

Summary

Research and development practices and gaps related to sustainable development of Slovenia

The basic premise of research within the research programme Sustainable Regional Development of Slovenia is that Slovenia has sufficient (geographic) potentials for a more decisive direction towards sustainable regional development. During the four-year period, we directed our research endeavours and activities towards developing new methodologies and forming new or adapted theoretical approaches – all with the goal of contributing to the transformation of the existing developmental model towards increased sustainability. Numerous applied studies that upgraded the theoretical and methodological premises using direct empirical data are no less important, while regional studies provided insight into the circumstances and processes in the heterogeneous Slovenian territory.

The decision for the sustainable regional development concept is paralleled by the initial finding that studies so far, mostly based on developmental paradigm in accordance with the continuity of trends to date, have run out and that new approaches have to be found. This is offered by the sustainable paradigm: the direction of future thinking, planning, working, and managing has to consider the principles of sustainability as a primary, most important aspect of development.

In the last two decades in Slovenia, regional developmental differences and environmental pressures have been increasing. Economic development is still generated through the exploitation of natural resources and human capital, landscape vulnerability is increasing due to climate changes, and the surface area of the best agricultural land is decreasing. New constructions are almost always undertaken on flatland and therefore most agriculturally suitable land, thereby directly and indirectly decreasing the level of national and regional self-sufficiency in food. Despite numerous measures and endeavours, this remains at a worryingly low level. The second significant problem is the quite localised regional development, which primarily solved issues of local infrastructure and developed small commercial zones, which resulted in much smaller gains than expected. On the other hand, these approaches were often wasteful in terms of energy and space, provided short-term effects, and were completely unambitious. Instead of the declared basis of increased use of knowledge, new technologies, and related growth of new jobs, it was the service sector that was primarily expanded, based on increased consumption and growth of demand. Environmental strains are becoming a significant cost and therefore a brake on the economy. In a world of limited resources, this does not represent a sustainable orientation. From the perspective of geographic potentials of Slovenian regions, it is therefore necessary or at least recommended to create a development orientation aimed towards a more coherent sustainable regional development, increased, planned and innovative use of regional developmental potentials, a more sensitive and expertly evaluated future siting of activities,

directed promotion of environment-friendly products and services, development of sustainable transport and tourism, production of quality and healthy food, appropriate ecosystem evaluation and marketing of protected areas (Plut et al., 2004; Vintar Mally, 2009; Lampič, Ogrin, 2009; Lampič, Mrak, Plut, 2012; Potočnik Slavič et al., 2016; Lampič et al., 2016). The same applies to the local level.

Because of the mentioned tendencies, it is necessary that geographers contribute to an actual and faster transition to a more sustainably orientated society. In addition to many scientific and expert contributions, monographs and parts thereof, presentations at renowned foreign and domestic scientific conferences, etc., we also present a portion of our findings in our joint monograph, warning of the fundamental obstacles and showing the possibilities for searching for some solutions. Due to its scope alone, the publication cannot present all fields included in the four-year studies. We're only presenting some of the most relevant ones.

The first, largest part analyses in detail the various aspects of sustainable regional development in the selected fields, from regional development of countryside town and urban environments to specific problems and perspective of marginal social groups. The presentation is logically concluded by the chapter of the quality of life: probably the key developmental premise if we talk about the purpose of sustainability. The second part presents a completely independent group of issue on schooling and education for sustainability. The conclusion of the publication presents the importance and some approaches of recognising and evaluating the geodiversity.

The chapter on the challenges of sustainable regional development in Slovenia is based on two methodologically different studies, which consider the same problem from two perspectives – **evaluation of possibilities of Slovenian statistical regions for future, more sustainability-oriented development**. For the purpose of both examinations, two comprehensive indicator systems were prepared, whereby the purpose of the first was the evaluation of performance of Slovenian region in implementing sustainable development so far (in terms of economic, social, and environmental development), whereas the purpose of the second one was evaluation of vulnerability of regions to selected future challenges of sustainable development (i.e. challenges related to economic and social aspects of globalisation, demographic changes, climate change, and sustainable energy use). The examination results help us determine the relative rank of the regions by individual developmental field and their comparative analyses, and we also calculated two new synthetic indicators (i.e. sustainable regional development indicator and region vulnerability indicator). Comparing the examination results, we can conclude that implementation of sustainable development is weakest in economically less developed regions of Slovenia, which are also the most vulnerable to future global challenges. On the other hand, economically less developed regions have better options in the environmental segment of sustainable development. It has been shown once again that Slovenian regions are extremely diverse in terms of development, and that sustainable development strategies adapted to individual regions with appropriately tailored responses to detected developmental threats will need to be prepared to achieve a higher level of overall sustainability.

