

LANDSCAPE AS THE BASIC POTENTIAL OF THE REGIONAL DEVELOPMENT (CASE STUDY: THE VAŽEC VILLAGE, SLOVAKIA)

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Abstract

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The development of each spatial unit is determined by the capital, whether natural or socioeconomic, which it possesses. Natural capital is determined by the properties of individual natural components of the landscape, both abiotic and biotic sources. Socioeconomic capital is linked to a socioeconomic activities in the landscape. Capital creates certain prerequisites for the development of individual socioeconomic activities. Society does not always optimally use the offered potential, which is connected with the manifestation of various environmental problems. The paper focuses on the presentation of the methodical procedure of natural capital evaluation on the example of the village of Važec. The methodological procedure is based on an integrated approach to the landscape. It focuses on the assessment of both natural capital and limiting factors resulting from the development of socioeconomic activities, namely:

- positive arising from the needs of nature and landscape protection, as well as from the protection of natural resources,
- negative (stress factors) linked to the contamination of environmental components, which in retrospect in relation to socioeconomic activities act as hygienic limits.

Key words: natural capital, sustainable development, geosystem, regulation, Važec village.

Introduction

The development of each residential unit is determined by the capital, whether natural or socioeconomic, which it possesses. Natural capital is given by the properties of individual natural components of the landscape, both abiotic and biotic sources (Drdoš, 2006). Socioeconomic capital is linked to a person and his activities in the country. Compared to natural capital, this changes much faster. However, natural capital is much more important as it offers natural resources for the development of society. On the basis of capital, the appropriateness of the country to provide and fulfill various functions in order to satisfy the needs of society is determined (Poláčik, Otaheľ, 1987). Natural capital determines diverse ecosystem services (MEA 2005; Maes et al., 2016; Dick et al., 2017; Saarikoski, 2017; Mederly et al., 2020; Vrbičanová et al., 2020) and creates the potential for the realization of individual socioeconomic activities. Socioeconomic potential is manifested in the form of supporting and, on the other hand, limiting factors for the development of individual socioeconomic activities. The offered capital is not always used efficiently by the company. The problem is the persistent sectoral

approach to the use of natural resources, as well as the fact that the value of the services provided by natural capital cannot yet be adequately quantified economically.

From the point of view of ensuring sustainable development, it is necessary to apply an integrated approach in capital evaluation (Izakovičová et al., 1997). The concept of integrated landscape management today is generally recognized as the best framework for the management of natural resources, which accomplishes several environmental objectives such as reduction of the soil degradation, conservation of biodiversity, keeping the water in the ecosystems, flood prevention, improvement of water quality, and reduction of the factors accelerating the climate change. It is considered not only an innovative way to mitigate the size, duration, and rate of negative effects of humans on landscape (Stelfox et al., 2004) but also a framework for the achievement of economic and social targets, even as tool for minimizing of occasional prices and effects of communities (Crossman, Bryan, 2007). The integrated approach is based on understanding the landscape as a geosystem (Miklós, Izakovičová, 1997), based on understanding of the landscape as an integrated natural resource, an interrelated complex of natural resources in certain

