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# DESTINATION ATTRACTIVENESS OF THE SOUTH BOHEMIAN REGION FROM THE VIEWPOINT OF SPATIAL DATA ANALYSIS

# ATRAKTIVNOST JIHOČESKÉHO KRAJE PRO CESTOVNÍ RUCH OČIMA PROSTOROVÉ ANALÝZY DAT

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**Abstract**

The aim of this paper is the evaluation of the South Bohemia region's destination attractiveness. The dimensionality of data describing the chosen attractions of the area was reduced by the factor analysis into six factors which served as an input for hot spot analysis. The hot spots analysis identifies clusters of high and low values of the factors. Cluster analysis of factor served then as a tool for a typology of the South Bohemian region according to its attractiveness for tourism. The paper shows the possibilities of spatial statistics and spatial data analysis usage in the evaluation of the area attractiveness. Obtained results can be used in the decision sphere for tourism attractions planning.

Keywords: destination attractiveness, destination management, hot spots analysis, spatial statistics

**Abstract**

Cílem příspěvku je hodnocení destinační atraktivnosti Jižních Čech. Dimenzionalita dat popisujících vybrané atraktivity v území byla redukována pomocí faktorové analýzy do šesti faktorů, jež posloužily jako vstup pro hot spots analýzu. Ta posloužila k identifikaci vysokých a nízkých hodnot daného faktoru atraktivnosti. Shluková analýza faktorů byla následně použita jako nástroj pro tvorbu typologie území Jihočeského kraje z hlediska jeho atraktivnosti z hlediska využití cestovním ruchem. Příspěvek poukazuje na možnosti využití prostorové statistiky a prostorové analýzy dat při hodnocení atraktivnosti území. Získané výsledky i použité metody mohou být použity v decizní sféře při plánování atraktivit cestovního ruchu.

Keywords: destinační atraktivnost, destinační management, hot spots analýza, prostorová statistika

## INTRODUCTION

The evaluation of tourism in an area is usually a difficult task. Many explanations have a spontaneous and sometimes unpredictable character. Glavan (2000), cited in Cornelius et al. (2010), reports that initial study research widened from the "existing" (in the sense of supply and demand) towards the "possible" (source of tourism or potential). The need for this

paradigm shift has emerged in connection with efforts to predict the possibility of making tourist activities in the area or the anticipation of further development of existing structures. Tourist destination competition in the global market is steadily increasing due to the large number of newly emerging destinations that are at a mature stage under the pressure of having to revive and improve their quality in order to survive in the context of intense competition. Therefore, destinations are trying to innovate and continually seek new sources of competitive advantage. These comparative advantages (in the form of tourism resources, adequate destination management and marketing strategies) may then be transformed into a tourist attraction and thus enable long-term sustainable development of destinations and improve its market position (Kresic, 2007).

## DESTINATION ATTRACTIVENESS

Many authors (Mihalic, 2000; Pikkemaat, 2004; Ritchie and Crouch, 2003; Kresic, 2007 Cracolici, Nijkamp, 2009, Leask, 2010) realize and describe the meaning of tourist destinations attractiveness as one of the most important determinants of destinations competitiveness. Destination attractiveness factors are defined as attributes of the destination which attract or motivate tourists to visit a specific destination zone. They determine both the direction and intensity of development of tourism in a specific receptive tourist area (Kusen, 2002). Tourists are not motivated nor desire to travel to a particular destination with insufficient supply, already perceived as unattractive. To ensure success in the international tourism market, a destination must ensure an overall attractiveness of at least the same or higher in comparison with its competitors. In the Czech literature, Navrátil (2012) discussed the issue of destination attractiveness with the example of the Šumava and Třeboňsko areas. The attractiveness is widely discussed also in various tourism regionalizations (Dohnal 1981, Bína 2001, Bína, 2010, Vystoupil 2007). Different approaches to the evaluation of destination attractiveness have been analysed by Schejbal (2013). This paper aims to identify and express basic kinds of attractiveness of the South Bohemian region through the instruments of spatial statistics. The aim is to show the “possibilities” by using these methods. In the Czech as well as foreign literature, there are many examples of the use of spatial analysis in the tourism analysis (e. g. Šíp, Klufová, 2010, Machalová et al., 2010, Hultman, 2007, Müller, 2006).

Attractiveness is of a great importance for the understanding and improving of the tourist destinations competitiveness (Buhalis, 2000; Crouch & Ritchie, 1999; Hu & Ritchie, 1993; Kresic, 2008; Vengesayi, 2003). It is often defined in relation to elements or attributes of a specific destination. According to Kresic (2008, p. 1813), it is made up of those attributes of

destination, which (with their own specific features) attract or motivate tourists to visit. Cho (2008, p. 221) similarly states that attractiveness is "an aggregated indicator of attributes that make a potential destination attractive." The number of attributes that can increase the attractiveness of the destination is quite extensive. Experts usually suggest such features as price, transportation, climate, quality of accommodation (Cho, 2008; Gartner, 1989), as well as the destination image (Anholt, 2010; Harrison-Walker, 2011). Vengesayi (2008) states that virtually every attribute of the destination can be identified at a certain stage as a source of attractiveness for tourists. Definition of the destination attributes represents something that refers to the "supply controlled" approach to attractiveness. Attractiveness is the power driving tourists, which is the result of "all the attractions that exist in a given place and a given time" (Formica & Uysal, 2006: p. 419). Under this approach, the destination is perceived as a "provider of tourism services with different elements of attractiveness" (Cracolici & Nijkamp, 2008: p. 337). On the contrary, demand approach adopts the attractiveness as a destination function to meet the needs of tourists and provide them with personal benefits (Formica & Uysal, 2006). Vengesayi (2008) works with attractiveness in terms of "attitudes and opinions of visitors in relation to the ability of the destination to meet their needs." Cracolici and Nijkamp (2008, p. 337) speak about "content with accessibility, quality and management of local tourism services satisfy customers' needs."

