Systemic approach to regional planning

OTO HUDEC
oto.hudec@tuke.sk
NATAŠA URBANČÍKOVÁ
natasa.urbancikova@tuke.sk
Technical University of Košice
Faculty of Economics
Letná 9
042 00 Košice
Slovak Republic

ABSTRACT

Region can be viewed as a system with a large range of alternative strategic alternatives, influenced by the interests of many actors. This gives a justification for the use of system tools for structuring the relationships, identifying key factors or preparing a strategic plan for development of a region. Soft systems methodology is applied to regional innovation system in the Prešov region.

Key words: region, system analysis, regional innovation system

JEL Classification: O10, O29, 038, R00

INTRODUCTION

The ongoing processes of internationalization and globalization of markets at an unprecedented rate contribute to the dynamics and the nature of changes in socio-political, economic, social and cultural spheres of life in society. The importance and complexity of these processes objectively gives more and more to the forefront the regional dimension of their interactions (Asheim, 2001). It is therefore important to examine and identify the causes and extent of external, or internal / local, conditions and effects, to differentiate local / regional content of interrelated processes, their impacts and aspects of operation and subsequently better to identify available potential, suitable accelerators and efficient ways of solutions. It is not surprising that in connection with the future direction of regions, we inevitably encounter terms such as actors, processes, organization, objectives, strategy, inputs and outputs, behavior; which are terms normally used in soft systems methodology.

A region can be approached as a complex spatial dynamic open system, and so systemic methodology can be applied to the study of regions. Soft Systems Methodology (SSM) can be suitable for modelling systems involving and helping human activities and that way SSM helps to understand the situation and problems and find possible solutions. Part of the SSM is the learning process and understanding of the situation. Each of the solutions can be examined in terms of the desired state and feasibility and from a systemic point of view the goal is transformation, change, from one state to a new one. SSM in the past 30 years has been often applied to complex and dynamic social situations (Ackoff, 1974), where there are conflicts between the parties, or in other words, objectives of change are controversial (Venable, 1999).

The region is considered to be a spatially selected area for the creation and implementation of regional economic, social, structural, or innovation policy. A characteristic feature of

regional policy is therefore setting goals and design of ambitious activities with a conscious strategy to achieve them. The region as an open system - a type of spatial economic organization - has other important features for the use of SSM methodology, such as the connection with the external environment, internal differentiation, procedural nature of the organization, etc. The ability of the region to adapt to the changed conditions in terms of regions functioning, structure, learning, improvement characterizes the region as an organic economic system (Hudec, 2008).

STRATEGIC PLAN OF REGION DEVELOPMENT

Regional strategic development plan is defined simply as an integrated conceptual development plan in the form of a document, which is the basis for future directions in development of a city following the development of the region, as well as larger territorial units. The strategic plan is developed for long-term coordination of public and private activities of economic, social, cultural and environmental character of the region or city. Principles of strategic planning based on economics and corporate governance gradually found application also in the management of complex territorial systems - municipalities, cities, regions (Davoudi, Strange, 2009; Adams, Alden, Harris, 2006). The resulting strategic document should arise as a final stage of the process of an open dialogue across the whole spectrum of subjects and groups in form of exactly identified and jointly shared values and goals.

Strategic Development Plan for the region usually consists of three stages corresponding to three basic stages of system analysis (Table 1), that lists the common methods used in the development of the plan.

Table 1: Methods used in the creation of strategic development plans.

Stage	Regional strategy creation	Used methods
Analysis	Analysis of economic and social development of region, situation analysis	o Analysis of secondary data o Primary research o Sources audit
Evaluation and creation	Tasks and primary needs in development of technical and social infrastructure, environment care, education, culture and other fields	o SWOT analysis o STEP analysis and foresight o Identification and prioritizing of problems o Impact studies
Implementation	Proposal of administrative and financial coverage	o Goals and priorities setting o Action plan creation

Source: own.

The evaluation stage uses standard methods as SWOT analysis and problem tree, and only exceptionally methods of trend analysis - STEP (Social, Technological, Economic and Political), foresight or impact studies. Existing developed methodological background for the creation of strategic plans is only gradually getting into practice. Here are some of the typical shortcomings encountered in strategic planning at the local level (Hudec, Džupka, 2004, Blazek, Vozáb 2003):

- under-developed horizontal and vertical program and policy coordination,
- disproportionate emphasis on the analysis with a large scale of not used information,

- poor data and their formal use, errors in collecting data, pointless methodology,
- poorly built partnerships,
- number of agencies and institutions offering work with copied phrases from programs of higher level,
- little courage in setting specific strategic objectives, programs of economic and social development are too broad,
- popular SWOT analysis is seen as a goal rather than a tool for identification of strategic objectives, they are considered very formally, with weak binding to the situation analysis and priorities,
- low ability to identify comparative advantages of a territory,
- low level of creativity, not many innovative ideas,
- low capacity for action of strategies,
- draft of priorities without anticipating and forecasting the future.

