DEVELOPMENT OF CULTURAL LANDSCAPE IN TOWN OF BOJNICE, SLOVAKIA, CENTRAL EUROPE

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Keywords

cultural landscape
research methodology of cultural landscape
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Abstract

Landscape as a complex entity is currently of interest to a growing range of scientific disciplines. However, the research of landscape in cultural studies is still considered a new phenomenon. Only minimal attention is paid to these issues in Slovakia and the Czech Republic. The method of creating transects of cultural landscape layers and their subsequent multitemporal analysis belongs to the most recent possibilities in research. The aim of the paper is to highlight certain positive aspects of the particular method and to outline opportunities for applying the knowledge in the field of cultural studies in the context of historical development.

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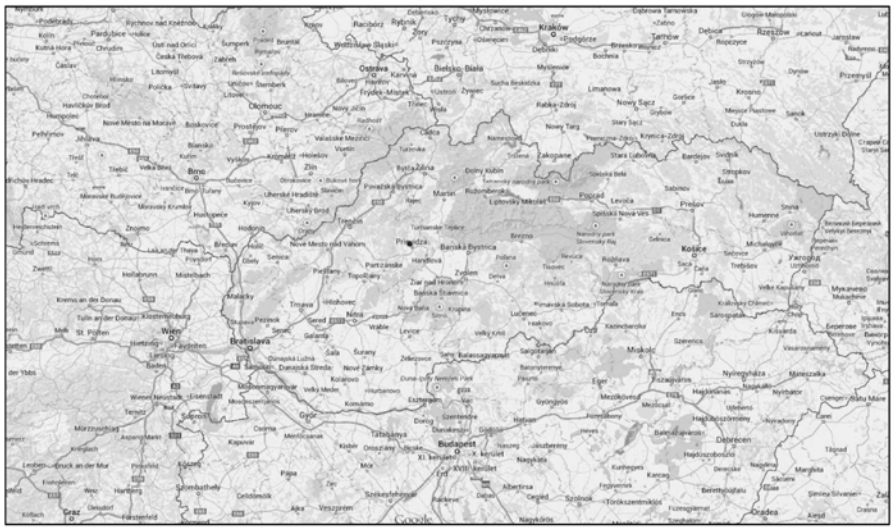
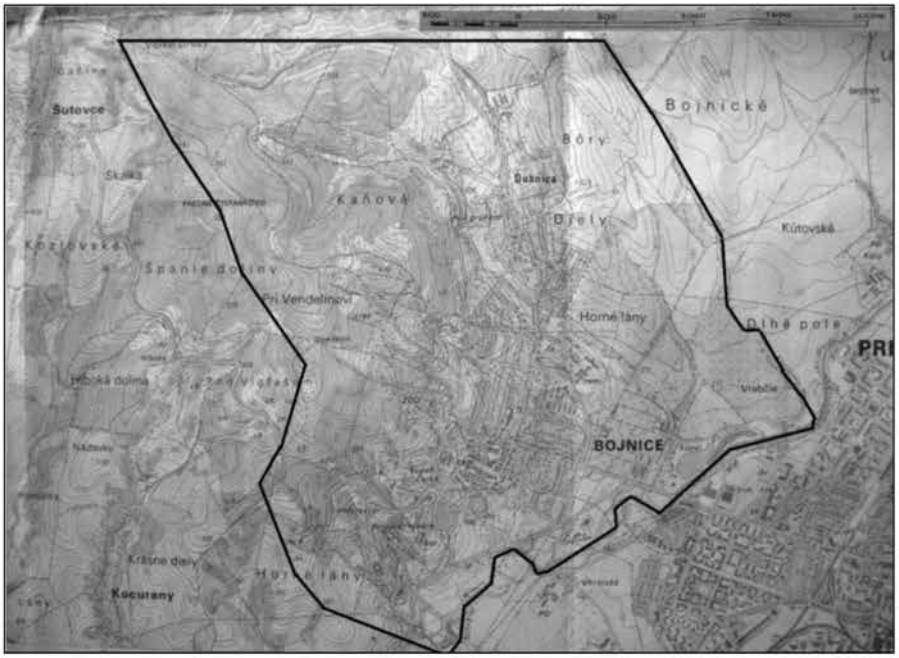
INTRODUCTION

Landscape as a complex entity is currently of interest to a growing range of disciplines. The research of landscape under **cultural studies** is considered a new phenomenon, particularly in Slovakia and the Czech Republic, where only little attention is paid to these issues. [1] The article focuses on new possibilities in research of cultural landscape, represented by the method of transects of cultural landscape layers (CLL) and their multitemporal analysis. It is based on the data obtained in the research of the town Bojnice and its environs, located in the western part of Slovakia, Central Europe. The results are also published in a dissertation thesis of *Zabensky, M.: Natural and Cultural Heritage in the Upper Nitra Region*, supervised by *doc. Dr. Peter Chrastina, PhD*. The main objective of the article is to highlight positive aspects of the research method and to outline new opportunities of applying the knowledge in cultural studies, particularly in the context of historical development.



Picture 1 Studied area within the borders of Slovakia.
Source: Google Maps (2012).

[1] Historical Geography and Landscape Ecology are the disciplines with the developed concept of the research of landscape.



Map 1 Studied area.
Source: Geodesy, Cartography and Cadastre Authority of the Slovak Republic (1993).

Studied area. The research is focused on cultural landscape (CL) in the territory of the town Bojnice. The area is a part of the district Prievidza, located in the south-eastern part of the Trencin region. The studied area was defined in accordance with historical development of Bojnice dominion, with an emphasis on human activities in the landscape, geomorphologic relief of the earth´s surface and administrative borders (map 1). The area is located on the ruins of Mesozoic sediments of the Strazov Nappe (particularly the slopes) and on the Paleogene marine sediments filling a large fault depression dating back to the younger Tertiary period. The fracture crosses the studied area. Due to thermal and mineral springs springing on its edges, travertine hills have been created there.

System	Alpide belt	
Sub-system	Carpathian Mountains	
Province	Western Carpathian Mountains	
Sub-province	Inner Western Carpathian Mountains	
Area	Fatra-Tatra Region	
Unit	Strazov Mountains	Upper Nitra Basin

Sub-unit	Mala Magura Mountains	Prievidza Basin

Table 1 *Geomorphological units in studied area*.
Author: M. Žabenský

Methodology of research of cultural landscape applicable in terms of cultural studies

The research methodology of cultural landscape consists of several successive steps which include and merge various methods used in the research of landscape. The method was designed on the basis of approach of cultural studies to the issue of the research of cultural landscape. It is also built on the analysis of methods used in related disciplines, e.g. historical geography - *Chrastina*;[2] cultural geography - *Oťaheľ, Hrnčiarová, Kozová*,[3] *Žigrai*;[4] landscape archeology - *Kuna*;[5] landscape ecology - *Petrovič*[6] and others.

The ***first step*** starts with the selection and definition of the studied area. In our case, it is the territory of Bojnice town and its present-day town part of Dubnica (previously associated with Bojnice dominion).

