

THE USE OF GIS TOOLS IN TOURISM RESEARCH ON THE EXAMPLE OF WODZISŁAW POWIAT

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Abstract. The activities in name of tourist development in Wodzislaw powiat are the reason to evaluate the tourist land development. The evaluation was prepared on the basis of selected indexes characterizing the level of tourist infrastructure development. It considered: the number of lodgings per km², the number of restaurants per km², the amount of additional attractions per km² and the density of tourist tracks. This database was analyzed by the use of GIS tools. Using GIS software allowed working with large databases and provided the possibility to create a graphic representation of the results. The level of tourist land development is diversified and depends on it function. The cities with the best developed tourist infrastructure are Wodzislaw Slaski, Radlin, Pszow, Rydułtowy and town in Odra Valley: Olza, Bukow and Nieboczowy. Pszow, Gorzyce and Godow commons have the biggest density of tourist tracks.

Keywords: GIS tools, tourist attractiveness, tourist spatial development, indexes of tourist infrastructure development, Wodzislaw powiat.

Introduction

In the face of a rapid development of the tourist sector and the availability of large portions of information about geographical space, there is a need of applying up-to-date technologies in tourist research. The use of GIS techniques in tourist information management improves the organization of self-governments, provides data about existing infrastructure and typifies places of highest values for potential investors.

The tourist space is considered as a part of geographical space (Warszyńska & Jackowski 1978). Together with the tourist phenomena, they are the subject of tourist geography research. The intensity of these phenomena depends on the tourist space resources which include nature values, cultural values and the attractiveness of the place which is understood as an adaptation of the area to fulfilling the tourist function.

The problem of using the GIS techniques in tourist geography has been taken up by many authors (Franges *et.al* 2003; Pawlicki *et.al* 2003; Szczepanowski 2011) who see the need of creating databases of buildings and publishing them as tourist information on the Internet (for example the database of historical monuments in Krakow and cultural heritage of Zagreb). The existing tourist databases were successfully used in the analysis of tourist space according to the level of its diversity (Kulczyk & Woźniak 2011).

The research on the number of cultural and nature values of the Wodzislaw – Karwina area was conducted by the author (Pukowiec 2011a) by preparing a valorization (Pukowiec 2011b). The natural and cultural resources of Wodzislaw powiat were also identified during the preparation of *The program of tourism and recreation development in Wodzislaw powiat for the years 2006-2013* (Szendera *et.al* 2005).

The aim of this project is to try to use the GIS tools to select parts of Wodzislaw powiat characterised by a good tourist land development. The research used indexes based on the density of lodgings, restaurants, additional attractions and tourist tracks per 1 km². The results of the research, together with preceding results concerning natural and cultural values of the Wodzislaw – Karwina area, will provide a complex database about the tourist space of Wodzislaw powiat, complemented with a cartographic analysis of its resources.

The area of research

Wodzislaw powiat is situated encompasses three physico-geographical units. The northern part in the area of Rybnik Plateau (Silesian Highlands makroregion), western part in Raciborz Valley (Silesian Lowlands makroregion) and south-eastern part in the area of Kończyce Upland (Ostrawa Valley makroregion). The neighbouring units are: Katowice Highland to the North, Glubczyce Plateau to the West, Silesian Foothills to the

South, Gorna Wisla Valley to the South-East and Pszczyna Plane to the East (Kondracki 2009).

In terms of administration, the area of research is situated in the south-western part of Silesian Voivodeship. To the north it has borders with Rybnik powiat and the city Rybnik, to the west with Raciborz powiat, to the south with Czech Republic and to the east with Jastrzebie Zdroj. Wodzislaw powiat consists of 5 rural commons: Lubomia, Gorzyce, Godow, Mszana and Marklowice and 4 urban commons: Pszow, Radlin, Rydułtowy and Wodzislaw Slaski as its capital city and administrative centre of this region (fig 1.).