**Destination attractions and their classification**

To understand the attractiveness of the destination, it is important to distinguish between the notions of destination attractiveness and destination attraction. Tourist attractions can be defined as specific elements of destination (climate, landscape elements, activities in destination etc.), which have the ability to attract visitors (Kresic & Prebežac, 2011). Unlike the attractions, the destination attractiveness has a predominantly cognitive significance as a mental image of the destination that exists only in the minds of potential visitors. Tourist attractions can be understood as physical manifestations of destination attractiveness and destination attractiveness as a mental image that is formed on the basis of natural attractions available in the area. Mayo and Jarvis (1981) argue that attractiveness can be defined as the perceived ability of the destination to provide individual benefits. Hu and Ritchie (1993, p. 25) define destination attractiveness as “a reflection of the feelings and opinions of the individual in relation to the ability of the destination to meet the special needs of the person within the holiday”.

The main problem concerning the definition of tourist attractions, according to Kresic and Prebežac (2011), is the fact that there are numerous (limiting) factors that can significantly affect the visitation of a particular area, but cannot be defined as a tourist attraction. Those factors are economic (exchange rates and cost of living), political (war and terrorism risks), socio-demographic (friendliness of the local people, courtesy of public employees) factors and the risks of natural disasters (droughts, tsunamis, earthquakes, etc.). This view is supported by studies reviewed by Kim and Morrison (2005), who concluded that factors such as the travel experience with tourism destination, changes in the political or social environment or socio-demographic factors, which cannot be considered tourist attractions, can significantly affect visitation of an area (Šíp, 2012). Therefore, it is sometimes difficult to distinguish between attractions and non-attractions. Regardless of the definition, there is a central element which is common to all definitions - the ability to attract visitors. Tourist attractions form a very heterogeneous category and their nature can be very diverse. Therefore, it is important to classify them into different categories with a higher degree of homogeneity for the purpose of transparency of a complex system of tourism and to facilitate their studies.

In the literature there are numerous classifications of tourist attractions. The basic classification was designed by UNWTO (Mc-Intyre, Hetherington & Inskeep, 1993) and distinguishes the following categories: natural resources, cultural and historical heritage in tourism, climate, infrastructure, tourist facilities and services.

Although this classification is adopted by the general professional public, it is considered insufficiently detailed. Therefore, there can be found other classifications in the literature. They differ from each other in degree of detail as well as the bases of classification. One of the latest classifications, generally accepted is the classification developed by Ritchie and Crouch (2005), is where the attractiveness is divided into seven main categories: physical geography and climate, culture and history, mix of activities, special events, entertainment, superstructure and market relations.

Tourist attractions classified in this way are part of the comprehensive model of the destination competitiveness, whose authors are Ritchie and Crouch (2003). Other features include supporting factors and resources, destination management, destination policy, planning and development, and qualification elements. The above mentioned classification of attractions has several advantages. Mainly, it classifies the attractiveness in a systematic and comprehensive manner. As part of a broader concept of destination competitiveness it clearly defines the important role of tourist attractions in the process of achieving competitiveness.

Thus Ritchie and Crouch (2003) created a theoretical framework for research of destination attractiveness.

## OBJECTIVES AND METHODS

When evaluating the destination attractiveness of the South Bohemian Region we come from, with regard to available data and the character of the area in terms of its use in tourism, the classification developed by the UNWTO (Mc-Intyre, Hetherington & Inskeep, 1993). Administrative unit (region) was chosen as a model area precisely because of the clear definition and data availability. Table 1 contains the variables used.

**Table 1** Dimension of South Bohemian destination attractiveness

| category | variables |
|---|---|
| Natural resources | Proportion of water areas to the total cadastral area of the municipality in % (VODY)<br>Proportion of forests to the total cadastral area of the municipality in % (LESY)<br>Proportion of protected natural areas to the total cadastral area of the municipality in % (CHU)<br>Density of watercourses (HVT)<br>Number of natural attractions (PA)<br>Average height above sea level (NV) |
| Cultural monuments and historical heritage | Number of rural attractions (VPZ)<br>Number of historical monuments (PP)<br>Number of religious monuments (SP)<br>Number of cultural attractions (KA) |
| Infrastructure and availability | Density of road network (HSS) in km/km$^2$<br>Number of road and rail stops (PZ)<br>Distance from the nearest municipality with extended power (NEARORP)<br>Distance from the nearest main road (NEARHSIL) |
| Tourism services and facilities, space for recreation | Number of accommodation and catering facilities (SUZ)<br>Number of sport attractions (SA)<br>Number of tourist information centres (TIC)<br>Number of tourist stamps and cards (TZV)<br>Proportion of economically active inhabitants employed in accommodation and catering in % (UBYT11)<br>Proportion of unoccupied dwellings to the total number of dwellings in % (NEOBD11)<br>Proportion of unoccupied dwellings used for recreation to the total of unoccupied dwellings in % (DREKR11) |

Source: Census 2011, [online]. 2016.[14.1.2016] URL: https://www.czso.cz/csu/czso/scitani-lidu-domu-a-bytu-2011, data OpenStreetMap [online]. 2015.[4.1.2015]. URL: http://download.geofabrik.de/, Points of Interest [online]. URL: http://www.poi.cz/

Variables CHU, HSS and HVT were created in ArcGIS using overlays of data layers containing municipalities and protected areas, respectively, watercourses and subsequent summarization of the area of protected areas, respectively lengths of watercourses in the cadastral areas. Variables OEM, PA, PP, PZ, RFA, SP, SA, TIC, TZV and KA arose by the operation Counts Points in Polygons available in freely downloadable extension of ArcGIS software called Hawth's Tools. The operation was applied to layers containing rural monument reserves, rural monument zones and skanzens, natural attractions, historical and religious monuments, road and railway stations and stops, sporting attractions, cultural attractions, tourist information centres and shops of tourist stamps and cards. This tool calculates the number of objects chosen category of attractions in polygons (cadastral areas of municipalities). Objects in used categories were created by the merging of objects obtained from publicly available sources OpenStreetMap, POI.cz and geographic database ArcČR500. The content of each category is shown in Table 2.

