

DEVELOPMENT OF VINEYARDS LANDSCAPE STRUCTURE WITH REGARD TO HISTORICAL AND CULTURAL VALUES

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Abstract

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The vineyards of almost a thousand years ago formed landscape structures and images of the Slovak countryside. This paper deals with vineyard structural developments in the Nitrianske Hrnčiarovce cadastre in the Nitra viticulture region. Herein, vineyards existing in 1896 are compared with those of 2010. This Cadastre's currently contain 991.33 hectares. Vineyards have been classified into five area groups. There are 554 parcels of vineyard covering 117.86 hectares (11.89% of all cadastre), and of these 53.07% or 294 plots, comprise small mosaic vineyards of less than 500 m². While the northern and eastern parts of the village have retained a well preserved historical vineyard structure regarding shape and area, the southern part now has large modern vineyards which were established during the 1970's. Space analysis of historical maps and aerial photos has documented the high cultural value of the vineyard's structure which is also enriched by specific fruit trees of the archeophyte group.

Maps of the vineyards' structural development authenticate the contents of this paper.

Key words: vineyard structure, historical value of vineyards, Nitrianske Hrnčiarovce

Introduction

The vine is one of the oldest cultural woody climbing plants in Europe and Asia. From 70 original wild natural species, almost 40 species of *Vitis* genus were selected and introduced to plant culture. The most cultivated has been *Vitis vinifera*, L. subspecies *sativa*, which has been subdivided into the three groups of *proles occidentalis*, *proles orientalis* and *proles pontica*.

The first vineyards in Slovak territory were planted by the Celtic population near Štúrovo in 500s B.C. The vine grain seeds were identified on the Molpir hill near Smo-

lenice and in the Mlynárce village near Nitra in 400–500 B.C. (Libant, 2009; Verešová, 2008).

According to historical documents, the highest vineyard areas in Slovak territory were inventoried in 1720, and these accounted for 57,000 ha. Vineyard area developments had the following trends since that time (1) 1870s – 40,000 ha, (2) 1920 – 8,800 ha, resulting from a phyloxeral attac, (3) 1937 – 14,700 ha, (4) 1945 – 12,000 ha, (5) 1956 – 16,000 ha, (6) 1978 to 1992) – 32,000 ha, (7) 1999 – 26,000 ha and (8) in 2008 – 21,477 ha, but only 16,439 ha were actively managed.

Currently, the European Commission has approved Slovakia vineyard planting rights of 22,227 ha (Libant, 2009; Farkaš, 2002; Jureková et al., 2005). The vine-growing area is divided into 6 vineyards regions, 40 zones and 624 settlements or cadastral territories. In 2008s the vineyard area distribution within regions was the following: the South Slovakia region had 28%, the Small Carpathian region had 27%, the Nitra region, 19%, Central Slovakia had 11%, Eastern Slovakia had 8% and the Tokaj region had 7%. Although the Slovak territory has 3542 cadastres with a 1384 ha average area of vines, grape growing is allocated to only 624 cadastres. In summary, this means that vineyard areas cover a very important part of the landscape structure and land use forms in Slovakia (Bernáth, 2008).

The proportion of vineyards by area in cadastral territories is variable and the following percentages apply : Sv. Jur cadastre – 29% (Štefunková, Cebecauer, 2006), Modra almost 30% (Suchý et al., 2008) and in Nitra and adjacent cadastres, e.g. Hostřová, Pohranice and Štitáre, from 6 to 14% (Pucherová, 2004). Although the mean area of vineyard parcels before agriculture intensification was only 0.45 ha, since agricultural cooperatives have been established this figure often reached more than 30 ha (Suchý et al., 2008). Overall, the size of these parcels depends on ownership relationships and the intensity of vine-growing.