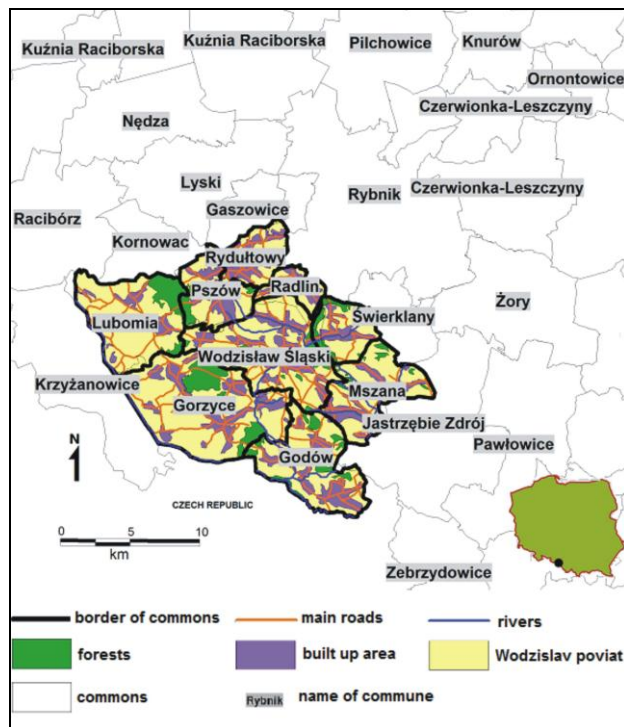


Fig 1. Localization sketch area

A specific location by the northern vent of the Moravian Gate, between Sudetes and Carpathians, in picturesque valleys of Odra and Olza rivers and the border area attests to its uniqueness. The natural and cultural diversity provides the richness of values which are the main tourist good, deciding on the localization of the remaining elements of the offerings for tourists (Wodejko 1997). As a result of the lack of one specifying factor – a driving force of tourism (mountains, sea, lakes, UNESCO monuments), a qualified mode tourism has developed. It includes bicycle tourism (bicycle tracks), observing the nature (bird watching) and tourism based on water supplies (canoeing, fishing).

The developing tourism requires an analysis of tourist infrastructure in a given area. Creating a database with information about tourist resources of the region should precede the process of tourism development and the findings of the analysis should be applied in creating the strategy of development. Hence the need of aggregation of data on a given area in which tourism is becoming more and more common. The use of GIS techniques will

enable the management of a large amount of information about tourist space and will facilitate its cartographic presentation.

Materials and methods of research

This work uses topographic maps of the area in 1:50 000 scale which were registered in the MapInfo Professional (version 7.5) program according to the coordinates of their quoin. The foundation for creating the tourist database were field investigations, information available on local self-governments websites and databases of accommodation available on the Internet.

The following field investigations were used: stocktaking of tourist accommodation, restaurants and additional attractions in the area. The work also uses the compilation of photographic documentation and the following methods: the analysis of the gathered material and supplementing it with information available on the Internet. The created tourist database was entered in a digital form to the GIS software, fulfilling the attributes tables of individual objects. In the last part of the work, by the use of cartographic methods the results were presented in the form of choropleth maps.

Field investigations were conducted in the year 2010 for Wodzislaw Slaski and in 2012 for the rest of Wodzislaw powiat. Tourist databases were created in 2010 and 2012 respectively. After working out, the results of the stocktaking were entered to the MapInfo Professional 7.5. A division according to the types of tourist object was conducted and the information about their localization, offer, service prices and number of locums available in case of restaurants and accommodation was entered to the table of attributes. The object were localized on a map of the powiat on which a net of areas of 1 km² was plotted.

On the basis of the information from the table of attributes, the choropleth maps according to selected tourist infrastructure indexes were prepared with the help of the net tool: the number of accommodation per 1 km², number of restaurants per 1 km², number of additional attractions per 1 km² and the density of tourist tracks per 1 km². The growth in the number of objects shows the infrastructure resources of Wodzislaw powiat.