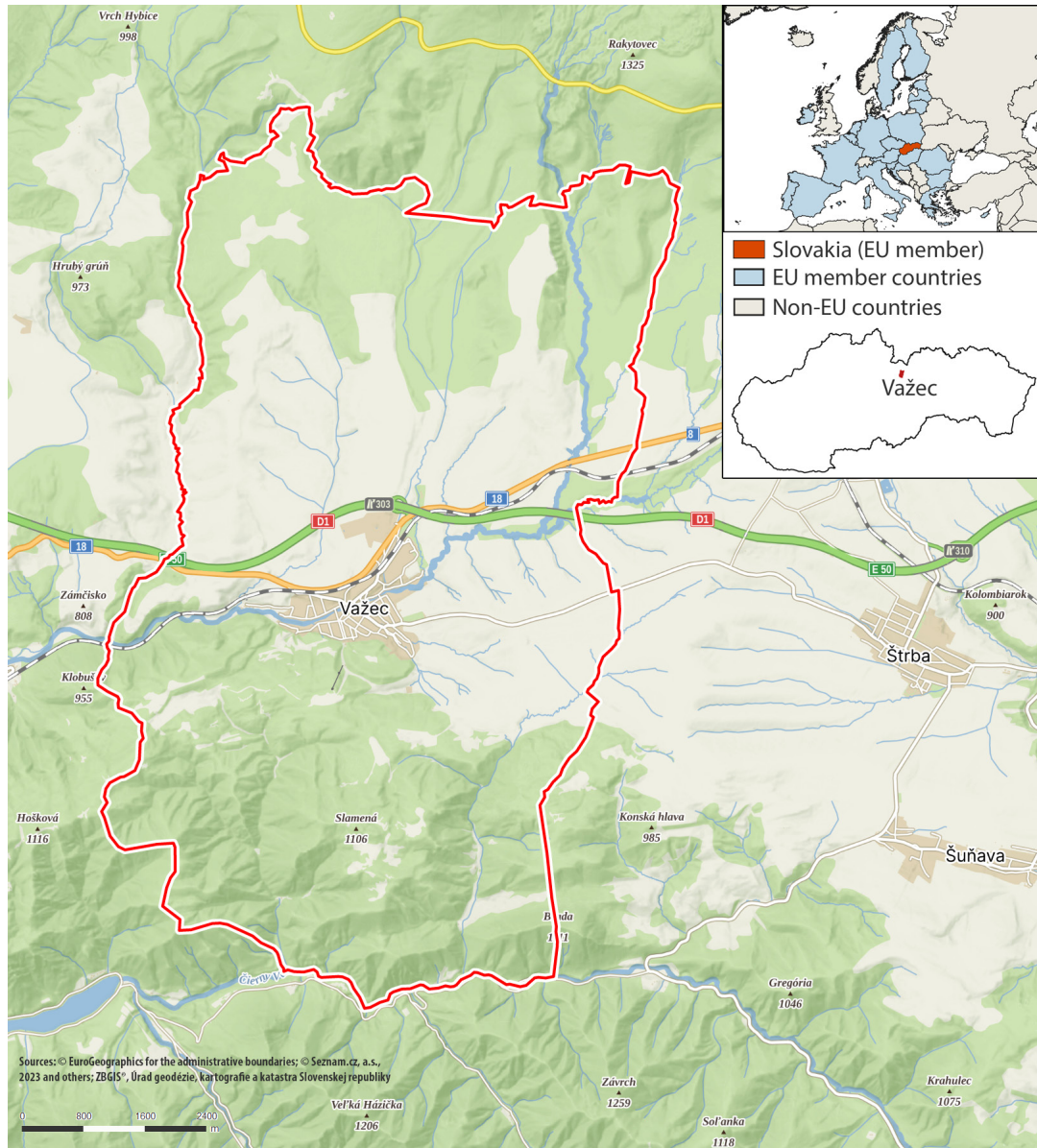


Fig. 1. Localization of the research area.

area. The area – the space – represents the integrating scope, scene in which all resources are occurring as layers (geological sources, water and soil sources, climate, biotic sources, and morphometric parameters), which are in permanent material-energy connection. This helps to understand the space as an integration of particular natural sources in given area. Every point of the earth surface presents specific homogeneous entity of mutual combination of listed sources (landscape building components, which through their attributes are capable to satisfy human needs and as such in relation to human society act as natural resources) and the relationship between these resources (Izakovičová et al., 2019a,b).

The goal of this study is to present a methodical procedure to evaluate capital (natural and socioeconomic) on an integrated basis. The methodical procedure is presented on the example of the village of Važec.

Material and methods

Methodology of the work

The basis for the evaluation of the capital of the municipality and the determination of the determinants of the further development of the municipality was the collection and evaluation of information on individual components of the geosystems of the territory, which we obtained from individual departmental databases and from the Statistical office. Background information had both the form of cartographic inputs (maps) expressing the properties of individual landscape-forming components and the form of statistical data. Subsequently, the data were interpreted and synthetically processed and evaluated in a GIS environment. The interpretation established the importance of individual properties for the evaluation of the capi-