We stop at the last item of the list. Prediction, forecasting, scenario methods are important, but not an often tool of strategic planning at regional or local context. In Slovakia there are only some attempts to get strategic planning to a higher professional level. First, it is relatively new discipline in Slovakia, and the second reason is its complexity. Predicting and forecasting is interdisciplinary in nature, requires experience of the implementing team and has not been yet sufficiently understood by the public, which expects quantitative forecasts for 10-15 years into the future. The combination of quantitative and qualitative approaches is not being emphasized enough. The importance of scenarios lies largely in the fact, that they show the key forces of development and the need for change and also have the ability to mobilize main actors in favor of important strategic decisions and enforcement of changes.

REGIONAL INNOVATION SYSTEM

The system means a conglomerate of functionally interconnected elements, institutions, processes and relationships between them. In the case of regional innovation systems under a system we understand a set of interactive elements or units forming an integrated whole in order to perform a function (Skyttner, L. 1996).

Regional innovation system can be defined as a set of economic, political and institutional relationships that occur in a given geographical area (region), and which generates collective learning processes leading to the rapid spread of knowledge and best practice (Wolfe, 2001). From the systemic and institutional point of view RIS can be defined as a system stimulating innovation capabilities of firms in the region with the aim to strengthen the region's economic growth and competitiveness. RIS theory is built upon the knowledge, that different national and regional factors, technological and scientific specialization and the corresponding "innovation culture" with its historical origins, characteristics, research, public and political-administrative institutions, together with institutional inter-linkages and networks (Hollingsworth, Boyer, 1997) significantly affect the ability of economic actors and deciders create and support successful innovation.

The basis of the term "innovation systems" is the assumption, that diffusion of knowledge and technology has both an individual and collective dimension (Edquist, 2001). Factors of technological changes are not present only in the activity of an individual enterprise, but also in other elements of the innovation system. Therefore, innovation should be viewed in the context of the systems, where the system represents all the elements and relationships involved in the production, dissemination and use of economically useful knowledge

(Lundvall, 1992). The innovation system consists from a structural point of view of four subsystems (Cooke, 2004; Kuhlmann, 2001): educational and research subsystem, economic-sectoral subsystem, politically-administrative subsystem, network subsystem - formal and informal networks.

In the case of regional innovation strategies, the standard tools of strategic planning are not sufficient. A strategic approach is needed, that takes into account the nature of the regional innovation system, the learning process and willingness to experiment, multi-level governance system, technological development in the field of research and development, strategic tools for other areas etc. To the classical strategic cycle are therefore added anticipative specific tools such as technology foresight, technology forecast and technology assessment (Kuhlmann, Edler, 2003). All these methods are related to evaluation and forecasting the impact of the proposed innovation policy and evaluation of feasibility of the strategic objectives aimed primarily at the area of technological development, science, research, innovation and wider regional development.

In addition to the three basic tools, a standard in strategic planning agenda for research, development and innovation policies and benchmarking, is becoming the use of learning on best practices and other methods, which add up or replace static methods such as SWOT analysis. To predict the future development qualitative and quantitative approach is used. Forecasting is working with potential scenarios, the anticipation is primarily targeted on selection of possible futures, rather than externally programmed destiny. Assessment of social impacts of technological development has two main elements of anticipation - the effects and impacts and their evaluation. It is something like a feedback for decision makers on how the strategy will affect the industry, institutions and people in achieving the strategic vision. The good thing about all the three methods and their combinations is a high rate of participation of the involved specialist public (in terms of creators, users or consumers of technological products) together with representatives of decision rings on anticipation activities.