**Table 2** Tourist attractions categories in South Bohemia

| category | variable | attractions |
|---|---|---|
| Natural attractions | PA | caves, monumental trees, springs, small protected areas, habitat conservation |
| Historical attractions | PP | castles, forts, ruins, historic underground |
| Religious attractions | SP | chapels, wayside shrines, churches, monasteries, synagogues |
| Cultural attractions | KA | theatres, museums, galleries |
| Sporting attractions | SA | ski centres, water parks and indoor swimming pools, adrenaline activities, outdoor swimming pool, a sport centre, golf courses, field hockey, in-line skating terrain, rope courses, rock climbing, paintball, fishing grounds MP, private fishing grounds, softball field |
| Accommodation | UZ | huts and sheds, hotels, hotels, spa hotels and homes, pensions, camps |
| Catering facilities | SZ | diners, restaurants |
| Rural attractions | VPZ | rural monument reserves, rural monument zones, open-air museums |

Source: own processing

Categories of accommodation and catering facilities were merged into one category of "catering and accommodation facilities" in the subsequent analysis because of severe correlation with other variables and among themselves (SUZ - see Table 1). Layers of objects obtained from www.POI.cz had to be converted from the format KML to the geodatabase (ArcGIS format) before their use in the analysis. It was also necessary to use the Merge tool for the joining objects with other objects of the category and use the Clip tool to select for that

portion of the objects that is located inside the South Bohemian region. A necessary condition for the geodatabase preparation was also the unification of the coordinate system of the individual layers. Variables NEARORP and NEARHSIL were obtained using NEAR tool of ArcGIS SW, variable UBYT11r, NEOBD11r and DREKR11r come from the results of the Census, 2011. An indicator of the number of beds and seats at the table was not used in the analysis. It would have much greater explanatory power than the number of accommodation and catering facilities. It is due to the source of the data - simple information about the location of these facilities without further specification (www.poi.cz). We are aware that is causes some distortion of the results. The exact number of beds and seats at the table in particular facilities was not available at the time of the article preparation.

Given the relatively large number of second variables, which are mutually correlated, factor analysis was used. Obtained factors were found by a principal components method and subsequently rotated by varimax method which produces orthogonal factors and meets the requirements of the most simple structure (Hebák et al., 2005).

**Spatial analysis of factors**

Apart from efforts to describe the spatial arrangement of the elements itself, the spatial arrangement of the attribute values (descriptive characteristics) of elements in the space (e.g. the spatial distribution of the unemployment rate, and others) is monitored in practice. The aim is to determine whether the elements with similar values tend to create clusters in space or not. The basic idea is based on the so-called Tobler´s first law of geography (Tobler, 1970), according to which "everything is connected to everything, but things close together relate more than distant things."

Among the first, Cliff and Ord (Cliff, Ord, 1969) described various examples of the concept of spatial autocorrelation and indicators to measure it. Spatial autocorrelation manifests where the value of a variable in one location depends on the values of this variable in neighbouring locations (sometimes also referred to as "adjacency effect" or "proximity effect").

The existence of spatial autocorrelation substantially violates the assumption of independence of each observation, which is usual in statistical testing. Data of this kind negatively influence the results of any regression analysis. Duplication of information in various observations affects sample distributions, especially standard errors of certain statistics.

To identify spatial clusters of high or low values there is used the procedure named of hot spots analysis in the literature, whose principle consists in that the local sum for a given element and its neighbours is proportionally compared with the sum of all the elements. If the local sum differs significantly from the expected local sum, i.e., the difference between them is too big for us, it could be considered the result of chance, we get statistically significant standardized value. Spatial clusters are usually identified by using the so-called Getis-Ord statistics $G_i$ and $G_i^*$.

Getis-Ord statistic $G_i$ is calculated as $G_i = \frac{\sum_j w_{ij} d(x_j)}{\sum_j x_j}$, where the denominator is constant with *i*, $w_{ii}=0$. This statistic does not include the focal point *i*. This is suitable in cases when we are interested in the influence of the chosen point on its surroundings. The second metric, $G_i^*$, includes the focal point and $w_{ii} \neq 0$. For statistically significant positive z-scores, the larger the z-score is, the more intense clustering of high values (hot spot). For statistically significant negative z-scores, the smaller the z-score is, the more intense the clustering of low values (cold spot).

Acquired factors were therefore subsequently processed by the spatial analysis tool Hot Spots Analysis with Rendering, accessible in the group of ArcGIS tools for spatial statistics, which is used to identify statistically significant clusters of chosen attribute using the Getis-Ord $G_i^*$ statistic.

## RESULTS AND DISCUSSION

Factor analysis identified six factors that explain 64% of the total variability. The first factor explains 17.6% of variability, the second 12.9%, third 11,8%, fourth 8.1%, fifth 7.2% and the sixth 6.3% of the total variability. Original 24 input variables were thus replaced by a newly formed six factors. The value of Kaiser-Meyer-Olkin rate (0.818) and Bartlett test (p-value = 0.000) confirm the appropriateness of using factor analysis.

Communalities in Table 3 estimate the variability of individual variables explained by factors. High values of almost all variables indicate that the factors represent variables well. Only the variables HVT and NEARORP have lower values of communalities.

From Table 4 it is apparent that the factor 1 loads heavily variables PZ, SUZ, SA, KA and HSS. Categories of tourist services, facilities and infrastructure prevail in these variables. Factor indicates the attractiveness of the (active) residential tourism - sports and cultural

activities tied to specific locations for which their availability is essential. It can therefore be described as "residential tourism".

