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DEVELOPMENT OF LANDSCAPE PLANNING AND ITS CURRENT APPLICATION IN THE SLOVAK REPUBLIC

During the last five decades in Slovakia (in the former Czechoslovakia until 1993), scientific landscape-ecological methods were developed which represent a solid theoretical basis for landscape planning, conservation/protection and management of landscape. The article deals with the development and history of the methodology of landscape planning, assessment of its legal back up and applications. SWOT analysis was applied to the assessment. Discussion points to those fields of landscape planning that should be revised and improved.

Key words: landscape planning approaches, landscape ecological planning, LANDEP, SWOT analysis, Slovak Republic

Mária Kozová, Eva Pauditšová РОЗВИТОК ЛАНДШАФТНОГО ПЛАНУВАННЯ ТА ЙОГО ЗАСТОСУВАННЯ ДО СЛОВАЦЬКОЇ РЕСПУБЛІКИ

За останні п'ять років в Словаччині (в колишній Чехословаччині до 1993 року), були розроблені наукові ландшафтно-екологічні методи, які являють собою теоретичні основи ландшафтного планування, охорони / захисту і управління ландшафтом. У статті йдеться про розвиток та історію методології ландшафтного планування, оцінки його правових основ і додатків. До оцінки було застосовано SWOT-аналіз. Вказані ті області ландшафтного планування, які повинні бути переглянуті і поліпшені.

Ключові слова: підходи ландшафтного планування, екологічне планування ландшафтів, LANDEP, SWOT аналіз, Словацька Республіка

Mária Kozová, Eva Pauditšová РАЗВИТИЕ ЛАНДШАФТНОГО ПЛАНИРОВАНИЯ И ЕГО ПРИМЕНЕНИЕ В СЛОВАЦКОЙ РЕСПУБЛИКЕ

За последние пять лет в Словакии (в бывшей Чехословакии до 1993 года), были разработаны научные ландшафтно-экологические методы, которые представляют собой теоретические основы ландшафтного планирования, охраны / защиты и управления ландшафтом. В статье говорится о развитии и истории методологии ландшафтного планирования, оценки его правовых основ и приложений. К оценке был применен SWOT-анализ. Указаны те области ландшафтного планирования, которые должны быть пересмотрены и улучшены.

Ключевые слова: подходы ландшафтного планирования, экологическое планирование ландшафтов, LANDEP, SWOT анализ, Словацкая Республика

INTRODUCTION

Landscape planning is one of the most important areas of applied landscape ecology bridging the theory and practice. Its methodology consists of a wide set of scientific and applied methods. Hundreds of different methods and approaches have been developed in the world particularly after 1960. Ndubisi (2002) provided an overall classification of methodological approaches that had been proposed and applied between 1960 and 2000. He reports that in spite of variety of approaches applied in different countries, the objective of these methodologies is the same: identifying of ecologically optimal variants for the spatial structure of the landscape.

Methods of assessment of the landscape-suitability approach constitute the basis of the

methodology applied to landscape planning. These are often combined with the assessment methods of the ecological carrying capacity with the aim of seeking an optimal location for different forms of land use. Currently, apart from the geographical and other nature sciences, also economic (ecological economy) and other technical disciplines contribute to the development of landscape planning methodology.

Landscape planning systems and their methods differ greatly and they depend on historical and land use development such as inhabited, agricultural and natural landscapes and also the intensity of disturbances and landscape character. In the European countries we can find several independent approaches for example: a) landscape planning as an optimising method of spatial arrangement respecting landscape ecological conditions e.g. Germany,

Austria, the Netherlands, Slovak Republic and Czech Republic; b) landscape planning respecting mainly landscape character and landscape scenery e.g. United Kingdom; c) landscape planning as a toll for the protection of cultural heritage e.g. Italy; and d) landscape planning respecting firstly nature protection e.g. Sweden and Denmark (Kozová, Finka, 2006).

