

TOURISM FUNCTION OF MAZOVIA VOIVODSHIP

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Abstract. The aim of this paper is to provide an overview over theoretical background of tourism function issue and to analyze its spatial composition in the counties of Mazovia region. Firstly, the author discusses the theory of tourism function and indicates some barriers involving its measurement. Secondly, tourism function has been analyzed by using partial indexes referring to tourism movement, tourism features and tourism values in the researched counties. Then, synthetic tourism function index has been calculated and analyzed and finally, the relation between tourism intensity and natural and anthropological resources have been researched.

Key words: tourism, tourism function index

INTRODUCTION

Tourism is a phenomenon which can not be closed in the administrative units. Tourist space is necessary connected with natural values and tourism infrastructure, what usually do not coincides with administrative borders. Therefore, the concept of tourism function included in administrative unit is somewhat artificial. However, in order to research tourism intensity, tourism function or other tourism issues, there is a need for statistical conceptualization, which allows illustrating its spatial differentiation on the national or regional level. For the need of the research analyzed in this paper, the tourism function has been researched on the level of counties of Mazovia region (one of the 16 voivodships in Poland).

The aim of the paper is to provide an overview over theoretical background of tourism function and to analyze its spatial distribution in Mazovia region. The data on tourists and accommodation, which have been used for the analyses, have been taken from the category “Tourism” → “multiply accommodation objects” of Main Statistical Office (GUS) local date base. Tourist service has been phrased in the amount of enterprises in section I – Accommodation and Gastronomic Activities (according to Statistical Classification of

Products by Activity in the European Economic Community, 2008 version). The needed data derives from the category "Economic entities" of GUS Local Data Base. Data referring natural and anthropological values were taken from the category "Environmental Protection" and "Forestry" of GUS Local Data Base as well as from the data base of The National Heritage Board of Poland. All data come from the year 2009.

TOURISM FUNCTION THEORY

In the literature two approaches to the tourism function issue can be distinguished. The first one is the classical approach (narrow one), which refers to economic meaning of tourism function. Warszńska and Jackowski [1979] describe areas with tourism function as territorial units in which tourism plays a dominating role in its economy. The same as areas with industrial or agricultural function, there are areas with significant tourism function, which can be described as tourist regions [Derek 2008]. Matczak [1989] or Kurek and Mika [2007] express tourism function as socio-economic activity of an area which is directed into tourism services. Another example is an approach proposed by Baretje and Defert [1972] that claim that areas with tourism function can be considered as territorial units where employment in tourism business constitutes more than 50% of the total employment [Cooper 2009]. However, such a approach is connected with difficulties concerning the measures. First of all, it is complicated to separate employment in trade and services directed only to tourists from the one directed to the residents. Secondly, the precise statistical data in this aspect are very limited. Though, oversimplifying this concept in Polish conditions, the tourism function can be evaluate by comparing the employment in section I – Accommodation and Food Service (according to PKD classification) to the total employment in the researched area. More applicable is approach proposed by Defert [1967] which refers tourism function to number of beds per capita. Some authors take into account also the numbers of tourists according to the number of residents or an area [Derek 2008].

The second approach to the tourism function theory is new (broad) one, which assumes that evaluation of tourism function of an area has to be more complex. Except of socio-economic aspect, the others factors like tourism infrastructure, tourism movement or tourism values are relevant. This approach reflects fully the character of tourism function issue. Derek [2008] underlines the fact that tourism function is developed only when each of three factors are highlighted, what illustrates Figure 1.

Fischbach [1989] claims, that by evaluating tourism function of an area even more aspects has to be considered and names seven groups of factors: tourism values, tourism infrastructure, communication availability, tourism movement (scale and structure), land use, incomes coming from tourism sector, and employment (scale and structure).

Summing up, it can be ascertain that the area with fully developed tourism function is an area distinguished by tourism values and infrastructure and reflecting relative high tourism movement.

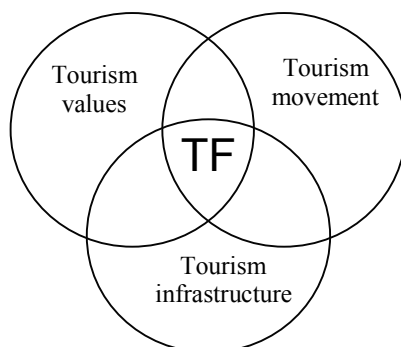


Fig. 1. Tourism function
Rys. 1. Funkcja turystyczna

Source: Derek [2008].
Źródło: Derek [2008].

