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SUSTAINABLE UTILISATION OF THE RIVER IPEL BASIN

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Abstract: The study evaluates the territory River Ipel Basin in terms of sustainable development. The main objective is to define the existing landscape-ecological and environmental problems, to design measures for elimination of those problems and/or to prevent new problems. The ultimate goal of the effort is to achieve such management practices that are in harmony with the potential of the area in the highest possible extent. The basic principles applied in landscape-ecological optimising of landscape organisation include protection of nature, biodiversity and landscape stability, protection of natural resources including water, soil, air/atmosphere, forests, etc., protection of cultural-historical resources, including protection of cultural monuments, protection of historical landscape structures, etc., and environmental protection.

Introduction

Issues of sustainability have won increased attention especially in the latest period when the cumulated environmental problems (such as the almost exhausted natural resources, deteriorating quality of the environment, threat to biodiversity, expansion of negative psychosocial phenomena etc.) outgrow the purely ecological framework and become existential. Thus the research on sustainability problems starts from the pragmatic needs. Many professional and political events deal with sustainability issues. Among them, the Rio Summit ’92 is one of the most important because it gave an impetus to the solution of problems regarding sustainable development on the worldwide level. Approaches (followed by definitions) to the concept of “sustainable development” (SD) in a worldwide scale are very numerous and heterogeneous. They are based on a variety of aspects. For instance, IUCN (1973) defines SD as “…such a way of the management of natural resources (air, water, soil, mineral resources) and living systems including man, which will ensure the achievement of the highest sustainable quality of life “. Later, the IUCN (1991) defined it as “…improving the quality of life of man within the carrying capacity of supporting ecosystems”. Other definitions were proposed by Rifkin (1980) who considers SD”… the development that accepts the limits of the consumption and utilization of natural resources”. Vavroušek (1993) perceives SD as “…life style that is approximating the ideals of humanism and harmonic relation between man and nature in a time-unlimited horizon”, or Chiras (1993)”…as life within the bounds of the carrying capacity of biosphere”. In Slovakia SD was defined by Izakovičová (1995) as “… the process aimed at ensuring an adequate development of all forms of life not excluding human life in a long-term temporal horizon” and by Nováček et al. (1996) as “…the goal-directed process of changes in the behaviour of human society towards itself and also towards its surroundings (i.e. landscape and its resources), which is aimed at increasing the contemporary and future potential for satisfying the human needs and those of other beings considering the possibilities (limits) of landscape and its resources” . As evident

from the above given definitions, SD is used to denote such societal development that regards and respects the natural and cultural-historical resources. Thus the fundamental goal of sustainability is to harmonize the economic development with the protection of nature, natural and cultural-historical resources, and the environment.

The basic principles of the sustainable landscape management are (Izakovičová et al. 1997):

a) **Preservation of the overall ecological stability of landscape** as the most general and complex condition for conserving the gene pool, biological diversity, stability and the natural functioning of ecosystems and through that also for conserving the natural production capacity of landscape. The preservation of ecological stability is therefore primarily achieved by the landscape-ecological optimisation of the spatial structure of landscape - through the suitable distribution of landscape elements in space, their proper utilization or protection.
b) **Protection and rational utilization of natural components (natural resources)**, in particular air, water, soil, biotic resources, mineral resources. The state of natural resources is determined by their quantity, quality conditions, Protection and rational utilization of natural resources is realized partly through the optimal collocation of objects and activities in the area and by application of suitable technologies.
c) **Protection of the close human environment** – that means: preserving the quality of air, drinking water and food chain, reducing negative influences like noise, radiation and waste, preservation of aesthetic quality and human environment etc. The protection of the environment against the unfavourable influences means mainly the optimisation of technological processes of production branches and preservation of the aesthetic quality of the environment means mainly the optimal land cover.

The basic goal of the paper is to present landscape-ecological evaluation of the River Ipel Basin from aspect of the principles and criteria of sustainable development and present proposal of the sustainable utilisation of this territory.

