# 9 SUMMARY (LANDSCAPE USE DEVELOPMENT OF TRENČÍN BASIN AND A PART OF ITS MOUTAIN BORDER)

## Introduction

Landscape as an open system, typical for its synergy of natural and anthropogenic agents, belongs among the important objects of multi-disciplinary studies. Since this phenomenon has continually been developing, it is difficult to specify its momentary state. Landscape change analysis is especially important in terms of assessment of not only the natural and socio-economic processes, their dynamics, causes, and stability of the present-day conditions, but mostly because of their possible development trends. This is significant for scientific, decision-making, and planning activities.

Economic use of landscape always means, to an extent, its destabilization. This phenomenon may be seen also in basins that represent a typical morpho-structural element and at the same time belong to the most densely populated Slovak regions (Chart 1). It is only natural that the above-mentioned phenomena are reflected in the development and characteristics of the cultural landscape of Trenčín basin and its mountain border.

## Described situation

Cultural landscape is a frequent topic used by the geographical and other professional public communities. (Chrastina, 2001c, 2002a) This specific orientation reflects the interest of the scientific community in confronting the global environmental crisis through sustainable development of the landscape space. (Drdoš, 1999) In order to ensure an effective future use of the geosphere, we need to pay attention to the development of its specific part that has gradually been changed by man, since the last glaciations.

Žigrai (1997b) uses the term cultural landscape to describe a natural landscape, changed by the more-less purposeful human activity. In line with Žigrai (1996b, 1997a, 2000) we show that the present (cultural) landscape is an area where the natural, economic, and social processes meet (Diagram 1). It closely reflects the state of the society in terms of its economic, technological, social, and spiritual dimension. (Table 1) The above mentioned suggests that cultural landscape represents a hybrid, open, natural-anthropogenic system, which is the result of individual and collective human action in space and time. (Diagram 2)

Community's changing demands on its landscape also change the way of landscape exploitation and its structural and visual characteristics. Landscape use (land use) is determined by the existing natural conditions of the surroundings, as well as by the demands, abilities, and possibilities of the human society. Change to any of these factors leads to a change to the landscape use. Landscape use is a specific expression of human activity in the context of time and space, accumulating in itself a certain historic, economic, social, and cultural potential. Further, it represents a crossing line between the natural conditions of the territory, technical potential, and human knowledge (Žigrai, 1995b, 1998). Study of landscape use and its temporal changes also includes an encoded information on the society and its socio-economic characteristics. This relationship suggests a need for inter and multi disciplinary approach in the study of principles and changes of this phenomenon (Jančura, 1999a, Žigrai, 2001a).

Žigrai (1998) suggests that one of the approaches that link temporal and spatial aspects related to cultural landscape transformation is to study the development and changes to the culture-landscape elements and layers. Landscape processes, either

natural or anthropogenic, cause on-going changes to the landscape. Related to the aspects that we study, this includes a study of temporal changes to the landscape use categories (TVK) within the geoecological landscape types (GT). These changes indicate a trend in the landscape use. Any temporal and spatial transformation to the landscape structure involves reciprocal relationships that influence matter and energy flow, as well as other landscape properties and characteristics (Lipský, 2000).

It is mainly the geographical and landscape ecology communities that study the changes to the landscape use (landscape development in general) in Slovakia. Among the known studies are the works of Žigrai (1978a, 1995a), Oťaheľ, Žigrai and Drgoňa (1993), Feranec, Oťaheľ and Cebacauer (2006), Feranec et al. (1997, 2002a, b), Michaeli (2005), Boltižiar (2002, 2003a-c, 2006, 2007), and Petrovič (2004, 2005), Olah (2001b, 2003a-c, 2005b), and Olah et al. (2005, 2006, 2007). Historical and geographical aspects of landscape use are featured mainly in the work of Boltižiar – Chrastina (2006), Chrastina (2005b, f, g, 2006 a-d), Chrastina – Boltižiar (2006a-c, 2008), Chrastina, Křováková and Brůna (2007).

We consider the geoecological type or subtype (GT/GsT) a potentially natural complex geosystem that determines the landscape use. If we are to accept and respect the principle of vertical dependencies and the synergic effect of the geological substrate, georelief, climatic, hydrological, and soil conditions and their characteristics in topical or chorical dimensions, then on the basis of potential vegetation we may reconstruct the natural conditions of a specific GT/GsT that primarily determine the possibilities of its exploitation.

We consider human impact on nature to be a certain kind of consequence, often without studying its causality. We can ask as to the relationship between the changes in the society's behavior and the changes in environment (Jančura, 1999b). In line with Žigrai (2000b), each landscape transformation should be perceived within the context of the socio-economic events that took place over a specific time period in the past.

Type of land use is partially determined by natural conditions; however, partially it is autonomous. Same land may be used through different approaches, depending on objectives and the economic potential. (Urbánek, 1994) It is at this point of landscape use research (not only in case of the Trenčín basin and mountain border) when a framework analysis of historical-geographical, culture-geographical, and landscape-geographical aspects is considered. Urbánek (1994) further suggests that the most valuable element of landscape is its evolutionary, synergic situation in form of organization of temporal and spatial rhythm of landscape elements. In our example, it is the TVK multi-temporal analysis within the framework of geological type or subtype/s. In the area of landscape conservation and management, the instrument we have at hand is human work. (applied term for landscape use) Work is a process that is heavily epigenetic, its autonomy is significant but never total. Connection of work to reason is the way to go, reflected in the rationalization of the landscape use (Olah, 2002).

Study of landscape use development, more precisely of the TVK changes within the GT/GsT structure, yields information on both the land itself, as well as the human society. It is a permanent process in terms of the endless feedback loop of Forman and Godron (1993).

**Objectives of this work**

With reference to the above mentioned, our objective is to:

■ Assess the development of the use of the Trenčín basin and mountain border based on literature and material sources;

■ monitor temporal changes to categories of landscape use (TVK) within geoecological (natural landscape) types/subtypes (GT/GsT);
■ identify the major causes behind the differentiated landscape use since the prehistoric times until 1998, together with a proposal for their interpretation (impact model);
■ to point out the anticipated trends in landscape development on the basis of objective outcomes of the recent steps.

Approaching such defined problem allows for a relatively reliable documentation of changes that afflicted the landscape of the monitored area before 1998. This is significant not only from the viewpoint of the basic research, but also allows formulating decision making and planning processes in the region.

