

# REGIONAL, SPATIAL AND ENVIRONMENTAL INDICATORS FOR AN ASSESSMENT OF REGIONAL DEVELOPMENT, STRUCTURE AND POTENTIALS

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## **Abstract**

The article brings theoretical, methodological and practical aspects of adopting regional, spatial and environmental data, indicators and criteria for the assessment of regional structure, potentials and development within the context of regional and spatial planning. The proposal of the system of indicators is presented on the basis of the CONSPACE project.

**Key words:** regional and spatial planning, regional and spatial development, regional, spatial and environmental indicators, CONSPACE

## **REGIONALNI, PROSTORSKI IN OKOLJSKI KAZALCI ZA VREDNOTENJE REGIONALNEGA RAZVOJA, STRUKTURE IN POTENCIALOV**

### **Izvleček**

Članek prikazuje teoretične, metodološke in praktične vidike uporabe regionalnih, prostorskih in okoljskih podatkov, kazalcev in meril za ocenjevanje regionalnega razvoja, regionale strukture in regionalnih potencialov v regionalnem in prostorskem planiranju. Predstavljeni sistem kazalcev je nastal na podlagi Interregovega projekta CONSPACE.

**Ključne besede:** regionalno in prostorsko planiranje, regionalni in prostorski razvoj, prostorski in okoljski kazalci, CONSPACE

## I. INTRODUCTION

The system of indicators is an instrument by which we measure and evaluate regional and spatial structure, its changes and development, and progress toward regional development goals and objectives. Such indicators have many uses: they can help identify trends, predict problems, assess options, set performance targets, and evaluate a particular area, jurisdiction or organization. Which indicators are used can significantly affect planning decisions. Indicators can be used to establish specific performance targets and contingency based plans. It may be appropriate to use a limited set of indicators which reflect the scale, resources and responsibilities of a particular sector, jurisdiction or agency. An activity or option may seem good and desirable when evaluated using one set of indicators, but harmful when evaluated using another. It is therefore important to carefully select indicators that reflects overall goals. It is also important to be realistic when selecting indicators, taking into account data availability, understandability and usefulness in decision-making. For planning it is usually best to choose a balanced set of indicators reflecting a combination of economic, social, spatial and environmental objectives. An indicator set that focuses too much on one type of impact or overlooks others can result in decisions that are not overall optimal. It is important that users understand the perspectives, assumptions and limitations of each indicator.

The prime objective of the system of indicators is to set up an operational system of indicators of development. It should facilitate the measurement, documentation and description of the state and progress in region as well as its position in relation to other regions, from the point of view of the spatial, economic and environmental aspects of sustainable development. It should be designed to provide information for the general public, political players and planning administration. By helping to publicise the objectives of development of region, the system will constitute an instrument for creating awareness of the consequences of development among the society.

The main purposes of determination of indicators are:

- to broad the knowledge basis by making available comparable data and indicators; and analyses and research on cross-border, transnational trends which influence development;
- to exchange information on the practice of planning on a comparable basis;
- to observe and evaluate development with implications for the development policy aims and options, as well as establishing appropriate criteria and indicators;
- to review available data and information system;
- to harmonise system of indicators with special emphasis on regional, spatial and environmental indicators;
- to use common databases for observation, analysis and evaluation of regional and spatial conditions, development trends, environmental characteristics and potentials for development;
- to collect data for unified analysis, categorization and typization, end avaluation of regional development structure;
- to determine methodology of regional profiling and ongoing regional monitoring.

## 2. THEORETICAL APPROACH

Regional development encompasses a wide range of issues, many of which are hard to quantify accurately and appropriately using available data sources. It requires attention to the past, the present, and the future. Underlying natural resource endowments and resource consumption define the spatial starting point for any society. The diversity of issues embedded in the concept of regional development makes the need for a broad-gauge of system of indicators more clear.

The multi-dimensional framework of the system of indicators cannot readily be reduced to a common scale. Transforming indicators to a common measurement metric would imply large-scale assumptions and generalizations that would bias the results and mask much of the analytic fraction of the indicator. Making variables comparable on an intra-regional level using GDP, demographic structure, or populated land area as denominators allows the aggregation of information that originally had different units of measurement and is the best option with the variety of the data included in the system of indicators.

