Regional Systems – How to Make Them Work?

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SUMMARY

Regions can be defined in many ways; they can be viewed generally as a system with a large variety of alternative strategic alternatives of inputs and outputs, influenced by the interests of numerous actors. This gives a good reason for the use of system tools for structuring the relationships, identifying key factors or put in order a strategic plan for development of a region. Soft systems methodology is one of the strategic system tools, not explicitly utilised in regional strategic planning, offering quite a number of impulses, especially if combining it with the innovation concept.
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INTRODUCTION

If we use the adjective "regional", first it is necessary to explain in what sense the term "region" can be used. The region is in this paper is derived from the context that relates to the concept of regional (innovation) strategy. Region is defined as a subnational territorial unit within a country, with an area larger than basic residential and administrative unit - municipality. From a systemic point of view, region is a complex dynamic system of open space with a large number of elements of varying quality and dense ties, it is richly structured and has a wide range of properties. The specific position is in this context, naming an economic region, which is a subsystem of the national economy, defined as a bounded territory, basically linked in social, urban and economic ties and from a geographic view, it is possible to characterize its level of economic performance or development, respectively.

REGION AS A SYSTEM, REGIONAL DEVELOPMENT AS AN OUTCOME

From the perspective of regional policy, region is a geographically defined area for the creation and implementation of regional economic, social, structural or innovation policy - is designed to meet the needs invoked by the internal active approach or in response to impulses from outside. A typical feature of the economic region is setting goals and purposeful activity with a strategy to achieve them. In terms of power implementation, crucial for a region is the degree of centralization and decentralization - to what extent is the regional authority responsible, capable and afforded for the developmental trajectory of the region.
In the light of the previous reflections, region as a type of regional economic organisation can be defined as an open system – definitely showing systemic features such as connection with the surroundings, internal differentiation, procedural nature of the organization, etc. The ability to adapt to the changed conditions in terms of its function, structure, learning, improvement enables to consider region as an organic system. Region exhibits characteristics of economic system with the internal and external linkages among the elements. Depending on the chosen level of distinctiveness it can be divided into different parts, based on the system as a whole, including its objectives. This means, region as an object of study can be investigated e.g. using system methodology via monitoring the changes in its state and structure. The regional behaviour is influenced by the internal elements on one hand, and external environment on the other hand. The status of the region as an open dynamic and organic system with its external and internal links can be illustrated by the following figure:

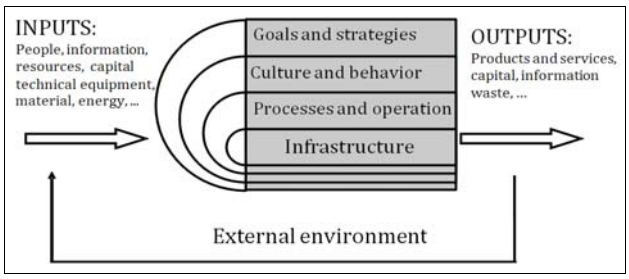


Figure 1. Region as an open system

It is not surprising that in connection to the potential trends of regions, we inevitably come across terms such as actors, stakeholders, assessing power and influence, processes, organisation, objectives, strategy, inputs and outputs, desirable changes via strategic planning, development, behaviour and system as well; which are terms as a rule used in soft systems methodology. Hence, region can be approached as a complex spatial dynamic open system, and consequently systemic methodology can be applied to study regions as systems. General System Theory, originally developed by Ludwig von Bertalanffy (Checkland, Scholes, 2000) and other scholars, can provide a useful analytical framework to describe and understand a range of factors involved in regional development. The whole complex can be understood and described by means of System Theory by defining sub-systems, system boundaries, external influence, entropy, feedback or system balance can be used to make clear complex and perplexing assortment of information involved in regional planning.

In general, Soft Systems Methodology (SSM) is certainly suitable for modelling systems involving human activities and in that way, SSM helps to understand the state of affairs and problems and to identify possible solutions. A part of SSM is the learning process and common understanding of the situation. Each solution can be examined in terms of the desired state and feasibility. From a systemic point of view, the goal is considered as a transformation, the change from one state to another. SSM in the past 30 years has been often applied to complex and dynamic social situations (Ackoff, 1974), where conflicts between the parties exist, or in other words, objectives of change are controversial. In a regional policy, region is considered as a spatially limited territory for the creation and implementation of regional economic, social, structural, or innovation regional policy. It is therefore supposed or committed to setting goals and to designing rational activities with a conscious strategy to achieve them.

In terms of objectives, it is traditional to link to the region to “regional development” - the general objective of regional development is achieving prosperity and welfare of regional population, which is derived from economic development and expressed by the area of competitiveness and the competitiveness of economic agents located therein. Regional development is in this sense located at the desirable output side of the system model.