**Location and definition of territory**

Scope of research focuses on the Trenčín basin and borders of the neighboring morphological structures – mountain ranges of Považský Inovec, Strážovské vrchy (engl. Strážovské hills), and Biele Karpaty (engl. White Carpathians). We identify the border of the region with the de-forested mountain border of the basin. Connection lines of the Beckovský and Trenčiansky ruptures of the Váh river form the southern part of the boundary.

Taking into consideration the hierarchical layout of geomorphologic units (Mazúr – Lukniš, 1980), the greatest portion of the territory is taken up by the Považské valley, specifically the Trenčín basin (section) bordered by the White Carpathian sub mountainous region (section) to the west. To the northeast, the basin is surrounded by the extensions of the Strážovské hills and a section of the Trenčín hills, with subsections of Teplická hills and Ostrý. To the east, the area is bordered by a part of the Inovec sub-mountainous region, connecting to the Považské lowland (Map 1).

The monitored area is of the size of 157,5 $km^2$ and takes up the central part of Trenčín district, with its southern extensions reaching into the district of Nové Mesto nad Váhom.

**Methodology of research**

Methodology focusing on a better knowledge of landscape use of the studied territory consisted of six steps.

■ First step was a casual analysis of the physical-geographical (geoecological) landscape structure, with the focus on its use by man (Chapter 5).

Input correlation layer involved an analysis of material landscape subsystems from the anthropocentric perspective. (Miklós – Izakovičová, 1997). Specifically, it was an analysis of the litho-, morpho-, hydro-, pedo-, and bio-geographical conditions. These represent an array of natural environment types which, when used, show overlapping physical and spiritual human reactions.

▪ To the research into the physical and geographical landscape structure we added the potential biota complex. If we are to accept and respect the principle of vertical dependencies and the synergic effect of landscape elements and characteristics in topical or chorical dimensions, then, notwithstanding the absence of the vegetation cover, we are able to reconstruct the potential vegetation within the geoecological landscape complexes of the model territory (Oťaheľ, 1995).

■ Second step was to create a spatial integrated model of geoecological (natural landscape) types (GT) and subtypes (GsT) as potentially natural geosystems.

▪ To reconstruct the GT/GsT, we employed the typology approach (Mičian, 1986a, Minár – Mičian, 2001) constructed by the superposition of analytical maps of geoecological (physical-geographical) landscape structure including the following

components: substrate (mother rock), geo-relief form, category of ground water, soil type (types), potential vegetation (Table 19, Map 2).

Typology approach as a method of determining the spatial scope or specific content (structure) of a given GT/GsT by Cebecauerová (1997, 2007), Feranec (1978) and Minár (2001) accepts the convergence of data. (to eliminate logical counterclaims) Its implementation as the leading-factor method allows us to superimpose the geo-relief that plays a decisive role in differentiation of other landscape elements (climate, soil types, biota, etc.); (Figures 36 – 52).

■ Creation of legend for the landscape use categories map with the scale of 1: 25 000 was the third phase in the methodology approach. It was created by combining the CORINE Land Cover interpretation key (Feranec et al, 1994, 1996, 1997, 2002a, b, Feranec – Oťaheľ, 1992, 2001). At the same time, the key included the human-geographical (Ivanička, 1971, 1983, Žigrai 1974a, 1975, 1980, 1983, Dubcová-Kramáreková, 1999), landscape-ecological (Bedrna et al., 1992, Miklós – Izakovičová, 1997, Jančura, 1997), or geoecological (Machová, 1994, Kopecká, 2006) approaches to the assessment of landscape changes, or study of landscape structure by the LANDEP methodology.

Such defined legend (Table 3) allows for a precise comparison between mapping units of the I. military mapping and the more recent cartographic outcomes that make it possible to identify a broad spectrum of TVK. Real life situations suggest that assessing too many landscape use categories is problematic. With this in mind, we have decided to employ aggregation- a purposeful merging of selected categories into one (e.g. forests and non-forest tree and underbrush vegetation – NSKV, settlements) or two levels. (agricultural land, uncovered substrate, e.g.)

■ Fourth step is a comparative analysis of:

▪ Mapped outcomes (1782/84 – I. military mapping, 1837/38 – II. military mapping, 1865/80 – cadastre mapping, 1955/56 – military mapping, 1989/91 – set of Basic maps of the ČSFR);

▪ aerial photographs from 1998.

Outcome of the comparative analysis was the separation of mapping units (of landscape use categories) – TVK (forests and non-forest tree and underbrush vegetation – NSKV, permanent grasslands, arable land, permanent cultures, fallows, water courses, substrate uncovered through natural process, substrate uncovered through anthropogenic process, settlements) on large-size topical maps 5 to 10 (1: 25 000). TVK represent a specific expression of physical and spiritual human reactions to an offer made by the landscape; they show how the territory (landscape) is used within a specific time horizon with the possibility to compare the culture-landscape layers (Chrastina, 2005f, g, 2006d).

■ Multitemporal analysis (fifth step) as the basis for the knowledge of local landscape use, consists of the following three stages:

▪ The first stage included correlation of GT/GsT and archaeological structures (enclosed settlement, burial place, finding) that we developed with the help of the topographical method. To the scope of assessment of interactions between the natural surroundings and human activities within the territory was further added monitoring of the occurrence of archeological sites within the GsT (a period from the Paleolithic to modern age, until 1782/84) by pie-chart.

▪ Second stage involves analysis of the TVK dynamics (development) within the environment of the Arc View GIS 3.1 geographical information systems software product. Its assessment builds on monitoring the surface relations of landscape use

categories at given time horizons (1782/84, 1837/38, 1865/80?, 1955/56, 1989/91, 1998) and a subsequent statistical processing (numerical and graphical analysis, culture-landscape layer profiles).

▪ Third stage. We also carried out studying the intensity of changes to TVK within the GT/GsT (1782/84 - 1998) through the GIS. Following characteristics were monitored:

a) Development of the spatial TVK spectrum within the GsT;

b) development of the spatial GsT spectrum within the TVK.

Variability of spatial reactions of the secondary landscape structure in given time horizons is shown by changes to a specific TVK within a given GT/GsT. With a relatively low dynamics of natural processes changing the face of the natural (physio-geographical) landscape element, intensity of such changes is adequate to the anthropogenic pressure that has a decisive effect on the development of the Trenčín basin and its mountain border.

Sixth stage includes survey of the terrain, yielding primary information on the studies region.

