

Methodologies of mapping the cultural services. Tourism suitability of wetlands

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Abstract: - The tourism sector provides good opportunities for many developing countries, wetlands for instance playing a vital part in this success. The connections between tourism and wetlands is however complex and sometimes in opposite. Thus, tourism can affect wetlands in many ways by causing habitat loss, pollution, noise or over-consumption of water. But with appropriate planning, the tourism can also be a novel mechanism for financing the nature conservation and improvement of local livelihoods. The production of tourism suitability map concerning Romanian Wetlands, achieved in the paper, involved many steps. The procedure started through defining of the base substrate (location of all localities with accommodation units from the Romanian territory) achieved with the GIS techniques and taking into account the number of habitants per localities, the area of the wetlands, the access to transportation routes, the average time of the tourists stay and the number of tourists at one hundred of habitants. All these generated criteria were classified in 5 ranks and for the each rank was attributed a value between 5 and 1, the final results being the mapping of tourism suitability of the Romanian localities, situated in the wetlands neighborhood.

Key-Words: -wetlands, tourism suitability, ecosystem services, cultural services, mapping methods

1 Introduction

Tourism is a great phenomenon of our times, being essential for the culture of our modern society. The need to travel and to be in contact with nature, promoting a healthy living style, can be for the developing countries, the main source of profit, creating jobs and opportunities, principally for the sensitive segments of the population [1, 2, 3].

The endless expansion of tourism, requires a careful management thus it must be ensure the maximization of its economic and social benefits, tackling at the same time its negative impacts on the environment and on our heritage [1, 4].

Wetlands represent the places were the richest biodiversity on the planet evolve and the ecosystem services which provide it play a key role in

sustainable development, affecting directly the lives of people, especially of the poor, who depends mainly by these services. Wetlands offer a range of recreational activities including sunbathing, swimming, boating, sport fishing, duck hunting, photography, bird-watching, and simply enjoying the landscape [1]. Wetlands are valuable assets because they carry out a number of important processes, either ecological, hydrological or social. These processes can be called wetland "functions" [5].

From the ecological point of view the wetlands represent an unlimited source of food expressed as plants, animals and micro-organisms. This natural heritage represent the habitat of the plants or animal considered to be rare or endangered [5]. From the hydrological point of view wetlands are considered to be retention basins during raining seasons, having

flood control function [6, 7, 8]. The social aspects of the wetlands are in good correlation with the recreation activities (access to wildlife), history and not least with the nature study [5].

All that the wetlands offer represent the main challenges for the tourism operator in order to promote attractive tourism packages which meet the consumer needs, enabling the development of a viable business.

Tourism suitability is represented by the potential of certain areas related to the attractiveness to which tourists are determined to visit and spend some time in the respective area, being caused by both natural and the anthropogenic factors. Tourist suitability of localities situated near the wetlands represent an indicator controlled by both potential of the natural environment and the area's infrastructure. Regarding the infrastructure is envisaged availability for a specific area and accommodation capacity.

Mapping activity is indispensable for almost all activities involving wetlands. For instance, wetland maps are essential tools for wetland management, protection, and restoration; land-use planning as it relates to wetlands; and regional analysis of wetland status and trends [9, 10]. These maps are used by governmental bodies (local and national agencies) as well as by nongovernmental organizations, businesses, and private sector and research organizations [6].

The present paper expose the determining of the wetlands tourist suitability degree of each localities from Romania by approaching mapping activity, overlapping each thematic layers which contributing in this calculation.

2 Data and methods

In order to determine the tourism suitability of localities situated nearby the wetlands, at national level have been established 4 criteria of classification for each locality, based on the number of inhabitants per locality, surface of wetlands, the access to transportation routes (road, railway, fluvial transport on the Danube River), average length of stay (number of arrivals in the accommodation units and number of nights spent in the accommodation units) and number of tourists per 100 inhabitants (Fig. 1). Each of the four criteria are classified in five ranks, based on the values of the database corresponding to each thus, each rank having a value between 5 and 1, resulting in the end a map with the degree of tourism suitability of the localities situated nearby the wetlands of Romania

The base layer of the map performed in GIS was represented by the location of all the localities with

accommodation units of the entire territory of the country (representation of point type).