The concept of development is also multifaceted; it is a melange of different meanings and shades. From the perspective of the public sector is typically aimed to increase revenue, to increase number of jobs and to reduce unemployment, to increase productivity, etc. Regional development is understood as the development of the region defined as a holistic process aimed at achieving progress in economic, social, cultural and environmental fields. The existing potential is used for improving living standards and quality of life of the inhabitants of the region. From a strategic development perspective, the developing of the following areas (Malizia and Feser, 1999):

- labour (the education and training, availability, price),
- infrastructure (availability, capacity, transportation, telecommunications, etc.)
- economic and community services and equipment (availability, capacity, universities and schools, business incubators, industrial and science parks, sports and tourist facilities, etc.)
- environment (natural, business, cultural, etc.)
- economic structure (the structure of the economic base, diversification, etc.)
- institutional capacity (management, knowledge, skills) to promote economic development and growth.

The term "development" has a vital economic tone, often associated with the words, social or sustainable. In philosophical terms, the development consists of of five essential elements, also called magic pentagon (Nohlen and Nuscheler, 1982):

- growth,
- labour,
- equality/justice,
- participation,
- independence/autonomy.

The future situation of the region as a system state is an outcome of the “action” - the spirit of SSM is a contrast between the situations as it is, and some models (regional development goals to be gained via strategic interventions) as it might be.

STRATEGIC PLANNING AND SOFT SYSTEM METHODOLOGY

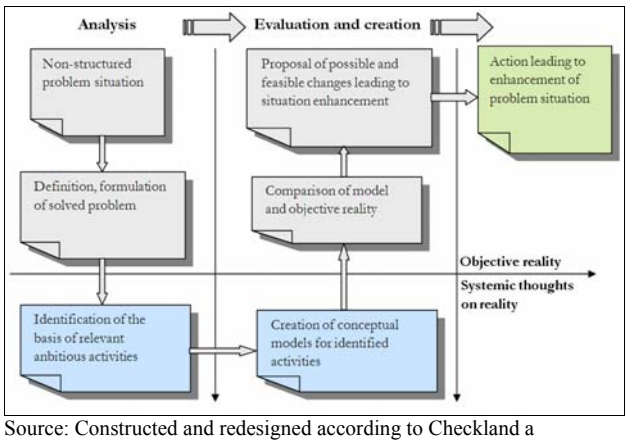
Regional strategic development plan is defined basically as an integrated conceptual development plan in the form of a document, aimed at future directions in development of the region. The strategic plan is developed for long-term coordination of public and private activities of economic, social, cultural and environmental character of the region.

Principles of strategic planning based on economics and corporate governance have 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	– Analysis of secondary data – 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	– SWOT analysis – STEP analysis and foresight – Identification of problems – and prioritising – o Impact studies
Implementation	Proposal of administrative and financial coverage	– Goals and priorities setting – o Action plan creation

The evaluation stage uses standard methods as SWOT analysis and problem tree, and 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 slowly getting into practice. Without a doubt, the regional unit as a system shows an ever-increasing complexity and uncertainty, with a great variety of possible strategic decisions. Stakeholders and actors (organisations and individuals) have sometimes an unpredictable behaviour, 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):



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

Figure 2. Seven stages of SSM.

It is essential to move from an 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 behaviour – 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 appraised to traditional methods in developing a strategic plan for development of a region. We can articulate 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, behaviour 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.

THE SSM METHODOLOGY USED IN THE PREŠOV SELF-GOVERNMENT REGION IN SLOVAKIA

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, Trippl, 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 Prešov self-government region (PSR) can be defined. The realisation of SSM in PSR 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 organisations, but also for promotion of innovation and creation of networks and clusters. Innovations, within the regional innovation system as a driving force, orients 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 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 (PSR) 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 PSR 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 Centres).
- 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-PSR: 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. PSR can be characterized as a peripheral region with the characteristics listed in the table below:

Table 2: Background of regional innovation system in PSR

Dimension	Characteristics
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 neighbour Košice region.
Education and training	Focus on lower qualification, the situation is gradually improving, large outflow of skilled labour
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 PSR is expected to create two institutions and two institutes oriented to enhance the regional innovation system:
  - The Regional Innovation Centre responsible for the system of design, management and implementation of innovation in regions, created as an association of public and private entities.
  - Regional Centre 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, PSR was successful in obtaining funding for the creation of so-called Innovative Partner Centre (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 PSR 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, behaviour and the environment in which the IPC is situated were specified, using detailed analysis of the CATWOE terminology.
  A comparison of competitiveness of PSR with neighbouring regions, and other close and similar regions, showed that PSR 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 PSR 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 labour. The public sector is not sufficiently effective. Perspective, in terms of PSR, is 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 labour 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 labour market needs and requirements of SMEs. Regional management of human resources development is underdeveloped. Human resource development should be the primary objective of PSR, 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 centres 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 PSR,
   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 Centre 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 Centre of Prešov self-government region.

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