Its main task was not only to carry out photo documentation of the selected morpho-sculptures, historic landscape structures, and TVK, but also to take samples in order to identify maternal rocks, soil types, plant groups, etc (more in Midriak, 2003)

Methodology of the non-destructive terrain procedures in archeology was based on the outcomes of the Czech school (see Kuna, 2004a, Neustupný, 2007). Identification of some sites and their cultural classification was possible through the surface survey (Kuna, 2004b) that involved the collection of industrial rock material and shreds or osteological material, respectively. Local landscape geo-relief analysis (more in Kuna – Tomášek, 2004) was an important part of the archeological structure research. The terrain research also included a visit to selected institutions (Municipal office in Trenčín – main architect office, District Municipal Office in Trenčín – department of environment, Trenčín museum, Slovak Hydrometeorological Institute in Bratislava-Koliba, Slovak Archaeology Institute in Nitra, Map archives of the Institute of Geodesy and Cadastre in Bratislava, Historical Institute in Prague, Österreichisches Staatsarchiv – Kriegsarchiv, Vienna, etc.) where we obtained the necessary information, literature, map documentation, or aerial photographs.

**Outcomes**

Development in landscape use of the studied territory reflects a process of stages in exploitation of the real existing natural conditions by the human society to satisfy its needs. Olah (2002c, 2003c) and Chromý (2003a, b) suggest that changes to the TVK structure within the geological type or possibly subtype can cause social oscillations on one hand (e.g. wars, epidemics, change in economic priorities, strategies and approaches, ownership schemes) with limits to the natural environment on the other hand (slope steep and exposition, erosion, landslides, floods, etc.). The mentioned aspects produce time-spatial changes to landscape use.

**Landscape use since the prehistoric times until 1782/84**

On the basis of archeological findings and modeling of the degree of anthropogenic impact based on historical accounts or preserved historical landscape structures in the first development phase, the Trenčín basin and its mountain border have been formed by man since the late prehistoric time (Map 3). Considering the number and quality of archeological structures we believe, that major landscape changes took place during the Bronze or Iron ages, and in the Middle Ages. While we can identify the late Paleolithic landscape with natural landscape as suggested by Mosiman

(1984 in Drdoš, 1999) synergic effect of weather oscillations and social changes had caused it to develop until 1782/84 in the direction of the A-euhemerobic landscape (conditionally distant from its original state) of the Trenčín basin, or in the direction of the mesohemerobic (half-natural) landscape of mountain slopes.

Anthropogenic exploitation affected especially the GsT of the River Váh proluvial cone and fluvial terraces and hilly land of the basin. This was caused by advantageous geoecological conditions of individual GsTs and, considering the flood risk, by a greater relative height of proluvial cones, fluvial terraces and hilly land (Figures 1, 2, 4). Slopes of mountain borders were used above all extensively. Strategic position of carbon rocks in the Váh River valley was reflected in the presence of fortified settlements (Figures 9, 59, 61). This general statement is witnessed by a number of archaeological sites within GsT over selected time horizons (Charts 8 through 17).

**Assessment of landscape use since the pre-historic times until 1782/84**

Based on qualitative (TVK or their primary forms) and quantitative (number of archaeological sites within GsT) characteristics of land use that existed in the pre-historic and historic times, we classify the study area into four development stages:

■ First stage including the Paleolithic and Mesolithic periods (30 000 – 5 300 B.C.) is characteristic for a minimum impact of the hunter-scavenger communities on transformation of the territory.

Concentration of settlements in the basin hilly land allowed for control of energy and material flows in open landscape of the Váh River valley (Table 20, Chart 8, Figure 53). Archaeological or archaeo-botanical and palynological data show a transitory disruption to the geological structure of the natural (ahemerobic) landscape occurring only within the settlement zones (topical level); insignificant level of anthropogenic influence together with succession were the preconditions for reaching the climax shortly after the site had been abandoned.

■ Second stage is typical for its more significant onset of anthropogenic impact. In its first phase – Neolithic (5 300 – 4 300 B.C.) started a process of irreversible changes to the natural landscape. (Gojda, 2000) On the outside, this transformation was apparent in the creation of the *shifting mosaic* with primary TVKs (Table 21, Chart 9, Figure 54). Rotation of settlements, fields, pastures, and forest within selected GsTs created conditions for the formation of the natural (oligohemerobic) landscape.

Notwithstanding the increasing devastation of the original forest vegetation during the second phase – Eneolithic (4 300 – 2 200 B.C.) by massively set fires (to acquire new areas for fields) and extensive cattle grazing, we assume that there was a low degree of cultural impact to the natural landscape of the Váh River watershed. Borders of the natural landscape of mountain slopes were only little effected by human activities (Tables 22, 23, Chart 10).

Similar scenario of anthropogenic landscape transformation of the study area was repeated in the third phase – early and middle Bronze age (2 200 – 1 200 B.C.). In fact, synergetic effect of the sub-boreal climate limited, and in some GsTs even totally stopped, the extensive human activities into the physical-geographical structure of the local landscape (Table 24, Chart 11). Due to a more arid climate, de-forested territories were subject to succession on mountain slopes and in the cone-terrace landscape.

■ Third stage represents a period of the mesohemerobic (semi-natural) landscape creation.

Arid climate of the latter and late Bronze ages (1 200 – 750 B.C.), development of metallurgy, and the climaxing pre-historic settlement of the region brought about an

unprecedented hemerobia to the study area stretching over the territories of agricultural land, mainly in the Váh River alluvium and the cone-terrace accumulation to the west of the basin (Table 25, Chart 12). Massive de-forestation of these GsTs in order to obtain more arable land gave rise to erosion. Demand of the agrarian production on new lands was caused also by flooding of the Váh River and its tributaries, which was devaluating the alluvial agricultural land by depositing clay layers accumulated by the flooding. Areas of arable land and pastures were extending off the main recipient watershed to the slopes of the White Carpathian sub mountainous region, and the Trenčianska hilly land. Primary TVKs; however, would take up only small areas within the mountain border, with no significant impact on the natural landscape character of mountain slopes.

Synergy of climate change, erosion, and social disturbances resulted in a pre-historic environmental crisis that at the close of the Bronze age caused reduction to the production potential of the majority of GsTs of the alluvial and cone-terrace landscape .