Materials and methods

The methodological procedure is based on the methodology of landscape-ecological planning LANDEP (Ružička and Miklós 1982), the methodology of territorial system of ecological stability (Izakovičová et. al. 2000) and the methodology of evaluation of collisions of interests in the landscape (Izakovičová et al. 1997).

The methodological procedure for elaboration of the proposal of sustainable utilisation of the River Ipel consists of the following basic steps (Table 1).

The methodology was applied to the Slovak part of River Ipel Basin. The catchment of the Ipel River lies on the interface lying in the north of the southern Carpathian Pannonian region. Its position involves natural specificities that determine the of the landscape. The highest-lying points include the Býkov peaks (1110 m), Javor (1044 m), and Sitno (1009 m). In the valley between Burda and the Borzssony Mountains near the village Chľaba, the Ipel floodplain is 105 m above sea level. Relative amplitude of the basin is 1005 m. The major part of the basin (more than ¾ of the area) is situated in the level of 600 m above sea; 3,649 km^2 of the total basin area (5,151 km^2) is which situated in the territory

Table 1. The methodological procedure

Steps	*Description*
I. Analyses	Evaluation of the resources and potentials of the territory and evaluation of the present state of their utilization
II. Evaluations	Specification of the basic landscape-ecological and environmental problems of the territory
III. Proposals	Elaboration of the proposal for elimination of current problems and proposal of the sustainable utilisation of the territory

of Slovakia, the rest of the area (1,502 km^2) is in the territory of Hungary. Pursuing the regional geomorphological division of the Slovak Republic (Lukniš and Mazúr 1978), the basin of the River Ipel is composed by the Štiavnické vrchy Mts. Javorie, Krupinská Plateau (part of the Slovenské stredohorie mountain range), Veporské Mts. as part of the Slovenské Rudohorie mountain range, Ipeľská and Lučenecká Basins as part of the Juhoslovenská Basin and the Ipeľská Hill Land as the eastern part of the Podunajská Hill Land within the Podunajská Lowland.

Results

Application to the study area – results of the solution

Application of the methodology to the study area consist from:

- Evaluation of the resources and potentials of the territory
- Problems associated with utilisation of resources and potential of the territory
- Proposal for sustainable utilisation of the territory

Evaluation of the resources and potentials of the territory

The area is important in terms of natural and cultural and historic resources, which represent a potential for varied socio-economic activities. The farming potential is given by the existence of quality water and the climate favourable for farm products including grapevine. The most productive soil complexes include Molic Fluvisols, calcaric Molic Fluvisol, Haplic Chernozems (WRB) on aeolian and aeolian-fluvial non-carbonate and carbonate sediments (Hraško et al. 1993). Their frequency is prevailingly linked with the southern part of the floodplain and the hill land of the River Ipel basin. Apart from intensive large-block agriculture, valuable historic structures of agricultural landscape survived here as well. There are two types of historic agricultural landscape structures in this area (Štefunková and Dobrovodská 1998). The first type is linked to the area of secluded homesteads and hamlets where the compound of original small-block extensively used meadows, pastures, orchards, gardens, fallows and vineyards in lesser extent represent the historic agricultural landscape structures. They occur prevailingly in the vicinity of individual or grouped shops and residential buildings or outside the residential area within the compound of large-blocks of fields, grassland and forest. The second type includes mosaics of small-scale mostly narrow fields oriented along the fall lines of slopes, peg and wire vineyards, grasslands, orchards, gardens, fallows, balks