**Table 3** Communalities

| variable | initial | extraction |
|---|---|---|
| VODY | 1.000 | 0.584 |
| LESY | 1.000 | 0.535 |
| HVT | 1.000 | 0.367 |
| HSS | 1.000 | 0.573 |
| PZ | 1.000 | 0.837 |
| VPZ | 1.000 | 0.588 |
| PP | 1.000 | 0.670 |
| SP | 1.000 | 0.546 |
| CHU | 1.000 | 0.609 |
| SA | 1.000 | 0.723 |
| KA | 1.000 | 0.744 |
| UBYT11 | 1.000 | 0.492 |
| DREKR11 | 1.000 | 0.709 |
| NEARHSIL | 1.000 | 0.709 |
| NEARORP | 1.000 | 0.495 |
| NV | 1.000 | 0.614 |
| SUZ | 1.000 | 0.899 |
| TIC | 1.000 | 0.661 |
| TZV | 1.000 | 0.716 |
| NEOBD11 | 1.000 | 0.729 |

Source: own processing in SPSS SW

**Table 4** Factor loadings

| variable | factor loadings | | | | | |
|---|---|---|---|---|---|---|
| | factor 1 | factor 2 | factor 3 | factor 4 | factor 5 | factor 6 |
| VODY | | | | | 0.737 | |
| LESY | | | 0.682 | | | |
| HVT | | | | | 0.592 | |
| HSS | 0.424 | | | -0.546 | | |
| PZ | 0.903 | | | | | |
| VPZ | | | | | | 0.693 |
| PP | | 0.790 | | | | |
| SP | | 0.692 | | | | |
| CHU | | | 0.659 | | 0.406 | |
| SA | 0.764 | 0.305 | | | | |
| KA | 0.787 | 0.333 | | | | |
| UBYT11 | | | 0.666 | | | |
| DREKR11 | | | | 0.790 | | |
| NEARHSIL | | | | | -0.463 | 0.599 |
| NEARORP | | | 0.383 | 0.427 | | 0.334 |
| NV | | | 0.704 | | | |
| SUZ | 0.854 | 0.377 | | | | |
| TIC | | 0.705 | | | | |
| TZV | 0.502 | 0.627 | | | | |
| NEOBD11 | | | | 0.814 | | |

Source: own processing in SPSS SW (listed only loadings greater than 0,3)

Factor 2 loads mainly the variables PP, SP, TIC and TZV. These variables are connected with historical and religious attractions in connection with the possibility of the location to buy tourist stamp or card when visiting. It can thus be described as the factor of "historical tourism". Factor 3 loads variables LESY, CHU, NV and UBYT11. Given the prevailing variables describing predominantly natural attractions, this factor was labelled as "nature tourism". Variables DREKR11 and NEOBD11 are positively correlated with factor 4, so this factor was designated as a "second home". Factor 5 was, with regard to variable VODY and HVT it loads most, identified as a factor of "water tourism and recreation at the water." Last, the sixth factor, loading mainly variables VPZ and NEARHSIL, was identified as a factor of "rural tourism". Here rural monument reserves, rural monument zones and open-air museums seem as significant, where again their availability is important.

**Spatial analysis of variables and factors**

When evaluating the level of spatial autocorrelation of input variables at the global level (Table 5) we found statistically significant values of Moran´s I for most variables. Exceptions are variable HVT (density of watercourses), PP (number of historical monuments) and SA (number of sporting attractions).

**Table 5 S**patial autocorrelation of input variables

| variable | Moran *I* | pseudo p-value |
|---|---|---|
| VODY | 0.1993 | 0.001 |
| LESY | 0.3180 | 0.001 |
| HVT | -0.0036 | 0.422 |
| HSS | 0.363 | 0.001 |
| PZ | 0.0227 | 0.034 |
| VPZ | 0.0961 | 0.001 |
| PP | 0.0036 | 0.328 |
| SP | 0.1274 | 0.001 |
| CHU | 0.6670 | 0.001 |
| SA | 0.153 | 0.096 |
| KA | -0.014 | 0.008 |
| UBYT11r | 0.3717 | 0.001 |
| DREKR11r | 0.3708 | 0.001 |
| NEARHSIL | 0.5972 | 0.001 |
| NEARORP | 0.5147 | 0.001 |
| NV | 0.8771 | 0.001 |
| SUZ | 0.203 | 0.041 |
| TIC | 0.0674 | 0.001 |
| TZV | 0.0612 | 0.002 |
| NEOBD11r | 0.3087 | 0.001 |

Source: own processing in GeoDa SW

They represent the attractions more or less evenly distributed throughout the whole area of the study region, the lack of spatial correlation is thus not surprising. It should be noted that the high value of Moran's I found at the variables NV, NEARHSIL, NEARORP and CHU has given itself the nature of these variables. Variable KA (number of cultural attractions) showed a statistically significant negative autocorrelation, which is probably related to the tendency to place cultural facilities into larger municipalities prevailing in the second half of the 20th century which corresponds to the development of a settlement system.

Table 6 shows that, except for a factor of 1, all factors exhibit statistically significant spatial autocorrelation, i.e. the tendency to cluster in space. It makes sense to seek locally significant clusters of high and low values of these factors which can provide information about important places in terms of the attractiveness of the area for a specific type of tourism.

**Table 6** Spatial autocorrelation of factors

| factor | Moran *I* | pseudo p-value |
|---|---|---|
| factor 1 | 0.0137 | 0.084 |
| factor 2 | 0.0425 | 0.005 |
| factor 3 | 0.6690 | 0.001 |
| factor 4 | 0.4436 | 0.001 |
| factor 5 | 0.3947 | 0.001 |
| factor 6 | 0.330 | 0.001 |