METHODOLOGY OF SOFT SYSTEMS IN REGIONAL POLICY

Indeed, the regional unit as a system shows an increasing complexity and uncertainty, with a variety of possible strategic decisions. Stakeholders and actors (organizations and individuals) have sometimes an unpredictable behavior, their decisions are interactive, they are mobile in the same way as many regional funds and resources. Low knowledge of problems in all their aspects (snarl of interrelated problems) requires a system tool for structuring of relations, identification of key factors, what leads to the tools of system analysis. The use of system analysis is usually based on the seven stages (Rosenhead, Mingers, 2001, Checkland and Scholes, 2000):

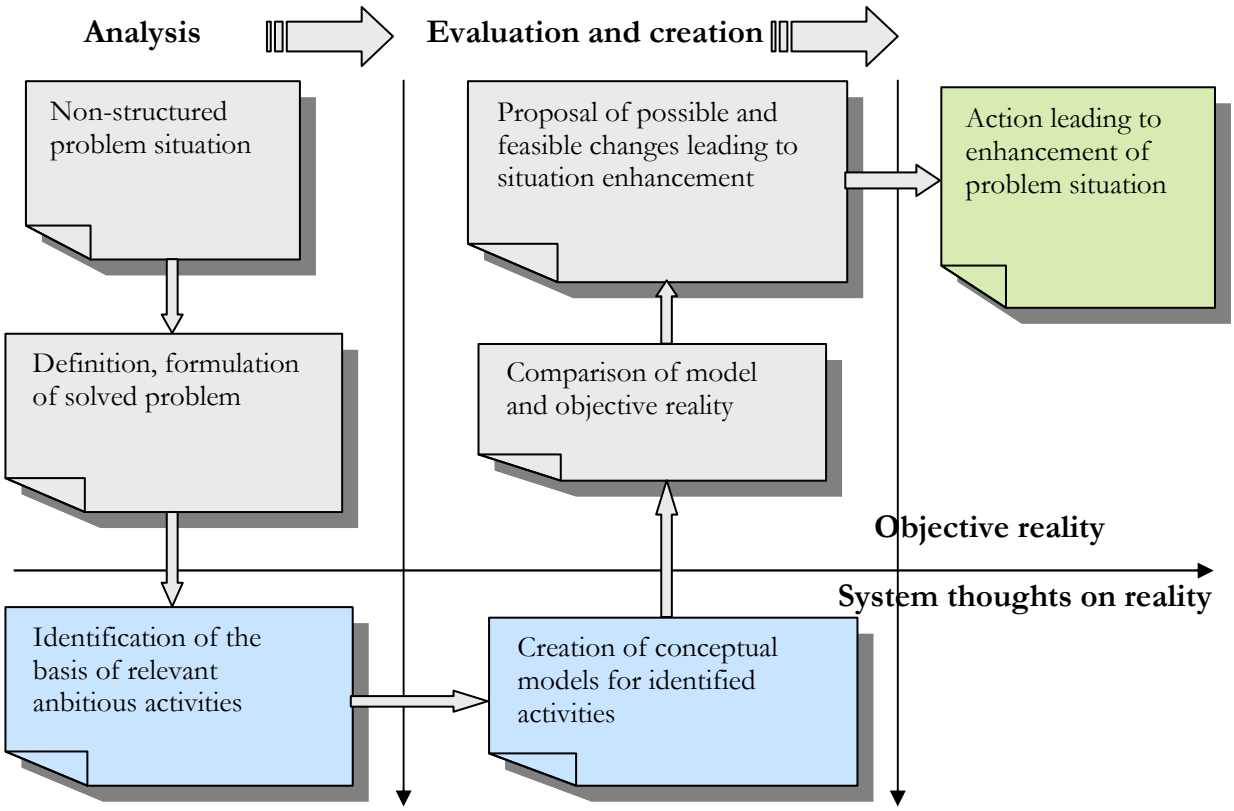

Fig. 1. Seven stages of SSM

Source: Constructed and redesigned according to Checkland a Scholes, 2000.

It is necessary to move from the unstructured problem situation to the description of basic system components:

- **Structure** (for example geographical or administrative boundaries, competences etc.),
- **Processes** (activities, information and material flows),
- **Climate** – relationships between structure and processes, and all related problems,
- **Culture and behavior** – interests, problems, conflicts, opinions,
- **Environment** - external subjects, factors influencing organization / territorial unit.

Hence, there is a question who does what and for whom, who is responsible to whom, what are the important terms and conditions and in what environments the planning takes place (Checkland and Scholes, 2000), namely to the use of the CATWOE terminology:

- **C**ustomers - who are the recipients of highest level of processes and how it affects them?
- **A**ctors – who are process participants, who will participate on the solution implementation and what will influence the success?
- **T**ransformation Process – which processes or systems are impacted by this activity?
- **W**orld View – what is the broader environment and broader impacts of this activity?
- **O**wner – who is the owner of the process or situation, that re the subject of the research and what role will they play in the solution?
- **E**nvironmental Constraints – what are the barriers and limitations, which will influence the solution and its success?