tal of the municipality in terms of potential for development. Natural capital was evaluated based on the characteristics of the abiotic (geomorphologic conditions, morphographic, morphometric, geological, pedological, and hydrological and climatic conditions) and biotic complexes of the landscape (structure and importance of biotopes). The real possibilities of using the capital of the municipality for individual social activities were re-evaluated based on the action of limiting factors – factors arising from the needs of nature protection and natural resources as well as from the point of view of the action of stress factors (Izakovičová, 2000). Subsequently, we re-evaluated the importance of natural capital with a map of the current use of the landscape in order to determine the problem areas of inappropriate use of natural capital – above/below the limit use of natural capital. The map of the current landscape structure was processed through the interpretation of aerial photographs and was subsequently verified and corrected through our own field research. In order to determine the effective use of the development potential of the village, we also carried out sociological research – interviews with selected groups of stakeholders and a questionnaire survey with the inhabitants of the village. Ten percent of the inhabitants of the village participated in the questionnaire survey. The goal of the questionnaire survey was to find out what the inhabitants think are the prospects for the development of the territory, what future development they expect, how they imagine the ideal use of resources in their village, which activities should be developed, and which factors hinder the use of the territory of the village. The result was the processing of the territory management proposal in terms of the principles and criteria of sustainable development.

Case study

The village of Važec is a typical Tatra village. It is located in the Liptovský region in the Liptovský Mikuláš district at the border of two national parks: the Tatra National Park (TANAP) and the Low Tatras National Park (NAPANT). The core of the village is Liptovská kotlina (Fig. 1). It is surrounded by the High Tatras Mts. from the north and the Low Tatras Mts. from the south. The total area reaches 59,68 km². The current landscape structure is dominated by forest and agricultural land, which occupies 88.85% of the cadastre area. In the village on 01/01/2023, there were 2,361 inhabitants. The village has a favorable age structure, and average age is 40.83 years (average age in Slovakia is 41.39 years). The village, in contrast to the Slovak situation, is characterized by a high natural population increase. The territory has a rich natural capital – the occurrence of protected areas (the village lies on the border of two national parks NAPANT and TANAP) and elements of territorial system of ecological stability (TSES), water resources (Bird protected area, water supply flow, water resources), and forest resources. Cultural and historical monuments are also valuable. An important positive development factor is also the favorable transport location. Two important traffic corridors pass through it in the west–east direction. The D1 highway passes north of the inner city of the residence. The electrified double-track line of ŽSR No. 180 Žilina–Košice passes through the southern part of the inner city of the village, which is the main railway line of Slovakia. In the northern part of the village of Važec, there is class

I state road class number 18, which connects to the D1 highway. The territory stands out for its high environmental quality, as it is not significantly burdened by stress factors (good air quality, soil and water resources).

Results

Based on the evaluation of the natural capital, it can be concluded that the village has considerable potential especially for the development of ecological agriculture and forestry and for the development of recreation and tourism (Bezák et al., 2010). The use of natural capital is also largely supported by the socioeconomic infrastructure of the territory, which in many cases facilitates the use of natural capital.

Recreational and touristic potential

The recreational and touristic potential is determined by both natural and cultural-historical factors. The village with its natural wealth and rich folklore traditions creates a good background for various forms of tourism. There is a sufficient number of different attractions that can be a suitable attractions for tourists. The municipality itself has, above all, huge potential in the Važecká cave, which has been accessible to the general public since 1954. The natural conditions (mountain relief, mountain climate with little temperature inversion) create good conditions for the development of winter sports as well as summer tourism. Among the winter sports, skiing and cross-country skiing are particularly developed. Skiing is concentrated in the Berutová dolinka location, where visitors have access to a 412-m long ski lift that provides access to two pistes – one medium difficulty and one easy. For beginners, there is an 80-m long cable car in the lower part of the resort with an easy slope. Cross-country skiing develops mainly in the southern part of the cadastre in the foothills of the Low Tatras Mts (Važecký Chrbát Hill), where cross-country tracks are built (Figs 1, 2). The dominant summer sports are hiking and cycling in connection with the connection with the surrounding villages via purpose-built roads and existing marked routes. There are several hiking trails in the village and its surroundings with connections to TANAP and NAPANT. Recreational and touristic activities can also include hunting. The nature of the hunting grounds belongs to the deer breeding area. Among the species of game animals found here are deer, roe deer, hare, wild boar, grouse, and partridge.