covered by wood vegetation and old abandoned parcels which are now overgrown by tree and shrub vegetation. The typical features of historical landscape in the region of the River Ipel Basin are individual cellars or those built next to press shops on slopes or partially inserted into the slopes arranged in rows, in groups or scattered in vineyards. Significance of these historic landscape structures is evident above all in terms of their historic and cultural value but also landscaping, social and ecological functions, as they represent anthropogenically controlled biotopes, important gene-pool localities of both fauna and flora and they increase the ecological stability of the landscape around the River Ipel. They are suitable biotopes for nesting and survival of the woodlark (*Lulula arborea*), Eurasian scops owl (*Otus scops*, and the European bee-eater (*Merops apiaster*). The species enjoy good living conditions on the sunny southern localities with scarce tree and shrub vegetation but also in young woods. Other important local species are the little bittern (*Ixobrychus minutus*), Eurasian eagle-owl (*Bubo bubo*), Eurasian marsh harrier (*Circus aeruginosus*), common kingfisher (*Alcedo atthis*), honey buzzard (*Pernis apivorus*), and many other (Darolová 1995).

Several valuable eco-sozoological localities also survive along agricenoses of this area. There are ten localities with NATURA 2000 biotopes of international significance (Ružičková et al. 1996); many of them are parts of protected territories. The Basin also boasts two National Nature Reserves, three localities of Natural Phenomena and two Protected Areas. Important European bird territory Niva rieky Ipeľ is also located in the Ipel Basin with typical biotopes of southern Slovakia: water biotope, agricultural landscape and pastures. It is important for the species like the white stork (*Ciconia ciconia*), lesser grey shrike (*Lanius minor*), little crake (*Porzana parva*), spotted crake (Porzana porzana), common kingfisher (*Alcedo atthis*), European bee-eater (*Merops apiaster*), and the Eurasian scops owl (*Otus scops*).

As far as wetland ecosystems in this model territory are concerned, the RAMSAR locality of Poiplie is among the most valuable ones. It is part of the bigger wetland spreading in Hungary. It is the territory with high concentration of natural assets in the spheres of geomorphology, hydrology, botany and zoology. The locality is the typical example of natural lowland alluvial ecosystems of the Pannonian bio-geographical region. It contains a preserved unique compound of wetland biotopes including susceptible and threatened plant and animal species, their associations with good population sizes and high diversity. It is an important biotope of the nesting and migrating water fowl ideal for fish spawning and it is the place where amphibians and mammals, but also insects and other animals reproduce (Slobodník and Kadlečík 2000).

The study area of the River Ipel Basin is among the less forested ones in Slovakia. Scarce woodiness is due to its lowland position and intensive farming. Regarding the landscape geomorphology, forest is not evenly distributed. The Forest Land Pool (FLP) prevails in the north; it is in balance with the Agricultural Land Pool in the south and it is scarcely represented in the rest of the territory. Forest compounds grow on morphologically dissected relief unsuitable for other forms of exploitation. There are several forest associations (Michalko J. et al. 1986). The original alluvial forest survives in fragments. Its greater part it exists outside the FLP, mostly within the bank vegetation. The willow-poplar alluvial forest grows on banks of bigger streams. Remnants of the Pannonian and Carpathian oak-hornbeam woods grow on moist stands while the higher situated positions are occupied by beech woods. Dry broad-leaved forests consist of thermophile mixed

sub-Mediterranean oak woods with admixture of *Quercus cerris*. Thermophile mixed sub-Mediterranean forests is represented by a complex of forest and grass-herbaceous thermo- and xerophile associations that developed in the warmest and driest stands. They are linked with the extreme relief forms such as the mountain crests and ridges and abrupt rock walls. Oak woods are the most spread climatic and zonal formations in the whole of the boundary region of the Ipel Basin due to the existing favourable conditions of the Krupinská Plateau and the Cerová Upland. They are linked to loess, loess and volcanic nappes with moderate slopes or steeper southerly exposed slopes. Besides, there are secondary forests such as the poplar monocultures, locust and pine woods. As far as the economic aspects are concerned, the economically exploited woods prevail in this territory while the protecting forest and those of special purpose form part of the FLP. Apart from economic functions forests in this territory also fulfil other than productive function although the functional productive type is the one most frequent followed by the counter-erosion/productive and water management/productive ones.

