

Physical-geographical information in the process of the optimisation of the landscape structure

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Abstract

We can divide this work and its goals into three basic parts. Here, the entering information is introducing the existed materials that refer to a given territory and also the results of the respective terrain research (July–August 2000, 2001). The first part of research deals with the physical-geographical characteristics. The second part consists of the geoecological synthesis of the territory. In this part, 175 homogenous units of topic dimension were selected. The last part deals with the application of obtained information and evaluates the degree of danger that can influence the ecological stability in the given region. The methodological process is based on the evaluation of the given country. It comes from comparison of natural conditions with the way people utilize the territory. This evaluation process is based on differentiation of secondary landscape structure. It is important to estimate the negative influence on the ecological stability and then to classify the abiocomplexes according to expected sensitivity to intensification of the anthropogenic functions. The result is proposal for effective usage of the territory considering its natural conditions

Key words: geotops, secondary landscape structure, ecological stability

Introduction

Human activities in the landscape are evolving. However, the landscape is not only a sum of components, but a presents complex system. We can describe it by many systemic landscape attributes e.g. ecological stability, ecological carrying capacity, landscape resistance, diversity, variability, productivity. Optimal spatial land use depends on the knowledge of these landscape attributes.

The methodology of the landscape planning works should contain three basic parts. First one is analysis of the components of physical-geographical sphere the next part is geoecological synthesis. Its aim is generation of a spatial information databases. The geoecological synthesis represents the base for evaluation of systemic facilities of landscape. There are very tight ties between these parts, so the wrong entry information is reflected in wrong outputs.

Theoretically we can define three ways of obtaining entering physical-geographical data:

- The first way is based on already existing physical-geographical foundation – this way is often used in planning practice. It is relatively fast but accuracy and compatibility of this unverified information can be incorrect.

- The second way represents obtaining of entry information right in the terrain – this way takes a lot of time, money and depends on qualification of solutionist.
- The third way is based on existing text and graphic foundations, which are verified and completed by terrain research.

Problem of processing information about abiotic natural landscape elements and their utilization in planning practice is the main topic of many works (e. g. Tremboš, 2000, Tremboš, 2002, Tremboš, 2003, Tremboš, Minár, 1997). Mičian (1999) compiled different sights on the geotops. Geotops generally, problems of their detailing and grouping to the choric units is the main topic of works of Mosimann (1990), Leser (1991), Billwitz (1997), Kolény (1998), Minár (1998). The problematic of the geoecological research and mapping is detaily described in Minár et al. (2001).

Approach of the recognition the landscape like a complex and its spatial organization is obtained in the methodology of the landscape synthesis (Drdoš, Urbánek, Mazúr, 1980). The complex approach based on comparison of natural conditions and present land use is applied in several methodologies of evaluating of the ecological stability (Hydrogeo, 1996, Tremboš, 1998, Tremboš et al., 1997, Tremboš et al., 1999) and also it is a base of the methodology LANDEP (Ružička, Miklós, 1982, Hrnčiarová, 1999, Hrnčiarová et al., 2000).

This article is focusing on the process of obtaining and completing this information. It also contains the purpose of the possible utilization of them in evaluation of the optimal spatial land use. It comes out of the geoecological research of the north part of cadastral territory of village Vígľaš.

Study area

The area of this territory is 15.6 km² and interferes into two, genetically different, geomorphological units. The Slatina hollow basin, which takes middle part of interest territory, is depression filled with neogen sediments. The Javorie in southwest part and the Rohy in east part are volcanic mountains build with Baden andesite. Lowest point is situated in west part, by river Slatina. Highest point is situated on the top of hill Rohy. Studed territory is cutted by Slatina River, which flows from east to west concurrently with road No. 50 and railway Zvolen – Lučenec.

Physical-geographical analysis and geoecological synthesis

Database of the physical-geographical information was filled by, already remembered, way based on utilization existing foundation and their completing by terrain research. We can divide existing physical-geographical information into spatial and non-spatial. We used maps and aerial photographs, which come under spatial information. The second type is represented by information with shape of text and tables.

These foundations represent information base for consecutive terrain research. This research was made as ta part of two surveys: the first in July–August 2000 and the

second in July–August 2001. By these surveys were described 109 research points. We mapped also secondary landscape structure and present geomorphological processes, which were necessary for the next part of this work.

On the base of analytic information about physical-geographical components we constructed and characterized physical-geographical complexes. We used combination of method “leading factor” and “superposition”. Like a leading factor was used georelief. According to Minár (1998), we can consider the homogenous types of geoecological units as the equivalent forms of georelief. The elementary forms of relief distinguish with quasi-homogenous morphometric parameters. Their boundaries are outlines of discontinuity of these parameters and they indicate also possible changes of the other physical-geographical components. Elementary forms of georelief were filled up by information, which described these, other components. We divided these elementary forms if there was an expressive differentiation within the boundaries of them.

According to the vertical relations between the components, 175 homogenous units of topic dimension were selected, which were classified into 12 geoecological types.

Homogenous units of topic dimension represent relatively same reaction on the human interference. In regard of this fact was made assessment the degree of danger that can influence the ecological stability, which was used by the optimalization of the spatial land use.

Evaluation process of optimalization of landscape structure

According to Míchal (1992), ecological stability is an ability of ecological system to survive although it is invaded by impact from outside. Also it can still reproduce its main feature.

The evaluation process was based on the comparison of the natural conditions with the secondary landscape structure.

For the evaluation was made also the analysis of present geomorphological processes and the secondary landscape structure. This information comes from the terrain research and also the air survey photographs.

After this manner was replied database of the input physical-geographical information, which was necessary for specific application.

This entrance information we can divide into these three groups:

1. Information about the abiocomplexes.
2. Information about the secondary landscape structure.
3. Information about the present geomorphological processes.

The assessment of the optimal spatial land use was based on differentiation of secondary landscape structure. It is important to estimate the negative influence on the ecological stability and then to classify the abiocomplexes according to expected sensitivity of intensification of the anthropogenic functions.

We can estimate three types of territory, with different availability of the land use:

- Territory, where suppositional measure of sensibility of the intensification of the anthropogenic functions is high and also it is necessary to propose changes for using this territory.

- Territory, where suppositional measure of sensibility of the intensification of the anthropogenic functions is low and also it is not necessary to change using this territory.
- Territory, where the existing type of exploitation is not the best, but suppositional measure of sensibility of the intensification of the anthropogenic functions is negligible. However, application of some arrangement can improve harmony between the exploitation and natural conditions.

Conclusion

In this work was paid attention on the geoecological characteristic of the north part of the cadastral territory Vígl'as. First entrance information is obtained by analysis of the individual parts of physical-geographical sphere. I verified and completed information, which was contained in the existing materials, by the results of the respective detailed surface research. According to the vertical relations between the components were selected homogenous units of topic dimension. These units present the relatively same reaction on the human interference. In regard of this fact was made assessment that shows the degree of danger that can influence the ecological stability, which was used by the optimalization of the spatial land use. This process was based on the comparison of the natural conditions with the way people utilize the territory.

The geoecological works often consist of these three basic parts: physical-geographical analysis, physical-geographical synthesis and application of this information. First we must complete the entering information, if we want to have a good quality of the output. This is the theory, but in the practice it is not always like this.

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