Results

With the help of GIS tools used in the analysis of the database, a level of tourist land development of Wodzislaw powiat could be shown. To show the places of best developed tourist infrastructure, the following indexes were taken into consideration: accommodation per 1 km², number of restaurants 1 km², number of additional attractions per 1 km² and the density of tourist tracks.

The stocktaken tourist database helped to show the number of accommodation, restaurants, additional tourist base and the length of tourist tracks in Wodzislaw powiat. The results of the stocktaking considering the division into commons are shown in the table (tab 1.).

In Wodzisław powiat there are 26 objects with accommodation services. There are 1274 places available. The biggest number of object is in the the cities of the northern part of the researched areas (Radlin, Pszów, Rydułtowy and Wodzisław Śląski). However, the biggest number of places is in the resorts of Odra Valley (western part of the powiat). The richest accommodation services is in Olza (Gorzyce commune) where the index of the number of available places per 1 km² is over 500. The data relating to the spatial distribution of accommodation according to the selected index is presented by the choropleth map (fig 2A).

The second index showing the level of preparation of the area to develop tourism is the number of restaurant per 1 km². It shows the advancement of restaurants infrastructure in Wodzisław powiat (fig 2B). Among 130 objects of this type, the biggest number is in the centres of cities: Rydułtowy and Radlin (5 and more restaurants), in Wodzisław Śląski and Pszów (3 or 4 restaurants). The stocktaken objects include restaurants, pizzerias, cafes, fast food restaurants and pubs serving food.

tourist base in the area of Wodzisław powiat. It helps to present how many additional attractions, which can be the motive for a trip or fulfil the basic tourist offer, there are and where they are. Additional attractions include: sport facilities, cultural facilities, amusement parks, art galleries and mini zoos or botanical gardens. The biggest number of attraction per 1 km² is in the centre of Wodzisław Śląski (4), in Rydułtowy (3) and in Bukow (Lubomia commune, 3). The spatial distribution of the object according to the selected index is presented by the choropleth map (fig 2C).

The last index in the evaluation of tourist land development is the length of tourist tracks per 1 km² (the density of tourist tracks). The total length of all the tracks in the powiat is 136,47 while the area of the powiat is 287 km² which gives an average density of 0,47 km of tourist tracks per 1 km². The biggest density of tourist tracks in in Pszów (half of the city's area has an index of over 2 km of tracks per 1 km²) and in the southern part of Godów and Gorzyce commons (2 km of tracks per 1 km²). A graphic representation of the results is presented by the choropleth map (fig 2D).

Table 1. The state of tourist infrastructure in Wodzisław powiat (taking into consideration the division into commons)

The number of additional attractions is a index which evaluates the level of development of the accompanying

Commune	Index	Accommodation number places per objects	Restaurants number of objects	Additional attractions number of attractions	The lenght of tourist tracks [km]
Wodzisław Śląski		299/11	51	12	16,4
Pszów		71/2	10	2	21,74
Radlin		53/2	10	4	6,31
Rydułtowy		12/1	26	7	3,25
Lubomia		64/1	5	4	16,88
Gorzyce		741/6	11	5	45,57
Godów		10/1	11	2	23,51
Mszana		12/1	4	2	0,57
Marklowice		12/1	2	1	2,24
Total		1274 places in 26 objects	130 objects	39 attractions	136,47 km