The use of the village's recreational potential is supported by a network of services, especially accommodation and catering facilities and technical infrastructure for the development of recreational and sports activities: ski lifts, cross-country tracks, and hiking trails. Among the accommodation establishments, the most important ones include boarding house Violet, villa Rhea, hostel Kriváň, boarding house Katarína, cottage Važec, cottage Alžbetka, Apartment 501, and accommodations at Bartko and Jakubčo. Catering establishments include Pizzeria Garzia. From business services, food stores are dominant – Coop Jednota, Agro-Milk, CBA Verex, Fresh, My. In addition, there is a market, a pharmacy, and a gift shop. There are also several cultural and historical attractions. In the village, there are three cultural monuments registered in the central list of Slovakia's monument fund, namely, Roman – the Catholic Church of the Three Kings

from the end of the 13th century, a log folk house with a log farm building, and Hálova drevenica – a log house located in the garden of Hálova's house. Log houses are a remnant of the original construction. In addition, there are also other important historical and cultural monuments: the Neo-Gothic Evangelical church from 1889 to 1892, preserved wooden houses from before the fire in 1931, social housing built after the fire in 1931 and a wooden colony built in the same period, archaizing wooden pillar tombstones in the cemetery, the building of the upper mill, the remains of the gutter in the Čierne location, the memorial house of Ján Hála with a picture gallery, the Važec folk culture museum, a private museum of agricultural tools and folk traditions, Slovak National Uprising monument in front of the Municipal Office building – memorial to those who died in the Second World War, and the cemetery of German soldiers who died in the Second World War. This is the most famous cemetery of German soldiers in Slovakia. The attraction is also the organization of various cultural and sports events, such as hospital Omilienci, welcoming spring in Važec and opening wells, building maypoles, parade of recruits, Bonfire of Sovereignty, music festivals, winter and summer sports games, forest run through the Birut valley, District firemen's league, Christmas netball and basketball tournament, Winter tournament in indoor football, and so on.

Agricultural potential

The agricultural potential is determined by the location of the village in the eastern part of the Liptovská basin with the dominance of brown soils, in floodplain areas with the occurrence of floodplain soils. The use of agricultural potential is ensured by the former agricultural cooperative Važec, which was established in 1960. Due to the preference for ecological forms of management, the cooperative became a certified ECO farm in 2005. Ecofarm manages 1,550 ha of permanent grassland and 470 ha of arable land, where it mainly practices ecological forms of management. They are based on the application of a balanced sowing procedure on alternating the cultivation of cereals with legumes, annual fodder, root crops, and especially multiyear cultivation of fodder on arable land. This means an annual rotation of different crops, organic cereals, and legumes are grown, especially oats, barley, spring wheat, triticale, broad beans, lupine, peas, and potatoes, which serve as core feed for animals. Pasture areas, concentrated as close as possible to the cooperative, are mainly intended for dairy cows. Mountain pastures are used for grazing young cattle, and rough fodder for the winter is made in the meadows. As part of fertilizing, they prefer fertilizing mainly with farmyard manure within the permitted range. They use cut straw for bedding. To replenish nitrogen in the soil, they expanded the cultivation of clover on arable land together with the application and use of bacteria in the soil.

Animal production is focused on sheep and cattle breeding and the subsequent processing of animal products – cheese, bryndza, žinčica, spears, sausages, threads, and yogurts. The farm is characterized by the production of organic beef and the processing and aging of beef. Livestock production also includes internationally recognized sheep breeding.

The focus on breeding is also confirmed by the development of landscape changes (Fig. 2), where arable land has been significantly transformed into permanent grasslands.

Forestry potential

The mountain relief of the Fatransko-Tatra region and Kozié chrbty Mts. create also conditions for a high forestry potential. According to the total values of land types, the forests in the cadastre are located on an area of 3529.18 ha, which is 58.99% of the total area of the cadastre. The area of forests is growing (Fig. 2) mainly in the northern part of the cadastre. The territory of the cadastre belongs organizationally to forest territory unit (FTU) Čierny Váh, Biely Váh, and Račková. According to the territorial planning documentation, the following economic forests are located in the cadastral territory:

51-HV-100 – limestone beech-fir forests, the target economy is spruce of exposed habitats, the economic method is felling with the forms of log and undergrowth small-area, the felling period is 100 years, the renewal period is 30 years, and the target trees are spruce and fir with an admixture of beech, valuable hardwoods, and larch.

