

CHANGES OF THE LANDSCAPE WITH DISPERSED SETTLEMENT

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Abstract

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The aim of this work is to characterise changes in mountain landscape with dispersed settlements. Dispersed settlements are one of the unique features within landscape structure of Slovakia. Character and genesis of these habitation forms was conditioned by a specific non-repetitive social situation. We studied following settlements in the region of the Upper Žitava river: Jedľové Kostofany, Malá Lehota and Veľká Lehota. These 3 rural communities are formed around their centres and also by 31 other more or less remote parts called "štále". We prepared analysis of the land use and population of the studied territory. In the research area we noticed dynamics of land use changes from 2 time periods (years 1956 and 2002).

Key words: dispersed settlement, landscape structure, land use, house found

Introduction

Landscape, natural or cultural, is under constant development, undergoes changes and it is difficult to indicate a constant state in it. We characterise landscape as a complex of all natural and cultural elements and a dynamic spatial system of natural and socio-economical features related to land cover. In landscape we define primary, secondary and tertiary landcover structure (Ružička, Miklós, 1982; Miklós, Izakovičová, 1997; Ružička, 2000). The secondary landscape structure (SLS) reflects characteristic physiognomic landcover elements that reflect a specific arrangement. It is created by natural complexes influenced by men and by partially or totally transformed dynamic systems as well as by newly created artificial elements (Ružička, Ružičková, 1973) or components (Forman, Godron, 1993). In relation to the SLS – (current state in definite time horizon) is SLS more general term. CLS (current landscape structure) is expressed by internal and external relationships among landscape elements, ecological factors (Ružička, 2000) and human activities resulting in to landscape elements. On their complex cognition and analyses is based each landscape-ecological research (Pucherová et al., 2001; Boltížiar, 2002, 2003; Dobrovodská, 2002).

Methods

Analysing and determining of landscape structure elements were done in accordance with LANDEP methodology (Ružička, Miklós, 1982; Ružička, 2000), where landscape elements were detailier differentiated according to specific features of the study area and the objectives of the work.

Thematic mapping is realized by the GIS "on screen" technique. Individual topographic maps and orthorectified air photos transformed into the standard cartographic projection of national topographic maps were used as the base for analyses. The result of the thematic mapping was verification with the terrain research and two interviews with local experts and inhabitants. The demographics data were compiled from statistics yearbooks and from terrain research in the settlements.

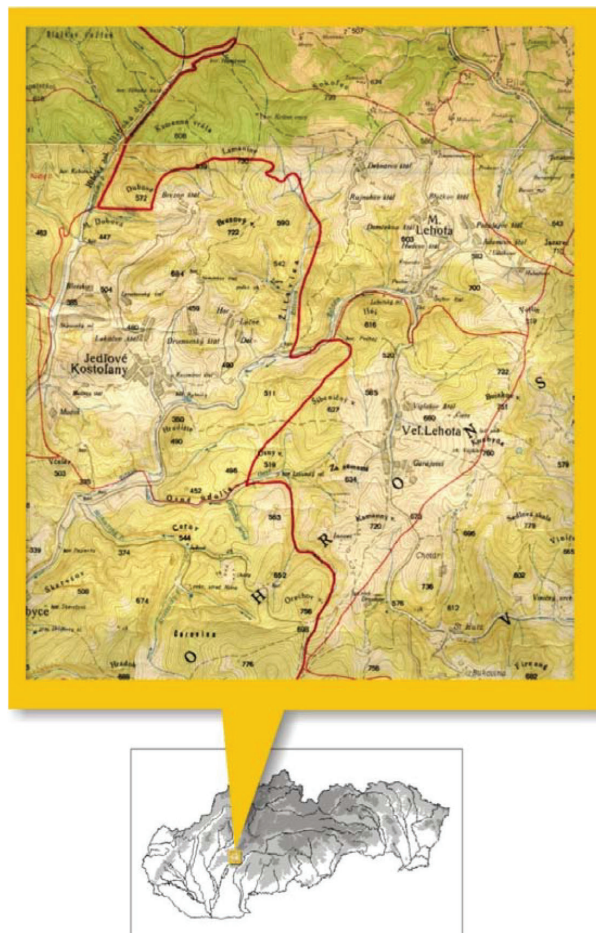


Fig. 1. The location of the study area.