Although we acknowledge that measuring, monitoring and evaluating regional development is challenging, there are some common misconceptions about how difficult it is. Some argue the indicators proposed within the system of indicators as constituents of regional development are causally connected in multiple ways, diminishing their ability to serve as indicators. It is true that the many indicators proposed are connected through complicated pathways of causality. Levels of environmental pollution, for example, can diminish the state of environmental systems, and also affect people and organisms adversely, while social and institutional capacity can intervene either in directly altering any of these phenomena or in changing the nature of the causal connections among them. We agree that this reality makes indicator creation challenging. However, complex causal structures are not a reason for inaction; in fact, we argue that indicators can help make it possible to resolve disputes on causality by strengthening the empirical nature of policy debates.

Among the most important questions about the criteria for the selection of indicators were discussed above all:

- **Validity:** Does the indicator measure a factor that is directly related to the quality of spatial development? Is the indicator a true reflection of the facts? Were the data collected using scientifically defensible measurement techniques? Will one arrive at the same result if two or more measurements of the indicator are made?
- **Availability and timeliness:** Is the indicator readily available on an annual basis? Are good quality time series data available at a reasonable cost or is it feasible to initiate a monitoring process that will make the information available in the future?
- **Reliability and stability:** Is the statistic compiled in a systematic and fair way that will be repeated every year?
- **Responsiveness:** Does the indicator respond quickly and noticeably to real changes?
- **Understandability:** Is the indicator simple enough to be interpreted readily by the experts? Can the information be presented in an easily understandable, appealing way to the target audience?

- **Policy relevance:** Does the indicator have relevance for development policy decisions?
- **Representativeness:** Do the indicators as a group cover important dimensions of the element? Is the indicator about a very narrow or broad quality of life issue?

There are, of course, several other criteria for determining the significance of indicators, for example: output, process, contextual, and shadow output indicators. The output indicators are measures of specified, real variables over time that can be directly related to policy objectives. The specified variables are defined in reference to the policy objectives and targets to be measured, recognising data constraints. The process indicators are measures of specified variables over time that relate to the means by which policy objectives are to be delivered in terms of policies, programmes, projects and proposals in lower order plans and strategies. The contextual indicators are measures of specified variables over time that can be only indirectly related to policy objectives and which take into account data constraints. The so-called shadow output indicators are the same as the above mentioned output indicators, but relate to perspective new objectives and policies, which the policy intends to develop in a future review rather than the existing policies. Information about these indicators can be collected prior to the review in order to inform the future spatial planning monitoring report and to provide baseline data for subsequent assessment of the relevant new policies. This classification of the indicators is directed more towards the monitoring as the process of measuring (qualitative or quantitative):

- changes in regional trends and conditions (regional monitoring);
- impact of spatial planning policies (policy monitoring);
- performance of policies against policy objectives and targets (plan, strategy monitoring);
- progress in delivering the agreed process (plan audit).

Description and definition of different indicators should include explanation about:

- **rationale** of each indicator for analysing regional and spatial structure, functions and their changes (trends);
- **definitions** in accordance with scientific standards;
- **sources and methods** for obtaining the data and calculating the results.

Within this context we selected and applied indicators on the basis of:

- **diversity** – a set of indicators that reflect all relevant economic, social and environmental planning objectives;
- **usefulness** – indicators that can be applied to planning decisions;
- **ease of understanding** – indicators understandable to experts and the general public;
- **data availability and collection costs** – indicators that rely on data that are available or can be collected with available resources;
- **comparability** – indicators and data that are suitable for comparison with other jurisdictions, times and organizations;
- **performance targets** – indicators that are suitable for establishing usable performance targets.

The system of indicators should be transparent, open and evolutionary. It should help to set up links with sector, regional or local systems of indicators of development. In order to achieve the above-mentioned objectives and to meet the needs of users, the system of indicators should fulfil the following requirements:

- it should be constructed around a systematic framework (methodological sheets) in order to meet the criteria of independence, neutrality and transparency inherent in public statistics and to allow for future development;
- indicators should be included in the methodological sheets according to a transparent and duly documented selection procedure;
- it should be possible to identify sub-groups adapted to users' needs;
- it should present the indicators in an attractive way which is suited to users' needs.
- it should indicate whether region is on the right path for achieving spatial development goals and objectives within the principles of sustainable development.

