TYPOLOGICAL FEATURES OF LANDSCAPE BY DISTINGUISHING LANDSCAPE TAXONOMIC UNITS

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ABSTRACT

Landscape as a whole of the components around us must be properly explored, analyzed, protected, managed and planned. All of this are necessary to ensure the sustainable (balanced) development of the state, which seeks a harmonious and responsible approach of the state and society to the landscape and spatial planning. Therefore, in this work, the author examines how landscape typological units are distinguished in different areas. Examining the works of different authors, it can be observed that often different and similar features of the landscape are chosen in order to distinguish taxonomic units. Also, even when distinguishing territorial units of a landscape with the same taxonomic level, the features identifying this unit do not always coincide. Therefore, it is necessary to harmonize landscape cognition practices in order to achieve a balanced landscape knowledge. The aim of this work is to contribute to the knowledge of the landscape. To achieve this goal, the following goals were set: 1. To perform literature analysis; 2. To determine the diversity of landscape features by distinguishing landscape typological units; 3. Identify the most commonly used landscape features; 4. To present the classification of landscape features according to the typological units of the landscape. The following methods were used in the work: literature analysis, cartographic analysis, database analysis.

Therefore, in order to harmonize the practices of landscape typological cognition, at first it should be defined which landscape features are considered essential. In other words, it is necessary to clearly distinguish and identify those features that are the most popular and provide the most information about the landscape itself. Thus, the aim of this work is to present the diversity of these features and to present their possible classification depending on the taxonomic units of the landscape to which they are assigned.

Keywords: *Landscape, landscape features, landscape taxonomic level*

INTRODUCTION

Landscape research is needed to ensure the sustainable development of areas. Therefore, the European Landscape Convention has led to more action to get to know the environment around us, thus encouraging states to explore and get to know the landscape in more detail. Although the Landscape as a whole of complexes in Lithuania has been studied since the 20th century the other half. on the other hand, its research was further stimulated by the European Landscape Convention, which aims to "establish and implement a landscape policy aimed at the protection, management and planning of the landscape" [1] as a result of which more different works and methodologies on landscape cognition topics emerged.

Therefore, when examining the works of Lithuanian and some foreign authors, we can notice a tendency to examine the landscape based on its morphological structure [2]. So, in this work the author examines the features of the landscape on the basis of which the boundaries of the typological units of the landscape are distinguished. To achieve this goal, the following goals were set: 1. To perform literature analysis; 2. To determine the diversity of landscape features by distinguishing landscape typological units; 3. Identify the most commonly used landscape features; 4. To present the classification of landscape features according to the typological units of the landscape. Also, it is common to divide landscape it into different taxonomic units of the landscape. For example sections, areas, districts, surrounding and what kind of landscape texnomic unit we traying to separate depends on the size of the area we are trying to get to know. And in order to define the boundaries of these units, landscape features are used. Therefore, this work examines which landscape features are distinguished most often, what is the diversity of these features and how their choice depends on the taxonomic level.

PRINCIPLES OF ASSIGNMENT OF LANDSCAPE TAXONOMIC UNITS

So, first we need to define what we consider to be a landscape in this case. According to Professor P. Kavaliauskas, the "landscape is the natural (surface rocks, ground air, surface and groundwater, soil, living organisms) and / or anthropogenic (archaeological remains, land use, buildings, engineering facilities and information field) components of the Earth's surface related to material, energy and information relations." [2]. This is the concept of landscape that is used in this work as well. Therefore, based on the already presented concept of landscape, we can notice that the landscape is basically a combination of various environmental elements around us and the distinction of these compounds can be observed in the works of different authors [3], [4], [5], [6]. However, how the typological units of the landscape will be distinguished often depends on which concept of the landscape is followed, and what taxonomic rank units the author wants to distinguish (Figure 1). Thus, in this work, the author examined the scientific concept of the allocation of landscape territorial units. So, in this case, depending on the taxonomic rank, it will also depend what features of the landscape we will be able to define. If we are talking about units at the regional level, then we will be able to distinguish between natural and anthropogenic elements of the landscape, and if we are at the local level, we could additionally assess the artistic /emotional elements of the landscape. It should be noted here that the artistic features are based on an understanding of the landscape as an eye-pleasing image [5], [7]. Thus, more features can be emerged at the lower level of the taxonomic unit. So how many