TOURISM FUNCTION INDEXES

The most popular way to measure spatial variation of tourism function is to examine the distribution of accommodation and the scale of tourism movement. Examining the distribution of accommodation capacity according to population or an area is not only because hotels and another related establishments are highly visible on the landscape but also because countries are more likely to collect statistical data on it than any other element of tourism supply [Pearce 1996]. However, although tourism accommodation and movement gives a useful indication of where tourism plays a significant role, absolute value do not necessarily reflect the importance of tourism within a region. The big urban centers may have a greater number of accommodation units and tourist visits than small towns or some peripheral areas, which in absolute terms would mean that tourist function of the large cities, is higher than of other areas but in reality it may not be so. Big cities may perform other urban functions which are more dominant than its tourism function. On the other hand, peripheral areas or small cities may be more dependants on tourism and may perform significant tourist functions. Therefore, the absolute values on accommodation and tourist visits are sometimes misleading and can give a wrong visual impression of the importance of tourism in a region.

In order to evaluate the relative importance of tourism in territorial units, the use of accommodation data is a logical one because the stay away from ones normal place of residence is one of the defining characteristics of tourism. To demonstrate different ways of analyzing and visualizing the spatial aspects of tourism at the various Nomenclature Units for Territorial Statistics (NUTS) levels some indexes were developed. Among the several methods proposed by researchers to measure the relative importance of tourism, the one that is the most popular is Defert's tourist function index (TFI). Defert [1966] in-

roduced TFI which is derived by comparing the number of bed available to tourists with resident population of the researched area. In this case tourist density is measured.

The Tourism Function Index is calculated:

$$TFI = (N \cdot 100)/P$$

where: N = number of bed spaces and P is the population.

However, Boniface and Cooper [2009] pay attention to the fact that Defert's tourism function index works good as a measure for holiday resorts but it underestimates the impact of tourism in cities with a large resident population, or in historic towns that attract large numbers of day visitors [Cooper 2009]. Also, it is important to underline that while TFI used to compare variations in accommodation density between regions within the same country is very meaningful, at the international level, though, can be misleading because of the differences in definitions and registration requirements among the countries.

Tourism function can be also measured by searching tourism intensity expressed by the quotient of the number of tourists to the local population (Scheider's index) or, proposed by Defert, to an area in km² (Defert's index). Another approach described in the literature is Charvat's index which examines the amount of beds according to an area. Coccossinis and Parparis [2000] describes some indexes which are less used namely: tourist comfort index based on a formula which distinguishes the quality between different types of accommodation using certain criteria, the concentration index which is an attempt to determine the degree of concentration of tourist activity as well as the attractiveness index, derived by comparing the number of bed nights between international and domestic tourists. Attractiveness index can be used in order to evaluate a region's profile in attracting specific types of tourism overall or by category.

For the purpose of evaluating spatial diversification of tourism function in Mazovia region the complex approach has been used. The tourism function has been researched in three aspects: tourism features, tourism movement and tourism values.

Two variables have been specified in order to evaluate tourist movement in the researched region, namely number of guests staying overnight per 100 inhabitants (Schneider's index) and number of guests per km² (Defert's index).

Variables examining tourism features have been divided in two groups: beds and tourism services. The amount of beds is referred to an area in km² (Charvat's index) and to 100 inhabitants (TFI) Tourist services are phrased in the amount of enterprises in section I and in the share of this objects in the total number of enterprises in the county.

While examining tourism features of some area, it is important to take into account environmental factors, which give physical and mental relaxation of tourists and anthropogenic ones, such as monuments of history, cultural heritage, collections of art but also sports centers, events, etc. However, while in case of towns cultural heritage, collections of art, sports centers, events are the most important, in peripheral areas environmental factors attracts tourists the most. Because of limited statistical data the natural values in this paper have been specified by percentage of an area protected by law and percentage of forests in the county. Anthropogenic values have been described by number of sites registered as historic monuments per area unit. The Table 1 shows the schema of variables used for the purpose of research.