Collection of available information sources constitutes ***the second phase*** of the research. It is necessary to combine and analyze all literary and other sources from various field of interest (geography, history, culture). A significant source of important information is the analysis of historical maps. These are particularly the maps from the first military mapping (Joseph period, 1763-1785), the second military mapping (Francis period, 1803-1869), the third military mapping (1869-1887), maps prepared by the Military Topographic Institute (*Vojenský topografický ústav*) in 1953-1957, maps made by the Geodesy, Cartography and Cadastre Authority of the Slovak Republic (*Úrad geodézie, kartografie a katastra Slovenskej republiky*) from 1992[7] and Google Maps (2009), based on aerial photography of the Slovak Republic at the beginning of the 21st century.

Historical paintings and photographs are considered another important source of information. These materials can be used in spatial identification and localization of certain landscape archetypes and historical landscape structures (HLS). The method of perception of historical landscape examines how the landscape was

[2] *Peter CHRASTINA, Profily kultúrnokrajinných vrstiev – metóda výskumu (nielen) industriálnej krajiny (na príklade mesta Nováky), HG 37, 2011, p. 168–183.*

[3] *Ján OŤAHEĽ – Tatiana HRNČIAROVÁ – Mária KOZOVÁ, Typológia krajiny Slovenska: regionalizácia jej prírodno-kultúrneho charakteru, Životné prostredie 42, 2008, p. 70–71.*

[4] *Florin ŽIGRAI, Integrovaný prístup k výskumu kultúrnej krajiny (vybrané teoreticko-metodologické aspekty), in: Zborník referátov Krajina – človek – kultúra, Banská Bystrica 2001, p. 16–22.*

[5] *Martin KUNA, Nedestruktivní terénní postupy v archeologii, Praha 2004, p. 15–29.*

[6] *František PETROVIČ, Vývoj krajiny v oblasti štálového osídlenia Pohronského Inovca a Tribeča, Bratislava 2005, p. 9–32.*

[7] *Martin BOLTIŽIAR – Branislav OLAH, Krajina a jej štruktúra (Mapovanie, zmeny, hodnotenie), Nitra 2009, p. 44–62.*

perceived by authors in various scientific, literary, historical, artistic, photographic and other works.[8]

The ***third stage*** is based on the analysis and the synthesis of the above mentioned sources. These data provide a framework for *cultural and geographical characteristic* of the landscape, which is analysed geomorphologically, climatologically, hydrologically, pedologically and biogeographically.[9] The impact of physical-geographical sphere on the *development of culture* and cultural innovation within the studied area is also described. The following step – the analytical-synthetic section focuses on *historical professions*, which are generally characterized and completed by specific data related to the examined area. The part devoted to the *history with an emphasis on the development of architecture* is also very important. Subsequently, landscape archetypes representing historical landscape structures and potential *traditional professions* in the studied area are being identified.[10]

In the ***fourth step***, the data are synthesized and expressed in transects of cultural landscape layers (CLL) which are examined through multitemporal analysis.[11] The CCL transect is a new method in the research of cultural landscape, created as a modification of the method of CCL profiles.[12] Related issues (the method of landscape profiles cuts) have been already examined by *Solowiej*,[13] *Dobrzańska, Kalicki*,[14] *Miehe*[15] and others.

The initial structure is formed on the basis of the maps at a scale of 1:25000 published by the Geodesy, Cartography and Cadastre Authority of the Slovak Republic in 1993 (these maps are characterized by the highest precision and good information value). Specific points, which are clearly identifiable in all even older map works, ale located and marked with letters (in our case from A to H). The height

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[8] The issue has already been researched by *Peter CHRASTINA, Výskum krajiny (z aspektu historickej geografie a krajinnej archeológie), Geografické štúdie 15/2, 2011, p. 17–42 a Mlada HOLÁ, Slezská města na raně novějších vedutách, HG 37, 2011, p. 49–67.*

[9] Cultural and geographical characteristics of the landscape analyzed also in *Harm de BLIJ – Harrison Johnson MURPHY, Human Geography: Culture, Society and Space, New York 1999, p. 80–220.*

[10] Landscape archetype is a relic preserved in the current landscape structure. It represents a certain form (or a remnant) of historical landscape structures or a primary landscape structure.

[11] The multitemporal analysis also discussed in *Ján OŤAHEĽ – Ján FERANEC, Výskum zmien krajinnej pokrývky pre poznanie vývoja krajiny, Geographia Slovaca 10, 1995, p. 187–190* or *Ján FERANEC, Prístupy k analýze viac časových údajov diaľkového prieskumu zeme, Geografický časopis 48, 1996, p. 3–10.*

[12] *Peter CHRASTINA, Profily kultúrnokrajinných vrstiev – metóda výskumu (nielen) industriálnej krajiny (na príklade mesta Nováky), HG 37, 2011, p. 168–183.*

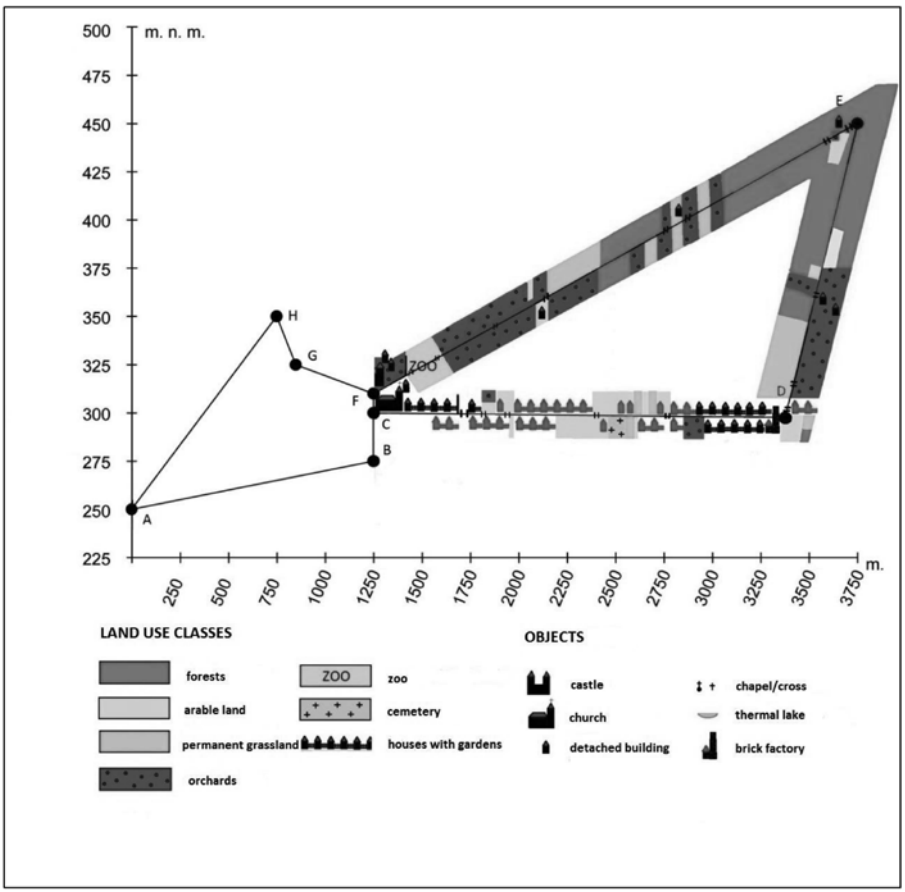
[13] *Daniela SOLOWIEJ, Podstawy metodyki oceny środowiska przyrodniczego człowieka, Poznań 1992, p. 22–97.*