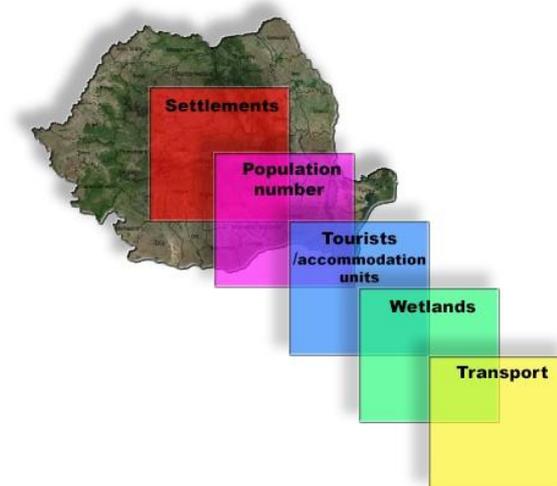


Fig.1 Thematic layer

The localities were filtered based on the criterion of the presence of accommodations between 2001 to 2014. Further on, it has been generated a circle per each locality (buffer) depending on the size of the locality, related to the number of inhabitants. The next step was the overlap with the wetlands and access roads situated near these localities.

2.1 Average length of stay of the tourists

By using the number of arrivals and nights spent in the accommodation units [11] it has been generated the criterion related to the average length of stay for each locality, based on dividing the number of nights spent to the number of arrivals. Thus, in the database have remained only the localities which had functional accommodation units between 2001 and 2014 (Fig. 2)

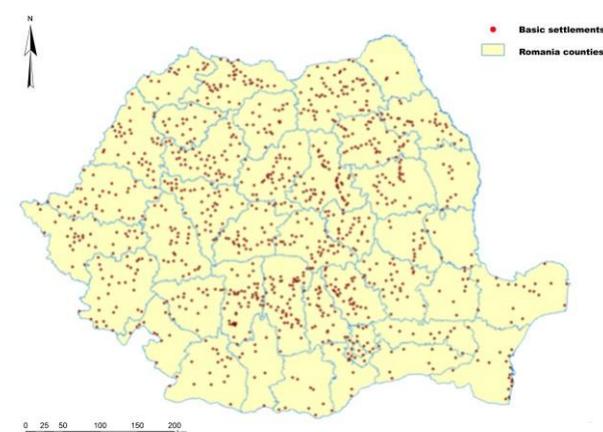


Fig.2 The map of functional accommodation units between 2001 and 2014

Classification:

- over 5 days (rank I – value 5)
- between 5 and 3 days (rank II – value 4)
- between 3 and 2 days (rank III – value 3)
- between 2 days and 1 day (rank IV – value 2)
- under 1 day (rank V – value 1)

2.2 Number of inhabitants per locality

A „buffer” has been applied to the map of localities with functional accommodation units between 2001 and 2014. The buffer is generating a series of circles with the center point in each locality. Thus, each radius of the circles has the length depending on the number of inhabitants, reported to the census performed in 2011.

Based on the population of each locality [11] having at least one accommodation units in the analyzed period, has been generated an influence area, a circle with the center point representing the locality and the circle’s radius with the length depending on the number of inhabitants. Practically, is resulting an influence area of the locality covering a surface directly proportional to the number of inhabitants. (Fig.3).

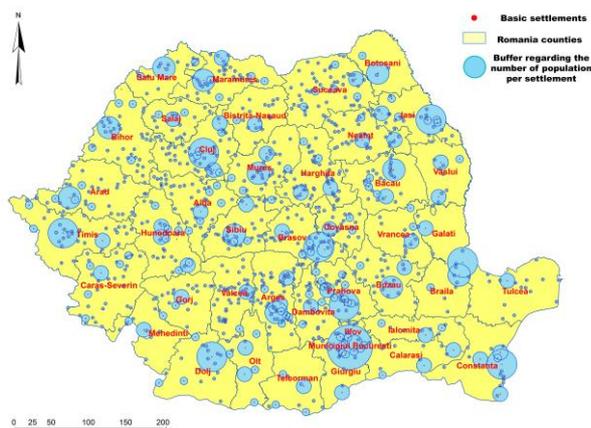


Fig.3 Map of the buffer applied depending on the number of inhabitants per locality

Classification:

- Over 200.000 inhabitants – radius 20 km (rank I – value 5)
- Between 200.000 and 100.000 inhabitants – radius 15 km (rank II – value 4)
- Between 100.000 and 30.000 inhabitants – radius 10 km (rank III – value 3)
- Between 30.000 and 10.000 inhabitants – radius 5 km (rank IV – value 2)
- Under 10.000 inhabitants – radius 2 km (rank V – value 1)

2.3 Number of inhabitants per locality

This criterion represents the percentage of tourists per 100 inhabitants. The highest values of this criterion are indicated by the localities of which the main economic sector is represented by tourist activities, generally the balneary resorts, mountain and coastal resorts (Fig. 4)