The territory of interest is hardly one with plenty water resources. The worst situation regarding drinking water resources is in the area of the Neogene of the Ipeľ Basin, the Lučenecká Basin and the western part of the Cerová Upland. There are several water sources that cater drinking water for population of the surrounding communities of Dolné Plachtince, Ľuboreč, Čebovská Upland, Kalonda and Chľaba. Apart from groundwater sources there are two water reservoirs: that of Ľuboreč with the volume of 3.79 mill. m^3, that of Nenince on Kosihovský Brook with the volume 1.941 mill. m^3 and 47 smaller water reservoirs and ponds. These are used for farming, recreation, fishing and regulation of water in the Basins. The most important are: Sklabiná, Želovce, Glabušovce, Ľadovo, Bajtava, and Jazierko. Surface waters also include the streams. Apart from the Ipeľ there are 20 other streams in the Basin with the statute of important streams in terms of water management. Occurrence of natural mineral springs is also important: the chemical composition and physical properties of the springs in Slatina make possible its use for therapeutic and consumer purposes (Krahulec P. et al 1977).

The territory is rich in gravel and sand which is extracted here as the natural ballast. Gravel/sand accumulations in this territory occur in the Ipel Basin. Stocks of building stones with dominating basalt are also important. However, extraction of raw material is often in conflict with the nature and natural resources conservation. Extraction also means certain interventions into the environment that may be direct (extracted spaces, pit heaps, settling pits, and dewatering) and provoked (subsidence of terrain, water contamination). Sometimes even the higher concentration of some natural components (contamination of groundwater with metals or radioactive substances) adversely impacts the environment.

Problems associated with resource and potential utilisation

Various socio-economic activities are pursued in the region on the base of resource and potential. Occurrence of minerals fostered the development of mining and processing activities, soil quality, along with favourable climate which favoured the development of agriculture and abundance of forest led to the development of forestry. Natural resources and the potential of the territory are not effectively used. An inappropriate use of natural resources led to a series of landscape-ecological problems in the territory in question. The following types of landscape-ecological problems have been selected:

A. Problems threatening spatial stability occur due to the territorial collision of stress factors and ecologically important territories. In this category there are the following types of problems:

- Pollution of water streams in the collision with their functions of biocorridors of the TSES,
- Barrier effect of built-up areas on the elements of the TSES,
- Local affecting of spatial stability by formation of non-functional agricultural landscape with the preponderance of large-area arable land in the structure agriculture landscape – southern part of the Ipeľ and Lučenec Basins,
- Threat to the sensitive ecosystems in the consequence of pollution (air pollution, water pollution, soil contamination etc.) due to sources located right on the territory as well as due to emissions transported from other sources that are not located in the region. The most intensive those of nearby situated industrial centres of Fiľakovo, Šahy, Lučenec, Veľký Krtíš etc.,
- Localisation of the mines of mineral materials in the protected area,
- Localisation of waste dumps on the protected territories.

B. Threats to natural resources due to effects of stress factors on the particular natural resources. In the given territory there are the following problems:

- Activation of the landslides in localities Ľuboriečka, Baňa Dolina as the result of brown coal mining,
- A possibility of endangering water resources in the consequence of inefficient sediment elimination from the sewage as well as the permeating sewage water from septic tanks and cesspools,
- Endangering of water resources in the consequence of animal production – localisation of livestock farms in the proximity of resources,
- Affected hydrological regime in the locality Baňa Dolina as the result of the mining,
- Affected the water resources quality in the consequence of soil contamination in the protected zones of underground water resources: Kalonda, Dolné Plachtince, Ľuboreč, Čebovce-Opatová etc.,
- Endangering of mineral waters in the locality Slatina in the consequence of polluted underground water,
- Collision of the intensive agricultural utilisation of the protected zones of water resources with their protective function,
- Damage to forests in the consequence of mining,
- Endangering of soil resources in the consequence of industry situated near industrial centres of Šahy, Lučenec, Veľký Krtíš, Fiľakovo, Veľké Zlievce, Vrbovka, Vinica etc. as big sources of emissions,
- Line endangering of soil resources as a consequence of transport exhalations along the most intensive loaded of transport corridors: I/75 (north border of the study area), 510008 (Vyškovce nad Ipľom – Šahy), I/66, I/71 (border of the study area – Fiľakovo, Biskupice – Radzovce), II/527 (Veľký Krtíš – Slovenské Ďarmoty), II/564 (Kamenica nad Hronom – Štúrovo), II/585 (Lučenec – Veľká nad Ipľom) etc.,