65-HV-110 – nutritive spruce with fir and beech, the target management is spruce nutritive habitats in mountainous areas, the felling economic method forms clear-cut small-area, stump, and undergrowth small-area, the felling period is 110 years, the renewal period is 30 years, and target wood species spruce with admixture of larch, beech, fir, and valuable deciduous trees.

Limiting and restricting factors of capital utilization

The use of individual potentials in the territory is limited by several factors, namely:

- a. Positive socioeconomic phenomena aimed at nature protection. The territory of the municipality of Važec is covered by TANAP and NAPANT protection zones and some small protected areas. The northern part of the cadastre above the D1 highway belongs to the protection zone of the Tatra National Park (TANAP). The southern part of the cadastral territory of the village belongs to the protection zone of the Low Tatras National Park (NAPANT). Its border passes through the Goat's Back Mountains. Protection zones are set aside in the vicinity of national parks. The third level of protection applies in the territory of national parks, small protected areas, and the second level of nature protection in their protective zones, which limits the intensive economic use of forests as well as the development of intensive agriculture and also limits some recreational activities. NATURA 2000 sites and elements of the territorial system of ecological stability act as a limitation to the intensive use of natural potential. NATURA 2000 Sites are found in the territory:
 - Protected bird territory of the Tatras, which was declared for the purpose of ensuring the favorable status of the habitats of bird species of European importance: golden eagle, black grouse, black grouse, wood grouse, sparrow grouse, mountain partridge, peregrine falcon, black stork, golden eagle, wood owl, woodpecker three-toed black woodpecker, and gray magpie and ensuring conditions for their survival and reproduction.
 - Territory of European importance – the stream of Biely Váh (SKUEV0143), where the following habi-