Landscape planning is historically interpreted as an integrated discipline linked with land-use planning, landscape architecture, spatial planning and management. Landscape planning though, has found a wide acceptance in preparation of plans for river basin management, nature conservation/protection, preparation of territorial systems of ecological stability, forest management, projects of land consolidation, socio-economic plans, tourism, conceptions for the protection of heritage and

other strategic plans relating to landscape. Among the first countries to develop landscape planning already in the 1950s were Germany and the Netherlands. Progressive methodologies for landscape planning were also developed in Central Europe, for instance in Switzerland, Austria, Belgium, Slovak Republic, Czech Republic, Poland and Hungary. At the beginning of the 1970s, the USA started ecological and environmental planning as one of approaches to landscape architecture and regional planning. Russia and other East European countries joined the trend in the 1990s. The article deals with the development of methodology of landscape planning assessment, its legal back up and applications. SWOT analysis was applied to the assessment. Discussion points to those fields of landscape planning that should be revised and improved.

DEVELOPMENT OF LANDSCAPE PLANNING METHODOLOGY IN THE SLOVAK REPUBLIC

Landscape ecology in Slovakia (until 1993 in the former Czechoslovakia) boasts an almost 50-year history. The applied methodology dwelled on approaches of what was referred to as the Central European landscape school and the Russian school which developed the learning about landscape within geography. Already at the beginning of the 1960s, landscape ecology in Slovakia focused on practical application of this science in land-use planning.

The Institute of Landscape Biology of the Slovak Academy of Sciences founded in 1965 was one of the first interdisciplinary scientific institutions in the former Czechoslovakia. It concentrated on solutions to topical problems in the field of care for the environment and created favourable conditions for the development of methodologies for landscape planning. Since the beginning it initiated cooperation with the Institute for Management of Nature and Conservation of the Technical University in Hannover (the principal centre of landscape planning in Germany founded in 1947) and other European scientific centres. Scientists of the Institute of Landscape Biology, namely Prof. M. Ružička and Prof. L. Miklós (Ružička, Miklós, 1981, 1990) developed an original Slovak methodology for landscape ecological planning (LANDEP) in the 1970s.

At the same time (1970s and 1980s), a team of scientists from the Institute of Geography of the Slovak Academy of Sciences in

Bratislava (founded in 1943), consisting of Prof. E. Mazúr, Prof. J. Drdoš, Dr. J. Urbánek, Prof. J. O'ahel' and others, prepared the scientific procedure of landscape synthesis (O'ahel', 1986, 1996). Main activities were connected with the preparation of the programme for the International Geographical Union: *Landscape Synthesis – Geoecological Basis of Comprehensive Landscape Management* (Drdoš, Urbánek, Mazúr, 1979; Huba, 1982; Drdoš, 1983). The programme was based on an integrating environmental principle and sustainable approach to land use. It was a purpose-bound methodology (contribution of basic geographical research to the applied landscape and environmental conservation research) with character of a plan.

Both above-mentioned scientific methodologies (LANDEP and the one of landscape synthesis and diagnosis) were continuously updated following the most recent scientific research. In the period between 1970 and 2011, they were applied to hundreds of projects addressing different tasks on the national level (for instance, General Ecological Plan of Slovakia at scale 1 : 500 000), regional level (at scale from 1 : 200 000 to 1 : 50 000) and local level (at scales from 1 : 25 000 to 1 : 5 000).

In the 1980s, foundation of the International Association for Landscape Ecology (IALE) at the 6th International Symposium dedicated to problems of ecological landscape

research held in Piešťany, Slovakia (1982) has greatly influenced the development of landscape ecology and planning. The GIS technologies were introduced in landscape mapping which improved the quality of until then applied method of “overlay” and production of the source or proposed maps. Progressively sustainable development was also taken into account when proposing measures. In the 1990s, political events dominated in Slovakia like in the rest of Europe. After the fall of the Iron Curtain, questions connected with the environmental quality and territorial development in countries of Central and Eastern Europe were in the foreground of interest both of public at large and experts. Slovakia accessed to the European Council in 1993 and became a Member Country of the European Union in 2004. Starting by 1990, Slovakia gradually signed several international conventions involved with landscape protection, management and planning. Among them is the European Landscape Convention (Florence, 2000), which entered in force in Slovakia in 2005. Adoption of the Convention meant an increased interest in the development of applied landscape-ecological methods including landscape planning and management in the whole of Europe. The European Landscape Convention brought about a new interpretation of landscape planning, as pursuing this Convention: «*Landscape planning*» means *strong forward-looking action to enhance, restore or create landscapes* (Florence, 2000). The Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention 1998), which entered in force in Slovakia in 2006, is also important for the development of landscape planning. The monograph of Kozová et al. (2010) contains a comprehensive overview of the history of landscape planning in Slovakia with examples of practical application of its tools.