- Soil contamination by heavy metals: Cu (lowland part of the region as the result of the intensive farming in the last years), Pb (river floodplain of the Rivers Ipeľ and Štiavnica), Hg (floodplain of the River Hron), Cd (river floodplain of the Rivers Ipeľ, Štiavnica and Hron), As (southern part of the study area),
- Affected landscape structure and generation of the anthropogenic relief forms: open mines, ground mines, stone pits, etc.,
- Collision of the mining activities with agricultural and water management activities – changes of the hydrological regime, acceleration of the erosion process, land occupation etc.,
- Endangering of soil resources by erosion often as the result of foul management of the farming landscape. The most endangered localities are Želovce – Čeláre, Dolné Plachtince – Slovenské Ďarmoty, Šahy – Plášťovce, Lučenec – Veľký Krtíš etc.,
- Endangering of water resources in the consequence of waste water released from industry and urbanisation: Lučenec, Veľký Krtíš, Fiľakovo, Lute, a. s. Lučenec, Bana Dolina, etc.

C. Problems threatening humans and their environment due to the effects of stress factors on an individual and their environment. In this category there are the following problems:

- Endangering of the settlement area in the consequence of air pollution, soil contamination, water pollution. The most loaded are settlements situated on the border of the study area: Šahy, Fiľakovo, Veľký Krtíš, Balog nad Ipľom, Veľké Zlievce, Vinica, Vrbovka etc.,
- Endangering of the human health in the consequence of consuming the polluted water,
- Endangering of the environment in the consequence of increased noise caused by the transports The population of the following settlements is most endangered: Horné Semerovce, Dolné Semerovce, Šahy, Demandice, Čebovce, Pribelce, Dolné Plachtince, Pôtor, Slovenské Kľačany, Závody, Fiľakovské Kováčovce, Biskupice, Radzava, Malý Krtíš, Nová Ves, Sklabina, Želovce, Záhorce, Slovenské Ďarmoty, Kremnica nad Hronom, Veľká nad Ipľom, Panicke Dravce, Výškovce nad Ipľom, Veľká nad Ipľom, Preseľany nad Ipľom, etc.,
- Negative effects of animal production in residential areas – collision of the hygienic zones of the animal farms with residential areas,
- Endangering of the settlement by the radon risk: Dúbrava – Závada, Vysoká nad Ipľom – Ipeľské Uľany – Hrušov – Čelovce, Koláre – Želovce – Bušince etc. (Čížek et al. 1992),
- Unfavourable hygienic and aesthetic effects of technical structures in the landscape.

Proposal for sustainable utilisation of the territory

The basic outputs of the landscape-ecological evaluation of the territory were the proposals how to eliminate landscape-ecological problems. The proposals consists of the following basic groups:

A. **Proposal for creation of the new landscape structure** – aimed at the change of the land use on the localities where the present utilisation of the territory is not harmony with the natural potential – proposal of the eco-stabilizing elements, creation of the functional ecological network mainly in the farming part of landscape, creation of the

puffer zone along water streams, forestation, establishment of the permanent grassland in localities endangered by erosion, application of measures against erosion, planting of the protective vegetation around permanent and mobile resources of emission, planting of the protective vegetation around industrial centres, animal farms aimed at the elimination of the negative effects of these elements on the environment, removal and recultivation of waste dumps etc.,