Also, in the early Iron age (800 – 750 B.C.) majority of the territory was of the oligohemerobic landscape character. Economic activities of the Hallstatt people in the Váh River alluvium and the surrounding GsTs deepened the semi-natural character of the local landscape with the mosaic of primary TVKs and grasslands. Continuation of the anthropogenic exploitation of the Váh River valley during the latter Iron age (500 – 0 B.C.) is typical for its increasing fields, grasslands, and pastures near small settlements or the fort on the so-called Ivanovská rock. Mesohemerobic landscape apparently extended to mountain slopes of milder steep where, after uprooting the oak-hornbeam vegetation, appeared areas of agricultural land (Table 26, Chart 13).

Temporary recession of settlements during the Roman period and the Migration of nations (0 – 5.century) together with succession resulted in temporary stagnation of the already slow change of natural landscape into mesohemerobic. The German Quads focused their attention on the remains of the primeval forests surrounding the settlements of the Váh River alluvium, fluvial terraces, fluvial cones, etc. (Table 27, Chart 14). Hence, the oligohemerobic landscape remained only at the borderlines of the territory. These lines; however, were not suitable for cultivation, due to the mountain slopes steep.

Last phase of the third stage – early Middle Ages (6. – 9. centuries) represents a period of equalization of differences between the mesohemerobic landscape of the lower altitudes and the oligohemerobic landscape of mountain slopes. The blooming Slavs settlements together with the damage to forests through wood exploitation and cattle grazing resulted in the natural character of the early-Middle age landscape being preserved most likely only on part of the territory (Table 28, Chart 15). As a matter of fact, colonization at those times did not exclude those lands with lower value located in the country of mountain slopes, also with stone exploitation activities.

■ Fourth stage includes a relatively long time period since the 10$^{th}$ century until 1782/84. Anthropogenic transformation of the physical-geographical landscape structure of the study area is typical for its intensive landscape cultivation.

Since the introduction of the three-field system in the 12$^{th}$ century, there are mostly fields in the local landscape influenced by the Middle-age agrarian economy. Colonization (internal and external) but mainly the massive de-forestation of the region, plowing of slopes and distribution tributaries of the Váh River, as well as increased total rainfall figures in the second half of the 14$^{th}$ century, all gave rise to the development of erosion that had a negative impact on sustainability of the agricultural production. Real consequences of the present environmental crisis included de-banking of the Váh River in the A-euhemerobic landscape (conditionally distant from its natural condition) and

appearance of ravines in the semi-natural landscape of mountain slopes (Table 29, Chart 16).

Alleviation of the anthropogenic pressure on the Late Middle Age landscape (15. – mid 16.centuries) was manifested in the gradually receding timber production on water courses alluviums and within the landscape of mountain slopes, giving rise to vineyards around the year 1550 (Figures 22, 24). During this time, a definite settlement structure was formed within GsT, outside the Váh River flooding zone (Figures 59 – 61, 63). More extensive TVKs (grasslands and pastures, orchards, etc.) alleviated the negative consequences of the anthropogenic impact to the agricultural land in the territory (Figure 57). Thanks to these impacts, the study area acquired the character of a cultural steppe, with dominating artificial (arable land) and semi-natural ecosystems (e.g. permanent cultures – gardens, orchards, wineyards, hop-fields) that, notwithstanding partial compliance with the environmental principles of landscape use, could not prevent the effects of water erosion (Table 30, Chart 17).

Neither in the 18$^{th}$ century (until 1782/4) was there a slowing-down to the development of the A-euhemerobic landscape of the Trenčín basin; the mesohemerobic (semi-natural) landscape of mountain slopes also was not free of the continuing transformation, as its identity was formed by both, fields, meadows and pastures, and vineyards on sunny substrates of the White Carpathians sub mountainous region, Čachtické Carpathians, and the Inovecké sub mountainous region (Table 32, Figure 67).

**Landscape use in 1782/84 – 1998**

Complex mechanism of cultural landscape creation of the study area continued in the period of 1782/84 – 1998.

More vivid picture of the development in the area of the study landscape use can be seen in the TVK trend (Table 33, Chart 18). This approach can allow us to clarify the impact of social changes to the formation of spatial cultural landscape organization. (Maps 5 – 10).

Slowing down of deforestation within the territory in the late 18$^{th}$ century caused by protective measures introduced by the Forest Code of M. Theresia (1769) reached its climax in 1837/38. Later, because of various turbulences (wars, introduction and imposition of cooperatives, urbanization) there was a rapid reduction (1865/80?, and 1955/56) to forest sizes and NSKV (Figure 68), followed by a slow growth in the size of the forestland (LPF) until 1998. Trend in permanent grasslands was identical with that of forests and NSKV until 1865/80(?). Collectivization of agriculture and change of grasslands and pastures into fields resulted in 1955/56 to 1989/91 in their increased size, maintained more-less at the same level until 1998. During the period of 1837/38 to 1955/56, after approximately a half-year reduction, the size of arable land has continually been on the rise. It relates to the position of the agrarian sector within the Upper Hungarian region as well as to the apparent collectivization attempts during the socialist era. Unsuitable organization of agricultural lands (PPF) within the dynamic geo-relief caused increased erosion, and since 1955/56 it also contributed to the retroactive delimitation of selected parcels favoring the LPFs, grasslands and pastures. (Figure 5) After restitutions, size of fields slightly increased until 1998. Effect of land reforms of the mid 20$^{th}$ century brought abandoning of the affected lands by their owners, and the emergence of fallows of relatively stable sizes. (Figures 18, 21) Genesis of the development of water areas and water courses within the territory shows a slightly dynamic character, with falling trend since 1955/56. Spatial relations of the substrate exposed by natural processes have gradually been decreasing since 1837/38. Building of dams on the Váh River course has been the cause behind the permanent

regression. Increase in the size of the substrate exposed through anthropogenic process follows the increasing anthropogenic pressure on landscape since 1955/56. Share of the built-up area in the first time horizons grew only slowly, with its sharp increase later in 1955/56 to 1989/91 – at the time of economic boost of the territory. Since then, the trend has remained roughly at the same level (Figures 65, 66).

Analysis of the TVK size within a specific GsT allowed for identification of the main trends in landscape use ( Tables 34 – 39). Potential of this approach is rooted in the ability to assess the correctness, suitability, and scope of use of the Trenčín basin and borders of the surrounding mountains.