Source: own processing in GeoDa SW

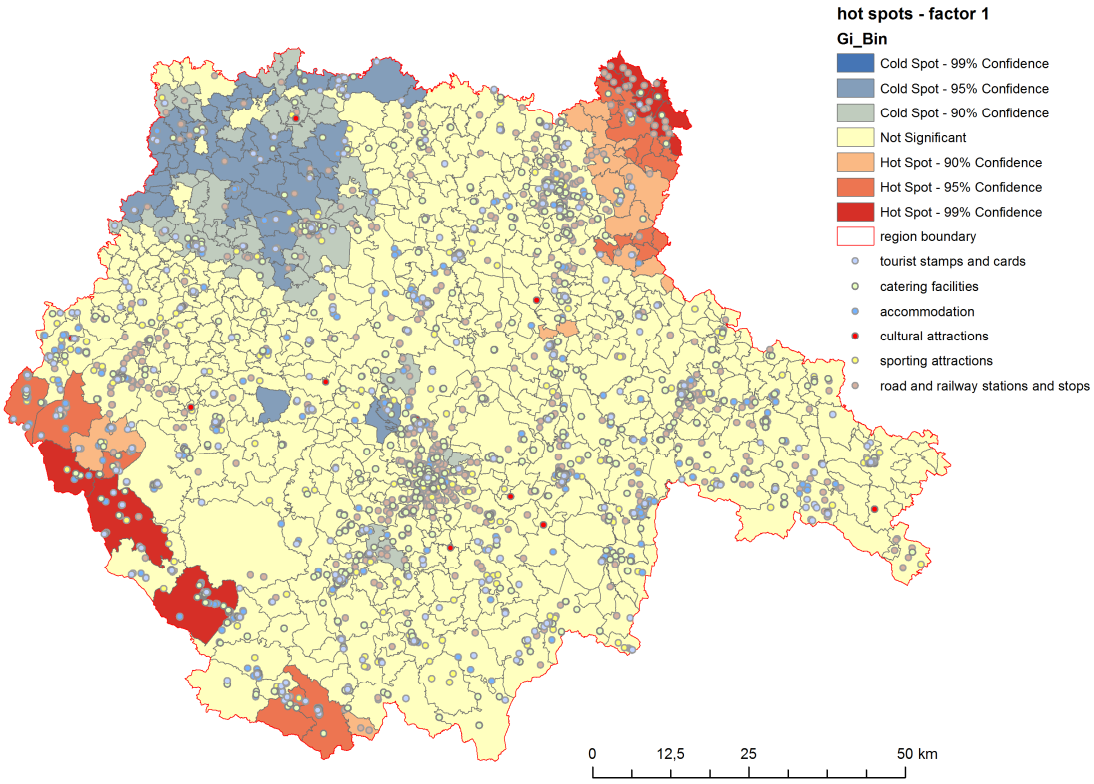
Selected spatial statistics tools may serve to identify parts of the territory statistically significant from the viewpoint of attractiveness (with high potential) as well as to identify the parts of "problematic" (with low potential). For this purpose, so-called Hot spots analysis was applied to all factors.

Statistically significant clusters of low and high values of factor 1 “(active) residential tourism” are shown in Fig. 1. Although the global Moran´s *I* statistics did not confirm statistically significant levels of spatial autocorrelation with this factor, spatial autocorrelation is manifested here locally. Getis-Ord $G_i^*$ statistics identified clusters of statistically significant high values of this factor in areas traditionally used by this type of (sport) tourism in Šumava, adjacent Novohradské mountains and their foothills (Stožec, Strážný, Borová Lada, Kvilda, Lenora, Horní Planá, Loučovice, Vyšší Brod, Horní Dvořiště).

The second major cluster of high values is located in the north-eastern part of the region. It is the cluster of small villages near Mladá Vožice. This region is attractive for its potential for hiking and cycling. On the contrary, a cluster of low values was identified in the wider hinterland of Písek. This corresponds e.g. with the classification of this area within the

Tourism Regionalization in the Czech Republic, where it is categorized as a rural landscape with average assumptions for tourism development (Vystoupil et al., 2006).

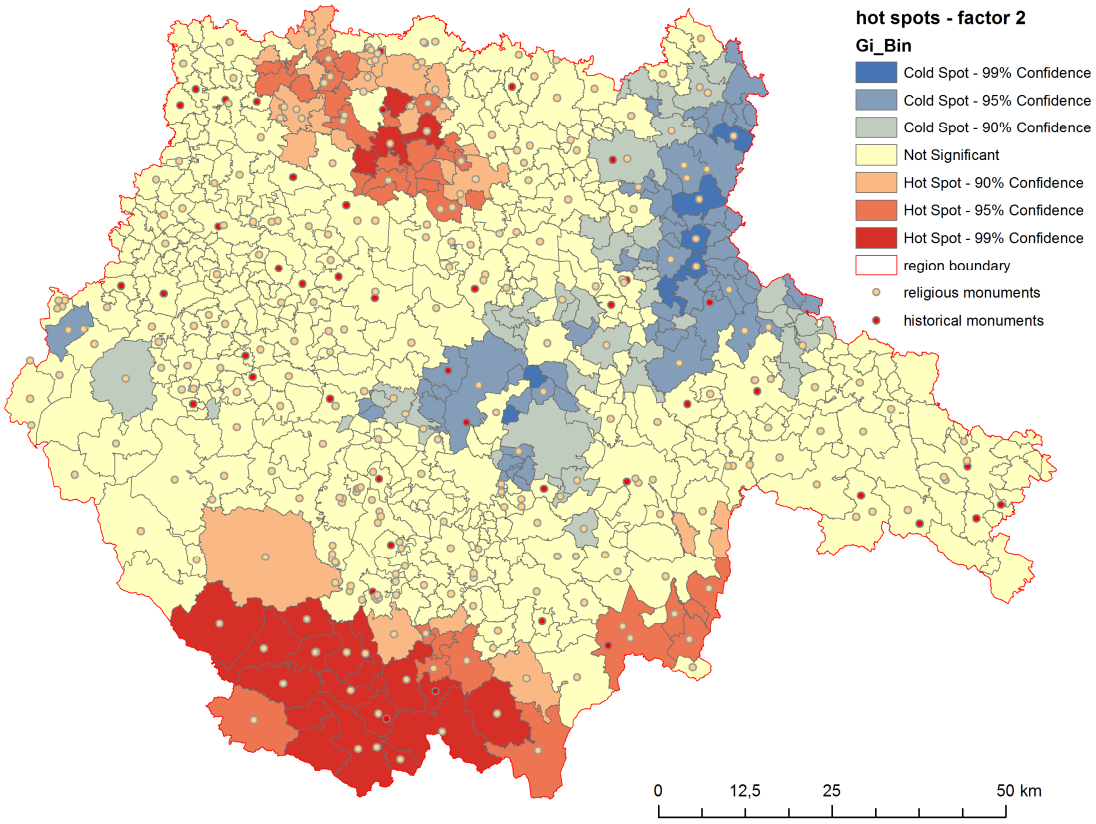
**Figure 1** Factor 1 hot spots – residential tourism




source: own processing in ArcGIS SW.