[14] *Halina* DOBRZAŃSKA – Tomasz KALICKI, Człowiek *i* środowisko *w dolinie Wisły koło Krakowa w okresie od I do VII w. n.e., Archeologia Polski 48, 2003, č. 1, s. 25–55.*

[15] *Georg MIEHE, Geo-ecological transect studies in Northeast Tibet (Quinghai, China) reveal human-made mid-holocene environmental changes in the Upper Yellow river catchament changing forest to grassland, Erdkunde 62, 2008, č. 3, s. 187–199.*

localization of the points expressed in transects of the landscape enables to analyze the impact of cultural innovation and the overall impact of culture (man and society) on the landscape, with an emphasis on the height zoning.

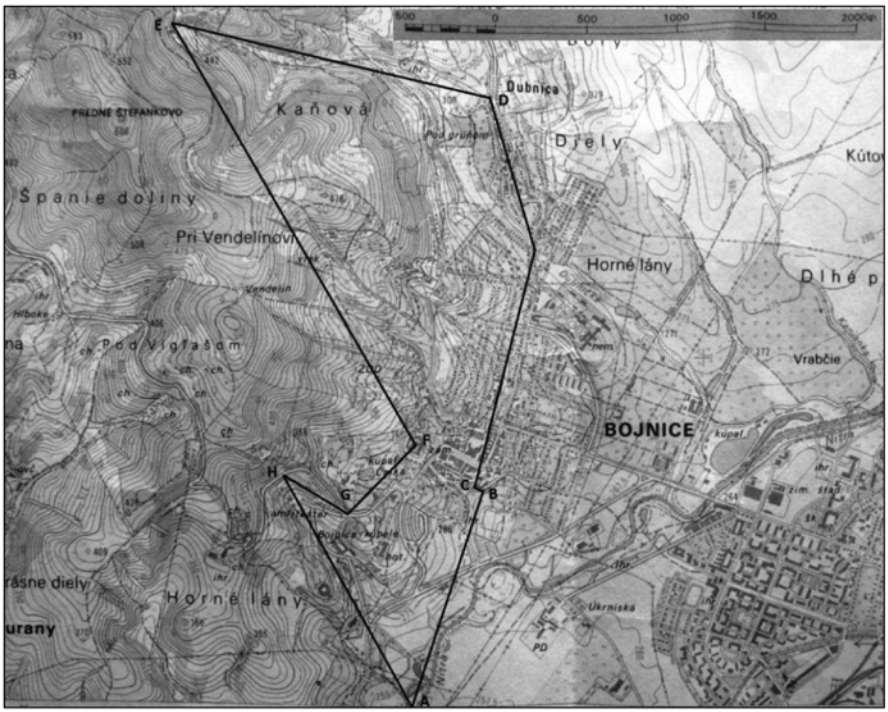
The transect illustrates certain elements of cultural landscape on *topical level* (buildings) and *choric level* (historical landscape levels, land use classes and their structure). One of the advantage is that the transect displays a cut of the landscape 500 meters wide, which facilitates the study of spatial relationships. A following multitemporal analysis is the base for monitoring the progress of these elements chronologically and spatially (extinction of historical landscape structures, persistence of landscape archetypes).



Picture 2 Transect of cultural landscape layers illustrating the situation in 1956 (processed and unprocessed part).
Author: M. Žabenský. **Edited by:** M. Dubská

Another positive aspect of the method is a dynamic view of relations and links between the human (society) and the landscape. Visual and symbolic map features are depicted in the transect. So that the dynamics of development of landscape be more visible, new elements are in red. It is also possible to create an „*additional CLL transect,*" which is not verified by maps but based on the analysis of more recent maps, historical records and visual materials.

Through a field research, which is a ***fifth step***, we can record the current state in the studied area. These data are used for further analysis and comparison of historical landscape structures (HLS) and current landscape structures (CLS). During the fieldwork, existing archetypes are verified and new archetypes are explored, which are also analyzed similarly as the archetypes found in the maps. Methods used during the research can be of non-destructive character such as *surface exploration* or destructive character, e.g. *exploratory excavation*. The photographic material documents the current status of land use classes (LUC), preserved HLS, landscape archetypes etc. The fieldwork is necessary if we want to add or modify certain elements in the transect of cultural landscape and to document the current status of cultural landscape layers.



Map 2 The transect in a profile line A-H-A.
Source: Geodesy, Cartography and Cadastre Authority of the Slovak Republic (1993). **Edited by** M. Žabenský and M. Dubská.

The ***final step*** is aimed to the assessment of the development of landscape and culture. We identify traditional and historical professions, we map the process of cultural innovation and the transformation of HLS to current landscape structures, we can describe the development of land use classes and finally the results can be illustrated using 3D model solutions[16]. This step should bring certain conclusions about mutual influence of human (culture) and nature (landscape) in space and time.

Cultural landscape layers – a case study area in Bojnice

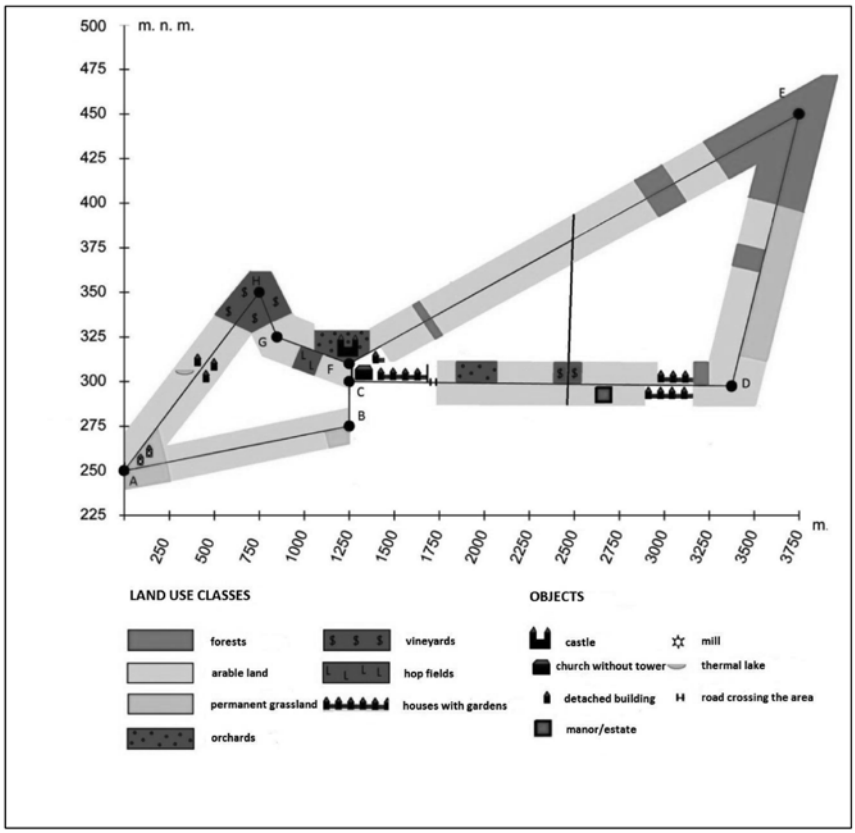
The chapter presents an additional transect showing the situation in the studied area in the period 1641-1647 as an example of practical application of the method.