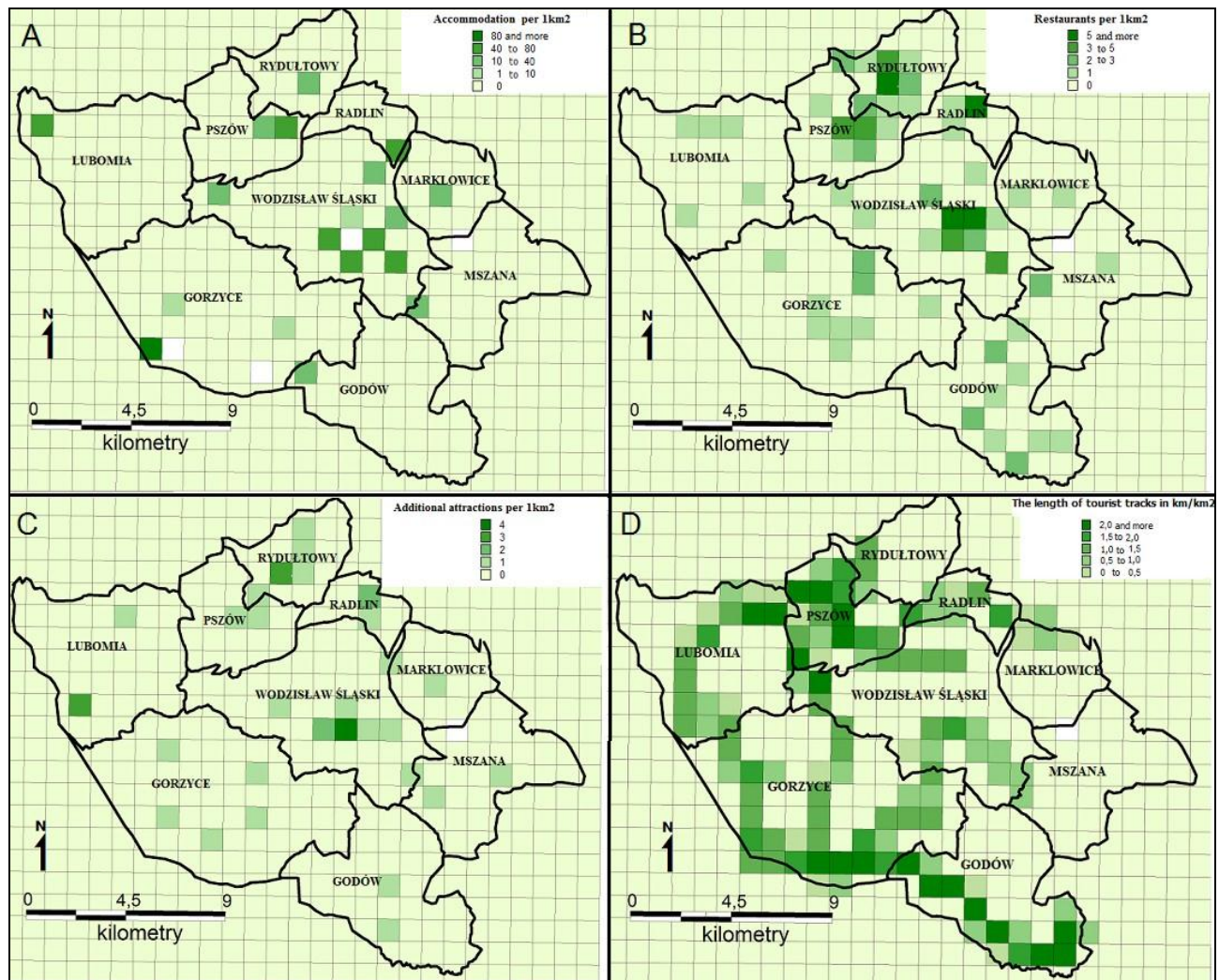


Fig 2. The level of tourist land development of Wodzisław powiat:
 A- choropleth map for the index of accommodation per 1km²,
 B- choropleth map for the index of restaurants per 1km²,
 C- choropleth map for the index of additional attractions per 1km²,
 D- choropleth map for the index of the density of tourist tracks (the length of tourist tracks in km/km²).

Discussion

The term “tourist attractiveness” relates to a total amount of several indexes which include tourist values, tourist land development and transport availability (Kurek & Mika 2008). Despite the fact that these are values that decide about the development of tourism, tourist infrastructure is also an important index. The number of tourist objects shows the level of adaptation to fulfil the tourist function.