LANDEP – Landscape Ecological Planning

LANDEP is the abbreviation of English (also adopted by Russian and German languages) phrase **Landscape Ecological Planning**. The aim of the LANDEP methodology is to prepare spatial and functional use of a territory, which is optimal in terms of landscape ecology. LANDEP is a systemic purpose-bound compound of applied landscape-

ecological methodologies for alternative proposals of ecologically friendly spatial arrangement of proposed activities in landscape (Ružička, 2000). Its content has a fixed basic structure and a logically built procedure. Simultaneously, it is an open system where specifications of the content and methodical steps always depend on nature of the given task, properties of the territory concerned, its size or the required specificity of processing.

Adoption of the Act no. 50/1976 on land-use planning and building order also influenced the creation of the LANDEP methodology. After 1976, landscape-ecological studies were started directly for surveys and analysis of land-use plans. The LANDEP methodology was applied to the assessment of ecological aspects of the development of towns and regions, agriculture, forest and water management and preparation of proposals for the regeneration of areas damaged by industrial or mining activities (Ružička, 2000).

The preliminary part of this methodology consists in delimitation of boundaries for the interest area and defining the types and character of the existing and planned socio-economic activities in the concerned area. It determines the level of specification for source materials, scales of maps and a schedule. Analytical background materials depending on the character of natural and socio-economic conditions of the given area are also included. The LANDEP methodology always follows the binding system steps: analysis, synthesis, interpretation, evaluation and propositions (Fig. 1) as the basis for the preparation of implementation (Ružička, 2000).

The scientific content of the first systemic block denoted *landscape-ecological source materials about territory* includes *analyses, syntheses and interpretations*. Character of the second systemic block is applied and it makes use of the knowledge and results drawn from the first block. It contains evaluations and concludes by *the landscape-ecological optimisation of land use* followed by an implementation model.

In 1997 the methodology of ecological carrying capacity of landscape was elaborated on the basis of LANDEP. This methodology established principles for spatial decision-making based on the limits of the ecological carrying capacity, and, it ensured sound ecological choices between landscape ecological