landscape features we can identify depends on what taxonomic rank units we plan to allocate.
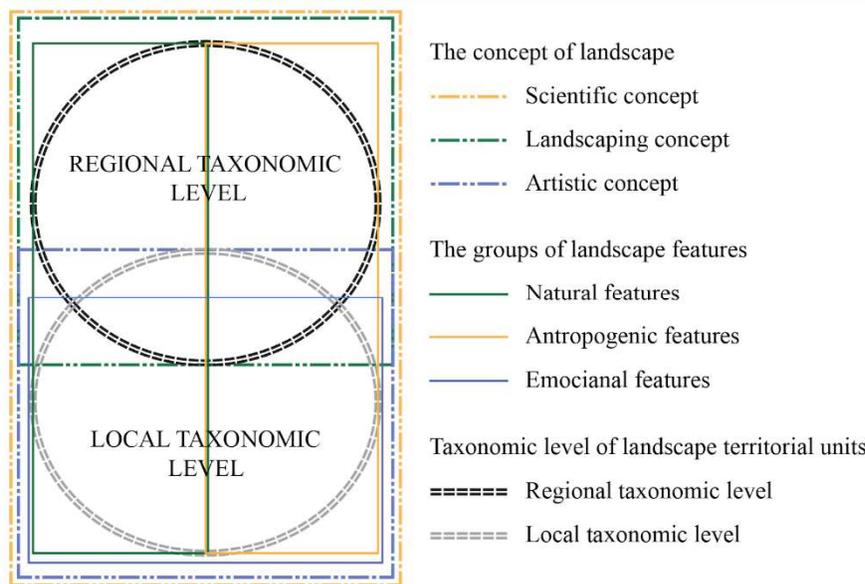
Fig. 1. *Landscape concept scheme. Author of the scheme Giedrė Kurmilavičienė*

LANDSCAPE FEATURES

When allocating landscape taxonomic units, there is often the problem of delimiting landscape boundaries, which often results from unequal selection of landscape features.
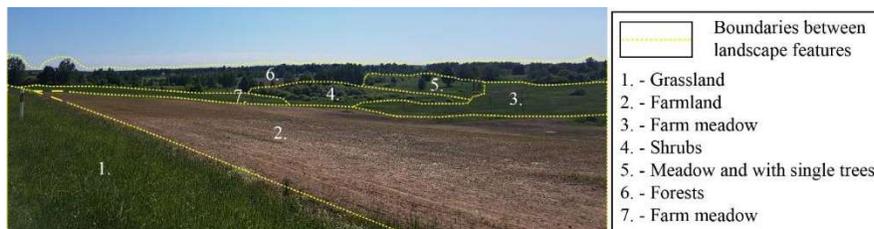
Fig. 2. *Boundaries between different landscape features in Anykščiai district.
Author of the photo and the scheme Giedrė Kurmilavičienė*

Therefore, in order to level the knowledge of the landscape, it is necessary to describe the most common features of the landscape. So, question is what features of the landscape can we distinguish? First of all, we can look very simply and distinguish the boundaries between the visible different features of the landscape and as shown in the figure (Figure 2). However, when examining the works of different authors, we can observe that first of all the features of the landscape should be divided into two groups: natural and anthropogenic [3], [4], [5], [6], [8]. The most commonly used anthropogenic landscape

Table 1. *Anthropogenic landscape features*

Anthropogenic landscape features	
Degree of cultivation	Type of land use
Natural	Forests
Relatively natural	Fields
Cultured	Gardens
Relatively urbanized	Pasture
Urbanized	Built - up areas

components are presented in Table 1. The most common natural landscape components are presented in Table no. 2. There are also works that include a visual assessment of landscape perception, one of which could be considered the work of the Institute of Observatory of Catalonia and their work Landscape catalogues of Catalonia [6]. Thus, the frequency of the choice of landscape features depends on the author of the work and his team experience.

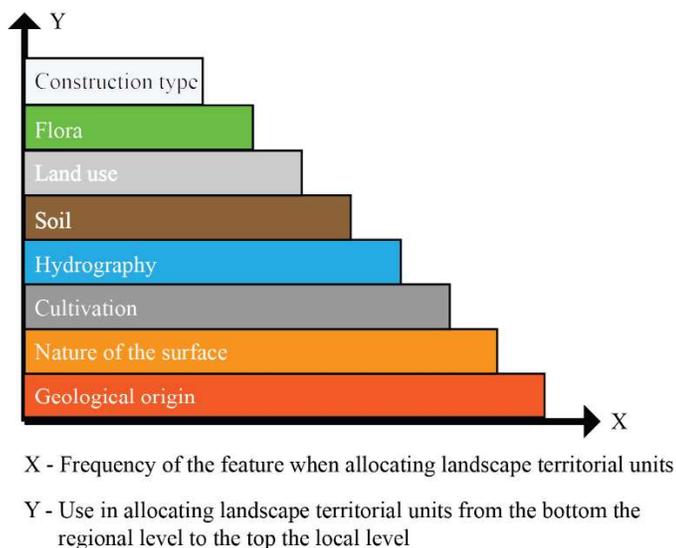**Table 2.** *Natural landscape features*

Natural landscape features					
Nature of the surface	Ground	Geological origin	Hydrography	Soil	Flora
Hills	Clay	Glacial	Density of lakes	Velėniniai	Spruce
Waves	Sandstone	Fluvioglacial	Density of swamps	Jauriniai	Pines
Ridges	Sand	Limnoglacial	Density of rivers	Pelkiniai	Oaks
Valleys	Pebbles	Erosive			Willows
Plains	Peat	Aeolian			