Considering the settlement characteristics of Slovenia, a special consideration has to be given to the rural areas, which are an exceptionally diverse, dynamic, and changeable multi-function space. Sustainable development of rural areas, which is the goal of development policies, has been studied qualitatively and quantitatively by recognising diverse forms and levels of resilience of relevant stakeholders. Even though their number has been constantly decreasing, family farms play an important role in the development of European and Slovenian rural areas. It is therefore necessary to research **how and in which fields farms should be adaptable, i. e. resilient** in order to contribute to the implementation of sustainable development of rural areas in Slovenia.

When explaining resilience, we use the so-called adaptive cycle (Darnhofer et al., 2016), with which we consider the non-linear dynamics of social-ecological systems and qualitatively illustrate the different types of changes. This is a continuous process composed of four phases. In the (1) exploitation phase, agriculture is adapted to the environment and oriented towards increasing efficiency, with the farm implementing small adjustments; in the (2) conservation phase, work on the farm is rationalised, uniform, with increased stability, and the farm implementing only necessary changes; in the (3) release phase, the farm has well established activities, but any small change causes uncertainty and threatens its organisation, since it demands creative experimentation, innovation, and a new direction; in the (4) reorganisation phase, the farm established new connections, uses new resources, and connects them in unusual ways.

A resilient farm therefore represents a social-ecological system that has to be capable of managing the adaptive cycle. With social and other changes in agriculture, uncertain phases are becoming increasingly more common on farms as well: the farm has to learn to react to disruptions, buffer the shocks, adapt to changes and (relatively quickly) form new, resilient operational patterns.

If we recognise a flexible farm as one of the key elements for the development of rural regions, the developmental dynamic of urban systems towards sustainable development requires different starting points. The current prevailing developmental paradigm of humanity is not compatible with nature and is not sustainable. Cities are the center **of global environmental imbalance** and of a material activity that does not have a future on a planet with limited environmental resources and self-purifying capacity. Cities, especially, therefore require a spatial organisation and method of production and consumption that will be in permanent balance with the environmental capacity (Plut, 2006). **The form of urban settlement** is a fundamental strategic factor that determines a city's sustainability. **The compact city concept** has become one of the solutions for sustainable city development. This concept establishes a development model that emphasises urban density but also prevents the cities from spreading outwards. There are three alternatives of further settlement patterns of high-density areas: dispersed distribution of population and activities, concentration in regional centres (compact city), and decentralised concentration. Comparative analyses show that, from the perspective of the three key goals of sustainable development, the decentralised concentration is optimal. This means a moderate strengthening of regional centres and certain settlement centres on the margins, with mixed land use and functions (Hilgardt, 1998). Spatial development of

Slovenian cities and wider urban areas on one hand represents a continuation of dispersed urbanisation within wider urban areas, which lately expanded outside urban regions to easily accessible rural areas. At the end of the 20th century, with increased demand for construction land for residential and commercial use, an important shift towards a more intensive internal development of cities occurred. Municipalities, which generally understand development as attracting investments for construction of apartments, economic zones, commercial premises, and infrastructure, have been obsequiously adapting their spatial plans to the interests of potential investors. Thus, many cases of inappropriate development and localisation of unsuitable activities on inappropriate locations have occurred.

Settlement areas of marginal social groups require completely different approaches. In Slovenia, these are primarily Romani settlements. Their primary problem is their disconnect with the local environment and lack of legality. City slums and primarily Romani settlements are islands of isolated world of Slovenian settlement system, which also burden their immediate surroundings, while not enabling their residents to participate on equal terms in education and later in the work environment. Practice so far has been dominated by minimalist corrective approaches, which maintained the dependency and a tutorial relationship. Developmental perspective were most often not even mentioned. However, based on new studies in this field, we can confirm that sustainable development of Romani settlements is not merely possible, but that it is their only realistic option. Marginal settlement areas have a specific spatial, as well as human and cultural capital. Their activation mobilises residents for a more responsible attitude to their own residential environment (apartment, home) and to the public and open space, while also allowing the development of aesthetic features of settlements, promotion of cultural heritage, and – in a limited scope – food production.