In Slovakia, vineyards have always formed the landscape scenery and character. Small and/or large area vineyards have a designed mosaic landscape structure and are important elements of visual landscape perception (Antrop, Van Eevelde, 2000; Ořahel, 2003; Štefunková, Cebecauer, 2006). From a historical viewpoint, their areas often changed due to natural and social economy deviations and also because of vine disease. Currently, the space composition and inner vineyards structure are continually changing under the influence of new vine-growing technologies and management. Developing changes have affected individual vine-regions differently, and now only some retain historical vineyard type landscape structures in Slovakia and over its borders. (Antrop, Van Eetvelde, 2000; Huba, 2000; Supuka, Verešová, 2009). Janota (1968) suggested that the Malé Karpaty territory surrounding the capital city of Bratislava be declared a protected study area, because it has a specific vineyard cultural landscape type and vines have been cultivated there since 270 B.C. Currently, especially in Europe, a new form of viticulture and viniculture has emerged based on the history of vine-growing and wine-production. There have also been created so called “vine-routes” and/or “king routs” which have cultural, education, oenology and recreation functions. In Slovakia, 10 such wine-routes are currently being designed (Bihuřová et al., 2010; Otepka, Habán, 2007).

Material and methods

The aim of this paper is to assess the area structure and space distribution of vineyards in the cadastral landscape unit of Nitrianske Hrnčiarovce and comparisons are investigated between 1896 and 2010.

Characteristics of the study area

The natural conditions of this study area are described according to Hreško et al. (2006). The cadastral territory of Nitrianske Hrnčiarovce is on southern slopes of the Tribeč mountains in the Zobor geomorphologic division of Nitra district. The two settlements were in close neighbourhood and were joined together as one settlement from 1970 to the 1990's. Nitrianske Hrnčiarovce village is situated at an altitude of 154 to 617 m a.s.l. and the terrain inclination is from 6° to 14° north to south, and the bedrock is formed by Neogene and Quaternary sediments. The soils are sandy-loam and loam and these are permeable with medium fertility. This territory has a moderately warm to warm climate, with an average annual temperature of 9 °C and 650 to 700 mm precipitation. Existent plant communities are of Western Carpathian floral type with a transition to Pannonia xerotherm flora while the natural vegetation creates oak-hornbeam Carpathian forests. Nitrianske Hrnčiarovce's development as a settlement was first described in Zobor documentation from the year 1113 as the villa Grincha. This village initially belonged to Nitra Castle and later to the Zobor monastery (Pucherová, 2004). The cadastral territory is within the Nitra vineyard region (Bernáth, 2008).

Aims and evaluation content

Nitrianske Hrnčiarovce's population have cultivated vines for an extremely long time, at least since the time of Nitra's principality. The main reasons for this were the proximity to Nitra's cultural, governance and church centre and the favourable climatic conditions. Vine-growing there belonged to historical economy activities and to land use forms, with a minimum thousand year tradition. Its continuous development is reflected in its representative historical landscape structure and its image. The aim of this paper is to assess the space and area of vineyard structures according to parcel size in the two time periods of 1896 and 2010.

The landscape structure and the land use form of vineyards in cadastral area parcels are established by means of the following maps. (1) The historical landscape structure in 1896 was taken from land register map sheets, originally in a scale of 1:2 880 and documents were provided by the Institute of Geodesy and Cartography in Bratislava. The map sheets were geo referenced in Arc GIS 9.x media and the parcel boundaries and areas were vectorised. and (2) Contemporary landscape structure in 2010 was taken from the vectorised cadastral map provided by the Cadastre Administration in Nitra. Dates were converted to Arc GIS media and the parcel areas were determined through classification of 5 area size. Aerial photos for visual landscape structure introduction were provided by TOPU Banská Bystrica which was valid in 1949 and EUROSENS Bratislava, valid in 2010.

