

THE CARTHOGRAPHIC DESIGN OF THE EVALUATION OF NATURAL POTENTIALS FOR THE NECESSITY OF SPATIAL PLANNING BY THE EXAMPLE OF SHARA MOUNTAIN (SOUTH SERBIA)

Jasmina Djordjević

Serbian Academy of Sciences and Arts, Geographical Institute "Jovan Cvijić" Beograd (Yugoslavia)

Dejan Djordjević

Institute for Spatial Planning, University of Belgrade, Geographical Faculty, Beograd (Yugoslavia)

Branka Tošić

Serbian Academy of Sciences and Arts, Geographical Institute "Jovan Cvijić" Beograd (Yugoslavia)

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The evaluation of the natural geographic characteristics is the main step in the initial phase of research for the purpose of rational usage of space. A detail quantative and qualitative analysis of the natural conditions resulted in a set of thematic maps for the mountainous region of South Serbia in which the relief elements are presented (hypsometry, slope angles, exposition), the geological characteristics (the stability of the terrain and hydrogeological specifications), hydrographic-hydrologic characteristics, climatic conditions and the pedologic cover. On the basis of several criteria the localities are singled out according to the level of favourability for certain activities and the cartographic method shows their dispersion in the studied area.

The zones and localities, which are most favourable for the development of certain fields of economy and habitation, were defined through a synthetic approach after a partial analysis of elements of the natural complex. A synthetic map of the favourable conditions of the terrain for the multi-purpose usages is given as the final result of the evaluation and is used as a main input information in the process of planning and organizing the space.

All the thematic maps are designed in a scale 1 : 100 000 in AUTO CAD technic, considering the concrete planning needs during the researches and the notable mountainous relief of the region.

1. The study arca

Shara Mountain Župas comprise the territory of Shara group of mountains within Republic of Serbia (F.R. of Yugoslavia). Three Župas named Gora, Opolje and Sredska belong to the Adriatic watershed and they represent a border arca (672,9 km², population about 49 000) with Former Yugoslav Republic of Macedonia and Republic of Albania. Because of its mid-Balkan position and the overall geographic diversity, Shara Mountain has attracted the attention of explorers, specially naturalists. On the northern and NW slopes lie tectonically predisposed mountainous ravines Sirinić, Sredska, Opolje and Gora. Due to their basic natural, particularly climatic features, they display typical Župa characteristics¹. A significant morphological

¹ The geographical concept of Župa is practically untranslatable; it is a highly intuitive presentation of an individualized geographical unit with specific geomorphological, climatic and ecological properties, which is widely spread in popular speech, historic sources as well as in scientific geographical literature.

characteristic of that part of Shara Mountain is the spacious mountain crest intersected by deeply cut mountain river ravines. This particularly applies to tributaries called the Prizrenska Bistrica river and the Plavska river. Above the crest there is a mountain range over 2500 m high with glaciation traces and mountain peaks divided by saddles where caravan roads used to lead in the past. They also linked the population of mutually isolated Župas and the Shara Mountain piedmont area. Namely, these Župas represent a resistant buffer zone which prevented compact albanization processes in areas between NE Albania, NW Macedonia and Prizren and Kosovo ravines. These circumstances brought about specific geopolitical and ethnocultural characteristics to the Shara Mountain region as a guard of Serbia's territorial integrity [1].

2. The evaluation method

In considering the characteristics of the Mount Shara district we chose the method of successive elimination to evaluate the natural potentials of the investigated terrain. The method of successive elimination involves criteria in a selected sequence/succession and evaluates only the area that remains suitable after the preceding evaluation phase (cascade effect). This method requires additional efforts on the part of the researcher because the succession of criteria application (and their significance respectively) should be defined at the beginning. The method of successive elimination is also combined with some other general and specific methods of which the cartographic method is the most important one.

The choice of assessments in this methodological approach depends on the current physical planning practice in our country. We have chosen four essential categories: most suitable, suitable, conditionally or less suitable and unsuitable.

The selection of the key land uses is a very important tool in the procedure as it indirectly defines the criteria for the evaluation of natural potentials. Based on the characteristics of the Mount Shara district we have chosen four key modes of land use: agriculture, industry, settling and tourism. The first three are actual uses and the fourth is a potential one, but, in our opinion, it is a very important mode of land use. When the most suitable terrains for the above purposes are earmarked we need to identify zones of conflict, both the actual and prospective ones; the selected land uses are rarely compatible with the situation on the terrain.

The selection of natural factors, that is, the elements of the natural complex is the next step, but there are some constraints: on one side it is necessary to cover all the relevant natural elements and, on the other side, to reduce the number of evaluation factors for efficiency sake [2]. There is no hierarchy among the chosen factors shown on a set of classified maps in this stage of successive elimination.

The matrix of the relevance of some natural factors to key land uses emerges from the relationship between different activities and the environment. The relationship of natural factors and land uses can be relevant, irrelevant and indifferent [4]. Therefore, it is quite understandable that the environmental values do not represent agricultural and industrial potentials, but do represent potentials for tourism and settling.

The hierarchy of the factors to be evaluated, namely the succession of their elimination, is based on an objective assessment of environmental factor significance for key land uses. Thus, the first to be successively eliminated are those factors whose criteria must be satisfied without failure. The secondary factors can refer in a general (land for agricultural use) or specific sense

to definite areas only (impact of maximum ground water table upon the stability required for housing and industrial building projects).