Additional transect of a cultural landscape layer in 1641-1647. The study is based on *urbarial inventories* (historical materials documenting number of houses, buildings, land, property etc.) dating back to 1614 and 1647. While the older document provides a spatial localization of studied elements, the newer one confirms the previous data and records certain changes. Drawings by Johann Ledent from the years 1641-1642 represent a useful source of information. These works of art depict the town of Bojnice and its environs, including buildings and objects. Since no visual material illustrating the neighboring area of Dubnica in that time is available, the landscape structure of the area is graphically separated by line. Reconstruction of the CL transect in this particular location was realized on the base of urbarial inventories from 1763-1785.

The section **AB** presents the land cut passing from the confluence of the river Nitra and the stream Teply potok (250 m n. m) to the foot of Prepostska cave (275 m n. m.). Two mills were situated at the mouth of Teply potok in 1614 (the area called *Teplica*). Their position can be specifically defined using more recent maps. The existence of mills in the area in earlier period is indirectly confirmed by the town privileges issued in 1366, when the king Ludwig I. granted the town the right to establish a mill. Due to the low flow of other water sources in Bojnice, this is the most suitable location for the establishment of a water mill. In the floodplain of the river Nitra, permanent grasslands are continually persisting for several centuries. Grasslands can also be found on areas beneath the Prepostska cave. The other part of the area was covered by arable land (crop rotation was practiced here, in Slovakia also called as a *three-field system*).

The transect **BC** covers the travertine massive overhang over the Prepostska cave with an elevation of 25 meters. The point C is located in the church, which is situated on the edge of the travertine hill (300 m n. m.) and determines the axis of the square. The section **CD** continues through the residential area of Bojnice town, passes through wavy hilly relief, to the village of Dubnica and ends at the confluence of the stream *Dubnička* and an unknown tributary.

[16] Possibilities of 3D visualisation also presented in *Tomáš ORŠULÁK – Jana CEEOVÁ – Pavel RAŠKA – Martin BALEJ, Virtuální 3D vizualizace zaniklého města Přísečnice, HG 37, 2011, p. 153–166.*



Picture 3 Additional transect of cultural landscape layer showing the situation in 1641-1647.
Author: M. Žabenský. **Edited by:** M. Dubská

The town was facing a number of significant changes during this period. *Kubová* and *Valovič* state that the Turks attacked the town in 1530 and 1599.[17] The castle wasn´t conquered, but the city was burned. Similar situation repeated in 1623 when the town was devastated by the troops of Gabriel Bethlen. Therefore, wooden palisades were built here in the half of the 17th century later converted to stone fortification completed around the year 1663. The construction of the stone fortification is related to the change of the owner of the Bojnice castle and estate, who made efforts to stabilize the area economically. *Pavol Palffy* became the owner in 1643 when he bought the castle from the king Ferdinand III. According to a historical document from 1647, the town consisted of 47 townhouses with associated

[17] *Anastázia KUBOVÁ – Dušan VALOVIČ, Bojnice, Martin 1990, p. 6.*

rural areas, from which 10 were abandoned due to unstable military situation. From the total number of 41 houses of serfs, four were abandoned. Agriculture was a major source of livelihood. Due to the three-field system based on crop rotation it was possible to grow spring crops and winter crops as well. In the process of soil cultivation 156 oxen and 11 horses were used.[18]

Economic prosperity led to the development of crafts and encouraged the beginnings of the guild system (in our territory called *cech* - an association of artisans or merchants who controlled the practice of their craft in a certain town). The first guild of shoemakers was established in 1653. Many other guilds were organized in the town of Bojnice in a later period – tailors, weavers, dyers, furriers, coopers and others. Due to the development of the fortification system, masonry, carpentry and stonemasonry made a big progress. Millers from Bojnice organized their guild together with other millers in the Upper Nitra region. Thanks to a massive development of crafts, the town of Bojnice became one of the leading towns in the region. The town was governed by an elected mayor and 12 senators. It had a city council with a notary and a city guardian called *hajduch*. On the square there was a pillory, a bench for guilty people called *dereš* and a town prison.

In these years, an important additional source of income of the local people, the nobility and the church as well, was the cultivation of saffron. But only tubers for planting were sold in Bojnice town markets. This is confirmed by a reference in the work *„Medicinales Epistlae"* by *John Menergus James* in the 17th century. As the southern parts of Hungarian monarchy were under the Turkish rule, focus of economic life moved to the territory of today´s Slovakia. In 1647 the town was granted new privileges, approved by the Emperor Ferdinand III., who gave the town the right to organize four fairs a year (on days of The Saint Spirit, St. Martin, St. George and St. Bartholomew). Apart from these annual fairs also weekly markets organized on Wednesdays were allowed. The lime tree of the King Matthias is the landscape archetype which preserved in front of the entrance gate to the castle. The tree dates back to the 14th century and it is named after the *King Matthias Corvinus* who used to sit under it and where he signed official documents.

The territory between the town of Bojnice and the village of Dubnica was used as arable land with a three-field system.[19] Near the city walls there was an orchard, existence of which is confirmed by a drawing of Ledent from 1641–1642. According to *Sopko*, vineyards were located on east oriented slopes on the cadastral line between Bojnice and Dubnica.[20] Since there exists only one eastern (south-eastern) oriented slope, these vineyards can be spatially precisely defined. In Dubnica, there used to be a manor (a large farm) of the Bojnice dominion. Its existence is documented from 1629. Number of houses can´t be specified for this period. Available data are only from a year 1598 – 13 houses and a year 1675 – 33 houses.

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[18] *Ján KOVÁČ, Bojnice, Banská Bystrica 1967, p. 74.*

[19] Dubnica is now an urban part of the Bojnice town. In the past, it was a village belonging to Bojnice dominion. The serfs worked at a manor farmstead situated between the town and the village.

