Comparative assessment of the overseas territories of France according to the criteria of provision of tourist resources

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Abstract. The article is devoted to assessing the availability of the largest French overseas departments with tourist resources based on quantitative characteristics. The main approaches to assessing the provision of the territory with resources – component-wise and integral were considered. The algorithm for conducting the assessment, including techniques of both main approaches, was presented. The component-wise assessment was carried out according to three main blocks of parameters that reflect the availability of tourist resources in the territory: provision of natural facilities; provision with objects of historical-cultural heritage; provision of tourist infrastructure. Due to the heterogeneity of the evaluation criteria, which does not allow using absolute indicators, a point-rating approach was applied, which allowed linking the main characteristics of each department being evaluated together and conducting a component-by-component, and then an integral assessment. Based on the results of geo-information analysis a map scheme was constructed, which reflects the geolocation of the evaluated departments and the degree of their availability of tourist resources. It will allow tourism industry organizers to more effectively to direct their efforts and funds to the development of tourism in the overseas departments of France. The work was built using GIS.

1. Introduction

Technologies for annual processing of old-arable soil of slope lands within a given land use area do not always meet the requirements of soil protection from water erosion. The noticeable manifestation of erosion processes is explained by insufficient consideration of many and various requirements for soil treatment on slope lands [1, 2, 3]. In studying these processes, it is necessary for conditions to be observed throughout the growing season of crops to prevent soil erosion, including conditions of immediate action, that is, immediately after soil treatment. French Republic is the most visited country in the world by tourists. Tourism is one of the main and rapidly developing sectors of the economy of this country, and tourist resources are the national property of both a separate department and the entire country as a whole.

According to the statistical data for 2017, France is the leader in the quantity of arrivals of foreign tourists with total number is 86.9 million people (the official website of the statistical agency of the French Republic, from https://www.entreprises.gouv.fr). The share of tourism accounted for 7.2% of the GDP of the French Republic. It is important to note the stability of the leader position of tourist
reception: for example, in the period from 2011 to 2017, France did not concede the championship to any country. In terms of total revenue from the tourism sector in 2017, France ranks third, behind the United States of America and Spain (Ministry of tourism of France, from https://france.fr/fr/maintenance-en-france).

According to the statistics Bureau of the Fifth French Republic [4], in 2018, France broke its own record by receiving 89.4 million foreign tourists. This index is 3% higher than in the previous year. According to the data of the official website of the French government (from https://www.entreprises.gouv.fr), by the end of 2020, the Ministry of tourism has a plan to receive 100 million tourists.

Tourism resources include natural heritage, cultural and historical sites and infrastructure elements.

2. Methods and materials
From each 10 trips in France, 9 of them are to continental part (Metropolitan area), 1 is to the overseas territories. Thus, visits to the dependent overseas territories of France (island departments except Corsica island, which belongs to the mainland), account for about 10% of the total number of tourist visits to the country [4].

Obviously, tourists are attracted by the territory of overseas departments by tourist resources and they determine the tourist flow. Knowing the specifics of providing parts of the country (in this case, the Overseas departments of France) with tourist resources, the government and private investors getting better where and what to invest for the best efficient use of them in order to develop the tourist flow.

Geographical factors (geological structure, topography, climate and air quality, water resources, flora and fauna) have a great impact on the quality and quantity of natural heritage sites. Water and climate resources are considered the most important of them. For the French overseas territories, which are located principally in the tropical climate zone and have access to the sea/ocean, the prospects for tourism development are primarily related to the coasts, so it is important to assess the coastline in terms of the availability of tourist resources [6].

Objects of historical and cultural heritage were formed mainly with time and under the influence of a particular civilization. For the French overseas territories in colonial period were during oriented with a close connection with the metropolis carried out by the sea, a characteristically gravitation of objects of historical and cultural heritage to the coasts, which were the line of maximum concentration colony’s life.

The degree tourist infrastructure's development directly depends on the level of economic and social development of the tourist destination. To assess the provision of any territory of tourist infrastructure, it is necessary to make a component-wise assessment of each of elements (primarily, transport’s elements, accommodation - hotels, food and entertainment).

Research Questions:
1. Inventory of the tourist resources of the French overseas departments (French Guyana, Guadeloupe, Martinique, Reunion, Mayotte).
2. Development of a methodology for conducting a comparative analysis of the availability of tourist resources in the overseas departments of France (French Guyana, Guadeloupe, Martinique, Reunion, Mayotte).

Purpose of the Study: establishing differences in the provision of the overseas departments of France (French Guyana, Guadeloupe, Martinique, Reunion, Mayotte) with tourist resources.

The organization of any activity, including tourism and recreation activities, requires a prior inventory and assessment of the resources, which is available on the territory.