B. **Proposal of technological measures** – proposal of the technological measures concentrated on elimination of stress factors; realisation of efficient technology aimed at the protection of water resources, realisation of water reclamation works, realisation of sewer systems, application of a special regime for the use of polluted soil, application of the integrated forest protection, realisation of efficient technology concentrated on waste management, etc.,

C. **Proposal of the revitalisation** – revitalisation of water streams, which represent hydric biocorridors, revitalisation of the territory damaged by exploitation of mining, removal and recultivation of waste dumps, revitalisation of the abandoned vineyards and agricultural plots, stabilisation of sensitive areas against landslides, etc.

D. **Proposal of landscape protection** – proposal of legal protection of the ecologically important landscape elements – biocenters, biocorridors, interactive elements, etc.

E. **Proposal of monitoring** – establishment of the complex monitoring aimed at the permanent control of the quality of individual environmental elements such as air pollution control, emission control, water quality monitoring, soil contamination control, observation of the state of biota in the study area, assurance of food security, land use changes, etc.

Conclusion

Landscape-ecological evaluation of the territory is intended to solve landscape-ecological problems resulting from incorrect utilisation of landscape by the society. Decisions concerning utilisation of landscape were not always adopted regarding the landscape-ecological principles. On the contrary, they were frequently made from the position of power of a single economic sector. The prevailing sectorial approach in the decision-making process involved with utilisation of landscape caused a series of landscape-ecolo-4gical problems solution of which is the primary task of landscape-ecological planning. The comprehensive approach is promoted by many authors (Antrop 2003, Bürgi et al. 2004, Lörinci and Balázs 2003, Hietel et al. 2004, Iverson 1988, Wiggering et al. 2007). We present a comprehensive landscape-ecological evaluation of the territory on the example of the boundary region of the River Ipel Basin. The proposed landscape-ecological optimisation of the territory and proposed set of measures represent the basic condition for sustainable development of the territory. The presented methodical procedure can be applied in landscape-ecological evaluation of any territory while the input parameters have to be modified according to the requirements of the research task and a scale of elaboration.

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References

Antrop M. 2003. Continuity and change in landscape. In Mander Ü. Antrop M. (eds.), Multifunctional landscapes. Vol. III – Continuity and change. WIT Press, Southampton, 1–14.

Baláž P. Cicmanová S. Fendek M. Tréger M. 2000: Nerastné suroviny. Ročenka. Spišská Nová Ves. Štátny geologický ústav D. Štúra. 259 s.

Bodiš D. Rapant S. 1999: Geochemickýc atlas - Riečne sedimenty, MŽP SR – GS SR, Bratislava.

Bürgi M. Hersperger A. H. Schneeberger N. 2004. Driving forces of landscape change – current and new directions. Landscape Ecol. 19: 857–868.

Čeřovský J. Feráková V. Holub J. Maglocký Š. Procházka F. 1999: Červená kniha ohrozených a vzácnych druhov rastlín a živočíchov SR a ČR, Vol. 5 Vyššie rastliny. Príroda, Bratislava.

Čížek P. Smolárová H. Gluch A. 1992: Odvodené mapy radónového rizika Slovenska, Záverečná správa, Spišská Nová Ves.

Darolová A. 1995: Ornitologický výskum vybraných lokalít Poiplia, pp. 48–59 - msc. In: David, S. (ed.), Výsledky výskumu inundácie Ipľa v úseku Veľká nad Ipľom - Chľaba (ústie Ipľa). Ipeľská únia Šahy, 139 s. - msc. + príl. (Depon in: Ipeľská únia Šahy).

David S. 1987: Floristický výzkum zanikajících lokalit nivy Ipľu. Jubil. zbor. Tekovského múzea. pp. 117–153.

Hietel E. Waldhardt R. Otte A. 2004. Analysing land-cover changes in relation to environmental variables in Hesse, Germany. Landscape Ecol. 19: 473–489.