[20] *Ján SOPKO, Po stopách Hornonitrianskeho vinohradníctva, in: Vlastivedný zborník Horná Nitra 1, (Banská Bystrica) 1962, p. 69–85.*

A part of the transect **DE** covers an east facing valley with the highest point at the end (450 m n.m.) and the lowest point at the confluence of streams (290 m n. m.). Reconstruction of the particular cut is difficult since no relevant maps are available. Based on more recent maps we can assume the existence of arable land, grassland and forests in the area, in roughly equal proportions. A similar situation is related to the transect **EF** which represents a type of scattered settlements called *kopanice* located above the town. Based on Ledent´s drawings dating back to 1641-1642 it can be clearly noticed that the appearance of the town was significantly changed by the impact of deforestation. The slope foothills of Mala Magura Mountains were covered by islands of forests, probably oak woods. These slopes were used, probably due to the topography and the terrain, as pastures and meadows rather than arable land. A mass loss of wood let to the prohibition of free access to the forest. The restriction was adopted in 1647 under the new municipal privileges. Many serfs often used wood as a fuel, but also as a source material for production of shingles or boards, which were then sold at the fairs. The serfs did not respect the prohibition and the right of the free access to forests remained a largely discussed question for several following centuries. During this period, we can observe a gradual and progressively coming change in construction practices. Wooden shingle roofs are replaced by straw roofs, especially on the houses of poor people.

The part of the transect **FGH** is mapping south-facing slopes with altitudes from 310 m n.m. (the castle) to 350 m n. m. (the mouth of so-called „spa valley"). In southern parts, there were appropriate conditions for the establishment of vineyards. This is confirmed by a note from 12th June 1612 in the Bojnice town book. The landlord of Bojnice, Nicholas Thurzo, owned a vineyard above thermal springs. As it was rather complicated to maintain the vineyards, he decided to rent it for 36 golds to *Martin Krsiak* and his fiancée *Katarina*.[21] The existence of vineyards is also mentioned in urbarial inventories. *„Matej Bell states that the vines grown on hillsides had sour fruits, so after their desolation they have never been renewed.* "[22] Despite these facts the viticulture persisted in the area even during the following century. Townspeople could sell their wine always two weeks before and two weeks after the fair. Also the nobility possessed the vineyards, but their production was directed to pubs for nobility in serving villages and towns, e.g. Prievidza. The special wine for nobility was imported from southern parts of the country (e.g. the villages of *Radošina, Hrnčiarovce, Veľký Cetín* and *Báb*). Carriages transporting the wine were accompanied by serfs who were skilled at the cultivation of wine. The beer sold in the pubs was produced in a local brewery. For these purposes, two hop fields were cultivated, situated between the town of Bojnice and nearby baths.

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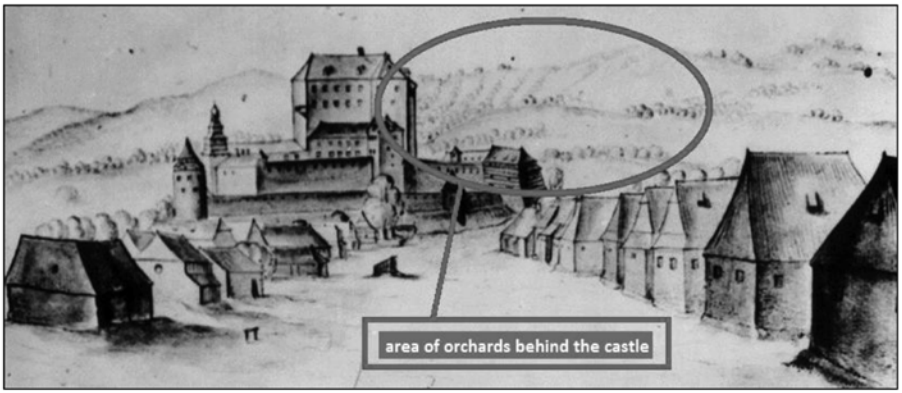
[21] *Ladislava HAGARA – Marta HAGAROVÁ, K edícii Bojnickej mestskej knihy (1572 – 1753), in: Vlastivedný zborník Horná Nitra 8, (Martin) 1970, p. 89–109.*

[22] *Ján KOVÁČ, Bojnice, Banská Bystrica 1967, p. 66.* The vineyards of Bojnice were devastated by Kuruc troops which attacked the area several times at the turn of the 17th and the 18th century.

We should also mention the production of fruit (pears, plums, nuts, apples, apricots), typical for the studied area. It is confirmed by works of art of J. Ledent from 1641-1642 where he illustrated orchards at the background of the castle. The urbarial documents from 1614 and 1647 also prove that orchards were cultivated even at the scattered settlements high above the town. Dried fruit was sold at local markets. The fruit was usually dried in a farm building called *susiaren*. These objects have a centuries-old tradition in the area. One of the biggest was located in the area called Bazantica, located behind the castle, but its existence is only proved by a record from the 19th century which mentions a fire that damaged the building. The drawing by Ledent captures some building at this location, but its function can´t be precisely defined.



Picture 4 Orchards behind the castle, as it is depicted on Ledent´s drawings from 1641–1642.

The transect **HA** covers an east-oriented valley where the baths are located. At the end of the valley, the stream Teply potok flows into the river Nitra (350 m n. m. – 250 m n. m.). The stream rises in a lake where the local people went to soak the hemp, used for cloth making. Since the water had mineral and thermal effects, the overall procedure of soaking speeded up from usual 2-3 weeks to only 2 or 3 days. The nobility received one tenth of the processed hemp and thus the landlords strongly supported its cultivation. Baths were located lower from the lake. Two pools made of marble blocks, a pub for the nobility and a hospital for 10 persons were built here in the studied period.

The study of landscape and its contribution to cultural studies

Based on the research of cultural and historical development of the landscape in the studied area, we have created several CLL transects showing the state in 1641–1647, 1752–1784, 1845–1869, 1882–1910, 1956, 1990 and 2012. Using the obtained data, it is also possible to foresee a development and to predict the state of the landscape, e.g. in the year 2040. The method of CLL transects and their multitemporal analysis allows us to monitor the structure of cultural elements not only on topical and choric level, but also chronologically. These data create structural and

spatial database of various information, links, phenomena, contexts and facts, which helps us to draft several conclusions.

Studying of the cultural landscape helps us to identify ***traditional and historical professions***. The landscape preserves certain features that can be re-discovered, reconstructed and revitalized. These elements are derived from various human activities through which a man satisfied his needs in the past. In the studied area, traditional and historical professions were mostly considered as an *additional* source of livelihood. Most of them were realized on the base of a home-made small-scale production (except livestock, stonemasonry, carpentry and masonry). Their identification was made based on following criteria:

- Long-term presence in the studied area;
- Impact of natural environment;
- Historical events and moments influencing the structure of employment;
- Socio-economic regulations influencing the structure of employment;
- Their presence in other regions.

Based on these aspects, we have identified following traditional and historical professions in the town of Bojnice and its environs: viticulture; fruit and vegetable growing; saffron production, livestock, linen production; masonry and carpentry.