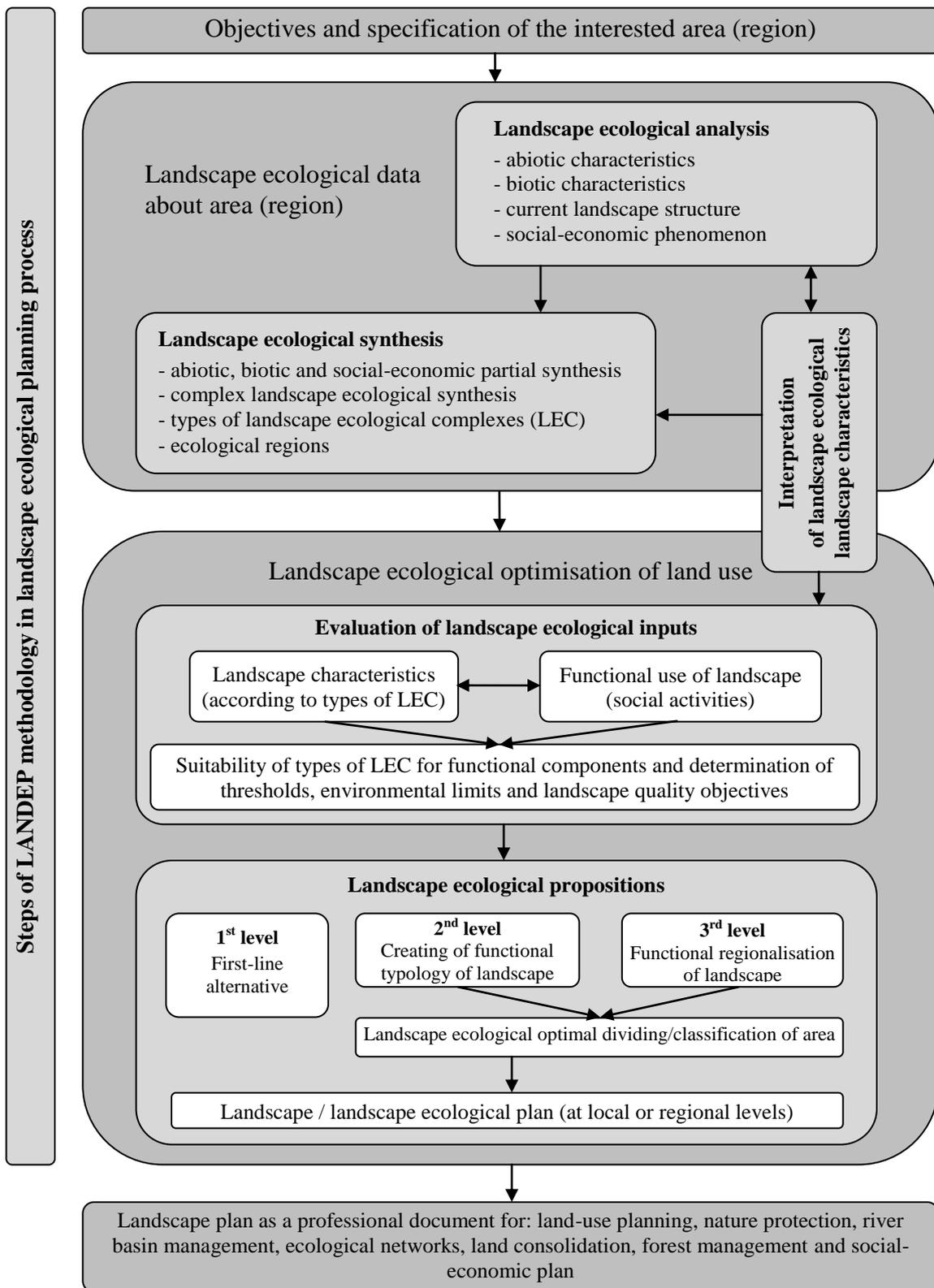


Fig. 1 – Steps of LANDEP methodology in landscape ecological planning process (Source: Ružička, Miklós, 1990; Ružička, 2000 – modified by the authors)

conditions and the present land use (Hrnčiarová *et al.*, 1997). The LANDEP also generated the methodological basis for additional procedures such as the methodology for the development of territorial systems of ecological stability (Ministry of Environment SR, 1993), procedures involved with the environmental impact assessment (Kozová *et al.*, 1995) and the methodology of integrated landscape management (Izakovičová *et al.*, 2006).

The LANDEP methodology received a significant international response and respect. In 1992, it was included into AGENDA 21 (approved at the World Summit of Earth held in Rio de Janeiro) as a recommended methodology ensuring an integrated approach to plan-

RESULTS: ASSESSMENT OF LANDSCAPE PLANNING IMPLEMENTATION IN PRACTICE

Legislation concerned with landscape planning and the relevant tools

Landscape planning in Slovakia does not enjoy such tradition in legal back up as, for instance, in Germany, Austria or Switzerland. Although the methodological development of landscape planning started already in the 1960s, landscape plans were only prepared for scientific purposes. Since 1976, it means since the new law on land-use planning and building order was approved, landscape-ecological and environmental aspects were integrated to some extent into the land-use planning procedure. However, landscape planning was not fully anchored in law (in difference from Germany or Austria).

Territorial systems of ecological stability (TSESs), also known as ecological networks were first to be treated by the Slovak legislation in 1991 (Act no. 330/1991 about land consolidation, land ownership, land administration, land pool and land associations). Principles of TSESs were progressively observed by other laws, particularly the Nature Protection Law, Environmental Impact Assessment Law and other.