In the case of Factor 2 "historical tourism" hot spots analysis revealed three different spatially extensive clusters of high attractiveness for historical tourism: the southern part of the Šumava Mountains and adjacent Novohradské Hory, Nové Hrady and its neighbourhood and the contiguous part of Vitorazsko region, wider hinterland of Milevsko and Čimelice. With the exception of the Šumava cluster, the other three belong to the category of rural landscapes with average assumptions for tourism development (Vystoupil et al., 2006). The character of clusters is determined by the nature of the variables loaded by a factor 2 (a large number of religious monuments and sites where you can get tourist stamps or cards). Conversely, a large cluster of low values of the factor 2 stretches along the north-eastern border of the region, a second smaller cluster is located near Hluboká nad Vltavou, which could seem to be a little bit of a surprising finding because this destination belongs to the most visited places in the Czech Republic. The values of factor loadings, however, are strongly influenced by variables which factor mainly loads. A more suitable title for the factor should therefore become into consideration.

**Figure 2** Factor 2 hot spots – historical tourism

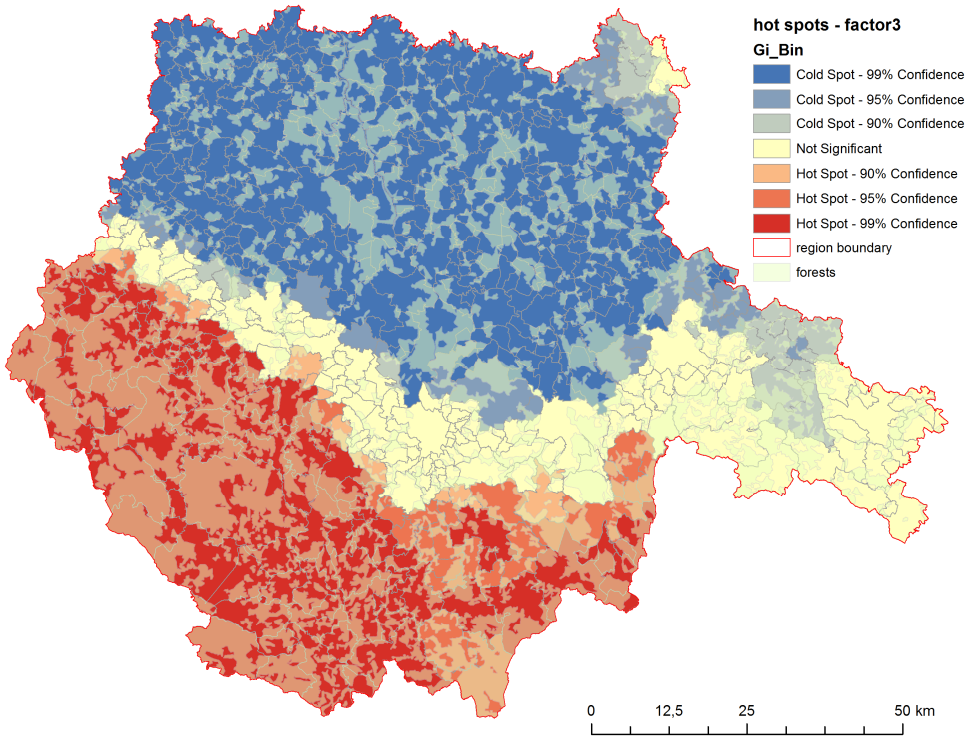



Source: own processing in ArcGIS SW.

Factor 3 "nature tourism", with regard to variables, which it mostly loads (the proportion of forested areas and protected areas on the cadastral areas, altitude and the proportion of economically active persons employed in accommodation and catering facilities), separates quite logically the mountainous areas from the rural landscape in the rest of the region.

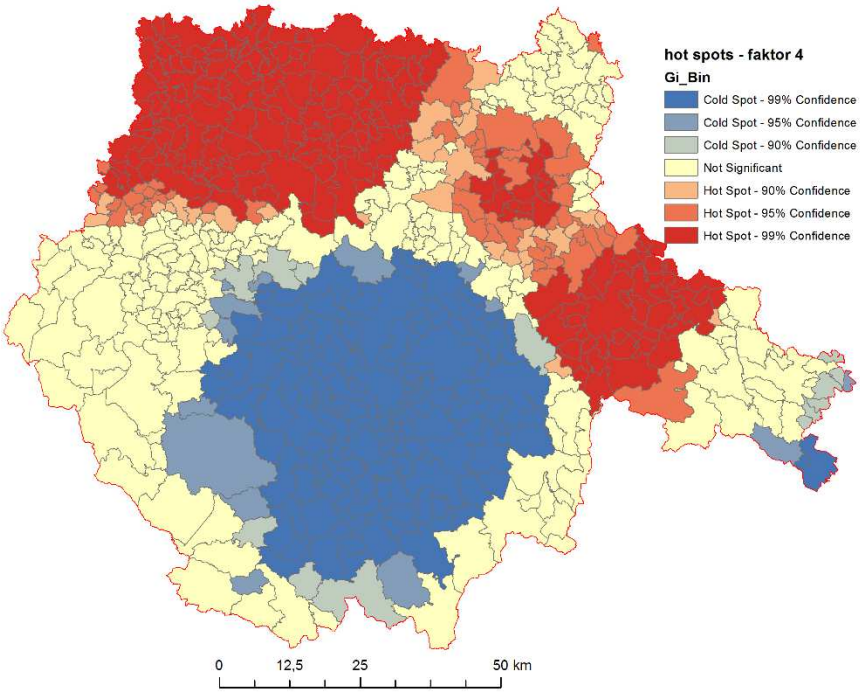
In the case of Factor 4 "second homes" the hot spots analysis has identified large interconnected clusters of high values in the northern and eastern parts of the region (broader hinterland of the towns Blatná, Strakonice, Pisek, Milevsko, Soběslav and Jindřichův Hradec), which corresponds with the broader socio - economic development by the size and population of small villages, mostly classified into categories of rural landscape with average conditions for the development of tourism (Vystoupil et al. , 2006) . Some of them belong to the so called inner periphery (Musil and Müller, 2006). Typical features of inner peripheries are e.g. leaving of young people to towns, demographic ageing and an increase in the proportion of unoccupied houses used for recreation. In contrast, a large compact cluster of low values covers a broader part of České Budějovice agglomeration, with intensive residential and economic functions.