The multitemporal analysis of CCL transects offers several views on the issue of **cultural innovation and the transformation of historical landscape structures to current landscape structures.** The dynamics of evolution of cultural innovation or diffusion and adoption of cultural elements is stimulated not only in the time of economic prosperity and welfare[23], but mostly during the period of turbulence and stagnation. If a life of a man or society is in danger, it is a breakthrough situation which forces us to create cultural innovation or to acquire and adopt cultural elements more quickly and more intensively than in the period of gradual economic progression. This fact is proved by the period of Turkish expansion and later Kuruc wars during which the town was plundered for several times. In these years, a wooden and later a stone fortification was realized, including the reconstruction of the castle. As a result of re-catholization activities of the Palffy family, certain objects, e.g. a tower on the church, a chapel at baths, a calvary or many roadside chapels and crosses were built. In the postwar period, many damaged or devastated residential and farm buildings were reconstructed. The country faced an economic and social boom.

As a second example, we can mention the period after World War II, during which many countries passed mass economic and social reconstruction. Due to new ideologies even the structure of landscape changed from historical (HLS) to current landscape structures (CLS). However, this process can´t be precisely defined in time, because the change started earlier, as a result of dissemination of cultural innovation related to the industrial revolution. But the largest intensity of HLS being transformed to CLS can be clearly observed after World War II. Original narrow

[23] The issue of dimensions and symbols in the cultural landscape discussed in *Florin ŽIGRAI, Dimenzie a znaky kultúrnej krajiny, Životné prostredie 34, 2000, p. 25–28.*

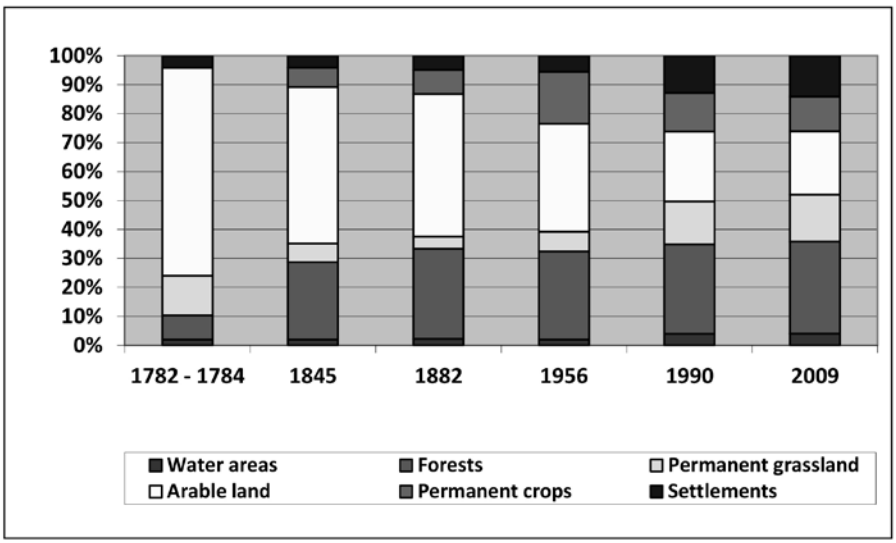
fields in shape of stripes were merged into large areas, large industrial companies were established, collective residential structures were built.[24] HLS are characterized with a greater synergy with the surrounding environment which is one of the key factors in the development of cultural values manifested in objects, symbols (signs) and behavior. HLS are a spatial expression of human needs in the past. A typical feature of the expression is the interdependence of HLS with natural environment, with the focus on aesthetic and emotional feelings of the individual (company).[25] CLS are characterized by a reduced dependence on natural environment, which is related to new technological possibilities and reduced spiritual relationship between human and the land (landscape). Given an example: in HLS, the vineyards were organized in smaller areas, often set in terraces and the vine was supported with wooden pillars made of vegetation in the surrounding area. Vineyards in CLS are usually organized in larger areas, with pillars made of concrete, which are not produced in the area but imported.

The methodology of research of the cultural landscape can also be applied in the assessment of **land use classes.** The particular structure of land use classes reflects how a man (society) could satisfy his needs in the past.

If we look back to certain historical periods, we can state that the dependence of society on agricultural arable land was naturally stronger in the past than today. Arable land occupied larger areas, also resulting from lower technological level of agricultural production. Together with the increasing intensity of diffusion of cultural innovation (e.g. new technologies in agriculture), the area of arable land reduced, but it was processed more effectively. We can also notice this effect after World War II when the area of arable land was decreasing, but the yields increased significantly.

[24] *Dagmar ŠTEFUNKOVÁ – Marta DOBROVODSKÁ, Historické poľnohospodárske formy využitia zeme – ich úloha v trvalo udržateľnom rozvoji, in: Acta Environmentalica Universitatis Comenianae, Bratislava 1997, p. 155-165.*

[25] The relationship of a man to the landscape analyzed in *Florin ŽIGRAI, Kultúrna krajina ako obraz vzťahu človek – prostredie, In: Krajina, človek a kultúra, Banská Bystrica 1997, p. 47-52, p. 124.*



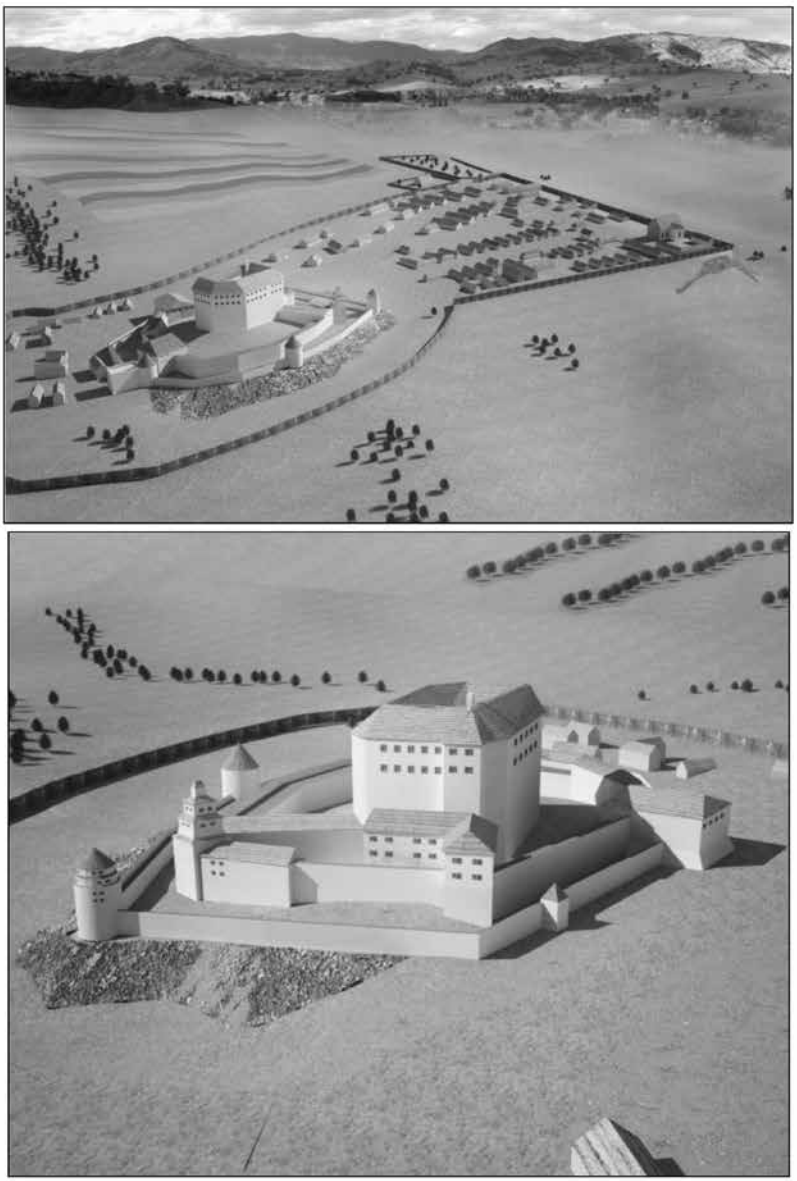
Graph 1 Development of land use classes.
Author: M. Žabenský. **Edited by:** M. Dubská