Characterisation of the study area

The study area is represented by these settlements (Fig. 1): Jedlové Kostofany (Fig. 2), Malá Lehota (Fig. 3) and Velká Lehota located on the NW boundary of the Protected Landscape Area Ponitrie. Total area of the settlements is 6874.9 ha and the altitude range from 317 up to 815 m above the sea level.

Fig. 2. Cherry tree plantation from 50s of the 20th century is the dominant element in the neighbouring of the Drienovský štál (Jedlové Kostofany village).



Fig. 3. Debnárov štál, one of settlement parts of the Malá Lehota village creates compositionally balanced mosaic of meadows, abandoned pastures and small fields.



The settlements are located in the central part of the Slovakia. Jedľové Kostofany belongs to the Zlaté Moravce district situated in the east part of the Nitra country. Malá Lehota and Veľká Lehota belong to Žarnovica district situated in the most west part of the Banská Bystrica country. The location of the settlements on the district boundary and on the county boundaries (Nitra, Banská Bystrica) classified them among marginal areas from the aspect of their social-demographic relations (Fig. 3).

According to the geomorphological classification of the Slovakia (Mazúr, Lukniš, 1978) the research area is located on the contact of two different geological-geomorphologic regions: Slovenské stredohorie (Pohronský Inovec Mts unit) and Fatra-Tatra region (Tríbeč Mts unit), sub province of the Inner Western Carpathian. Common feature of these settlements is their categorization to areas with dispersed settlements.

Dispersed settlements

Dispersed settlements (DSs) in Slovakia present an autonomous demonstration of socio-economical activity preconditioned by specific natural and historical terms. DSs emerge as a product of the youngest colonial wave in our territory and its genesis was spatially and temporary considerably differentiated (Huba, 1989). "Kopanice" are a specific example of soil exploitation and simultaneously a specific type of a settlement (Janšák, 1967). They emerge in a specific historical period, in which social poverty forced a part of population cultivated and settled in mountainous areas with suitable soils.

The first references about number of the villages with the dispersed settlements come from Janšák (1929), who identified 132 villages with 2176 parts. In 1961, in Slovakia, were 166 villages with dispersed settlements with 2899 dispersed parts, on the area 4640 km² (Sitár, 1967), what represented 9.46% of the Slovakia. Increase in number of villages and a dispersed settlement is probably a result of a not accurate setting in 1929 and not as a result of new villages formation. In the present time, formation of new villages with dispersed settlements is unreal, not at all from a perspective of new agricultural soil needs. Formerly, a tendency of declination and extinction of dispersed settlements prevails (Lauko, 1999; Lauko, Nemček, 1998; Spišiak, 1997, 1998, 1999).

The basic function of the dispersed settlements was soil cultivation at the marginal areas (Sitár, 1967). In the last years these areas decline (Bleha, Mládek, 2004). One way how could be this problem solved is to develop tourist activities and travelling or to change these settlements to objects of second housing (cottages) (Bičík et al., 2001; Olah, 2003a,b).

In Slovakia, there are five regions with dispersed settlements. The research area belongs to the dispersed area of the Nová Baňa region. The dispersed settlements in this region were formed mostly with relation to mining, woodcutter, charcoal burner, carman, glass manufactory and pasturage activities (Petrovič, 2002a,b). Stránská (1966) defined the term "štále" within the context of the terminology of German inhabitants from the middle Slovakia, who came in to this region in the period of mine development, in the 14th century. The German people called their seasonal residences as "stande" and also Slovak "štále" were in the beginning only seasonal residences.

The land use changes

The landscape patterns in the form of mosaic land use were developed under influence of two significant factors: type and accessibility of natural resources and dynamic of the demographic processes. These two factors are immediate connected with the network of the economic, ecologic, social and cultural components.

Type and accessibility of natural resources

The components of the SLS are perceived as construction elements of the landscape mosaic and also as natural resources, used and changed by people with result in forms of different landscape patterns. In the research area we can present dynamic of these changes on the bases of land use analyses in two time horizons. The changes interpretation were realised on the bases of military (scale 1:25 000) and topographic (scale 1:10 000) maps. Apart from maps also accessible historical documents and time photos were used. The best base for details of the SLS components was a colour air photo in a big scale. In confrontation of time horizons we considered the basic groups of landscape elements.