We found out that the TVK matrix in 1782/84 to 1865/80(?) more-less considered the parameters of each GsT in the territory. During this time, man either avoided the extreme habitats, or would completely adjust their form and the way of their exploitation. For example, the specific alluvium of the Váh River with fluvisols within the reach of inundations was exploited slightly extensively. Locations of gravel deposits (substrate exposed through natural process) complemented grasslands, pastures, and fields (Chart 19, Figure 69). Chart 20 and Figure 31 show that the enclaves of mollic fluvisols on the borders of the Váh alluvium had major economic value for the local inhabitants. (with mostly fields present) The space of the basin hilly side with luvisols was also exploited with equal intensity during that period, containing fields, orchards, less vineyards, (by the end of the 18th century) and hop fields (Figure 62). Development of the TVK within the geoecological landscape subtypes of mountain slopes is also interesting. While the GsT of less suitable trophic conditions (acidic cambisols etc.) covered mostly forests and NSKV (Chart 31), other GsTs (with dominating rendzinas, pararendzinas, cambisols and luvisols) were used as fields by man, despite the geo-relief steep and erosion (Chart 29). Vineyards on the warm substrates of the White Carpathian sub-mountainous region and the Inovec sub-mountainous region were unique in this regard (Figure 67).

Social advancement, collectivization of agriculture, and industrialization of the northern areas of the basin directed the landscape use of 1955/56 also in relation to less-suitable GsTs. It was especially the case of the Váh River alluvium with fluvisols and mollic fluvisols where, after building dams on its natural water course and the completion of a hydro-technical systems, the area witnessed an intensified use of agricultural land and the rise of settlements (Charts 19 and 20). Unification of lots into large arable land units, grasslands and pastures, impacted the contact geoecological subtypes of the cone-terrace landscape, hilly landscape, as well as the adjacent portions of the mountain slopes landscape (Charts 22 to 27, Figure 16). Continuing landscape anthropization is indicated by natural-technical systems on the Váh River and its tributaries (Figure 19), gravel fields, clay fields of brickworks (Figure 14), and quarries.

Scenario of the TVK development within GsT from 1989/91 to 1998 should be looked at on the background of the changes happening after 1989. The agricultural industry reacted to reduced direct subsidies by an extensive exploitation of agricultural land within the more accentuated geo-relief of the White Carpathian and Inovec sub-mountainous regions (Figure 2). While the process of abandoning non-profitable locations of big steep characteristics or the emergence of fallows in the White Carpathian sub-mountainous region started earlier (after 1955/56), increased size of forest and NSKV in mountain slope landscape complies with the European trend of cultural landscape use of mountainous and sub-mountainous areas, as shown by Sviček (2000), Lipský (1999, 2000), and Olah (2003). On the other hand, arable land and permanent cultures were intensified (hop fields) on the Váh River alluvium with fluvisols and mollic fluvisols, also on broader portions of the alluviums of its tributaries

(Charts 19 – 21), as well as within the cone-terrace and hilly landscape (Charts 22 to 27). Restitutions allowed for another cultivation of fallows into fields within the White Carpathian sub-mountainous region (Figure 24). Majority of geoecological subtypes of the alluvial and cone-terrace landscape was affected by the spatial growth of settlements (Figure 22) or possibly by building of infrastructure (Figure 12).

Objective of the analysis of trend in the spatial GsT spectrum within TVK is to answer the question of what changed the geoecological spectrum of a specific TVK over the monitored period. Study of the mentioned relationship allows for a more complex view on mutual interactions of natural landscape characteristics and their exploitation.

The period of 1782/84 to 1865/80(?) is typical for its more-less balanced share of forests and NSKV within the GsT of the alluvial, cone-terrace, hilly, and mountain slopes landscapes. Their recession in the second half of the 20$^{th}$ century from the agrarian-exploited hilly landscape was offset from 1955/56 to 1998 by a partial forestation of the White Carpathian sub-mountainous region (Chart 37). In case of permanent grasslands, we discovered a gradual reduction in the importance of alluvial landscape as the forage basis (Figure 7); after 1955/56, this role was taken over by some slopes of the White Carpathian sub-mountainous region (Chart 38). Over the monitored period, (1782/84 – 1998) arable landscape is apparent especially in the Váh River alluvium of fluvisols and mollic fluvisols on cone-terrace level (Figure 13), or takes up the basin hilly land of luvisols (Figure 4). Fields are present also within the less accentuated georelief of the White Carpathian sub-mountainous region (Figure 5); until 1955/56 arable lands on the slopes of the Trenčín hilly land within the Trenčín city limits were economically significant (Chart 39).

Due to the specific demands of the produce on the character of the habitat, permanent cultures during individual time periods occupy mainly the GsT of the alluvial, cone-terrace and hilly landscapes (Chart 40). Vineyards in the landscape of mountain slopes are present only in the years 1782/84 – 1865/80/?). We find fallows on the slopes of the White Carpathian sub-mountainous region; they appeared after 1995/56 as a result of succession of the abandoned agricultural land with fields and permanent cultures (Chart 41, Figure 24). In relation to the expansion of water areas and water courses within the territory, the GsT spectrum of the alluvial landscape has been homogeneous over the whole monitored period (Chart 42). Expansion of exposed substrate through natural process is mostly present across locations in the immediate proximity to the river within the Váh River alluvium (Figure 17, 65) or connected to the carbon rocks landscape (Chart 43). In case of the exposed substrate by anthropogenic process, there has been since 1955/56 a gradual reduction in significance of the landscape of mountainous slopes, terraces and basin hilly land (Chart 44). Next, until 1998, the mentioned TVK appears mainly on the Váh River alluvium with fluvisols. In case of settlements, we see a balanced ratio of the GsT of alluvial and cone-terrace landscape from 1782/84 to 1865/80(?), despite the negative public experience with the Váh River flooding (Figures 29, 30). Chart 45 shows that after regulation of the river and completion of the system of hydro mechanical works, there has been since 1955/56 a spatial expansion in the built-up areas within the main recipient's alluvium. Synergic effect of steeps prevented the emergence of more significant settlements and their parts, with the exception of some zones within the White Carpathian sub-mountainous region, and the Trenčín hilly land.

**Assessment of landscape use in 1782/84 – 1998**

To assess the development of the Trenčín basin landscape and its mountain border from 1782/84 to 1998, we have to consider three major distinct development phases. Each phase reflects the character of technical, socio-cultural, and ecological-environmental dimensions of the cultural landscape (Žigrai, 1997a, 2000a).