Results

Contemporary space and area of vineyard structure in the assessed cadastre

The nature potential, together with historical and current development of socio-economic activities in Nitrianske Hrnčiarovce cadastre leading to the contemporary landscape structure in 2010 is shown in Fig. 1, and the representation of landscape elements according to category can be seen in Table 1. Space and area interpretation shows that vine - growing tradition has historical roots and time continuity in the evaluated territory. Vineyards

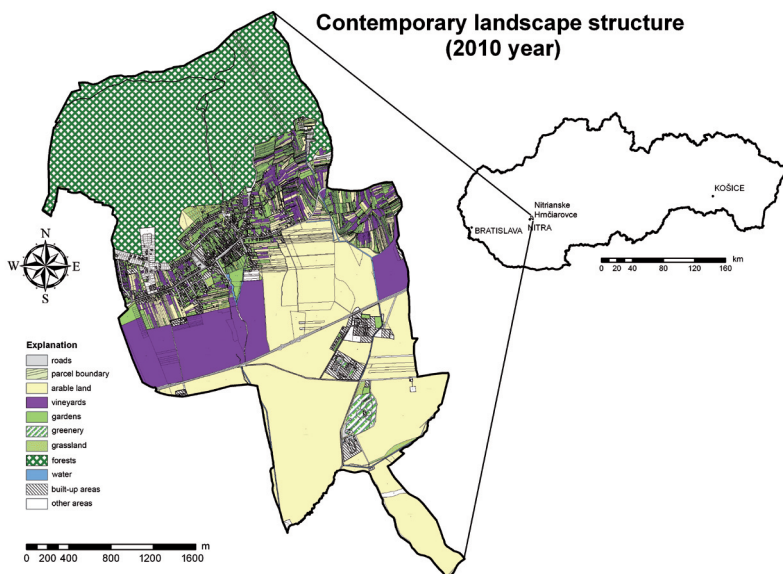


Fig. 1. Contemporary landscape structure of Nitrianske Hrnčiarovce cadastre, 2010 year.

Table 1. Secondary landscape structure of Nitrianske Hrnčiarovce cadastre, 2010 year.

Landscape elements	Area [ha]	%
Roads	30.7374	3.10
Water	6.9211	0.70
Other areas	23.3298	2.35
Arable land	355.9652	35.91
Greenery	9.3960	0.95
Built-up areas	49.2182	4.96
Grassland	12.5246	1.26
Gardens	67.3623	6.80
Forests	318.0182	32.08
Vineyards	117.8615	11.89
Σ	991.3343	100.00

represent an important proportion of permanent agricultural elements covering 117.86 ha and 11.89% of land use forms. This indicates that the vineyard area takes up almost one third of forest area covering 310.02 ha (32.08%) and one third of arable land area at 355.96 ha. This accounts for 35.91% of cadastral land cover. Vineyards as landscape elements hold third place in land usage.

Table 2. Area vineyard parcels according to size categories.

Category	Area [m ²]	Number of parcels	Area parcels together [ha]	%
1	< 500	294	7.9891	6.78
2	500–1000	164	11.5263	9.78
3	1000–5000	88	14.8242	12.58
4	5000–10 000	1	0.7580	0.64
5	> 10 000	7	82.7639	70.22
Σ		554	117.8615	100.00

There are 5 size categories for vineyard structure assessment according to parcel area size as shown in Table 2.

The highest number of vineyard parcels at 53.07% fall within the first area size category up to 500 m². However, these are the second smallest group with regard to the total parcel area, comprising only 6.78%. Although there are only 7 parcels in the highest area category of more than 10 ha, their area is 82.76 ha which is 70.22% of the total vineyards' area. The first and last area size groups of vineyard parcels are presented on the map in Fig. 2 which depicts space distribution of those area categories of vineyards. Space distribution determination criterion appears to depend on the parcel location in relationship to the settlement and slope inclination. The first two area categories of under 500 m² and 500–1000 m² are allocated inside the village built up area as parts of garden plots of family houses. Adjacent spaces to the village are located on steeper slopes and less fertile soils. The highest area