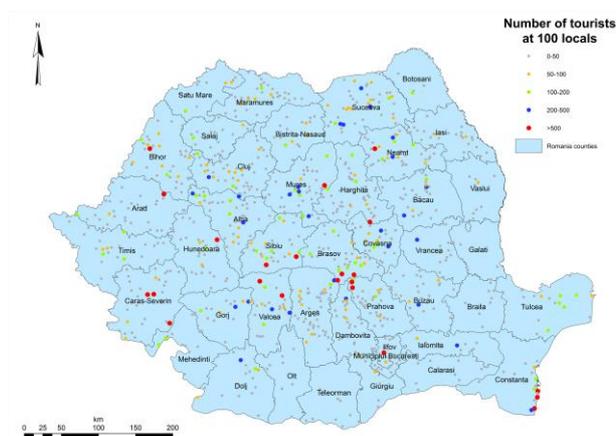


Fig.4 Map of number of tourists per 100 inhabitants

Classification:

- over 500 tourists (rank I – value 5)
- between 500 and 200 tourists (rank II – value 4)
- between 200 and 100 tourists (rank III – value 3)
- between 100 and 50 tourists (rank IV – value 2)
- between 50 and 10 tourists (rank V – value 1)

The data used for the criteria related to the average length of stay of tourists and the number of tourists per 100 inhabitants have been extracted from the website of the National Institute of Statistics from Romania (INS) [11], for a period of 14 years, between 2001 and 2014. On this purpose have been extracted 3 databases regarding specific indicators, as follows:

2.3.1 Arrivals of tourists in touristic accommodation units, on types of units, on counties and localities (2001-2014)

This indicator refers to the number of tourists staying in the touristic accommodation units and includes all the persons (Romanians and foreigners) that are traveling outside the localities in which they have their stable residence, for a period smaller than 12 months, and stay at least one night in a touristic accommodation unit, in areas of the country; the main reason of travel is other than for developing a gainful activity in the visited places.

2.3.2 Nights spent in touristic accommodation units, on type of units, counties and localities (2001 – 2014)

This indicator refers to the touristic overnight, for a period of 24 hours, starting with the hotel hours for which a person that is registered in the evidence of the accommodation unit and benefits of hosting in the account of the price paid, even if the effective length of stay is smaller than the mentioned period. Are taken also into account the nights for the additional beds installed (paid by costumers).

2.3.3 The census of Romanian population on localities (year of 2011)

In order to present the situation that applies currently regarding the arrivals and overnights in the analyzed localities, we have selected as reference year, the year of 2014. This aspect has been taken into account due to the fact that an average applied based on the database from the analyze period would minimize the potential of localities of which the development of touristic infrastructure is recent.

The databases of this indicators have been processed to be synchronized with the table of elements of the map provided in GIS format, containing the positioning of localities on the entire territory of Romania in point format (Fig. 5)

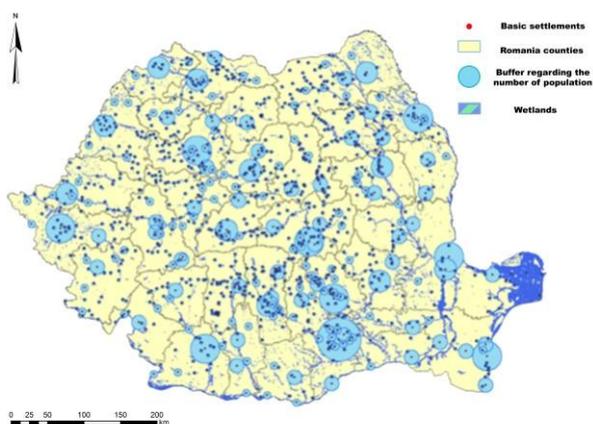


Fig.5 Overlap with the wetlands at national level

2.4 Surface of wetlands

Over the buffer applied to the map of localities has been intersected the map of wetlands' delineations at national level, after which it resulted the percentage of wetland area in the surface of the buffer, from each locality (Fig.5).

Classification:

- over 20% (rank I – value 5)
- between 20 and 10% (rank II – value 4)
- between 10 and 5% (rank III – value 3)
- between 5 and 1% (rank IV – value 2)
- under 1 % (rank V – value 1)

2.5 Access to the transportation routes

Also, over the created buffer has been intersected the map that represents the national network of roads (highways, national/European roads, county/village roads), the railway network of Romania (main and secondary railways) and the course of Danube River on the territory of the country. The access roads have been classified depending on the accessibility and degree of spreading at national level (Fig.6).