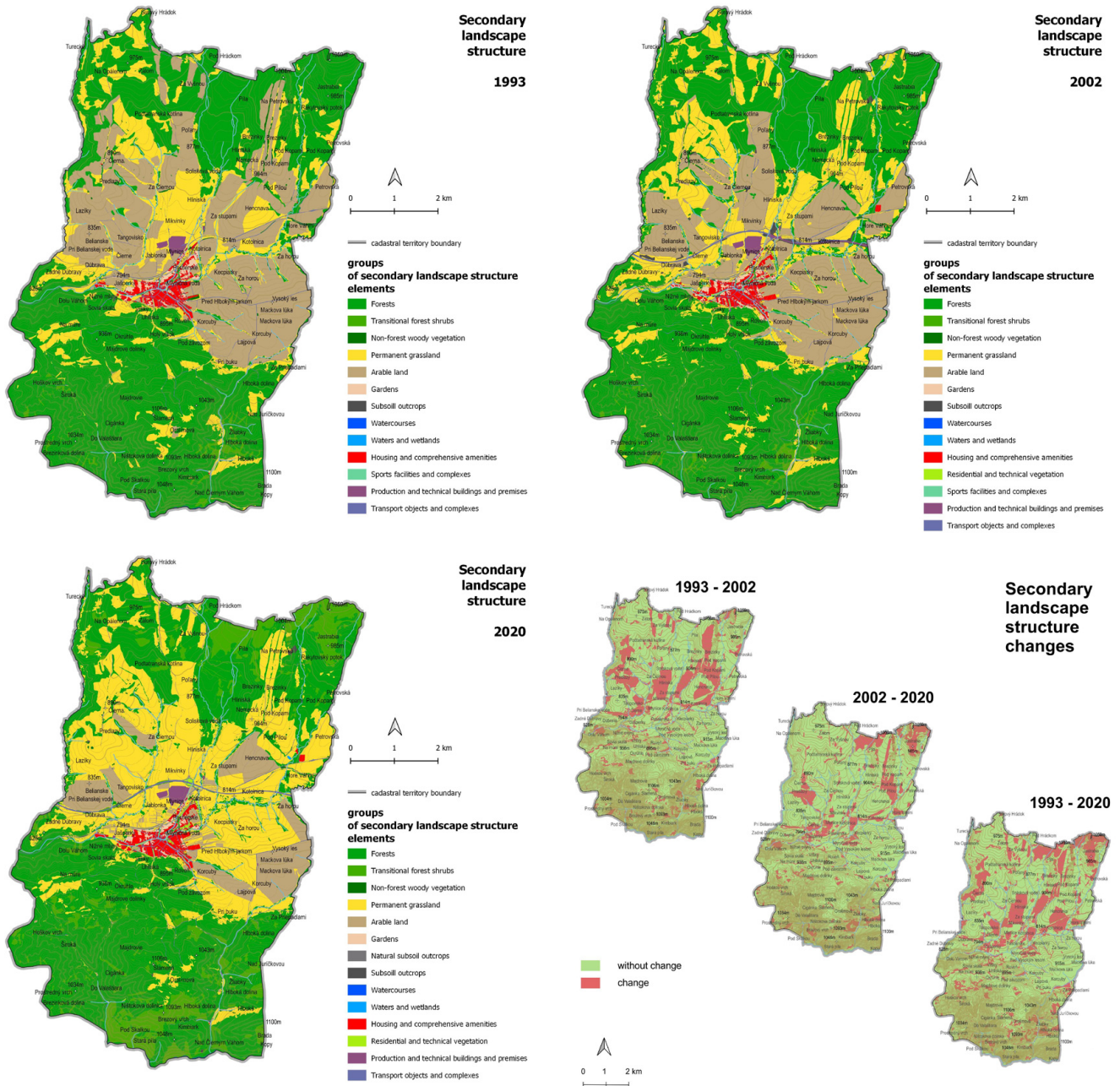


Fig. 2. Land-use changes in the Važec village between 1993 and 2020.

tats are subject to protection: 6510 – lowland and foothill meadows, 3220 – mountain watercourses and herbaceous vegetation along their banks, 7230 – bogs with a high base content, 6430 – moisture-loving tall herbaceous border communities on river floodplains from the lowlands to the alpine level, 91E0 – floodplain willow-poplar and alder forests.

Of the TSES elements, the territory includes the following:

- Three hydric biocorridors – supraregional biocorridor Biely Váh and two regional biocorridors Belanský potok and Lúčny potok.
- Two terrestrial biocorridors – biocorridor of supra-re-

gional significance Belianske potok-Kozie chrbty (terrestrial biocorridor, the axis of which forms the wider vicinity of the Belianske potok valley connecting the Tatra biocenter with the Kozie chrbty biocenter) and a regional biocorridor leading along the edge of continuous forest stands south of the village on the border of the Liptovská kotlina valley and Kozie chrbty Mts.

- The biocenter of regional importance Kozie chrbty Mts. (predominantly forested area on limestone bedrock) and the biocenter of regional importance Henčava (the foothill landscape is a colorful mosaic of forests, bogs, meadows, and pastures).

- b. Positive factors resulting from the protection of natural resources. Limiting and restricting factors of development can be included in this group:
- Water resource protection zones: There are three categories of water resource protection in the territory, the southern part of the cadastral territory belongs to the protected water management area of the Nízke Tatry Mts., which represents an important area of natural accumulation of groundwater. In the protected water management area, there must be economic interests, production interests, transport interests, and other interests aligned with the requirements for the protection of qualitative properties of water resources. The second category is represented by the Biely Váh stream, important for water management with its tributaries, and the third category consists of water sources and designated protection zones in their vicinity. The following water sources are located in the area: Mlynica 0.7 l/s, Martinková 0.6 l/s, and Soliská 1-3 2.1 l/s, which are used to supply the population with drinking water. An alternative water source in the Hliniská location was determined for farm Važec by the decision of municipal office Liptovský Mikuláš, Department of the Environment No. ŠVS-99/02789-Li dated 17.12.1999. Protection zones I and II are established in the vicinity of water sources degree. Grade I sanitary protection band is 10 m in size and is fenced. Subsequently, PHO II is set aside. A degree is defined based on the natural conditions of the territory. The Brezová water reservoir is located in the southern part of the cadastre, which is considered as an alternative drinking water reservoir.
 - Protection of forest resources: From the protection of forest resources, there are protected forests in the cadastre area of Važec municipality: 01-OV-150 – forests in extremely unfavorable habitats, the main goal of which is to protect the territory from manifestations of natural risks and hazards. The forests are located in the southern part of the cadastre in the area of Kozie chrby Mts.
- c. Limits and restrictions resulting from the action of stress factors: The cadastral territory of the municipality of Važec is not significantly affected by the action of stress factors, as there are no production facilities located here that would act as large or medium sources of pollution. Small sources of air pollution are local heating systems in housing units that are not connected to a gas pipeline. Local cesspools and septic tanks can act as sources of water pollution in the territory, where there is a risk of leakage and seepage of pollutants into the groundwater. Due to the built-up area and quite high connection of the population to the sewage system, the risk of pollution is not high. In the village of Važec, the Biroutova landfill – municipal waste dump – is a localized environmental burden despite the fact that it was revitalized and currently acts as a limiting factor for the production of agricultural crops for direct consumption as well as for the implementation of sports and recreational activities. We also include protective zones of natural stress