SSM can be compared to traditional methods in developing a strategic plan for development of a region. We can say that the process of creation and implementation of strategic planning uses some elements of the SSM, but in practice its success encounters the usual simplification of systemic approach, inconsistency, lack of foresight and forecast, or a lacking theoretical base, on which strategic plans are built.

The region, as an object of analysis and future strategic direction, should be viewed dynamically, we should monitor changes in its state, behavior and structure, which is influenced on one hand by its internal components, and on the other hand by the external environment. Under the previous aspects of the SSM, the region can be characterized by its structure, processes, climate, interests of stakeholders and the external environment. It is also possible to simply apply the CATWOE terminology.

Regional innovation system and the Prešov self-government region

On the basis of generally accepted division of regions and appropriate regional policy Prešov region can be included in the group of peripheral regions (Tödtling, Tripple, 2005), with all the typical characteristics. On behalf of this classification and also on behalf of the experience of successful regional policies in European regions in this category, an appropriate mix of regional policy for PSK can be defined.

The realization of SSM in the Prešov region has been based on several theoretical concepts of regional innovation system, path dependence, learning regions, knowledge base and triple helix. A summary of the mentioned terms and concepts can be found in a more comprehensive concept of constructing regional advantage, as described for example in (Cooke, 2006). Spatial level of the region is ideal for the creation of innovations of products, processes and organizations, but also for promotion of innovation and creation of networks and clusters. Innovations, within the regional innovation system as a driving force, orient businesses and other institutions in the innovation system on ambitious goals, lead to the reconstruction of industrial structures and contribute to the emergence of new economic sectors. From a procedural perspective, the regional innovation system is characterized by interactions and transitions between its various functions and actors, whose experience, knowledge and know-how support and reinforce each other. This way the role of both human and social capital is reinforced.

The concepts of the global knowledge economy and the learning regions have difficulties with the task of management of changes and uncertainty. The rapidly changing environment requires flexibility, reaction speed and versatility. Therefore, for the regional development, except the regional innovation capacity of the in region localized institutions, the function of a learning innovation system based on a partnership with a high level of social capital (Lundvall, 1992) is very important. From the view of governance and management at the regional level the concept of multi-level governance was established, corresponding to the multidimensional nature of governance at the regional level for both vertical and horizontal axis, with a complex system of responsibilities, goals, interests, funding sources, etc. (Marks et al., 1996, Kohler-Koch, 2003).

THE SSM METHODOLOGY USED FOR REGIONAL INNOVATIONS IN THE PREŠOV REGION

The goal of SSM application was to design changes and to expand the regional innovation system by using the existing realistic innovation support for the business sector within the region, in accordance with the strategic objectives of the region. In terms of research

methodology for SSM, methods like foresighting, forecasting, trend analysis, scenario building, empirical research (focus groups-group interviews, questionnaires and structured interviews), SWOT analysis, benchmarking, STEP analysis, feasibility study and an impact studies were used. The systems analysis procedure which was carried out in the form of seven stages of SSM can be characterized for the Prešov Region (PSK) as follows:

Stage 1: The unstructured problem situation:

The starting position resulted from the situation since the establishment of self-government regions in 2002 and the weak position of the PSK as the most underdeveloped region with high unemployment, low GDP, the lowest share of value-added industries in Slovakia, with extremely low spending on research and development and with vaguely set directions for future economic development. There is a low degree of cooperation between R&D and educational institutions and businesses, substantial lags in knowledge and technology transfers exist, coordination between regional institutions and regional leaders is at its beginning and the prioritization of research, development and innovation is very unclear. The forming supportive component of the regional innovation system consists of RRA agencies (Regional Development Agencies) and RPIC (Regional Advisory and Information Centers).

Stage 2: Definition, formulation of the solved problem

The Prešov region has reached the formulation of key problems of economic development in the form of two analytical strategic outcomes financed from external sources:

RIS-PSK: Proposal from the medium and long-term Regional Innovation Strategy for the Prešov Self-government Region, which identified the key regional actors in the field of innovation and regional development, laid the foundations for regional partnership of public and private sector and managed to set the first goals in the field of promotion of innovation support and shaping of the regional innovation system. The general objective of RIS is based on the theory of regional innovation systems – to establish or strengthen regional innovation systems for enhancement of regional competitiveness.