### 3. METHODOLOGICAL APPROACH

The creation of the list of indicators for assessing regional structure, potentials and development was determined on the basis of a selective approach inside the concept of CONSPACE project which consists of the next steps:

- determination of types of data and indicators to be reviewed;
- collection and review of available data, indicators and information systems by involving local governments included in the project;
- the enlistment of ideal/optimal indicators for monitoring regional development;
- the adaptation of a common terminology and a unified set of measurable indicators;
- the forecast indicators;
- the final list of indicators;
- the methodology sheets – the basic characteristics of indicators and a clear scientific argumentation for their selection to the system of indicators (to describe, designate and categorize indicators);
- the final proposal of the system of spatial indicators including spatial and environmental indicators.

The end list of indicators was »evaluated« according to the list of indicators for monitoring European territory (European Spatial Planning Observation Network - ESPON), Monitoring the Alpine Region's Sustainability (MARS) and cohesion objectives achievement (A New Partnership for Cohesion). On the basis of this analysis the list of possible ideal/optimal indicators for monitoring development in regions was proposed.

The list of the ideal indicators contains above all (but not exclusively) the basic indicators (basic data for indicators), which should be used for calculating the so-called derived (synthesized) indicators at the regional level.

All indicators were divided into three main groups according to their significance: key indicators, *core* indicators, and *research* indicators. The criteria for structuring indicators

according to their significance or according to the diversity of indicators, was mainly the degree of their availability.

Argumentation for all proposed indicators was prepared on the basis of the scientific literature and already known projects (European Spatial Planning Observation Network - ESPON, Monitoring the Alpine Region's Sustainability – MARS, Cohesion objectives achievement - A New Partnership for Cohesion).

Methodology sheets were prepared for all indicators. They serve as a method of preparing a common terminology for presenting basic characteristics of indicators, their connectedness with planning goals and to state their clear scientific argumentation for their selection to the system of indicators. Methodology is constructed of four groups of information bringing information about:

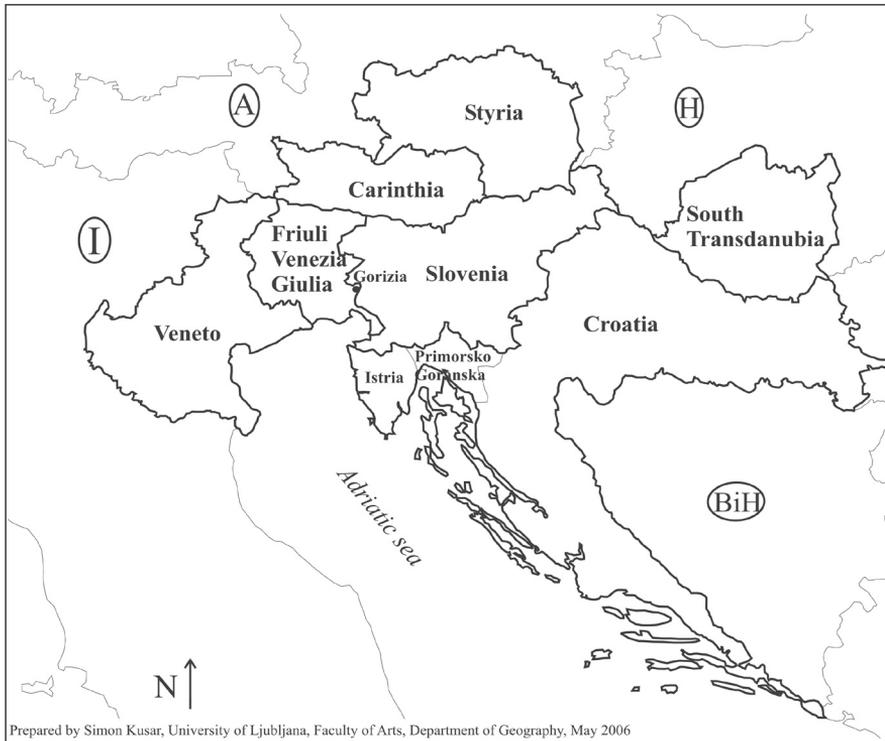
- **name of indicator** - unit, calculation, importance, possible variation;
- **criteria** - scientific argumentation, continuity of collection of data, adequacy for interpretation, supranational suitability, connection with planning goals, availability of data, spatial level resolution and comparability of data;
- **subjects classification** - group, content, connection with specific goals and connectedness with other indicators;
- **argumentation of indicator** - reference for indicator, source for data, spatial level, geographical extend, time frame and final remarks/comments.