The data from two time horizons were compiled with support of GIS – ArcView 3.1 and subsequently the area changes were compared. In the landscape, we select on the first level eight basic groups of the landscape elements. These groups were divided in to 43 subcategories of the landscape elements and these subcategories for better interpretation was divided in to 74 individual landscape elements. Table 1 documents changes in the expansion of the basic groups of the landscape elements and from this arise a shift towards less intensive land use. This phenomenon is connected with change of land use intensity after 1989, when important changes in land used started. This concerns especially changes of arable lands and grasslands, where visible decrease of the area exist. Noticeable is in-

Table 1. Land use changes in the years 1956 and 2002

Settlements	Jedlové Kostofany		Malá Lehota		Velká Lehota	
	1956	2002	1956	2002	1956	2002
Groups of land use elements (ha) / years	1956	2002	1956	2002	1956	2002
Elements of forest and non-forest tree vegetation	1336.66	1756.61	1211.83	1345.57	834.13	1000.56
Elements of grassland vegetation	778.18	664.92	583.76	589.87	561.48	493.38
Elements of agricultural plantations	505.27	199.20	376.18	241.38	348.51	270.83
Elements of bedrock and substrate	0.33	1.81	3.16	5.48	0.24	0.38
Elements of water courses and water bodies	10.05	8.96	10.54	10.64	6.85	7.12
Elements of urban and recreational areas	57.01	44.35	63.37	48.53	85.15	47.89
Elements of technical structures	0.41	4.64	0.00	4.64	0.00	4.72
Elements of transportation	41.49	49.38	34.79	37.52	25.53	37.01
Together [ha]	2729.37	2729.37	2283.63	2283.63	1861.89	1861.89

T a b l e 2. The number of inhabitants of the settlements Jedřové Kostofany (JK), Malá Lehota (ML) and Veřká Lehota (VL) in the years 1869–2000

Settlements/years	1869	1880	1890	1900	1910	1921	1930	1940	1950	1961	1970	1980	1991	2000
Number of inhabitants JK	1087	1008	999	1127	1186	1534	1490	1433	1350	1701	1580	1378	1108	1028
Number of inhabitants ML	818	773	939	1054	1309	1389	1536	1702	1417	1805	1667	1399	1244	1052
Number of inhabitants VL	652	651	700	714	968	1063	1104	1236	1130	1649	1615	1533	1346	1297

T a b l e 3. The growth index of the settlements Jedřové Kostofany (JK), Malá Lehota (ML) a Veřká Lehota (VL) in the years 1869–2000

Settlements /years	1880	1890	1900	1910	1921	1930	1940	1950	1961	1970	1980	1991	2000
Index of growth [%] JK	92.73	99.10	112.81	105.23	129.34	97.13	96.17	94.20	126.00	92.88	87.21	80.40	92.77
Index of growth [%] ML	98.49	125.35	112.24	124.19	106.11	110.58	110.80	83.25	127.38	92.35	83.92	82.98	90.61
Index of growth [%] VL	99.84	107.52	102.00	135.57	109.81	103.85	111.95	91.42	145.92	97.93	94.92	88.92	84.56

crease in forest and non-forest tree vegetation area, what is associated with land use changes of grasslands and meadows in the forest land area. Other reason is change of land use intensity after 1989 that led in to extinction and depression of agricultural enterprises.

Demographic processes

In the area with dispersed settlements we notice except changes in representation of the landscape elements also changes in demographic indicators, which indicate the trend of qualitative and quantitative landscape changes. The sources for analyses of demographic changes we used statistical data – Census of people (Table 2), which were completed with own terrain research.

Economy changes and subsequently changes in the whole society influenced mainly by transformation of the economic system in the last years were reflected in urban and especially in rural areas. The concentration of industry in to cities and subsequently decrease in economic base in rural areas cause outflow mainly of young rural people with consequence in ageing and dying out of these villages. Among these villages are also research area villages. Dynamics of the people in the period of 1869–2000 documents Table 2 and Table 3 (ŠŠÚ 1978, ŠŠÚ 1984, ŠÚ SR 1994).