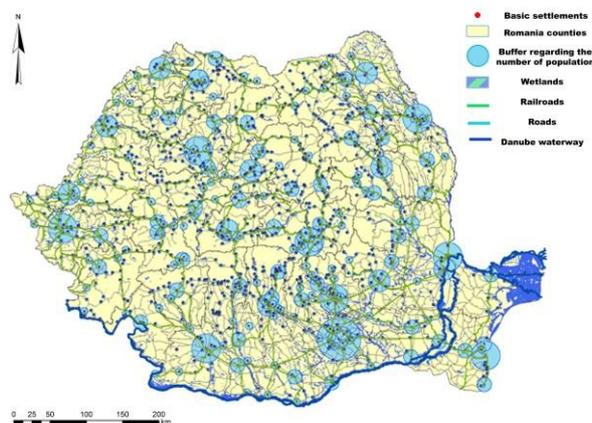


Fig.6 Overlap with the railways, roads and Danube River at national level

Classification:

- highways and main railways (rank I – value 5)
- national/European roads (rank II – value 4)
- secondary railways (rank III – value 3)
- Danube River (rank IV – value 2)
- County/village roads (rank V – value 1)

3 The final map of tourism suitability of the localities situated nearby the wetlands

After applying these criteria that have role of filter on the localities with functional accommodation units at national level, has resulted a map that indicates their tourism suitability, represented by a series of 5 ranks, calculated in percentages, based on the 4 criteria. These criteria have been generated after processing the data analyzed above, thus being established the 4 criteria of importance for calculating the final rank of suitability of a locality, as follows:

- Number of tourists per 100 inhabitants represented 40%;
- Surface of wetlands from inside the circle with the radius generated depending on the number of inhabitants represented 30%;
- Average length of stay of tourists represented 20%;
- Access to the transportation routes (road, railway and fluvial on the Danube River) represented 10%; For each one of the 960 localities taken into account, has resulted a value between 1 and 4.2, depending on the touristic attractiveness of the wetlands (Table 1).

Table.1 The first 30 positions regarding touristic suitability of wetlands, at Romanian level

No.	Settlement/County	Final rank
1	Sulina_Tulcea	4.20
2	Braila_Braila	4.00
3	Crisan_Tulcea	4.00
4	Coronini_Caras-Severin	3.90
5	Itesti_Bacau	3.80
6	Sanmartin_Bihor	3.80
7	Mangalia_Constanta	3.80
8	Baile Tusnad_Harghita	3.80
9	Simian_Mehedinti	3.80
10	Dubova_Mehedinti	3.80
11	Zimnicea_Teleorman	3.80
12	Macin_Tulcea	3.80
13	Maliuc_Tulcea	3.80
14	Tulcea_Tulcea	3.70
15	Pojejena_Caras-Severin	3.60
16	Ileanda_Salaj	3.60
17	Eforie Sud_Constanta	3.50
18	Amara_Ialomita	3.50
19	Balatesti_Neamt	3.50
20	Plopeni_Prahova	3.50
21	Ortisoara_Timis	3.50
22	Sfantu Gheorghe_Tulcea	3.50
23	Prajila_Valcea	3.50
24	Targu Ocna_Bacau	3.40
25	Medgidia_Constanta	3.40
26	Pucioasa_Dambovita	3.40
27	Holboca_Iasi	3.40
28	Orsova_Mehedinti	3.40
29	Gruia_Mehedinti	3.40
30	Lunca Bradului_Mures	3.40

Classification:

- Rank 5, values between 1-1.6
- Rank 4, values between 1.61-2.7
- Rank 3, values between 2.71-3.2
- Rank 2, values between 3.21-3.6
- Rank 1, values between 3.61-4.2

The final map (Fig. 7 and Annex 1) provided a number of 960 localities, being divided in the 5 ranks, as follows:

- Rank 5 – 154 localities
- Rank 4 – 617 localities
- Rank 3 – 144 localities
- Rank 2 – 31 localities
- Rank 1 – 14 localities

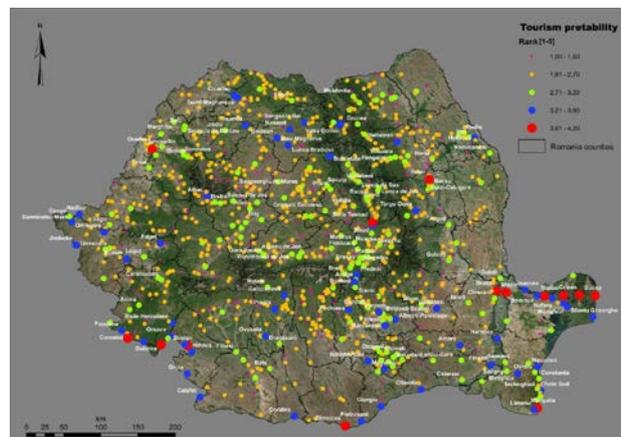


Fig.7 Map of tourism suitability of wetlands at national level

4 Conclusions

According to the criteria applied, it has resulted that the locality with the highest degree of touristic suitability for wetlands, is situated in the Danube Delta, being represented by Sulina city from Tulcea County, recording a final rank of 4.2. Also, in the first 30 positions can be found touristic localities as Mangalia, Baile Tusnad and Eforie Sud.

From the 14 localities framed in the rank I, five are situated in Tulcea county. It can be observed that Tulcea and Braila cities are the only residence seats present in rank I.

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Appendix 1: Map of tourism suitability of wetlands at national level