3. The cartographic presentation

By evaluating the natural potential in order to define four categories of the land suitability for agriculture, industry, settling and tourism, a set of appropriate maps is made showing and evaluating each natural factor. All the maps are made in 1:25 000 scale, suitable for local planning exercises. The thematic maps are also designed in a scale 1: 100 000 in AUTO CAD technic for the purpose of regional planning. The list of maps include:

- Geological Map,
- Geomorphological Map,
- Terrain Stability Map,
- Hypsometric Map,
- Terrain Inclination Map,
- Terrain Exposition Map,
- Pedological Map,
- Soil Quality Map,
- Hidrographic Map,
- Climatic Zones Map,
- Vegetation Map and
- Soil Erosion Map.

When these maps are interpolated in a predefined succession, four basic maps of land suitability for key land uses are obtained, covering all the relevant natural factors. Then the most suitable areas for four key uses are transferred to a synthesis map (Fig. 1). On this map possible conflicts or complementarities in the applications are drawn in the geographical sense. The final step is to compare the results with the actual land use and assess the cost-effectiveness of the natural potential use in the studied area.

4. Discussion

The areas most suitable for the development of agriculture, construction of industrial facilities and housing projects can be found in the river alluviums and on the table lands near the existing settlements in the district of Opolje. The localities attractive for winter sports are the sunny valleys on the southern and southeast flanks of Mount Shara.

In the pattern of land use, arable and forest areas predominate while much less land is used for industry, business, and residing. The intensity of arable land use drops steadily contrary to the natural potentials for agricultural development, animal husbandry above all. The land most suitable for building is in general terms already used for urban purposes.

Morphometric and climatic conditions show that the focus of future development should be cattle breeding, health food production, the processing at different degrees of animal products, edible plants and particularly significant medicinal herbs. As regards housing projects one should not anticipate any major expansion of the existing settlements or any major construction projects in the district.

The cartographic method used above is best for discussing the land use issues, particularly in physical planning. The cartographic method is the best tool for representing land features, while the cartographic generalization method helps to determine the regularities and

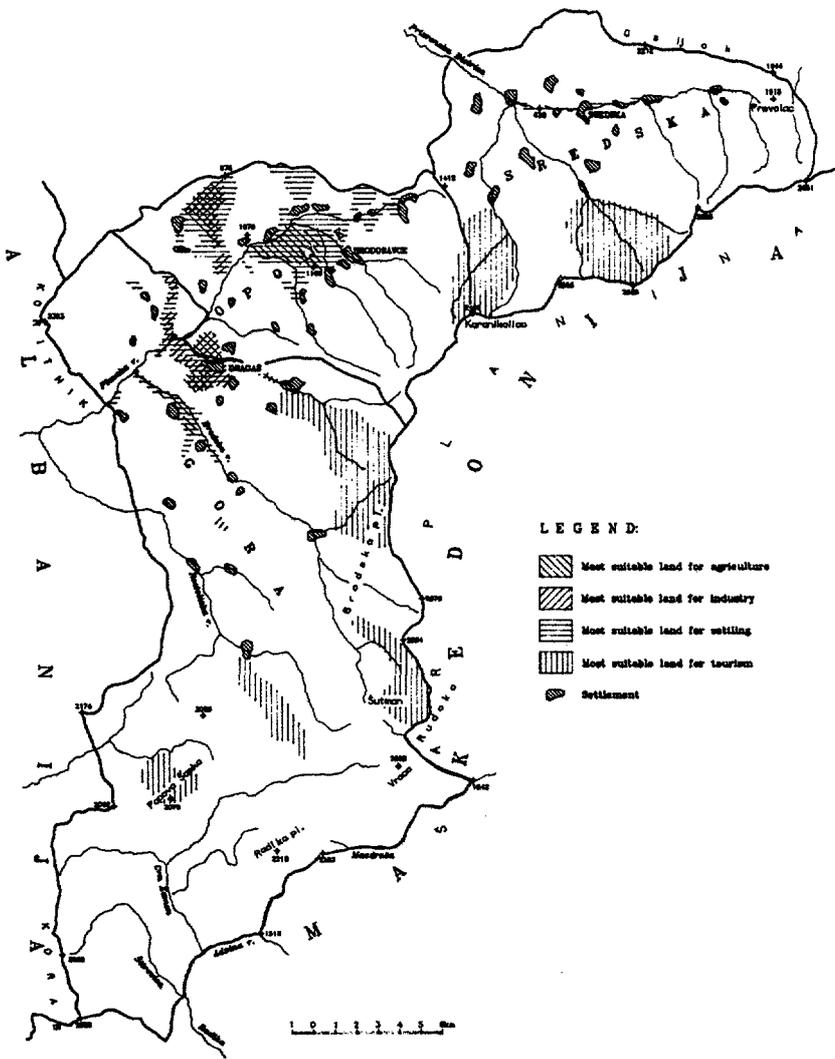


Figure 1: Synthesis map of the most suitable zones for agriculture, industry, settling and tourism.

principles in the position, condition and changes of the mapped terrain [3]. In addition to the visible map contents plasticity and symbols, particularly important for physical planning are the immanent map contents that enable quantification of the values, such as: intensity, frequency, structure, relationship and other, but also regularity, principles, zoning, areals, etc.

References

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