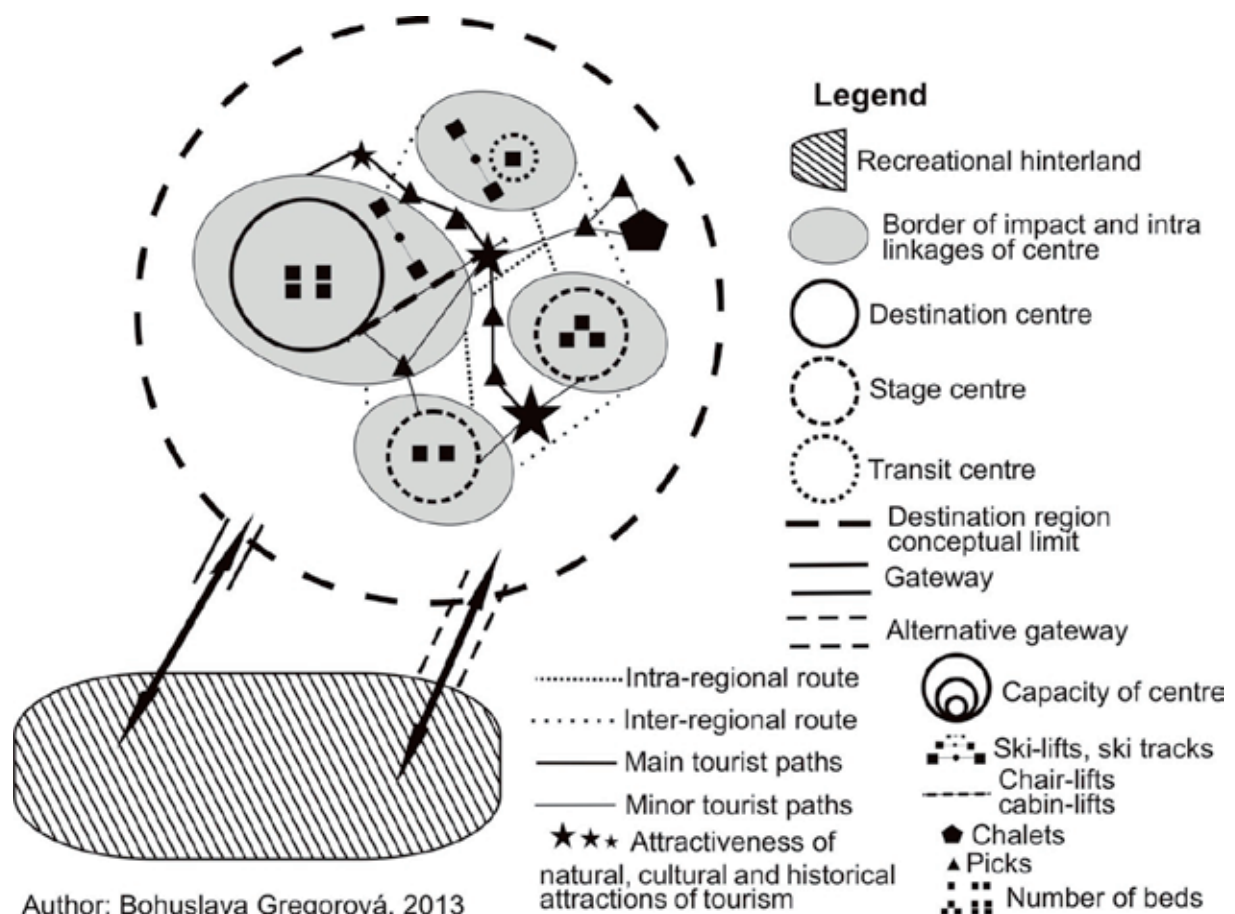


Figure 6 Theoretical spatial model of tourism in the high mountains in Slovakia

9 Conclusions

In this paper we tried to outline the issue of tourism models. Our interest was focused on the spatial models that we created in an application to the recreation areas of the High Tatras and the Low Tatras. Our main task was to formulate the rules and criteria for the creating of tourism models that will be applicable to any high mountains in Slovakia. The basis of our model is the node the core – recreation centre surrounded by its hinterland, in which are important elements of tourism situated. Several cores create a destination region which has a close relationship with its recreational hinterland.

The High Tatras and the Low Tatras are situated at all communication lines which interconnect the main destination re-

gions in Slovakia and are the main axes of tourism development (Mišunová, 1994):

1. Bratislava-Trnava-Piešťany-Trenčín-Žilina-Ružomberok-Poprad-Prešov-Košice,
2. Bratislava-Nitra-Banská Štiavnica-Zvolen-Banská Bystrica-Dobšiná-Betliar-Košice,
3. Dolný Kubín-Ružomberok-Banská Bystrica-Zvolen-Šahy.

Research of spatial models of tourism brings many new knowledge that are irrecoverable to the creating of concepts and models for further development of tourism in the recreation centres, particularly in relation to the sustainable development and environment protection in these centres.

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