The Federal Act no. 17/1992 on the environment created certain framework for the requests of landscape planning. This law defined the acceptable environmental load and for the first time it introduced the concept of environmental impact assessment. In 1994, the Act no. 127/1994 on environmental impact assessment and a new Act no. 287/1994 on nature and landscape conservation were approved and adopted. These two laws promoted

ning and management of a country's resources. American author Ndubisi (2002), bringing a comprehensive synthesis and characteristics of the current status of the world ecological (landscape) planning in his book, describes the LANDEP as a thoroughly elaborated landscape-ecological optimising method for the selection of suitable activities. Ndubisi (2002) was also positive about the fact that the LANDEP contains, apart from other, an implementation mechanism. Such renowned landscape ecologists as Naveh and Lieberman (1994) consider the LANDEP methodology one of the most important and fully applicable procedures of landscape planning.

the application of landscape ecological procedures such as those used for the assessment of landscape appearance, of landscape structure, its potential and carrying capacity, and other.

After 1990, also the Act no. 50/1976 on land-use planning and the building order (Building Law) was gradually amended especially in terms of political and social changes. This time it included some requests concerning the environment. However, it was only in 2000, when the need to formulate a legal framework for the integrated management based on the most recent knowledge in the field of landscape ecology was incorporated into the amended Building Law (Act no. 237/2000) although merely the position of landscape (or landscape ecological) plan was defined. Pursuing § 19c, article 2 of Building Law «*Optimal spatial arrangement and functional land use respecting landscape-ecological, cultural-historic and socio-economic conditions (landscape-ecological plan) is processed for the land-use plan of a region and land-use plan of municipality in the framework of surveys and analyses*». Preparation of four basis cartographic outputs: types of landscape-ecological compounds, environmental problems, alternative landscape-ecological selection and landscape plan is recommended.

Since 2004 the landscape plan in the Slovak legislation has been also defined in § 13 of Act No. 364/2004 Coll. on Waters (Water Act). The Water Act specifies the plan of river basin management and defines also a clear attachment to landscape plan. The Water Act presents: «*the river basin management plan*

will be obligatory used in landscape planning or may be considered for the landscape plan itself». That already witnesses that the river basin management plan should represent a complex document with required program of environmental measures. Selected principles of

integrated landscape management, which are oriented towards protection and rational use of natural resources, assurance of protection against natural risks and hazards, securing the environmental protection as well as protection

Table

SWOT analysis – current implementation of landscape planning in the Slovak Republic

<i>Strengths and advantages</i>	<i>Weaknesses and disadvantages</i>
<ul style="list-style-type: none"> • Almost 50-year tradition in application of landscape plans; methodologies are continuously developed and improved • Additional relevant methods and methodological procedures for the preparation of territorial systems of ecological stability, assessment of landscape ecological carrying capacity, and the environmental impact assessment were developed and applied. • Preparation of landscape plans as expert documents necessary for the land-use planning is laid down by the Building Law since 2000. • Additional tools relevant for landscape planning such as land consolidation (since 1991) territorial systems of ecological stability (since 1991) are also backed by the law. • Landscape plan is integrated into the Water Law since 2004 and may replace the river basin management plan. • A quality university education is provided to future experts in landscape planning and scientific research in this field. 	<ul style="list-style-type: none"> • Currently, neither the Building Law nor any other law defines the position of landscape planning within the planning processes. • Landscape plan is only a background source prepared in the stage of survey and preparation of the land-use plan • Legally binding methodological guideline to preparation of landscape plans is missing. • Landscape plan in structure recommended for the practice does not reflect, for instance, preparation of adaptation measures palliating the climate change, assessment of the changing land use, assessment of appearance of landscape and fragmentation of landscape, the landscape quality objectives, etc. • Position of the strategic landscape plan that should be prepared in response to the requests of the European Landscape Convention is not clear. • Coordination of landscape plans and land consolidation is missing due to not completed land consolidation projects in Slovakia. • Currently, the tools of landscape planning (with some exceptions) are characterized by absence of public participation.
<i>Opportunities and development potential</i>	<i>Threats in developing of landscape planning</i>
<ul style="list-style-type: none"> • Adoption of a law on landscape planning (its preparation took place between 2003 and 2007 under the National Programme for Implementation of the European Landscape Convention while there was not political will for its adoption) may contribute to improved implementation of landscape plan • Consequent fulfilment of the requests laid by the European Landscape Convention may bring improved assessment of landscape appearance and the targeted landscape quality and to speed up the preparation of strategic landscape plans. • Consequent fulfilment of the Aarhus Convention (2008) should contribute to participation of public and other entities in preparation of landscape plans. 	<ul style="list-style-type: none"> • Outlasting fragmentation of decision-making competencies concerning landscape that encumbers the preparation and coordination of regulations necessary for the protection, management and planning of land use. • The risk of misinterpretation and low acceptance of the significance of landscape plan. Transports, constructions or regional development sectors often perceive landscape planning as a dual planning system along with the land-use plans. • Based on the mentioned risks it is also possible that the justified requests of landscape will not be satisfactorily covered by the new Building Law and the new Nature and Landscape Conservation Law and landscape planning tools will be not effective.