**Figure 3** Factor 3 hot spots – nature tourism




Source: own processing in ArcGIS SW.

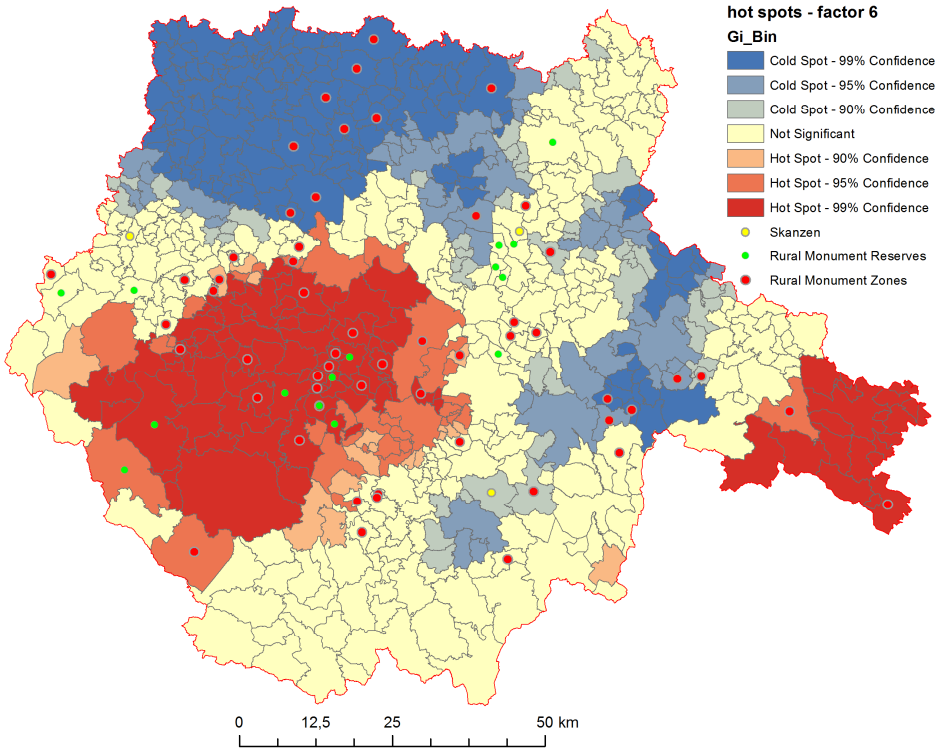
**Figure 4** Factor 4 hot spots – second homes




Source: own processing in ArcGIS SW.

Factor 5 labelled as "water tourism and recreation on the water" because it loads heavily variables proportion of water courses in cadastral areas and the density of water flows, which forms a large compact spatial cluster of high values in the catchment areas of Lužnice, Nežárka and partly Vltava rivers. A large part of this cluster belongs in the Třeboň pond basin, traditionally used for various forms of water recreation and water tourism. The fact that some areas along the upper part of the Vltava river (e.g. Horní Brod) were classified into clusters of low values, seems to be surprising because these parts are intensively used for water tourism. This again shows the effect of particular variables which factor 5 loads - the proportion of water courses on the cadastral areas and calculation of the density of water flows from all flows, regardless of their significance.

**Figure 6** Factor 6 hot spots – rural tourism




Source: own processing in ArcGIS SW.

High values of the factor 6 "rural tourism" form two compact clusters: Prachatice, Lhenice and Vodňany surroundings and the hinterland of Slavonice in the south-eastern part of the region. Clusters of low values are located in the northern part of the region (the territory between Blatná, Písek and Milevsko and near Malšice, Jistebnice and Bechyně) and a cluster of villages between Třeboň and J. Hradec. When comparing particular clusters of the factor 6 to Tourism Regionalization in the Czech Republic (Vystoupil et al., 2006), we ascertain that both clusters of high and low values fall partly into the category of rural landscape with

favourable conditions for tourism and partly into the category rural landscape with average assumptions for tourism. Differences are logically given by different methodology and criteria. In the case of hot spots of the factor 6, the variables which this factor loads significantly (numbers village conservation zones, nature reserves and open-air museums) again influence the results of the analysis. A location also plays its role and influences the values of the factor 6.

**Cluster analysis of factors**

Cluster analysis was used in order to create a typology of the municipalities´ attractiveness based on particular factors. Factors were extracted by the method of principal components and are therefore not correlated and can be used as input variables for the cluster analysis. Hierarchical clustering helped to find out a suitable number of clusters. Subsequent use of the Ward's method enabled us to classify individual municipalities into five clusters with a different level of destination attractiveness for tourism use.