■ First phase represents the years 1782/84 – 1865/80(?). Distribution and structure of TVK reflects the significance of geoecological limits at the exploitation of land at a given time. Man of this time did not possess the technical instruments that would allow him to change the GsT characteristics more significantly and adopt them to his needs. It means that man cultivated the land in a differentiated way, following the landscape-ecology fundaments. He either must have avoided the extreme habitats within the alluvial landscape with the existing danger of the Váh River flooding or those select locations found in the mountain slopes landscape with less suitable soil-substrate and steep conditions, or totally adapted the form and manner of their exploitation. (e.g. extensive grasslands and pastures) This means that the TVK matrix more-less respected the set parameters of a specific GT/GsT. Similar landscape use may also be found in Oťaheľ, Žigrai and Drgoňa (1993), Žigrai (1978a, 1995a), Lipský (1994, 2000), Michaeli, Hofierka and Ivanová (2008c), Olah (2002c, 2003c), Olah et al. (2006).

Process of change of the real landscape over this time period followed the trend from before 1782/84. Trenčín basin with the dominance of arable land, permanent cultures, and settlements has retained the character of the euhemerobic landscape. Growth of social needs and demands on landscape at the end of the 18$^{th}$ century has been apparent in fields, grasslands, and pastures of the Trenčín mountain region, or in the vineyards of the sunny slopes of the White Carpathian and Inovec sub-mountainous regions (Figure 67). All this has contributed to the A-euhemerobic appearance of the lowland landscape.

■ Second phase in the history of landscape use dates to 1955/56. Social advancement, agricultural collectivization, and industrialization (building of industrial zones afflicted mostly the northern parts of the basin) directed the landscape use also toward less favorable GsT. This included mostly the Váh River alluvium with fluvisols and mollic fluvisols, where, after restricting the natural watercourse with dams and completing the Váh River cascade, agricultural land and settlements were intensified. Landscape view of the contact GsT of the cone-terrace, hilly land landscape and mountain slopes landscape was affected by the aggregation of smaller lots into large-size arable units and pastures and meadows (Figure 16); sites with less favorable soil-substrate and exposition conditions gave way to orchards and hop fields. Continuing anthropogenesis of the landscape aspect of the territory is indicated by natural-technical systems (small water dam in the stream's watershed in the area of Rúbanisko, and Biskupská zdrž), gravel fields, brickworks, and quarries.

Insensitive expansion of intensive TVKs was accompanied in the whole territory by liquidation of bocages, grass boundaries, and NSKV stripes. Unification of landscape structure within the Trenčín basin gave rise to a strongly-effected (B-euhemerobic) landscape (Figure 12). Intensively exploited area of Trenčín by humans in the second third of the 20$^{th}$ century acquired the character of the poly-hemerobic landscape, which is far from the natural condition. (Mosiman, 1984 in Drdoš, 1999) Notwithstanding the rough treatment from farmers (aggregation of small-sized fields, meliorations), mountain slopes have retained their character of the A-euhemerobic landscape.

■ Third phase of landscape use includes the years from 1989/91 to 1998. In its reaction to the reduced direct subsidies, the agricultural sector intensively used the agricultural

land, especially within the more heavily accentuated georelief of mountain slopes landscape (Figure 21). Process of abandoning non-profitable locations of high steep resulted in the appearance of fallows in the areas of Vinohrady, Stará and Nová hora (Figures 22, 24) or in greater size of forests and NSKV in some GsTs. The fact that this is a whole-European trend in the history of cultural landscape of mostly mountainous and sub-mountainous areas is further supported by the works of Bičík and Kupková (2002), Jančura (1999b), Jeleček (2002), Havlíček (1998), Chromý (2003a, b), Kertész, Lóczy and Huszár (1995), Lipský (1999, 2000), Mather (2002), Michaeli (2005, 2008b), Olah (2002c, 2003b, c), Olah, Boltižiar and Petrovič (2006), Olah et al. (2006), Petek and Gabrovec (2002), Sviček (2000).

On the other hand, arable land and permanent cultures were intensified (hop fields) in the alluviums of watercourses, cone-terrace layer, and in the hilly land. Restitutions of the early 90-ties of the last century allowed for a repeated cultivation of a number of fallows into fields (Figure 24), as well as increased interest in torsos of agrarian terraces with bocages (Figure 18).

Toward the end of the 20$^{th}$ century, the Trenčín basin – Váh River alluvium and the contact accumulation forms, were exposed to an intense anthropogenic pressure. Besides agricultural production, individual GsTs were also affected by spatial expansion of settlements (Figure 13) and highway construction (Figure 12). The mentioned aspects can be seen in the B-euhemerobic landscape that converged into polyhemerobic landscape in the territory of Trenčín. Despite the growing size of forests, NSKV, and pastures and meadows, mountain slopes in 1989/91 and 1998 remained within the A-euhemerobic landscape dimension.

**Anticipated trends in landscape use**

Outcomes of landscape use analysis delineate the main trends of the future use of landscape in the territory. Objectives and methodology of our research were closest to the concept of identical landscape (Jančura, 2002, Jančura – Slámová, 2002).[99] Anticipating future trend of the Trenčín basin within the context of climate change, we tried to take into consideration the consequences and their impacts on the landscape structure of the study region.

With regard to the recently discovered facts, we drafted the primary trends in landscape use of the study area in the 21$^{st}$ century (appr. by 2100). Building on the studies of Žigrai (1978a, 1995a), Olah (2002c, 2003c), Michaeli and Kandráčová (1985), Miklós and Izakovičová (1997), Oťaheľ, Žigrai and Drgoňa (1993) we meanwhile propose a concept of functional-chorological organization of landscape use categories within a specific GT (GsT), which makes sense from the aspect of sustainable development of the study area.

■ Alluvial landscape GsT of the Váh River alluvium represents an elongated concentration force that will continue to accumulate a number of types of human economic activities. The works of Žigrai (1978a, 1995a) as well as the landscape development analysis until 1998 suggest that the industrial-residential and agricultural functions will continue to be the two major anthropogenic activities within the given space. Their competing relationship will result in the reduction of agricultural land (especially arable land) - and will give way to technical and social infrastructure. In line with the Complex urban proposal of the ÚPN SÚ Trenčín (Kostovský et al., 1998) the

[99] He considers the development of landscape as a trend toward a balanced ratio between landscape-ecological, cultural-historical, and land adjustments.