of nature, biological diversity and overall stability of the landscape were integrated into the Water Act. A very important tool for integrated landscape management is the new Act No. 7/2010 Coll. on Flood Control. In order to achieve optimal protection against flooding it must be flood risk management plan, as well as river basin management plan coordinated with other planning instruments of the landscape that they will jointly form an integrated land management tool for the entire area of the river basin.

Additional requests concerning landscape protection and land use were integrated into the new Act no. 543/2002 on nature and landscape protection in wording of later issued provisions; Act no. 220/2004 on protection and use of farmland in wording of later issued provisions, Act no. 326/2005 on forest in wording of later issued provisions, the new Act no.

24/2006 on environmental impact assessment in wording of later issued provisions, Act no. 359/2007 on prevention and reparation of environmental damages in wording of later issued provisions, Act no. 539/2008 on support to regional development, and Act no. 3/2010 on national infrastructure for spatial information.

SWOT analysis of current implementation of landscape planning

SWOT is an acronym for Strengths, Weaknesses, Opportunities and Threats. By definition, Strengths (S) and Weaknesses (W) are considered to be internal factors over which we have some measure of control (Tab.). Also, by definition, Opportunities (O) and Threats (T) are considered to be external factors over which we have essentially no control (Bory, Dallhammer, 2009).

DISCUSSION

In spite of satisfactory methodical and legal provisions supporting landscape planning in Slovakia, their applications run into certain problems that encumber implementation of landscape planning in practice. Position of landscape planning must be legally ensured as a comprehensive planning process in harmony with other steps of land-use planning; it should be taken into account by the resulting regulations ruling the land-use planning, regional development, the integrated management of river basins and plans of other sectors is definitely desirable. Full implementation of landscape planning is limited by the fact that in Slovakia the relevant competences are split between the Ministry of Environment, Ministry of Land Management and Development of Rural Area and the Ministry of Transport, Construction and Regional Development. Coordination is not always easy and fruitful.

Landscape planning used as an efficient tool for the implementation of recommendations set by the European Landscape Convention as well as other conventions concerning landscape conservation/protection, assessment, planning and management is a great challenge. It is necessary to coordinate an integrated preparation of landscape plans, proposals of ecological networks, conceptions of nature and landscape conservation, assessment of the landscape appearance, plans of integrated river basin management and other conceptual doc-

uments in the field of landscape conservation/protection, management and planning.

The scientific-theoretical, methodical, methodological and above all practical development of landscape planning calls for preparation of specialists – landscape planners. After 1990, in Slovakia several faculties and specialized university departments were established which concentrate on education of interdisciplinary experts able to cooperate with the representatives of other planning fields and integrate the varied aspects of landscaping, sustainable development, landscape protection and use into overall plans. An improved efficiency of landscape planning will require participation of local communities and other target groups in an effort to reach better acceptability of landscape planning results by these groups.

A thorough scientific analysis will be necessary with the aim to establish links and implications between the *target values and limits* respecting the principle of preliminary caution, *standards, environmental limits and threshold values*, which, if not observed, may cause an abrupt change (even collapse) of ecosystems (Haines-Young et al., 2006).

The most recent experience acquired in the planning practice show that the quality landscape planning methodology in combination with appropriate legal back up may contribute to preparation of efficient: (1) adaptation

measures palliating the expected effects of climate change and efficient measures protecting biodiversity; (2) protecting measures against flooding and quality river basin management plans; (3) agro-environmental schemes for farming landscape; (4) land-use plans of towns especially in cases when it is necessary to reduce uncontrolled urban sprawl resulting in monocultural residential peripheries; (5) documents of strategic environmental

assessment; and (6) strategic and conceptual plans (especially for regional and local levels).

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