POKER: Its aim was to strengthen the partnership framework for regional development cooperation of actors in the Slovakia-East region (Prešov and Košice self-government region, NUTS3 level) and to jointly define a development strategy of the Slovakia-East region, within which the Slovakia-East profile, forecasts, scenarios and development strategy for the NUTS2 was established.

Both activities allowed the identification of key players of the regional innovation system and marked the beginning of building a consensus between them. PSK can be characterized as a peripheral region with the characteristics listed in the table below:

Tab. 2: Background of regional innovation system in PSK

Businesses and Regional clusters	Dominated by small and medium enterprises, cluster initiatives are missing.
Innovation activities	Low level of R&D&I in the region Emphasis on small innovations of products and process innovation.
Universities and research organizations	Relatively newly formed with an unfit profile (social sciences), however, there is technically oriented education in the neighbor Košice region.
Education and training	Focus on lower qualification, the situation is gradually improving, large outflow of skilled labor
Knowledge transfer	Lack of specialized intermediary services
Networks	Poorly developed networks

Stage 3: Identification of the nature of relevant and ambitious activities

In the regional innovation strategy, the nature of activities needed to promote innovation is shaped:

- Target area 1: Development of a knowledge economy (R&D support in the region, promoting cooperation between R&D institutions and industry and businesses, development of innovation infrastructure ...)
- Target area 2: Creation of qualified work positions
- Target area 3: Human resources development
- Target area 4: Implementation of innovation and technology transfer in the traditional manufacturing and services sectors (the implementation of innovation and technology transfer in selected sectors of industry, tourism and agricultural sector).

Stage 4: Proposal of possible and feasible changes leading to situation improvement

Regional Innovation Strategy of PSK is expected to create two institutions and two institutes oriented to enhance the regional innovation system:

- The Regional Innovation Center responsible for the system of design, management and implementation of innovation in regions, created as an association of public and private entities.
- Regional Center of technology and know-how transfer - as an intermediary between research activities and application of research and development results in industrial praxis.
- Innovation forum - by organizing theme-oriented meetings creates space for communication of companies, national and regional institutions and other institutions active in the field of innovation and knowledge economy
- Regional Development Fund - proposal for establishment of a pilot Fund, based on the example of the Slovakia-East region.

Stage 5: Comparison of model and objective reality

The further development showed that although the proposed activities would support the development of innovation in the region, but with the exception of the Innovation forum there is no option to implement these activities as intended due to financial reasons. In contrast, PSK was successful in obtaining funding for the creation of so-called Innovative Partner Center (IPC), using a model of the Norwegian Molde Knowledge Park, with application to the conditions of Prešov region through public-private partnerships.

The biggest added value should therefore be to identify potential projects for the IPC and the way they are funded in each of the areas:

a) Tourism, culture and external relations,
b) Entrepreneurship and development support in Prešov region,
c) Human resources development in the field of education, research and sport.

To verify the transferability of know-how from the Norwegian model into the terms of PSK and to analyze its specialization and feasibility, a very detailed analysis was performed by using qualitative and quantitative forecasting methods, structured interviews with regional actors in the field of innovation, several controlled discussions (Innovative Forums) and a mobilization meeting.

In terms of the SSM methodology, the structure, processes, climate, culture, behavior and the environment in which the IPC is situated were specified, using detailed analysis of the CATWOE terminology.

A comparison of competitiveness of PSK with neighboring regions, and other close and similar regions, showed that PSK is lagging behind in production, GDP and gross value added. A barrier to competitiveness is also a relatively high unemployment rate, not because of its height, but rather because of the structure of unemployed individuals and their educational level. The PSK competitiveness position compared to other regions of Slovakia, Hungary and Poland was exceptional in the number of beds in accommodation establishments in tourism as one of the indicators of potential in tourism.