In the 18th and the first half of the 19th century, the livestock was considered an important source of livelihood and quite a significant income of local population. The reducing area of permanent grassland at the end of the 19th century confirms the gradual stagnation of livestock farming also due to lower prices of cattle at markets. A large share of permanent grassland in the second half of the 20th century is linked with the elimination of orchards and subsequent conversion of the land to meadows (grassland). The livestock production in the studied area in the sixties, seventies and eighties of the 20th century increased slightly. Since then stagnates.

The increasing share of forest areas in the 18th and 19th century is related to regulations made by the Palffy family (prohibition of access of serfs to forests) and reforms of the ruler Maria Theresa in the forestry sector. This process continues in the 20th century, mainly due to a decrease in farming activities (except forest production and recreation) in areas of higher altitude or a more complicated access. Fruit production was typical for the studied area for centuries. The greatest territorial expansion of orchards is recorded in the first half of the 20th century. Fruit production is now stagnating and slowly ceases to exist. Settlement structures face enormous growth during the 20th century. The village of Dubnica was administratively and structurally linked to the town of Bojnice in 1960. Settlements are mostly built on the areas of former orchards.

One of the options how to present the results of the research of cultural landscape is the creation of **3D model simulation of cultural landscape in the graphical interface of 3D MAX program**. The model was made on the base of

urbarial documents from 1614 and 1647, where a specification of certain buildings, including their technological and construction description can be found.

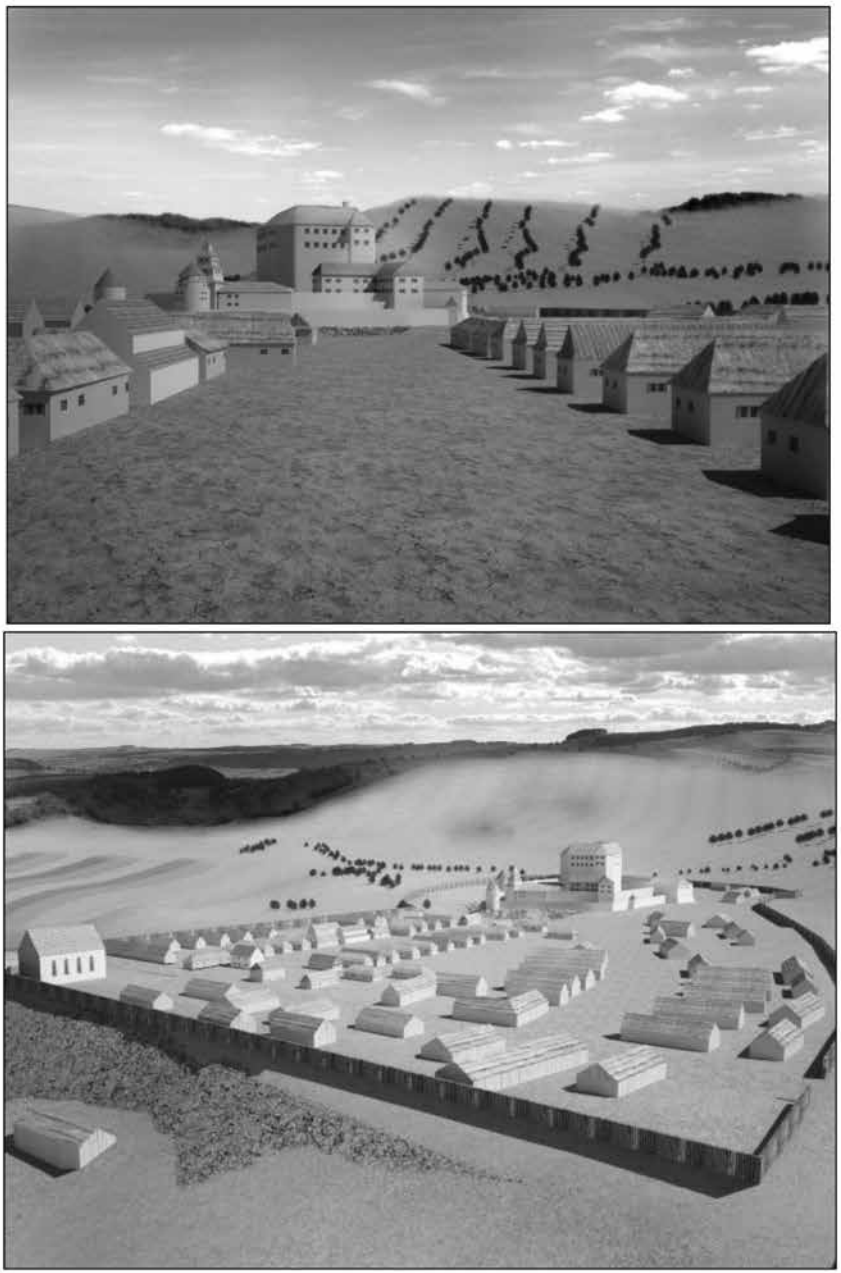


Picture 5, 6 The town of Bojnice and the castle in 1641-1642.
Authors: Ľ. Žabenský – M. Žabenský.

The 3D models were also based on the drawings of J. Ledent from 1641 and 1642 which depicted the town from multiple perspectives and confirmed the facts stated in historical urbarial documents. These work of arts had to be carefully analyzed since the perception of reality of authors in past centuries was sometimes inaccurate (authors often used to add some elements which actually didn´t exist in the area). Based on the comparison of these works with newer maps and a real relief of the environment, we can confirm that the paintings display the landscape and the objects with a high degree of accuracy and realism. The exact spatial location of individual objects was made on the basis of maps of second military (Francis) mapping (1806-1869), which - thanks to geodetic survey- shows a precise position of buildings and objects. It should be noted that the 3D model shows only those objects and structures that could have been located precisely in space and time.