The number of accommodation, restaurants and additional attraction in the area of Wodzisław Śląski, Pszów, Radlin and Rydułtowy is a result of the cultural, administrative and trade functions of these towns in Wodzisław powiat. It is provided not for tourists but rather for people from the region who spend here their free time. However, in the face of developing tourism, the existing tourist base will provide a basis for tourist development which will improve gradually. The resorts situated in Odra Valley (the western part of Lubomia and

Gorzyce commons) which used to belong to companies and now are private, facilitated the creation of restaurants and additional attractions. In this case, the well developed tourist base is the result of the existing tourism, especially in Odra Valley.

The density of tourist tracks is a result of the localization of tourist values and socio-economic factors. In Pszów it is connected with the retreat resort and Kalwaria park. In the western part of the powiat there is a bicycle track which lead along the most important monuments of the region (Szendera *et.al* 2005). The bicycle tracks in Godów and Gorzyce were created as a part of Śląsk Cieszyński Euroregion activities.

The managing of tourist information requires up-to-date techniques facilitating the work of objects responsible for the promotion of the region. GIS systems help not only to store and process the data but also to create spatial presentations. A characteristic feature of GIS systems is connecting the descriptive data with the localization in space (Ziółkowski 2007). Thus, they are a proper tool for

conducting research on the level of tourist land development and further presentation of results. GIS systems are used for stocktaking and providing data about tourist values (Szczepanowski 2011) and that is why they can be helpful in identifying and promoting tourist values of a given area.

The works in which the analyses of tourist space were conducted are useful in the activities promoting a region, managing tourist information, working out tourist development programs and spatial development (Kulczyk & Woźniak 2011). The research in the area of tourist space should precede the activities for the development of tourism in a region. The evaluation of the level of tourist resources, including tourist land development, can be helpful in the activities for promoting a powiat and improving the development of tourism.

Conclusions

This research shows a large suitability of GIS tools in preparing this type of analyses and is a basis for following conclusions:

- GIS software is useful for presenting spatial data in connected with a descriptive database
- The tool of MapInfo Professional net helps to get information about the level of spatial development of Wodzisław powiat and to create a graphic presentation of the results in the form of theme map
- The results of the tourist base analyses can provide a basis for working out the strategy of tourism development of the region
- Graphic results in the form of choropleth maps provide a source of information for tourists about accommodation, restaurant and additional attractions
- The level of tourist land development is a result of its function (tourist centre, administrative centre, cultural centre of the region)
- The density of tourist tracks depends on the localization of natural and cultural tourist values and the abilities of local self-governments

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Abstrakt

Działania na rzecz rozwoju turystyki w powiecie wodzisławskim są powodem do oceny zagospodarowania turystycznego obszaru. Ocenę wykonano w oparciu o wybrane wskaźniki, charakteryzujące stopień rozwoju infrastruktury turystycznej. Uwzględniono: liczbę miejsc noclegowych/km², liczbę lokali gastronomicznych/km², liczbę atrakcji dodatkowych/km² oraz gęstość szlaków turystycznych. Bazę danych o zapleczu noclegowym, gastronomicznym, atrakcjach towarzyszących i szlakach turystycznych poddano analizie przy użyciu narzędzi GIS. Wykorzystanie oprogramowania GIS umożliwiło pracę z dużymi bazami danych i pozwoliło na graficzną prezentację wyników. Stopień zagospodarowania turystycznego obszaru jest zróżnicowany i zależy od pełnionej przez niego funkcji. Najlepiej rozwiniętą bazę turystyczną posiadają miasta Wodzisław Śląski, Radlin, Pszów i Rydułtowy oraz miejscowości w Dolinie Odry: Olza, Buków i Nieboczowy. Największa gęstość szlaków turystycznych występuje w Pszowie oraz w gminach Gorzyce i Godów.

Słowa kluczowe: narzędzia GIS, atrakcyjność turystyczna, zagospodarowanie turystyczne, wskaźniki rozwoju infrastruktury turystycznej, powiat wodzisławski.