Dynamics in number of inhabitants of the villages has common growth tendencies. The decrease in 1880 is possibility to explain as a result of the Austria–Hungarian compensation in 1867, which caused stronger Hungarian repression and that caused certain emigration. Since this year the number of inhabitants in Malá Lehota and Veľká Lehota started to increase (in Jedľové Kostofany was a small decrease), and in the Veľká Lehota culminated in the year 1961 (with one exception 1940). Interesting fact is that number of inhabitants in all villages was increasing, as before as after the First World War, besides in the Jedľové Kostofany was in 1921 the maximum growth index of this village 129.34%. The decrease of number of people in Jedľové Kostofany came in 1930 and continued till 1950. This decrease appeared also in Malá Lehota but later, in 1950, as a result of the Second World War and mostly by loss of men population. Interesting situation was in 1940, when in Malá Lehota and Veľká Lehota quite intensively increased the population. The relatively good distance from the areas endangered by war influenced this state. Maximum number of the inhabitants culminated in all the villages in 1961, when Malá Lehota and Veľká Lehota reached maximum values of the growth index (ML – 127.38%, VL – 145.92%, JK – had second highest value in the history 126%). Growing number of inhabitants was preconditioned by starting the factories Calex, Závody 29. augusta in Zlaté Moravce, but also factories Kveta, Izomat and Drevorob in Nová Baňa. Other positive moment that influenced growing number of the people represented pronatal proceedings of the government. From 1970, in all villages started decrease of number of the people, that reached its top in Jedľové Kostofany and Malá Lehota in 1991 (the growth index in JK – 80.4% and ML – 82.98%), in Veľká Lehota was shifted in the year 2000 (the growth index 84.56%). The decrease of the population in Jedľové Kostofany was influenced by building restriction valid from 1970 to 1990. Veľká Lehota, the smallest village in 1961, has nowadays approximately of 150 inhabitants more than other two villages. This situation is probably influenced with smaller number dispersed settlements of this village and with higher concentration of inhabitants and services in centre of the village.

Results

One of potential solutions how to preserve at least the current state is to use the rural areas for travelling/tourist activity. The rural settlements could be considered as recreational areas with special attributes creating conditions for filling needs and requirements of rural tourist activities. The possibility of rural areas to profit from travelling activities is determinate by existing infrastructure and ability to fill requirements of tourist. Rural settlements are connected with agricultural production. In the last years, there is possible to see some new trends in travelling activities. A main one is shift from package holidays to individual holidays in original landscape, knowing traditions and folklore and also interest in new alternative forms of agriculture – agro tourist activity.

In the research area is developing a special form of tourist activity – dispersed settlements are becoming weekend/seasonal cottage areas. This activity started in the 90-s last

century, but it intensified only in the recent years. These reflect in number of non-permanent residences houses, from which 3/4 serve as cottages. The number of the non-permanent residence houses changed from 316 in 1991 (ŠÚ SR, 1994) of 65% to 522 in 2001 (Table 4). Also number of inhabitants is relatively stable (in the year 1991 – 3538 inhabitants, in 2001 – 3318 inhabitants). Decreased number of non-permanent residence houses is evident sign of change. Up to 32.8% of houses in the research villages are non-permanent residences. Favourable localisation in tourist attractive not disturbed landscape, in mosaic of meadows, pastures and forests causes increase in short-term recreation and subsequently shift from house found towards cottages. As a proof of previous claims (a shift from mass tourism to individual weekend/seasonal cottages) is a finding that up to 65.70% of the non-permanent residence houses are located in parts with dispersed settlements - štále (Table 4). The centres of the villages are intensively used. The positive element of this change is that in majority the original architecture was preserved. This could positively influence perception of the landscape by perspective visitors.

T a b l e 4. State of the house fond and inhabitants in the years 1991 and 2001

Settlement/ years	Number of non-residential houses in the village		Number of houses in the village		Number of inhabitants in the village		Number of non-residential houses in the separated parts	Number of houses in the separated parts	Number of inhabitants in the separated parts
	1991	2001	1991	2001	1991	2001	2001	2001	2001
Jedřové Kostofany	167	214	539	551	1089	1037	147	213	163
Malá Lehota	86	197	456	531	1161	1052	165	390	654
Velká Lehota	63	111	481	509	1288	1229	31	54	68
Together	316	522	1476	1591	3538	3318	343	657	885

Summary

According to Ofaheř, Feranec (1995), analyses of changes in landscape are very important for assessment of natural and socio-economic processes and their dynamic, causes and stability of present state of the research area and mainly for predicting potential trends of future development. Any time-space change in the landscape structure reflects back and influence matter and energy flows as well as other attributes and characteristics of the landscape (Lipský, 2000).