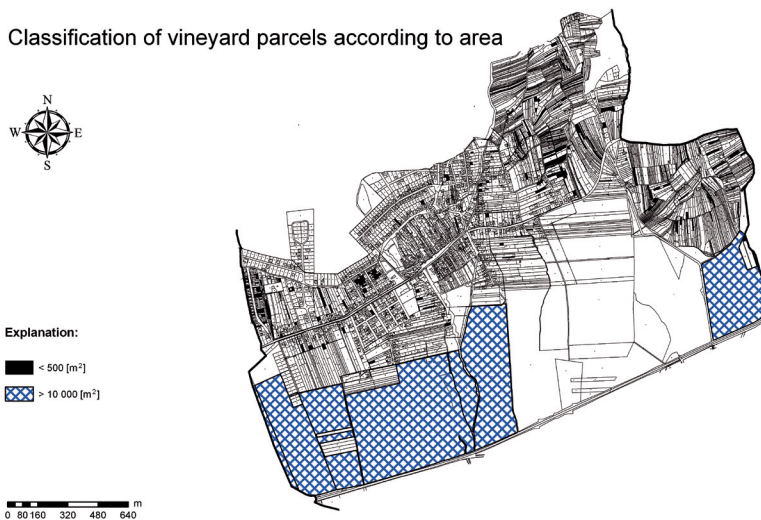


Fig. 2. Space distribution of vineyard parcels according to two size categories, < 500 m² and > 10 000 m².

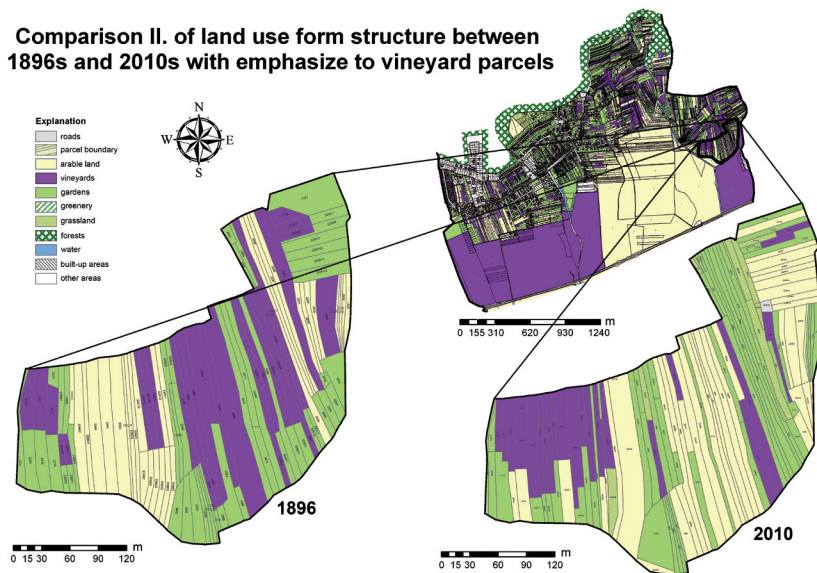


Fig. 3. Comparison of land-use forms at mosaics vineyard plots within historical sequences 1896 and 2010 years.

cadastral category of vineyards over 1 ha are located to the south part out of the village on medium slopes or lowland at deeper soils with higher fertility values. These vineyards occupy 82.76 ha with an average parcel area of 11.82 ha, and they were planted in the 1970's in coordination with the Agrocomplex Nitra state enterprise.

The inner space structures of the vineyards has changed with area size, where small area parcels have higher row density and the oldest vineyards have the rare but traditional climbing support of vine-stakes. The inner structure now allows hand or small machinery cultivation. This area group and older vineyards are very often supplemented by traditional fruit trees and the following were located : cherry, pear, peach, apple, black mulberry, service tree, almond tree, medlar and quince trees. The large area modern vineyard parcels also have a greater distance between rows at 2.5–3.0 m, they are taller at 3.0–3.5 m and they are adapted for intensive cultivation methods and machinery usage.