THE USE OF LANDSCAPE FEATURESIN THE ALLOCATION OF TAXONOMIC UNITS
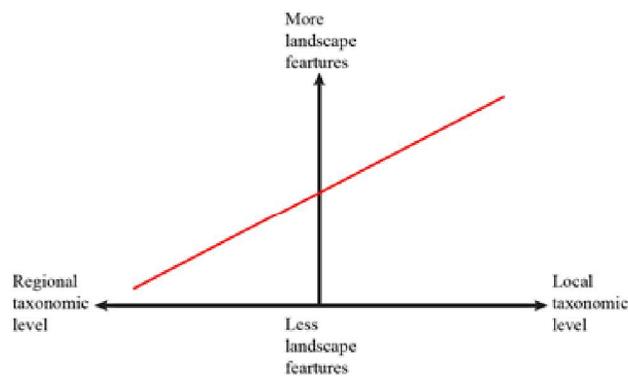
Fig. 3. *Dependence of landscape features on taxonomic level. Author of the scheme Giedrė Kurmilavičienė*

Thus, when distinguishing landscape taxonomic units, the authors' works show a tendency for fewer features to be chosen when assigning higher taxonomic units, for example, when distinguishing landscape areas, geological origin, orography andnaturalness are identified. Meanwhile, when allocating landscapes, geological origin, orography, naturalness, land use, flora are chosen for landscape features [3], [4], [5], [6], [8], [9], [10]. So in many cases, depending on what taxonomic level the units will be separated will depend on how many features of the landscape we will be able to identify. As you can see in the image (Figure 3), the more landscape features we try to use when allocating landscape territorial units, the lower the taxonomic level of territorial units will be and vice versa the higher the taxonomic rank, the fewer landscape features we can use. And finally, examining the works of different authors, it becomes clear that certain features of the landscape are used regardless of the taxonomic rank of the units assigned, and that would be: geological origin, nature of surface, cultivation, hydrography. And some features are devoted to examining the landscape in great detail at the local level. Typically, such landscape knowledge is done to ensure proper site planning or to identify the most valuable sites. Thus, the more detailed information about a landscape is identified by a landscape feature, the lower the taxonomic range will be used, but this does not mean that, in exceptional cases, features such as land use will not be used to allocate units at the regional level. And figure 4 (Figure 4) also depicts the relationship between the taxonomic rank and how often a particular trait is used to distinguish it.

X - Frequency of the feature when allocating landscape territorial units

Y - Use in allocating landscape territorial units from the bottom the
    regional level to the top the local level

Fig. 4. *The popularity of landscape features use to distinguish different taxonomic levels. Author of the scheme Giedrė Kurmilavičienė*

Identifying landscape features to whom and when they are used is difficult, but we can see regularities and dependencies that the more we can summarize landscape features, the higher the taxonomic range we can use them, and the more landscape features we choose, the smaller the taxonomic rank units we allocate.

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CONCLUSION

The different practices in distinguishing landscape taxonomic units in the works of different authors leads to problems of landscape concept and uncertainty of landscape boundaries.

The landscape features chosen by different authors for taxonomic units often depend on the authors' experience, the concept of the landscape, the taxonomic level of the landscape, and sometimes the desire to emphasize the uniqueness of the landscape in certain areas therefore, expert judgment is required at this time for the allocation of landscape taxonomic units.

In order to ensure a uniform level of landscape zoning and spatial planning documents, it is necessary to define the specific features of the landscape used to designate specific taxonomic units of the landscape and thus to reduce the differences between the levels of knowledge of the landscape.

ACKNOWLEDGEMENTS

REFERENCES

[1] European Landscape Covention, 2001

[2] Kavaliauskas P., Kraštovaizdžio samprata ir planavimas, Book, Vilnius, 2011, pp 5- 176

[3] Lūkins M., NikodemusO., Peneze Z., Rendenieks Z., Vinogradovs I., Zarina A., Ainavas. Kn. Latvija. Zeme, Daba, Tauta, Valsts, Book, Ryga, 2018.

[4] Oja T., RaukasA., Kaska I., Rooma I., Jago L., Raagmaa H., Kull A., Aunap R., Alumae H., Eesti maastikud, Book, Tartu, 2005.

[5] Nogué J., Sala P., Prototype Landscape Catalogue, Book, Barselona, 2006.

[6] Kavaliauskas P., Lietuvos nacionalinių ir regioninių parkų morfostruktūros analizė kraštovaizdžio geografijos aspektu: 1. Metodologija, Geografijos metraštis, Vilnius, 2019

[7] Kavaliauskas P., Kraštovaizdžio grožio pažinimo ir apsaugos problema teritorinėje aplinkosaugoje. Kraštovaizdžio architektūra – profesijos horizontai ir sinergija, Kraštovaizdžio architektūros forumo mokslo darbai, Vilnius, 2015, pp 162-177.

[8] Veteikis D., Problem of distinguishing and classification of landscape technotopes (on the example of Lithuanian territory). Ekologia, Bratislava, 2006, pp 240-247.

[9] Vaitkevičius E., Kraštovaizdžio morfologinių apylinkių skyrimo problemos.

[10] Geografija, Vilnius, 1992, pp 48 – 56.

[11] Jones H., 2009. Methodology for Nottinghamshire Landscape Character Assessment. Nottingham. Nuskaityta iš Nottingham.