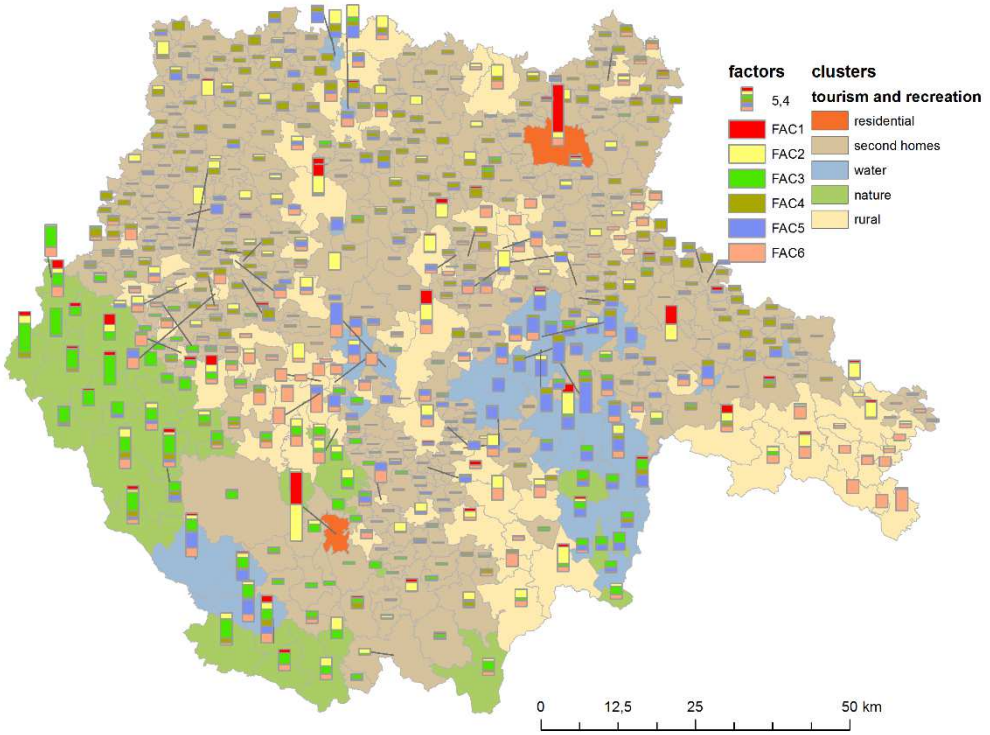
**Table 7** Cluster analysis of factors - ANOVA table

| | Cluster | | Error | | F | Sig. |
|---|---|---|---|---|---|---|
| | Mean Square | df | Mean Square | df | | |
| Factor 1 | 43.609 | 4 | 0.217 | 634 | 200.920 | 0.000 |
| Factor 2 | 93.434 | 4 | 0.380 | 634 | 245.659 | 0.000 |
| Factor 3 | 87.633 | 4 | 0.460 | 634 | 190.492 | 0.000 |
| Factor 4 | 4.501 | 4 | 0.979 | 634 | 4.598 | 0.001 |
| Factor 5 | 80.351 | 4 | 0.511 | 634 | 157.129 | 0.000 |
| Factor 6 | 9.415 | 4 | 0.951 | 634 | 9.897 | 0.000 |

Source: own processing in SPSS SW

Table 7 show the statistical significance of all six factors for inclusion into clusters. Different numbers of clusters (4-8) were tested during the analysis. The number of 5 seems as the best division, corresponding to the principal types of destination attractiveness of the region and to the types of tourism. The resulting clusters are shown in Figure 7.

**Figure 7** cluster analysis of factors – typology of tourism attractiveness




Source: own processing in ArcGIS SW.

The factor of historical tourism has not manifested in the resulting types. This is due to the character of the variables used in the analysis and the fact that the municipalities usually have not only one distinct type of attractiveness but they usually have attractiveness for different types of tourism. It would be worth considering, for example, to use fuzzy cluster analysis which could give better results. Used factors load all the input variables in varying degrees. However, the procedure discussed above led to the identification of the basic types of attractiveness, which agree to some extent on the basic characteristics with Tourism Regionalization in the Czech Republic carried out on the basis of different input variables and different methods (Vystoupil et al, 2006). Resulting typology corresponds to the type of destination and connected forms of tourism (Pásková, 2003).

## CONCLUSION

Rating the attractiveness of the area for its use in tourism is of great importance for further decisions on future developments. In this paper, we focused on evaluating the supply side, i.e. the evaluation of the attractiveness of the South Bohemian region by inventories of major attractions and their subsequent spatial analysis. Values of partial factors of attractiveness of the territory, obtained by factor analysis of the input variables, were analysed using the so-called Hot spots analysis. Cluster analysis of factors served as a tool for the generation of a

basic typology of destination attractiveness of municipalities in the region. The results obtained, with regard to the availability of data, determines the selection of the variables used, relatively faithfully reflect reality, which leads to the conclusion that it is conducted with a methodical process "viable" and can be further developed and improved. Analysis results can then be utilized in the decision-making sphere for deciding on the further development of tourism in the territory. We start here from the idea that the overall attractiveness is the basic determinant for the development of tourism, and it must be constantly reviewed and improved so that destinations remain competitive in the tourism market.

Determining the attractiveness of tourism destinations is very difficult, but necessary. The attractiveness of tourist destinations is usually a subjective expression of the judge, in which there is no objective criteria to determine the degree of attractiveness. The potential of a destination also impacts objective factors. Tourism is a form of consumption that meets the needs of its customers, the tourists, vacationers and visitors, but are in fact employees of this industry and residents destination. The basic problem for determining the attractiveness of a tourist destination is to determine the number of its visitors. The quality and character of services provided and offer additional services may allow the life-cycle destination to increase or decrease the overall attractiveness of a basic product or service, and therefore the destination. At present, the primary destination attractiveness often gradually pushes artificially generated attractiveness which leads to a decrease of destination originality. Therefore, it is necessary to monitor the dynamics of the types and forms of tourism attractions and destinations relevant.

Despite all the problems, it is important that the attractiveness of a destination can be crucial in the analysis and decision-making processes in public administration, urban planning and tourism. It is an important tool that can be used to measure the overall benefits of tourism in the municipality, region, district or state. It also represents an important tool of marketing communications of a tourist destination. One of the main meanings of the indicators of destination attractiveness is the fact that it can be an almost irreplaceable tool when comparing different destinations and other indicators to assess the actual destination development over time.

Through indicators of attractiveness of tourist destinations, they can also determine its position in the tourism market, which is essential both for solving logistical problems in the development of tourism products and for the development of a marketing strategy and the associated destination by specifying the correct target tourist segment. Measuring the

attractiveness of tourist destinations is the basic tool of management and marketing tourist destinations and objective assessment of the effectiveness of individual marketing decisions.

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