Table 1. Variables for tourism function evaluation
 Tabela 1. Zmienne tworzące wskaźnik poziomu rozwoju funkcji turystycznej

Specification		Variable	Data source
Tourist movement	Guests	Number of guests staying overnight/100 inhabitants	GUS
		Number of guests staying overnight/km ²	
Tourism features	Beds	Number of beds/km ²	GUS
		Number of beds/all inhabitants · 100	
	Tourist services in the county	Number of companies registered in section I Number of companies registered in section I/number of all companies	
Tourism values	Natural values	Percentage of area in the county protected by law	GUS
		Percentage of forests	
	Anthropogenic values	Number of sites registered as historic monuments per area unit	KOBiDZ

Source: Own elaboration based on Derek [2008].

Źródło: Opracowanie własne na podstawie Derek [2008].

RESULTS

The analyses of tourist movement and tourism features in the counties of Mazovia region delivered the following findings. Three counties shows Schneider's index higher than average for Poland namely Warsaw, Legionowski and Warsaw West powiat. Relative high index has also Pruskowski powiat, whereas the lowest values show: Ostrołęcki (0), Zwoleński (0) and Lipski powiat. Looking at the number of tourists according to km² (Defert's index), the highest values, much above the national average, appear in the poviats: Warsaw, Siedlce, Radom, Ostrołęka, Pruskowski, Plock, and Legionowski. These are mainly towns with big population or poviats situated near Warsaw. The lowest Defert's index appears again in the counties: Ostrołęcki (0), Zwoleński (0), Lipski and Żuromiński.

Analysing the number of beds per km² it can be observed that Warsaw, Siedlce, Radom, Ostrołęka, Plock, Legionowski and Pruskowski have higher values than average, where Warsaw is definitely a leader. Generally, Defert's index is connected with relative high number of beds. However, sometimes poviats show insufficient use of existing accommodation units (e.g. Węgrowski). Meanwhile the highest rate of beds according to 100 inhabitants (TFI) has Łosicki and Legionowski powiat. The lowest values in this two, referring accommodation, groups can be observed in Ostrołęcki (0), Żuromiński (0), Przasnyski, Żyrardowski.

Examining the amount of tourism enterprises per 1000 inhabitants it can be observed that poviats: Warsaw, Legionowski, Warsaw West and Piaseczyński are in front ranks. However, taking into account the average for Poland, the share of these companies in the all enterprises in the powiat is not meaningful. It indicates the fact, that Mazovia shows low scale of tourism companies in comparison to other Polish regions. The lowest num-

bers of companies in section I show Ostrołęcki, Siedlecki, Węgrowski, and Żuromiński poviats. The above discussed results have been shown in the Table 2.

The analyses of natural and anthropological values of researched poviats have brought to the following conclusions (Table 3). The poviats with the highest % of forest are Wyszowski, Szydłowiecki, Kozienski, Legionowski, Ostrołęcki. The highest % share of protected areas show Otwocki, Legionowski, Żuromiński and Żyrardowski, while the lowest have Ostrołęka, Makowski, Ostrołęcki, and Wyszowski powiat. Referring to the number of protected monuments per 100 km², the highest value reflect Warsaw, Radom, Płock, Siedlce.

Table 2. Tourism movement and features indexes for the poviats in Mazovia Voivodship
Tabela 2. Wskaźniki ruchu i zagospodarowania turystycznego dla powiatów województwa mazowieckiego