Hraško J. Linkeš V. J. Šurina B. Šály R. 1993: Pôdna mapa SR. M :400 000, Výskumný ústav pôdnej úrodnosti, Bratislava.

Iverson L. R. 1988. Land-use changes in Illinois, USA: The influence of landscape attributes on current and historic land use. Landscape Ecol. 2: 45–61.

Izakovičová Z. et. al. 2000: Territorial system of ecological stability. Landscape 21, Ministry of Environment Bratislava (in Slovak).

Izakovičová Z. Miklós L. Drdoš J. 1997: Landscape-ecological conditions of the sustainable development. Veda Bratislava. (in Slovak)-

Krahulec P. et al. 1977: Minerálne vody Slovenska 1. Balneografia akrenografia, Martin.

Krahulec P. et al. 1978: Minerálne vody Slovenska 2. Krenografia, Martin.

Lörinci R. Balázs K. 2003. Historical land use analysis and landscape development investigations for devising sustainable land use structure: Case from Hungary. In: Mander Ü. Antrop M. (eds.): Multifunctional landscapes. Vol. III – Continuity and change. WIT Press, Southampton, pp. 243–262.

Lukniš M. Mazúr E. 1978: Regionálne geomorfologické členenie SSR. Geografický časopis, 30, 2, SAV, Bratislava, pp. 101–122.

Michalko J. et al. 1986: Geobotanická mapa ČSSR. Slovenská socialistická republika, textová časť a mapové prílohy, VEDA, Bratislava.

Miklós L. Izakovičová Z. et. al. 2003. Landscape-ecological evaluation River Ipel Basin. Institute of Landscape Ecology, SAS, (in Slovak).

Ružičková H. Halada Ľ. Jedlička J. Kalivodová E. (eds.) 1996: Biotopy Slovenska. Príručka k mapovaniu a katalóg biotopov, ÚKE SAV.

Slobodník V. Kadlečík J. (eds.) 2000: Mokrade Slovenskej republiky. SZOPK, Prievidza.

Štefunková D. Dobrovodská M. 1998: Kultúrno-historické zdroje Slovenska a ich význam pre trvalo udržateľný rozvoj. In: Izakovičová, Z. a kol. (eds.): Implementácia trvalo udržateľného rozvoja. ÚKE SAV, Bratislava, pp. 104–111.

Wiggering., Dalchow., Glemnitz., Helming., Muller., Schultz., Stachow., Zander., 2007: Indicators for multifunctionality impacts in landscape. In: Bunce., Jongman., Hojas., Weiil. (eds.): 25 Years of Landscape Ecology: Scientific principles in practice. Proceeding from the 7th IALE World Congress – 2. part. pp. 817–818.

FENNTARTHATÓ HASZNOSÍTÁS LEHETŐSÉGE AZ IPOLY VÖLGYBEN

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Kulcsszavak: fenntartható fejlődés, Ipoly-völgy, környezeti és tájökológiai problémák

Összefoglalás: A jelen vizsgálat a fenntartható fejlődés szempontból értékeli az Ipoly környékét. A fő cél volt meghatározni, definiálni a tájökológiai és környeztei problémákat és felvázolni azon intézkedéseket, melyek segítenek az újabbakat kizárni és/vagy megelőzni. A végső cél törekedni olyan megvalósításra a gazdálkodási gyakorlatban amelyek öszhangban vannak a területi adottságokkal és ezek kibontakozási és fenntartási lehetőségeivel. Az alapvető szempont a tájökológai optmalizáció megvalósítása a tájszerkezetben, tartalmazva a természetvédelmet, a biodiverzitás és a tájkép stabilitását, a természeti kincsek, mint a víz, talaj, levegő/légkör, erdők, stb., a kultúrtörténeti kincsek védelmét, beleértve a kulturtörténeti emlékeket, emlékműveket, a történeti tájszerkezetet stb., és a környezetvédelmet.