factors in this category of limits and restrictions. In the territory, these are:

- Protective zones of transport corridors, which are set aside in longitudinal zones along the lines of transport corridors. Their size depends on the significance of the road. These zones represent zones of negative impact of road traffic on the surroundings. The most significant negative effects resulting from the development of transport include noise, the production of traffic exhalations, dustiness, a barrier effect to the migration of biota, light effects, etc. These zones limit the localization of all anthropogenic objects and also limit the development of forestry and agriculture.
- Protective zones of electrical lines and protective zones of product pipelines. In these protective zones, it is forbidden to establish structures and carry out surface modifications that would disturb the stability of the territory, to build facilities and plant vegetation that would endanger energy works and their smooth and safe operation.

Discussion

The natural capital is a determining factor in the development of individual territorial units, as assets provide people with free goods and services, often called ecosystem services which make human life possible (Costanza, 2014; Maes et al., 2016; Haines-Young, Potschin, 2012; Miklós et al., 2020). The value of the natural capital changes over time, as people significantly interfere with the use of the country's natural potential with their activities (Fig. 2). Human action in the country has a bipolar character: on one hand, there are activities that enhance and improve the given natural capital; on the other hand, there are activities that threaten the value of the country's natural capital and cause its threat and degradation. So, on one hand, the value of the natural capital is preserved and also improved in the form of nature and landscape protection, as well as the protection of natural resources, where different degrees of protection are declared to protect the landscape capital as well as its individual components. The higher the degree of protection declared, the more efficient the use of natural capital is ensured. On the other hand, man endangers and degrades natural capital with his activities. Many human activities act as stress factors in relation to natural components. Their action is manifested not only by primary effects, which cause a direct capture of natural ecosystems and natural resources, especially soil, but also by secondary effects, causing the degradation of the qualitative properties of natural resources. Despite the importance of natural capital for the development of society and the activities carried out to protect it, the loss of natural capital continues to accelerate (Wakernagel, Rees, 1977; EU, 2021). Based on the "State of Nature in the European Union" report, only a quarter (27%) of the species have a good conservation status at EU level. Most species (63%) continue to have a poor or bad status. The situation is worse for habitats – just 15% having a good status. The vast majority (81%) are in a poor or bad status (EU, 2021). The situation is similar in Slovakia, where 75% of species and 60.4% of biotopes of European importance were in an unfavorable condition (unsatisfactory or bad) (SAŽP, 2023). Endangering biodiversity is a consequence of inappropriate use of natural capital, especially the application of a sectoral approach to

landscape management (Mojses, Petrovič, 2013; Pauditšová, Slabeciusova, 2014; Skokanová et al., 2016; Karlík et al., 2017; Masný et al., 2017; Petrovič et al., 2017; Izakovičová et al., 2019a,b; Grežo et al., 2020; Žarnovičan et al., 2021; Vojtek et al., 2022; Dežerický et al., 2023).

The problems arising from the sectoral approach to the management of the country can also be seen in the area of interest. Intensive forestry – changes in the wood composition of stands, changes in stand structure, liquidation of old stands over 120 years old, and the creation of an unstable forest spruce monoculture – causes the extinction of some rare plant and animal species and threatens the biodiversity of the area. Logging, moving wood with heavy machinery, and deforestation due to the construction of forest roads caused a significant disturbance of the soil and vegetation cover and disturbed the ecological stability of forest ecosystems. These activities are also linked to the danger of the territory due to erosion-accumulation processes. The abandonment of agricultural lands, especially those that are more difficult to access, causes the