No.	Powiat	Tourist movement			Tourist features		
		Schneider's index	Defert's index	Charvat's index	TFI	Enterprises in section I/1000 inhabitants	Enterprises in section I/total enterprises
1	2	3	4	5	6	7	8
1	Białobrzegi	9.792	5.157	0.131	0.249	2.197	0.029
2	Ciechanowski	14.971	12.759	0.555	0.651	1.269	0.017
3	Garwoliński	13.355	11.119	0.666	0.8	1.084	0.017
4	Gostyniński	11.334	8.613	0.302	0.397	1.432	0.021
5	Grodziski	18.012	40.221	0.785	0.351	2.795	0.022
6	Grójecki	20.357	15.556	0.289	0.378	3.156	0.037
7	Kozienski	11.120	7.444	0.461	0.689	1.906	0.029
8	Legionowski	96.109	246.521	4.452	1.736	3.780	0.027
9	Lipski	0.987	0.481	0.026	0.054	1.426	0.020
10	Łosicki	25.219	10.561	1.636	3.907	1.082	0.017
11	Makowski	2.637	1.149	0.067	0.155	1.530	0.020
12	Miński	13.313	16.440	0.551	0.446	1.794	0.024
13	Mławski	9.632	5.962	0.172	0.278	1.448	0.021
14	Nowodworski	15.1597	16.755	0.507	0.459	1.778	0.022
15	Ostrołęcki	0	0	0	0	0.994	0.020
16	Ostrowski	19.279	11.818	0.296	0.483	1.807	0.021
17	Otwocki	23.343	45.391	1.032	0.53	2.441	0.0231
18	Piaseczyński	26.559	67.309	1.803	0.711	3.449	0.021
19	Płocki	19.069	11.477	0.48	0.798	1.265	0.044
20	Płoński	13.317	8.429	0.125	0.197	1.427	0.023

Table 2 cont.
cd. tabeli 2

1	2	3	4	5	6	7	8
21	Powiat m. Ostrołęka	28.646	528.758	6.137	0.3323	3.437	0.022
22	Powiat m. Płock	20.093	285.702	6.881	0.4839	2.427	0.032
23	Powiat m. Radom	18.537	370.420	7.441	0.372	2.564	0.022
24	Powiat m. Siedlce	23.881	571.908	21.782	0.909	2.346	0.022
25	Powiat m.st. Warszawa	122.945	4080.881	44.3	1.334	4.532	0.023
26	Pruszkowski	44.143	269.315	3.99	0.654	3.580	0.022
27	Przasnyski	2.480	1.075	0.015	0.035	1.155	0.018
28	Przysuski	11.774	6.362	0.38	0.704	1.271	0.021
29	Pułtowski	28.031	17.245	0.324	0.527	2.196	0.0297
30	Radomski	8.582	8.258	0.318	0.33	1.127	0.017
31	Siedlecki	3.819	1.931	0.072	0.143	0.752	0.013
32	Sierpecki	5.835	3.662	0.252	0.401	1.008	0.0181
33	Sochaczewski	9.825	11.280	0.235	0.204	2.406	0.024
34	Sokołowski	2.310	1.145	0.068	0.137	1.069	0.0174
35	Szydłowiecki	28.337	25.180	0.506	0.569	1.294	0.019
36	Warszawski Zachodni	51.680	101.990	2.626	0.547	3.831	0.028
37	Węgrowski	13.140	7.226	1.339	0.678	0.879	0.014
38	Wołomiński	6.0632	13.519	0.387	0.705	2.793	0.025
39	Wyszowski	20.657	17.041	0.553	0.248	1.701	0.021
40	Zwoleński	0	0	0.46	0.558	1.074	0.021
41	Żuromiński	1.358	0.679	0	0	0.943	0.015
42	Żyrardowski	17.219	24.379	0.009	0.019	2.625	0.024
43	Average for Poland	50.316	61.895	1.939	1.576	3.079	3.079

Source: Own elaboration based on the CSO Local Data Base (2009).

Źródło: Opracowanie własne na podstawie Bazy Danych Lokalnych GUS (2009).

Synthetic tourism function index has been calculated as the arithmetic mean of standardized all 9 variables, by mean = 100 and standard deviation = 15. The results show that poviats counties with the highest indexes are: Warsaw (146), Legionowski (115) Płock (111), Radom (108), Siedlce (108), Warszawski Zachodni (108), Ostrołęka (104), Łosicki (104) and the poviats with the lowest indexes are: Zwoleński (93), Lipski (93), Sierpecki (92), Siedlecki (90), Żuromiński (90).

Analyzing the correlation between synthetic index of tourism movement and features and tourism values it can be observed that they are only mildly related.

The natural values separately show even lower correlation, whereas the number of anthropological values is more related with tourism movement and infrastructure (Table 4).