Doing assessment of resources availability in the territory (regardless of the nature of the resource being assessed), two main approaches are usually suggested:
1. Private assessment of potential, based on the construction of a indicator's system, each of which reflects certain aspects of sustainable development (economic, ecological, social and others
2. The integral method to assessing the potential based on the construction of a generalized indicator, which can be used to determine the degree of stability of the natural and socio-economic development of the object.

Each of these methods has their own positive and negative sides.

In order to simplify the use of the results of the assessment of the territory's availability of tourist resources, an integrated method is used. In opposed of the approach of private assessment, which summing up the results in the form of a complex system of private assessments, the integrated assessment is based on the construction of a generalized indicator, which can be used to determine the availability of tourist resources in the territory [1].

The logic of fulfillment the assessment of the territory's provision of tourist resources implies the consistent implementation of the following actions:

1. Definition of the object of assessment – in this case, it is each of the compared French overseas departments.
2. Definition of the subject's assessment, in respect of whom the assessment is carried out. In general - these are tourists, in a particular cases - there are tourist's groups and organizers of tourist activities (tour operators, administrative authorities, local residents, citizenships of the country), focused on certain types of tourist activities.
3. Defining indicators and criteria for evaluating an object that are reflecting the most significant characteristics from the point of view of the subject for evaluation.
4. Gathering data.
5. Unifying quantitative data. Obviously, the characteristics, which reflect the availability of tourist resources almost always lie in different planes – for example, total number of hotels, air temperature, and density of the roads.
6. Analysis and interpretation of the results that were obtained.

The object of assessment in this article is the French overseas departments; the subject of assessment is the organizers of tourist activities; the list of evaluation criteria and ranking system is presented below; the evaluation criteria were combined into integral indicators by summing up the ranks of each department obtained for each block of evaluation parameters (availability of natural, cultural and historical heritage and tourist infrastructure)[1].

A comprehensive assessment of the availability of the French overseas departments with tourist resources allows identifying the most valuable for the development territories of tourism and recreation. That’s why on these lands, first of all, it is so advisable to develop tourist and recreational activities [9].

In order to achieve an objective assessment of the availability of French overseas departments with tourist resources, a score was used for some criteria. Then, based on the total points received by each department, its rank was determined. The result is an integrated assessment of the departments, where not the points are summed up, but the ranks obtained by each department during the component-wise evaluation. The department that obtained the highest integral rank as a result is considered optimal for the development of tourism.

Obviously, the degree (level) of suitability of the territory for tourism development mostly depends on the type of planned tourist activity. For example, a territory with a grand natural heritage, but poorly developed infrastructure, low density of population and scarce historical and cultural heritage, is promising for the development of nature-oriented types of tourism, and is not suitable for entertainment, event and similar types of tourism.

The study is based on the analysis of spatial data in the shapefiles format, performed using the program Quantum GIS 16.2 [2, 7]. Based on the analysis of the data obtained, a ranking was carried out (tables 1, 2, 3) [8], reflecting the provision of each of the French overseas departments of objects of natural, cultural and historical heritage and tourist infrastructure. For each assessment criterion, all the compared territories got a point that shows the department's availability of a particular tourist resource. According to the results of calculating the total points, a rank is assigned to each territory (the higher the sum of points, the higher the rank) [1]. The results of the component-wise assessment, reflected by
ranks, were combined and presented as a table of integrated assessment of the availability of tourist resources in the studied territory (table 4).

In assessing the provision of the overseas departments of France with natural heritage elements, the following criteria were applied: the availability of UNESCO World Heritage Sites; the presence of natural parks; the presence of national parks; the presence of regional parks; availability of marine reservations (National parks of France, from https://www.parcs-naturels-regionaux.fr/).

The assessment of the availability of cultural and historical heritage elements in French overseas departments was based on the following criteria: the availability of historical monuments; the presence of architectural monuments; the presence of archaeological monuments; the presence of castles; and the total quantity of museums and Museum centers.

An important element of the characteristics of the territory from the tourist point of view is the level of development of its infrastructure. The main indicators of its development were following criteria for evaluation: the quantity of accommodation facilities (hotels), food facilities, entertainment facilities, the density of roads.

3. Results and Discussion

The tables below show comparative point and rating assessment of the overseas departments of France according to the criteria of availability of natural and cultural and historical heritage and also tourist infrastructure (tables 1-4).