Váh River alluvium remains in the B-euhemerobic dimension, or as a poly-hemerobic landscape with the tendency of further anthropogenesis of physical-geographical structure of the Váh River alluvium with fluvisols and mollic fluvisols. Concentration of intensive TVKs in potentially flooded Váh territory will call for a complex risk solution to flooding (more in Minár – Tremboš, 1994b, Tremboš – Minár – Machová, 1994, Trizna – Minár, 1996, Trizna, 1998, Kolejka, 2001)

Of the number of flood-preventive measures (Langhammer – Vilímek, 2004, Vaishar, 1999, 2002) we have chosen the proposal of optimal river alluvium profile in the territory outside of human settlements (Figure 70). Another way of preventing the theoretical threat of floods in the alluvial landscape is to use the development surfaces at the contact GsT of cone-terrace or hilly landscape. After further bordering of the Váh River tributaries (especially following a real-life assessment of the flood risk) planning of building activities could also include the broader zones of smaller streams' alluviums.

■ Agricultural and residential functions will continue to dominate in the cone-terrace landscape. In line with Kostovský et al. (1998) and Medrely et al. (2007) we expect an increased interest in the lots located on the fluvial cone of the Soblahov stream and on the adjacent Váh terrace in the area of Belá (Figure 13). Proposed implementation of geologically optimal profile of the Váh alluvium within agricultural landscape aims at counteracting potential flood threats. This long-range adjustment will result in returned location of the alluvial part of municipal land of a number of villages to unoccupied parts of the Sedličniansky stream alluvium, or to cone-terrace accumulation in the western part of the basin (Figure 23). From a long-term perspective, it is also possible to witness continuing concentrated activities on the strip of the riss Váh River terrace between so-called Ivanovská rock and Štvrtok n/V. (Figure 2). Occupying of high-value lands for building purposes will bring a number of problems to the agrarian sector. (more in e.g. Kabrda – Bičík – Šefrna, 2006); the biggest of these challenges will probably involve implementation of effective and, at the same time, sustainable management of agricultural land (Jančura – Kollár, 1996) within the B-euhemerobic landscape of the Trenčín basin.

■ System changes to Slovak agriculture in the EU post-accession period will be reflected in future trends of hilly landscape. Now we already know that relative surplus of agricultural land, excessive production of food, and lower profitability of food production will result in increased sizes of grasslands, forests, and NSKV. (Lipský, 1999) Transition to grassland-type landscape will affect mainly the locations of eroded luvisols and luvisols at the contact zone of the basin's hilly land with the surrounding mountains. Analogical situations from the Liptovská basin (Žigrai, 1978a, 1995a) suggest that we might expect forestation of the pseudo-clay soil types on the bottom of ravines, or regosols on steeper slopes. Forest management practice (with the assistance of the EU structural funds) in this case recommends introducing fast-growing trees. (Lesníci…, 2006).[100] Attempt to effectively use fields will most likely result in segmentation of large-size units to more natural and less-eroded forms (Jančura - Kollár, 1996, Lapka – Gottlieb, 2000, Kopecká, 2006) with the presence of agrarian terraces, boundaries, and bocages (Barančok 1997, Seko 1997, Štefunková and Dobrovodská 1997).

Models of plant production related to atmospheric precipitations and climate change (Špánik et al., 2000) showed a potential reduction in usable soil water in the

[100] Introduction of poplar tree types (*Populus sp.*), willows (*Salix sp*), and alders (*Alnus sp.*) to agricultural land was called for as early as in the forest code of Maria Theresia from 1769.

period of May through October. Lower rainfall totals during the vegetation period will most likely result in the structure of produce on arable land within the basin hilly land. PPF will contain not only wheat (*Triticum sativum*) but also possibly *Amaranthus hypochondriacus* or various energy plants (e.g. *Rumex Uetuša*, Petříková, 2005).

Related to the planned transition of part of the infrastructure from the Váh River alluvium to the adjacent GsTs, there will be an expansion of municipal land within the hilly landscape. Therefore, there is a need to thoughtfully regulate the construction activities of the expanding cities of Trenčín, Soblahov, Trenčianska Turná, and Trenčianske Stankovce, in line with the functional delimitation and bearing capacities of local landscape.

■ Mountain slopes landscape that has never been free of problems in view of the anthropogenic activities, will be affected by partial forestation (Lipský, 1999). Synergic effect of the basin's mountain border steeps will result in marginalized agricultural land including small-size arable units, grasslands, pastures, and orchards. With the aim to preserve competitiveness of the agrarian sector, character of the geoecological processes of a specific geo-complex will be a decisive phenomenon behind the TVK expansion. Midriak (2002) suggests that agro technological approaches will adopt to these changes (contour-line cultivation of land), georelief forms (building of agrarian terraces again) and structure of plant production with dominating anti-erosion effective cultures (mixed produce, densely-sown grains) and meadows and pastures. Threat of the gravitational deformations will still represent a barrier to the building of settlements and traffic infrastructure on the slopes of the White Carpathian sub-mountainous region at the connections with the alluvial landscape (Minár-Tremboš, 1994). In terms of future building of residential zones, significant are the sunny (south – west) sites in the Trenčín upcountry, that will, over the middle-term time period (appr. by 2050), potentially become a competitive environment to the alluvial landscape, with considerably lower quality of housing and flood risks. In relation to the building of geologically optimal profile of the Váh River alluvium, we also anticipate a transition of the alluvial part of municipal land of the most endangered rural settlements to the adjacent GsT of the mountain slopes landscape.

■ Extensive use of carbon rocks landscape will dominate also in the coming decades of the 21st century. Besides the nature protection aspect, to assess its future development we also have to take into consideration mainly the gravitational processes (falling off of rock pieces) which, combined with insufficient maintenance of historical architecture of castles and the municipal fortification system of Trenčín (Samák, 2003b, Závacký, 2003), can negatively affect human activities at the base of these elevations, or in the alluvial land. (Chrastina, 2006a)

**Scientific and practical implications of the monography**

On the basis of the reached outcomes, this monograph may be used to serve the needs of the basic and applied research in the following manner:

■ Integrated approach (Žigrai, 2001a, 2004, Oťaheľ, 1999, Izakovičová, 2006) to the study of prehistoric and historic development of use of the Trenčín basin landscape and its mountain border made it possible to capture the real and dimensional picture of mutual relations between the demand (landscape use) and supply (natural potential) of the territory. Assessment of landscape development on the basis of archaeological structures, historical reports and preserved maps, introduces into the subject area a relatively exact and traceable temporal dimension, which is important not only for the basic research (e.g. from the perspective of complex knowledge of landscape) but also for social practical aspect (assessment of present, prediction of future development

trends) obviously within the paradigm of sustainable development (Huba – Ira, 1996, 2006, Olah, 2005a).