Table 3. Tourism values in the poviats of Mazovia Voivodship
 Tabela 3. Wskaźniki walorów turystycznych dla powiatów województwa mazowieckiego

No.	Powiat	% of forest	% of protected areas	Number of monuments/100 km ²
1	2	3	4	5
1	Białobrzeski	25.1	54.781	5.320
2	Ciechanowski	16	37.393	8.396
3	Garwoliński	29.7	36.770	4.280
4	Gostyniński	22.4	42.852	6.341
5	Grodziski	11.7	23.520	26.158
6	Grójecki	13.1	22.941	10.094
7	Kozienicki	30.2	11.414	4.803
8	Legionowski	30.1	72.131	9.743
9	Lipski	17.2	20.389	5.405
10	Łosicki	21.3	23.517	7.253
11	Makowski	25.2	0.966	3.286
12	Miński	21.1	29.813	7.474
13	Mławski	19.2	50.219	42.857
14	Nowodworski	26.1	61.030	6.474
15	Ostrołęcki	30.9	0.449	2.479
16	Ostrowski	27.9	1.059	5.747
17	Otwocki	29.8	78.108	9.902
18	Piaseczyński	18.1	52.474	25.281
19	Płocki	17.1	33.520	6.625
20	Płoński	13.4	35.563	6.884
21	Powiat m. Ostrołęka	8.7	0	89.655
22	Powiat m. Płock	4.8	22.677	187.5
23	Powiat m. Radom	6.4	2.254	172.321
24	Powiat m. Siedlce	6.6	13.433	96.875
25	Powiat m.st. Warszawa	14.3	23.259	251.450
26	Pruszkowski	10.7	34.874	23.577
27	Przasnyski	29.3	3.222	4.265
28	Przysuski	30.7	40.160	4.619
29	Pułtuski	18.9	16.853	7.980
30	Radomski	25	21.619	6.209
31	Siedlecki	18.3	24.466	4.678
32	Sierpecki	13.5	49.978	6.690
33	Sochaczewski	14.7	34.4874	11.292
34	Sokołowski	23.4	40.928	4.332

Table 3 cont.
cd. tabeli 3

1	2	3	4	5
35	Szydłowiecki	31.8	39.014	5.752
36	Warszawski Zachodni	25.1	46.892	10.299
37	Węgrowski	27	38.036	5.173
38	Wołomiński	29.3	20.901	5.136
39	Wyszowski	33	0.095	5.365
40	Zwoleński	14.9	11.054	5.061
41	Żuromiński	20.4	74.079	2.973
42	Żyrardowski	22.6	60.758	42.401
43	Avarage for Poland	29	32.31	20.251

Source: Own elaboration on the base of the CSO Local Data Base and The National Heritage Board data base.

Źródło: Opracowanie własne na podstawie Bazy Danych Lokalnych GUS i bazy danych Narodowego Instytutu Dziedzictwa.

Table 4. Correlation between tourism function indexes
Tabela 4. Korelacja między wskaźnikami funkcji turystycznej

	Tourism movement, features <-> tourism values (natural and anthropological)	Tourism movement, features <-> natural tourism values	Tourism movement, features <-> anthropological tourism values
Pearson's coefficient	0.637	0.432	0.657

Source: Author's elaboration.

Źródło: Opracowanie własne.

CONCLUSIONS

The following conclusions may be drawn from this research:

- Spatial composition of tourism function in Mazovia region is much differentiated. There are high disparities between development of tourism in Warsaw agglomeration, towns and peripheral areas.
- Despite of valuable natural resources peripheral poviats are very backward referring to tourism development and show insufficient use of existing accommodation.
- Tourism function in Warsaw agglomeration and towns shows correlation with anthropological advantages, while natural values do not relevantly affect the level of tourism function.
- Mazovia region shows low scale of tourism companies in compression to other polish regions.
- The research of tourism function issue is limited because of not sufficient availability of certain statistical data.

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FUNKCJA TURYSTYCZNA WOJEWÓDZTWA MAZOWIECKIEGO

Streszczenie. Celem artykułu jest przedstawienie oraz próba analizy przestrzennego zróżnicowania funkcji turystycznej w powiatach województwa mazowieckiego. W celu określenia funkcji turystycznej obliczono i zbadano wskaźniki cząstkowe odnoszące się do ruchu turystycznego, zagospodarowania turystycznego oraz naturalnych i antropogenicznych walorów turystycznych. W dalszej kolejności na podstawie skonstruowanego wskaźnika syntetycznego zbadano zależność między ruchem turystycznym a walorami turystycznymi.

Słowa kluczowe: turystyka, funkcja turystyczna

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