Process of continues dying out of inhabitants of these settlements seems to be inevitable. The research area as a part of the area with dispersed settlements has some specific cultural, historic and natural values, which reflects life and activities of people under heavy mountain conditions. For settlement foundation played important function natural conditions and mainly geo-relief. Generally, the settlements were founded on evened out river

surface level and middle mountain level. Some houses used leeward places in depressions of peri-glacial modelled spring valley areas or in peripheral parts of distinctive elevations.

In the contribution we wanted to highlight function of detail mapping of present land use in a context of demographic changes in the area, which belong among peripheral regions with semi-intensive land use. The important phenomenon of the research area, in comparison with others regions with dispersed settlements, is that in large scale elements of original historic landscape and the landscape image were preserved. On the research area, in spite of collectivisation prevails using of small patches of meadows, pastures and arable lands. This is a positive condition from a perspective to use the research area in context of principles of sustainable development.

The region keeps its cultural-historic potential by keeping local traditions and folklore – piper traditions by organizing international festivals, folklore singers bands and similarly. In the research area is located a fragment of the Middle Age tower – “Živánska tower” from the end of the 14th century. Preserved historic elements of land use with high degree of perception and landscape image is also supported by fact that a part of the research area belongs to the Landscape Protected Area (PLA) Ponitrie and its protected zone.

Keeping on the present development tendencies could lead in to extinction of this specific form of settlement. This is the reason why to pay attention and search for solutions how to preserve these historic landscape structures, which create dominant elements of the landscape structure in these regions.

Conclusions

The aim of this work is to characterise changes in mountain landscape with dispersed settlements. Dispersed settlements are one of the unique features within landscape structure of Slovakia. Character and genesis of these habitation forms was conditioned by a specific non-repetitive social situation. We studied following settlements in the region of the Upper Žitava river: Jedľové Kostofány, Malá Lehota and Veľká Lehota. These 3 rural communities are formed besides their centres also by 31 other more or less remote parts – “štále“. We prepared analysis of the land use and population of the studied territory. In the research area we noticed dynamics of land use changes from 2 time periods (years 1956 and 2002). Data from these periods were processing by means of Geographical Informational System (GIS) – ArcGis 8.3. The analyses of the demographic characteristics indicate qualitative and quantitative changes, bounding to spill the territory. The study area, as the territory with the dispersed settlement, has original cultural, historical and natural values that reflect the life and activities of the people in the difficult mountain conditions. Process of gradual waning of the permanently living people is irreversible. The present development tendencies can result into destruction of these original elements of the historical landscape and settlement structures, and therefore we should pay attention on their maintenance.

Translated by the author

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Petrovič F.: **Zmeny krajiny s rozptýleným osídlením.**

Cieľom práce je charakterizovať zmeny v krajine s rozptýleným osídlením. Rozptýlené osídlenie je špecifický prvok krajinej štruktúry Slovenska. Charakter vzniku a vývoj tejto špecifickej formy osídlenia podmieňovali osobitné spoločenské a sociálne podmienky. Záujmové územie tvoria katastre obcí Jedľové Kostoľany, Malá Lehota a Veľká Lehota. Tieto tri obce sú popri centra obce zložené z 31 samostatných častí – štálov.

V práci prezentujeme dynamiku zmien krajinného využívania územia v dvoch časových horizontoch (rok 1956 a 2002) a analýzu vývoja obyvateľstva. Dynamiku zmien krajinného využitia sme spracovali s použitím Geografických Informačných Systémov (GIS) – ArcGis 8.3. Analýza demografických charakteristík indikuje kvalitatívne a kvantitatívne zmeny vedúce až k postupnému vymretiu územia. Proces postupného vymierania trvalo bývajúcich obyvateľov štálov sa zdá neodvratný. Prezentovaná kopaničiarska oblasť má niektoré svojrázne kultúrne, historické a prírodné hodnoty, ktoré sú odrazom života a aktivít človeka v náročných horských podmienkach. Pri súčasných vývojových tendenciách však môže dôjsť až k zániku tohto špecifického osídlenia a preto by sa mu mala venovať zvýšená pozornosť a hľadať riešenia na zachovanie týchto historických krajinných štruktúr, ktoré v týchto regiónoch tvoria dominantné prvky krajinej štruktúry.