■ At the assessment of the prehistoric and historic development of landscape of the study area until 1526, we also used methodologies and methods of landscape archaeology (Žigrai – Chrastina, 2002). On the basis of reached outcomes, to carry out land survey, we suggest to focus on the chorical level (in our case the GsT), which, contrary to the regional dimension preferred by Wiedermann (2003, p. 40), offers the possibility of a more homogeneous view of the past trend in land use. In fact, synergy of status parameters of the geoecological subtype is reflected in the character and properties of geoecological links, which at the same time represent limits to the anthropogenic landscape exploitation.

With regard to the above mentioned, potential of the landscape-archaeological approach builds on the possibility to make a precise chronology of selected morphological sculptures. Our case involves a relationship within the prehistoric settlement (Paleolithic – Neolithic) of the cone-terrace landscape of the western end of the basin. Paleolithic man was looking mainly for middle cones (riss) with loess cover. Low cones from the Ice age (Würm) and adjacent portions of terraces settled during the Neolithic period at the times of the Szeletien and Gravettien, played, most likely, only a constituting function and therefore could not be part of the general structure at that time.

■ We carried out inter-disciplinary approaches to the study of transformation of natural landscape of the study area by man (Žigrai, 2004), considering the historical perspective (histography), physical geography (geoecology), cultural geography, or cultural ecology and landscape archaeology. These aspects that are part of the document orient the historical and geographical research toward environmental history (Jeleček, 1994, 1999, 2000), specifically toward the environmental and cultural-geographical concept of historical geography (Chromý – Jeleček, 2005, Jeleček, 2007).

■ Study of long-term changes in the interaction between the society and the nature is the topic of an IGU project, called „LUCC – Land use/Land Cover Change“ (Jeleček – Burda – Chromý, 2000). Implications and practical use of the monograph are apparent within the framework of this research project; furthermore, if we add the physical-geographical (geoecological), historical-geographical, cultural-geographical, and landscape-archaeological aspects to the multi-temporal historical perspective (historical dynamic land use/landscape use).

■ The reached outcomes may be implemented at drafting a proposal of sustainable use and conservation of cultural landscape of the study area (more in Wagner, 1999); as there are selected theses from this monograph that correspond to the environmental indicators of sustainable development under Agenda 21 (Klinda, 1996, 2001), especially to the indicators 75 (change in land use) and 76 (change in landscape conditions).

Ira (1997), Izakovičová (1997), Drdoš (1999) and Kupčík (2001) suggest that the featured subject area meets the criteria to supplement the selected theses of the National Environmental Strategy of SR (principle of environmental impact assessment of landscape), National Environmental Action Plan of SR (sector of nature and landscape conservation), and the National study called "On the way to a Sustainable Slovakia“ (sub-chapters 1. 3 and 3. 3 – Land use).

The subject of landscape use of the Trenčín basin and its mountain border according to Mrva (2005) and Kozová (2006b) complies with selected theses of the EU Strategy of sustainable development of regions.

Demo, Bielek, and Hronec (1999) show that the creation of a landscape structure with the balanced ratio of natural, human, and ecological elements is one of the

conditions for sustainable development. It is these aspects that can (and need to) be considered at drafting the Program of agricultural land conservation (Bodnár et al., 1997), as well as the Local Agenda 21 (Huba – Kozová – Mederly, 2002) that are still lacking in the territory.

■ In line with Drdoš (2001a, 2005b), Izakovičová (2005, 2006), Lipský (1999, 2000), Olah (2002c, 2003b, c), Oťaheľ, and Feranc (2006) and Sviček (2000), we consider the subject area to be one of the landscape management instruments. Integrated approach to landscape creation (Hrnčiarová, 2003, Jančura, 2002) may, through environmental planning (specifically through territorial and landscape planning – Drdoš, 2001b, 2005a, Drdoš – Michaeli, 2005a, b) prevent landscape unification occurring within the context of its one-sided exploitation, or in relation to natural limits of unsuitable placing of anthropogenic activities (Izakovičová – Miklós, 2001). Kozová (2001b), Boucníková, and Fanta (2005) show that the mentioned aspects create an explicit part of the European Landscape Convention (European..., 2000).

Despite the fact that the submitted document takes into consideration the above-mentioned specifications, it was not used at the creation of the landscape-ecological plan of the city of Trenčín (Mederly et al., 2007), which, under the provisions of Act 237/2000 Coll. on physical planning and building code (Building Act), represents an instrument of optimal (and sustainable) spatial planning and functional use of the territory (Izakovičová – Moyzeová, 2006, Krnáčová – Hrnčiarová, 2006).

■ Pursuant to Act 50/2001 Coll. (on support to regional development), the selected texts of this monograph comply with the criteria of information database of the selected documents on regional development at the municipal level or part of the Trenčín regional government unit (more in e.g. Čech – Krokusová, 2005, 2007, Kandráčová – Michaeli, 1997).

■ Development of tourism and other human activities exert a continuing pressure on the Trenčín basin landscape and on the borders of the adjacent morphological structures. Therefore, it is critical to consider the issue of marketing of the territory (Vaňová, 1999) with regard to its sustainable development (Čech, 2002, 2006a, b, Krogmann, 1999, 2005), or to create a Local Agenda 21.

■ Characteristics of the casual aspects of the historical-genetic elements of landscape has the potential to call man to the proactive approach; specifically, to prevent the loss of the landscape's historical memory (Chrastina, 2005d). With this perspective, the monograph introduces a model project - information database usable at monitoring and timely detection of crisis situations in the outside environment, (more in Gozora 2003, Šimák, 2004) accentuating the education aspect of crisis management (Chrastina, 2006a).

■ Analysis of the geological structure of local landscape is a precondition to modeling the operational preparation of territory for military purposes. For this reason our work may be used as a study material – educational tool in the study of military-geographical characteristics of the battleground, or in assessing its physical-geographical sphere (more in Lauermann - Rybanský, 2002).

**Conclusion**

Study of landscape use of the Trenčín basin and its mountain border fulfills the objectives we set forth in the introduction. With these attributes in mind, we may use the monograph's information database at activities connected to conservation of the local landscape and promoting its sustainable development. Meanwhile, the monograph presents one of the possible approaches to studying the region's genius loci. As stated by Denecke (1985), characteristics of the historical-genetic aspects of landscape allow for

a relatively reliable documentation of changes that had afflicted the study area before 1998, which is significant for creating decision-making and planning processes in the region.