**Table 1.** Assessment of the availability of natural heritage elements in overseas departments of France.

| Criteria | French Guyana | Guadeloupe | Martinique | Reunion | Mayotte |
|----------|---------------|------------|------------|---------|---------|
| 1        | 0             | 1          | 1          | 0       | 0       |
| 2        | 1             | 1          | 1          | 0       | 0       |
| 3        | 1             | 0          | 0          | 1       | 0       |
| 4        | 0             | 1          | 0          | 1       | 1       |
| 5        | 3             | 3          | 3          | 2       | 2       |
| Σ b       | 5             | 6          | 5          | 4       | 3       |
| Rank c    | II            | I          | II         | III     | IV      |

*Criteria: 1 - The availability of UNESCO World Heritage Sites (no – 0 point, there is – 1 point); 2 - The presence of natural national parks (no – 0 point, there is – 1 point); 3 - The presence of regional parks (no – 0 point, there is – 1 point); 4 - The presence of marine reservations (no – 0 point, there is – 1 point); 5 - Quantity of protected forests (no – 0 point, 1-3 – 1 point, 4-6 – 2 points, more 6 – 3 points); Σ - Sum of points in the evaluation region; Rank - The total indicator produced by the amount of points received in the assessment.*

**Table 2.** Assessment of the availability of cultural and historical heritage elements in overseas departments of France.

| Criteria | French Guyana | Guadeloupe | Martinique | Reunion | Mayotte |
|----------|---------------|------------|------------|---------|---------|
| 1        | 1             | 1          | 1          | 1       | 1       |
| 2        | 1             | 1          | 1          | 1       | 1       |
| 3        | 1             | 1          | 1          | 1       | 0       |
| 4        | 2             | 1          | 3          | 3       | 2       |
| 5        | 3             | 2          | 3          | 3       | 3       |
| Σ b       | 8             | 6          | 9          | 9       | 7       |
Rank c

| Criteria | French Guyana | Guadeloupe | Martinique | Reunion | Mayotte |
|----------|---------------|------------|------------|---------|---------|
| 1        | 2             | 5          | 5          | 2       | 1       |
| 2        | 3             | 3          | 4          | 3       | 1       |
| 3        | 1             | 2          | 3          | 1       | 1       |
| 4        | 1             | 2          | 2          | 3       | 2       |
| \( \Sigma \) b | 7          | 12         | 14         | 8       | 5       |
| Rank c   | IV            | II         | I          | III     | V       |

Table 3. Assessment of the availability of tourist infrastructure in the French overseas departments.

\( a \) Criteria: 1 - The quantity of accommodation facilities (hotels) (less 50 – 1 point, 51-100 – 2 points, 101-150 – 3 points, 151-200 – 4 points; 201-250 – 5 points), 2 - The quantity of food facilities (less 100 – 1 point, 101-250 – 2 points, more 250 – 3 points), 3 - The quantity of entertainment facilities (less 50 – 1 point, 51-200 – 2 points, 201-350 – 3 points, more 350 – 4 points), 4 - The density of roads km/km² (less 0,029 – 1 point, 0,030-0,039 – 2 points, more 0,040 – 3 points);

\( b \) \( \Sigma \) - Sum of points in the evaluation region;

\( c \) Rank c - The total indicator produced by the amount of points received in the assessment.

| Criteria a | French Guyana | Guadeloupe | Martinique | Reunion | Mayotte |
|------------|---------------|------------|------------|---------|---------|
| 1          | II            | I          | II         | III     | IV      |
| 2          | II            | IV         | I          | I       | III     |
| 3          | IV            | II         | I          | III     | V       |
| \( \Sigma \) b | 8          | 7          | 4          | 7       | 12      |
| Rank c     | III           | II         | I          | II      | IV      |

Table 4. Integrated assessment of the availability of tourist resources in French overseas departments.

\( a \) Criteria: 1 - The total indicators rank of the provision of natural resources in overseas departments of France; 2 - The total indicators rank of the provision of cultural and historical heritage elements in overseas departments of France; 3 - The total indicators rank of the provision of tourist infrastructure in the French overseas departments.

\( b \) \( \Sigma \) - Sum of points in the evaluation region;

\( c \) Rank c - The total indicator produced by the amount of points received in the assessment.

According to the results of an integrated assessment of the assessment of French overseas departments with tourist resources, the clear leader is the Reunion. The outsider is Mayotte, what mostly can be explained that the area of this department is significantly smaller than other comparable territories (table 4, figure 1).
Figure 1. Map of integrated assessment of the availability of tourist resources in French overseas departments (Electronic atlas French government, from https://geo.data.gouv.fr).

4. Conclusion
A serious problem of the French overseas departments is high seismic activity, which creates the threat of tsunamis and earthquakes. Work is currently underway by the French government to ensure the safety of the population and tourists [5].

And also one more stressor of tourism development in French overseas departments is their distance and remoteness from Europe [3]. However, the presence of international airports and government’s subsidies for flights from the continent solve this problem and help for attracting tourists.

Important factor realizing tourist and recreational activities is the overall level of economic and social development of the overseas territories. Being a part of France and getting government funding. In all the regions realizing social and economic programs, which aimed at the education and training of personnel involved in the tourism sector. Actively attracting investors. Using new method for protecting the environment, natural monuments, national parks and reservations.

The assessment let to rank the overseas departments of France according to the criteria of the availability of tourist resources. The results of a comparative assessment based on a point-rating approach allow identifying the advantages and disadvantages of the studied territories in terms of prospects for tourism development and investment. And also these results of component-wise assessment allow establishing the optimal tourist specialization of each of the compared territories.

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