A special subset of research was dedicated to the **problems of defining, measuring, and implementing a sustainable regional quality of life in Slovenia**. These problems were not addresses in a large-scale and systematic manner, but through a discussion to connect the views, problems, examples of good practices, ideas, and questions presented in the studies so far. We presented up-to-date and potential contributions of geography and related “spatial” sciences to the study and support for implementation of a sustainable quality of life. Because a special chapter of this book (Vintar Mally, Kušar) is dedicated to an objective measurement of sustainable regional development in Slovenia, this contribution focuses slightly more on the **subjective evaluation of a regional quality of life** and a discussion on its **potential contribution to the implementation of a sustainable quality of life**. To illustrate the discussed problems, we use some selected results of the study on subjective evaluation of district and even regional quality of life in Slovenia. Among the central challenges and opportunities for studying sustainable quality of life in the future, we would like to highlight the following: upgrade of hedonistic with more eudemonic and sustainability-oriented goals of development of society; effective correlation of measuring the level of achieving the sustainable quality of life with measureable elements of everyday lives of individuals and local communities; effective “information-action loop” – a system of notifications, raising awareness, empowerment, and assistance for activities of individuals and local communities; searching for effective

ways for establishing values and practices that allow the sustainable quality of life to become the fundamental goal of individuals and society.

Inclusion of sustainable development in the education process must not be just an extra subject – sustainable development, as a foundation of all human activities, must be included in educational programmes. Education must also be directed towards an active mind-set, critical thinking, and has to consider a multi-disciplinary, inter-disciplinary, as well as a problem-oriented approach. Contents and approaches covered by the sustainable paradigm are familiar to the teaching of geography. In its essence, geography originates from a horizontal, integrated approach, but is also based on the field method or experiential learning; therefore, integration of the principles of sustainability with the teaching of geography does not represent a revolutionary change. The principles of sustainable development, as well as other contents related to space, are being included in the geography education for over a decade. This practice is also being implemented in the Department of Geography at the Faculty of Arts of the University of Ljubljana, as we participated in different projects related to the subject at hand. At first, the emphasis was on a sustainable attitude towards space, e.g. project *R.A.V.E. Space – Raising Awareness of Values of Space through the Process of Education* (INTERREG IIIB CADSES Programme, 2005–2007), but later developed into teaching sustainable mobility (project *Sustainable Mobility in Practice and Let's Meet at the Station*). Experience obtained with these and similar projects show that, for sustainable development, schooling and education are both processes that require a comprehensive approach not only in the formal education process, but also outside educational institutions, in everyday life.

Physical environment is the most important natural resource, basic conditions for survival. Nevertheless, both the biotic and abiotic component of the environment are under threat due to reckless and excessive exploitation of nature. A comprehensive method for evaluating species, genetic, and ecosystem diversity, dealing with biotic part of nature, has been established so far. Even though the abiotic part of the natural environment is also an important natural resource, its systematic assessment, which could contribute to its effective use, has only been performed in the last fifteen years.

The system of documenting, assessing, and protecting the abiotic nature is therefore lagging far behind the biotic nature protection. And even though geodiversity is a relatively new approach of identification and evaluation of individual abiotic parts of nature, many different methods have already been proposed. The first methods were intended only for identification of individual elements of nature with aim towards of geoconservation or geotourism. However, partially automatic methods are being recently employed, which comprehensively consider all elements of abiotic nature and terrain diversity in the studied region. Based on these two elements, indexes of diversity, density, and spatial distribution of individual elements are determined, which are the foundation for systematic and objective assessment of geodiversity indexes in a specific area. Even though geodiversity evaluation is lagging far behind, it is developing appropriate methodological foundations that will enable evaluation of abiotic nature on the same level as evaluation of biotic nature in the future.

Translated by GRENS-TIM d.o.o.

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