disappearance of its traditional forms of management, a change in the species composition of meadows, the retreat of rare and endangered species of flora and fauna, and the spread of ruderal species. Intensive recreation in protected areas that does not respect the vegetation and nesting periods of birds manifests itself in the threat of some rare plant and animal species. Similarly, the uncontrollable development of recreation is also linked to the dumping of waste in open land and the creation of uncontrolled landfills. From the point of view of prevention and elimination of endangerment and degradation of natural capital, it is necessary to bridge the sectoral approach to the management of the territory and it is necessary to harmonize the use of natural capital by individual sectors. When using capital, it is necessary not only to take into account the supporting factors but also to respect the restrictions and limits resulting from the protection of nature and natural resources. From a hygienic point of view, it is also necessary to take into account the limits resulting from the action of stress factors in the use of natural capital (Fig. 2, Tables 1, 2, and 3).

Table 1. Supporting and limiting factors of recreation development.

Presence of Važecká cave
Forests – potential for hiking and fruit picking
Attractive location on the border of two National Parks – NAPANT and TANAP
Good environmental quality
Built infrastructure for the development of tourism – ski lifts, cross-country trails, cycle paths, accommodation, and catering facilities
Favorable traffic location
Cultural monuments, J. Hálu gallery, Važec folk culture museum, and the largest cemetery of German soldiers
Organization of various cultural and sports events
Nature protection – TANAP, NAPANT, and elements of TSES
Protection of natural resources – protective zones of water resources, protective forests, and forests of special purpose
Increasing demands on infrastructure and unsatisfactory infrastructure

Table 2. Supporting and limiting factors of the development of ecological agriculture.

Natural conditions suitable for ecological farming, mountain meadows, pastures, and mosaic landscape structures
The presence of independent farmers interested in ecological forms of farming
Rich tradition and built infrastructure – Ekofarma (production, processing, and sale of products)
Internationally certified sheep breeding
Rich promotion of organic products
Lack of human resources – aging farmers and lack of interest of the younger generation
Change in ecological conditions due to climate change

Table 3. Supporting and limiting factors of forestry development.

A rich representation of forests with a renewal period of 30 years
The presence of independent farmers interested in ecological forms of farming
A rich tradition
Built infrastructure
Convenient traffic location
Risks of threat and damage to forest stand due to climate change – occurrence of natural hazards
Nature protection – TANAP, NAPANT, and elements of TSES
Protection of water resources – protection zones
Fulfillment of purposeful functions of forest ecosystems – protection forests and forests of special purpose

In the long term, the rate at which natural capital is depleted needs to match the rate at which it can regenerate; otherwise, the life support systems that we need from nature will run out (Scherr, Heiner, 2016). The SDGs were developed on the basis that we can achieve a sustainable rate of natural capital usage. The fulfillment of the SDGs is possible by respecting the limits and restrictions in the use of natural capital. Regulations (restrictions and limits) must be respected already in the decision-making process on the use of the natural capital of the given territory. A new instrument can also contribute to the protection of natural capital called “Natural capital accounting.” The natural capital accounting is a tool to measure the changes in the stock and condition of natural capital (ecosystems) at a variety of scales and to integrate the flow and value of ecosystem services into accounting and reporting systems in a standard way. Based on the United Nations new statistical framework, it provides a common set of rules and methods to track changes in ecosystems and their services across policy areas (United Nations, 2020).

Conclusion

From the point of view of ensuring the efficient use of ecosystem services and ensuring the sustainable development of individual territorial natural-socioeconomic units, it is necessary to overcome the sectoral approach to the use of natural resources and the natural capital of the territory and replace it with a complex geosystem approach. The sectoral approach leads to the emergence of conflicts of interests in the use of the land and subsequently to the manifestation of various environmental problems, where the intensive use of one resource can threaten the quality of another resource. For example, intensive agriculture in a protected water management area can cause pollution of water resources, intensive forestry in protected areas is a threat to the area's biodiversity, etc. An integrated approach leads to the optimization of the use of natural resources, as it evaluates the appropriateness of the use of spatial units as an integration of all natural resources on a given area and harmonizes the use of the territory based on the combination of the properties of individual resources – it sets restrictions and limits for the use of the natural capital of the territory. If we do not want to realize the use of one natural resource at the expense of another, it is necessary to respect these limits in the management of the territory.

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