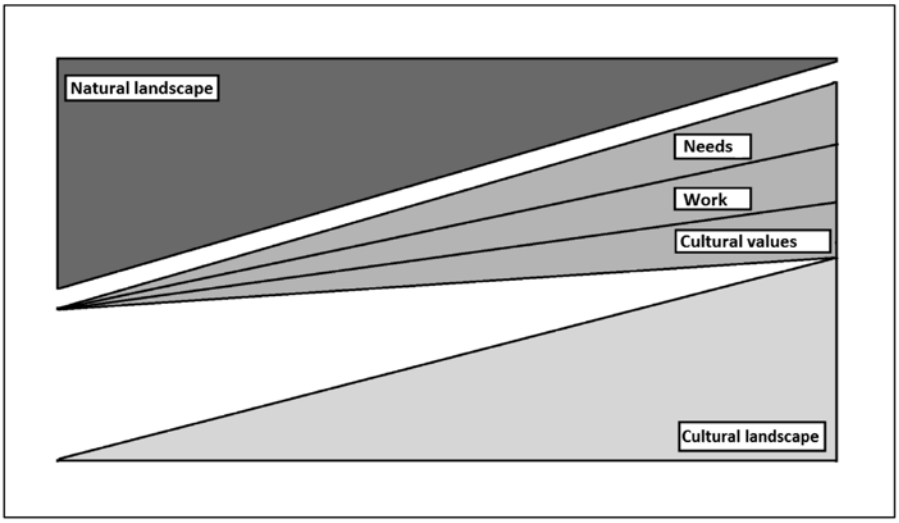
The visualizations show the status of CLL during the Turkish expansion. The town was fortified with a wooden palisade, which was started by the Thurzo family and later converted into a stone fortification completed in 1663 by Pavol Palffy, the owner the Bojnice dominion. The dominant of the town was the castle with administrative buildings. In the second half of the 17th century, a large reconstruction of the castle was realized, which significantly changed the appearance of the castle. The model shows the building in its original medieval appearance. The town had two main streets. The older diagonal street passed from the lower gate to the castle. The newer square was created later, probably in the 14th century. The axis of the square is defined by a church which had no tower at that time. The church consisted of a Romanesque nave and a Gothic chapel.

The environs of the town were covered mainly with arable land using a system of crop rotation. Grasslands and pastures occupied a reasonably large area, because the livestock production was the income of the nobility and the main source of livelihood for local population. Forests were mostly cleared and smaller areas of tree vegetation were located especially at strips dividing the fields called *medza* or at higher altitudes. On scattered settlements behind the town there were orchards. The fruit was dried and sold, or exchanged for grain. Cultivation of vine and collection of saffron made an important source of income for people. In this period, an access to forests was restricted, which determined certain architectural changes. Shingle roofs at houses of serfs were replaced by straw.



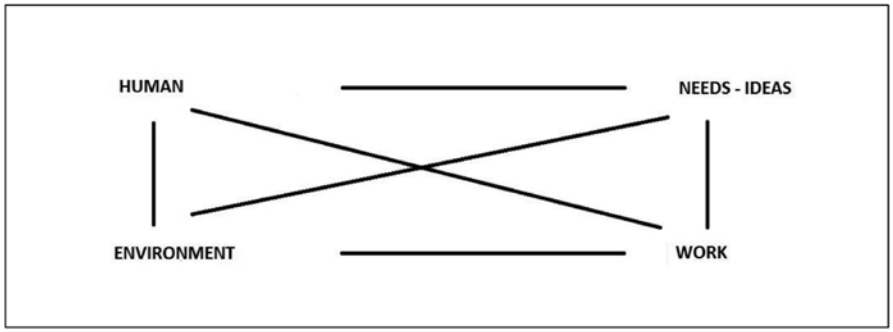
Picture 7, 8 The square and the view from the north-east.
Authors: Ľ. Žabenský – M. Žabenský.

We can also outline certain conclusions about the **relationship between a man (society) and landscape (natural and cultural).** Cultural landscape changes in specific time and the change is constant. Human modifies the landscape according to his needs.[26] (Graph 2). The further we go in the timeline back to the past, the greater is the dependence of a man on natural landscape. In the past (and to a lesser extent even today), the landscape represented a barrier limiting certain human activities. The structure of grown crops was dependent on specific climatic conditions different in mountainous and lowland areas. Building materials (wood, clay, stone) were used in the past according to their availability and natural occurrence in a certain location.



Graph 2 Human (society) and landscape (natural and cultural)
Author: M. Žabenský. **Edited by:** M. Dubská

[26] *Humberto ORTEGA VILLASEÑOR, Exploring Relationships between Human Behavior and Nature, in: International Journal of Philosophy, Fu Jen Catholic University Taiwan, 2008, p. 21-31.*



Scheme 1 Synergic effects.
Author: M. Žabenský. **Edited by:** M. Dubská

A man had to satisfy his need in certain geographic space. Although his activities were somehow limited by geographical conditions, the landscape also provided some possibilities, opportunities and tools how to satisfy these needs. Needs of society are progressively increasing in historical development. After meeting fundamental (physiological) needs, other needs, e.g. needs for safety, security, social needs, needs for recognition and self-fulfillment, follow. Needs are met mainly through *work* that changes the thinking of a human and constitutes values of a society. Work and development of cultural values in time change the ratio between natural and cultural landscape (Graph 2). Cultural landscape represents a spatial expression of cultural values that arise on the base of needs being satisfied by work.

CONCLUSION

The study deals with the issue of research of cultural landscape and its contribution to cultural studies. Based on the analysis of related disciplines such as historical geography, cultural geography or landscape archeology, the study contains a design of methodology and a formulation of research methods of cultural landscape. The issue is presented on the case study of the area of Bojnice. The method of creating CLL transects and their multitemporal analysis is one of the newest possibilities in the research of landscape. It is based on a similar method of profiles of cultural landscape layers. The method can be practically applied also in the field of cultural landscape management, regional development and spatial planning, particularly in terms of the sustainable development issue. The results can be indirectly used in other related industries, e.g. tourism or film industry. Large European museums such as Louvre Paris or the British museum present historical changes in landscape through 3D visual presentations. Spatial modeling of the surface can be practically used in film production aimed at the reconstruction of historical development of the country.

In the studied area, we managed to identify historic and traditional work such as viticulture, fruit growing and gardening (vegetable), livestock, production of linen, masonry and carpentry. The multitemporal analysis allows us to see the spread of cultural innovation in space and time, with emphasis on various factors influencing the process. It also includes the analysis of historical landscape structures and the process of their transformation into current landscape structures. By evaluating the land use classes, we have obtained a picture of the evolution of structure in the studied area and the means of livelihood of the local population (livestock farming, fruit growing and agriculture). The results can be visually interpreted in the form of 3D modeling solutions. The aim of the paper was to present a new research methodology of cultural landscape and to present its importance in cultural studies and other scientific disciplines such as historical geography.