Stage 6: Establishment of conceptual models for identified activities

Research, analyses and trends show:

a) Tourism: conceptually, it is necessary to solve the current situation where the great existing natural tourism potential is not used, the yearly accommodation facilities usage ratio is very low (fewer than 20%), customer structure and structure of offered products and services are not profiled enough and the region lacks an unified information system. The biggest current issue of tourism development in terms of the Prešov region is the uncoordinated tourism development. Perspective areas in the field of tourism in terms of the Prešov region are - conference and scientific tourism, silver economy, health tourism, hunting tourism, experiential tourism and other out of them originating opportunities for tourism. There are great possibilities for public-private projects in tourism. Marketing of the region is underdeveloped and neglected, segmentation of the target groups is missing, promotion is nearly non-existent, and there is no unified information system or networks creation

b) Entrepreneurship and development support: in long-term the lowest number of organizations and staff is in research and development, low level of cooperation of the regional innovation policy actors, low level of cohesion in R&D and innovation and their utilization. Low is also the level of innovative activities of enterprises in the region and the awareness of the importance of such activities. The rate of investment in innovation of products and services is low as well. The business environment is characterized by high administrative demandingness of entrepreneurship and a high tax and social-contribution system, which has a negative impact on the price of labor. The public sector is not sufficiently effective. Perspective, in terms of PSK, are the industries of: electrical engineering, machinery production aimed at automating and robotics, tourism, health care and social services.

c) Human resources: the outflow of graduates of secondary schools and universities in the Prešov region can be considered as massive. Nowadays a significant shortage of skilled labor in several sectors can be noticed (mechatronics, specialist constructers, programmers,

metallurgy workers, technology workers, staff focused on testing according to European and world standards, machine and metal processors, millers and turners), as a result to the lack of cooperation and inter-connection of the educational process with labor market needs and requirements of SMEs. Regional management of human resources development is underdeveloped. Human resource development should be the primary objective of PSK, to achieve a total raise of the entire region and improve the quality of life for the majority of its inhabitants. This need will be closely linked to the requirement on universities to be far more linked to the regional businesses and public organizations, and to serve as centers for research, consultancy and staff training.

Previous stages allowed creating a draft concept of the future position of the IPC, which should not seek to intervene in support of all projects and especially given the already existing infrastructure (e.g. the NADSME network). On the other hand, by specializing in innovation and intermediation, public-private partnerships, the IPC will create its own irreplaceable position, thanks to which it could build a peer network and confirm its irreplaceable position within the market in a relatively short period of time. In this context, cooperation with the existing network of support institutions and co-financing entities is essential.

Stage 7: Action leading to improvement of problem situation

The system analysis has guided the considerations towards the establishment of IPC as a place to generate ideas, innovation, networking, intermediary services and finance. Typical features of the IPC should be openness, to ability to participate, professionalism, communicativeness, networking potential, incubator of ideological goals and projects. The product of IPC will be projects and their implementation, while for the initial period the following projects are proposed:

a) Tourism, culture and external relations:
1. Project aimed at the systematic approach to tourism, coordination of activities in PSK,
2. Project aimed at marketing of the region – specifically on the area of tourism – the target groups, the viable types of tourism
3. Projects focused geographically (Spiš, Vysoké Tatry, etc.) or typologically (congress tourism, silver economy, etc.)

b) Entrepreneurship and development support:
1. Project aimed to support innovative industries with a scientific research base in the region (automation, pharmaceuticals, electronics, and chemistry) with the focus to create cluster initiatives in the region, to involve companies in global value-creating chains and to promote research and development.
2. Innovation voucher project in the region for innovation implementation in a smaller scale in small and medium-sized enterprises.
3. Project of cooperation in the foundation of innovative firms in partnership with the RPIC (incubator) and University of Prešov (UCITT – University Center for Innovation, Technology Transfers and Intellectual Property Protection).

c) Human resources development in the fields of education, research and sport:
1. Project for training of human resources in the field of innovation, innovation management in enterprises and regional innovation policy,
2. Educational project in the field of entrepreneurship in collaboration with the University of Prešov and high schools in the region.
3. Project of education and training in tourism (target groups coming into contact with visitors).

It is assumed, that in the first stages of its existence, the IPC will be financed from external sources, mainly operational programs, as the sources from private sector are limited. However, for the projects to be successful, the private sector has not only to be involved in them, but also has to provide a level of co-financing of the projects.

CONCLUSIONS

Regional unit is considered as a system, typical by complexity, uncertainty, a large range of possible strategic decisions, often conflicting interests of involved stakeholders and actors. System approach to the region also raises the need for system tools designed for structuring of relations, identification of key factors, which leads to the tools of system analysis. In terms of the SSM methodology, the region can be characterized by its structure, processes, climate, interests of involved groups and external environment. SSM can be used both to establish a strategic development plan of the region, as well as to address specific problems, such as the creation or expansion of a regional innovation system.

System approach, involving seven stages of SSM, relaying on a sufficient theoretical base and range of demanding methods, has led to the proposal of the nature and activities of Innovation Partnership Center of Prešov self-government region.

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