Culture-historical vineyards assessment

When cadastral maps from 1896 and 2010 were compared years, vineyards in the northern and eastern parts of Nitrianske Hrnčiarovce have approximately the same area and space structure at both times (Fig. 3). This shows that these landscape cadastral segments were not subject to the collectivisation in the 1950's with integration into very large area plots.

Comparison I. of land use form structure between 1896s and 2010s with emphasize to vineyard parcels

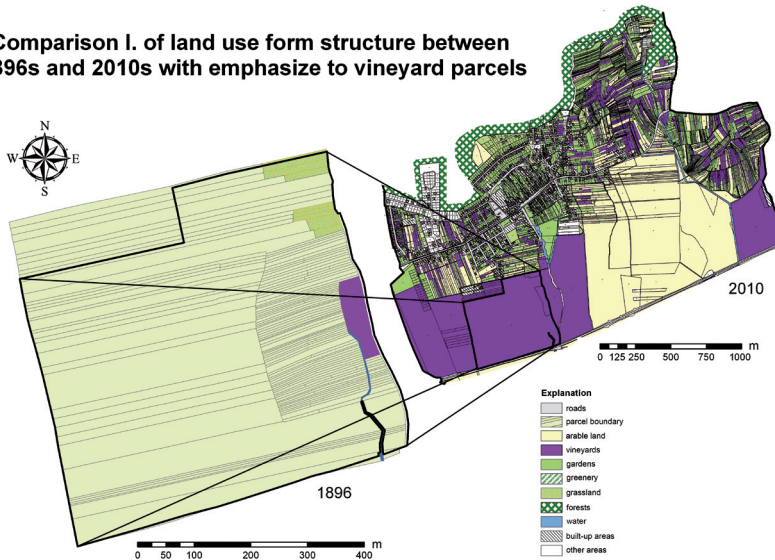


Fig. 4. Comparison of land-use forms at great area vineyard plots within historical sequences 1896 and 2010 years.

However, some exceptions have occurred where parcels close to the village boundaries were reclassified into new building grounds or cadastral plots have fused with business transactions. This is documented by parcel number, since there were 578 in 1896 and in 2010 – 554 parcels (Fig. 3). Generally, however, vineyard structure in that part of the cadastre has historical continuity of almost 120 years.

The aerial photos focus on the landscape structure of agricultural land use in 1949 and 2010 (Figs 5, 6). The historical development of 1949 shows that segments appeared as small striped parcel structures, reflecting different ownerships and variable land use. This image represents high landscape diversity and a scenic visual perception effect. Aerial photos from 2010 show visible landscape structure changes mainly in the southern part out of the village where small parcels were united with large plot blocks (Figs 4, 6). Landscape structure and diversity in this part is rougher but uniform and biodiversity and aesthetic services appear to have decreased. In contrast, well-preserved parcel structure with historical-continuation value is apparent to the north and east of the village, although some noticeable changes were made during land use (Figs 3, 6).

The southern part of the cadastre is formed by large area vineyards, thus reflecting collectivisation when areas in 1896 were used as arable land in a small private mosaic structure (Fig. 3). Aerial photos from 1949 and 2010 show some changed and well-preserved structural landscape elements in vineyard plot area development. The cultural-historical and structural-visual vineyards value of Nitrianske Hrnčiarovce can be defined as follows:

Historical aerial photo of vineyards
(1949 year)



Fig. 5. Aerial photo landscape structure of Nitrianske Hrnčiarovce cadastre in 1949 year.

Contemporary aerial photo of vineyards
(2010 year)

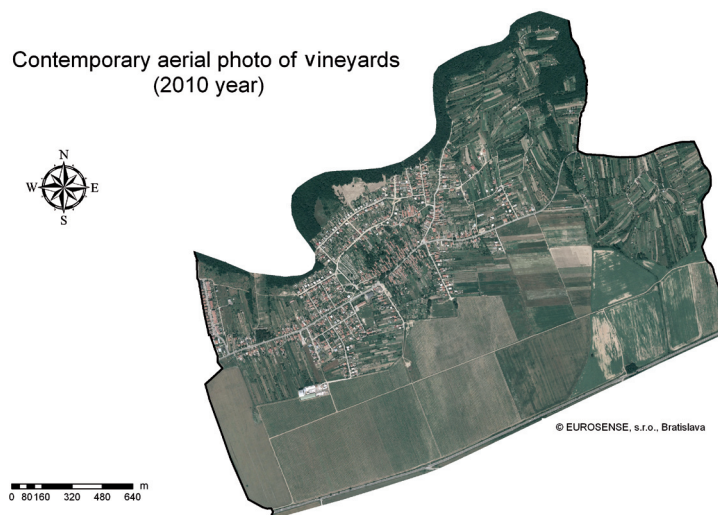


Fig. 6. Aerial photo landscape structure of Nitrianske Hrnčiarovce cadastre in 2010 year.

- a) Viniculture has a long historical tradition connected with the ancient Nitra city and its Slavonic history.
- b) The majority of the vineyards are located to the east and north of the village with well-preserved parcel area structure and inside space architecture retained from the past to the present.

- c) Many vineyard houses and wine cellars have been reconstructed and these create important potential for modern recreation and leisure.
- d) Historical vineyards are enriched by fruit trees which offer health benefits, aesthetic value and biodiversity.
- e) New vineyards have been planted to the south of the village which are intensively managed and lack fruit trees. These create a dominant foreground to the village.
- f) Vineyards are the third largest group of landscape elements in the cadastre, and they are an important phenomenon in the landscape's image and character.
- g) Nitrianske Hrnčiarovce is in the Nitra king wine-rout, and for agro-tourism viticulture here is connected with vine and wine traditional culture, folk architecture and wine celebrations.

Discussion and conclusion

Many traditional viticulture regions and cadastral territories in Slovakia have a similar historical development. There is mainly well-preserved landscape structure on the slope terrains, but intensive agricultural processes have greatly changed the lowlands. Vineyards located in the vicinity of big town settlements are often endangered through building investment and replaced by large houses and recreation centres, as has occurred in the surrounds of Bratislava (Suchý et al., 2008). Currently, the Nitra district and adjacent villages enjoy smaller investment pressure but similar construction impact is expected in the near future (Pucherová, 2004; Supuka, Štěpánková, 2006). Well-preserved historical vineyards should be preserved as spaces for cultural landscape protection, as expected by the European Landscape Convention.

Similar historical vineyard structure can be found in other traditional European vineyard countries such as Portugal, Spain and parts of South Moravia in the Czech Republic. Additionally, large vineyard plots are also located in many countries with progressive management technology. These include, the French Bordeaux region, Italy and Germany. The historical vine-growing tradition is well-preserved here, but the cultural-landscape structure and visual-aesthetic effect are slowly being transferred to new values (Libant, 2009; Supuka, Verešová, 2009; Štefunková, Cebecauer, 2006 and others). Since small historical vineyard plots depend on economic conditions for their preservation, they should now be guided by expert vine-ecology management processes. This process is extremely important to shape Nitrianske Hrnčiarovce's cadastral destiny.

The current assessment of the Nitrianske Hrnčiarovce cadastre shows that it has so far retained its high cultural, historical, and aesthetic-visual values. To a large extent, this is due to its well-preserved vineyard countryside segment which maintains high biodiversity as well as its historical cultural traditions. New changes in vineyards here represent a changing period in modern technology, but it is sincerely hoped that such changes will not adversely affect the continuation of viticulture in the Nitra region.

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