## 4. REGIONAL, SPATIAL AND ENVIRONMENTAL INDICATORS FOR AN ASSESSMENT OF REGIONAL STRUCTURE, POTENTIALS AND DEVELOPMENT OF THE CONSPACE REGION

The CONSPACE project (Common Strategy Network for Spatial Development and Implementation), which was launched in 2003, deals with topics of integrated regional planning and sustainable regional development. It aims at improving the harmonization of spatial planning, better mutual knowledge of planning principles and strategies, elaboration of common strategies for spatial development and the preparation of implementation of actions. It is realized as part of the INTERREG III B CADSES Operational Program (Kušar, 2006). The central objective of the CONSPACE project is to get acceptance of a transnational regional development strategy that shows the way to advance and improve existing spatial structures and to reduce regional disparities (Bory, Puchinger, 2005).

CONSPACE project partners are spatial planning authorities representing ten regions in five nations: Carinthia (A), Styria (A), Veneto (I), Friuli-Venezia Giulia (I), Gorizia (I), Slovenia (SI), Croatia (HR), Primorsko-Goranska (HR), Istria (HR) and South Transdanubian regional development agency (Baranya, Somogy and Tolna, HU) (CONSPACE).

Figure 1: Territorial extent of the CONSPACE region  
 Slika 1: Prostorski obseg CONSPACE regije



The project was organized into six work packages (WPs) whereof the first comprises the project management. WP 2, which is managed by Slovenian partner (Ministry of Environment and Spatial Planning), is dealing with enhancement of cohesion of planning tools and procedures, of the compatibility of existing planning databases, information instruments and of planning attitudes. Development of indicators was an important section in the WP 2 and probably the most scientific contribution to the whole CONSPACE project. WP 2 therefore prepared the system of indicators for monitoring regional structure, potentials and development of the CONSPACE region, which will be used for collecting data on regional and spatial development from each partner, preparing evaluation of existing spatial, regional and environmental characteristics for each region included in CONSPACE region and CONSPACE region as a whole, preparing comparative analysis of CONSPACE region with average of the European Union (EU) and selected existing EU regions and to evaluate contemporary and potential significance of CONSPACE region according to regional, spatial and environmental characteristics and regional and spatial potentials for development of the region.

#### 4.1. Indicators of monitoring regional development

The list of indicators for monitoring regional development in the CONSPACE project region was determined on the basis of an analysis of existing indicators used in the already existent monitoring system of spatial development in all CONSPACE partners. The list of indicators used in majority of partners was later supplemented with indicators for monitoring European territory (European Spatial Planning Observation Network - ESPON), Monitoring the Alpine Region's Sustainability (MARS) and cohesion objectives achievement (A New Partnership for Cohesion). Criteria for structuring indicators to *key*, *core* and *research* indicators was their significance or diversity of indicators, mainly based on the degree of their availability. Key indicators can be used immediately, while for research indicators some additional research or data collection need to be done.

The proposed list of indicators comprises 10 groups of indicators with altogether 104 indicators. They try to define regional structure of the CONSPACE project region through demographic structure, socio-economic structure, settlement net, countryside, quality of living, infrastructure, land use, protected areas, degraded areas and endangered areas. Each group of indicators consist of a number of indicators, of which 24 are *key*, 18 *core* and 62 *research* indicators.

Table 1: The list of ideal indicators for monitoring regional development

Preglednica 1: Seznam kazalcev za vrednotenje regionalnega razvoja

Group of indicators	Indicators
Demographic structure	<b>Number of population</b> , <i>Population density</i> , <i>Natural balance</i> , <i>Migratory balance</i> , <i>Migratory balance (distinction for foreign residents)</i> , <i>Share of migration in population growth</i> , <i>Age groups (children)</i> , <b>Age groups (old age)</b> , <b>Age groups (working population)</b> , <b>Number of households</b>
Socio-economic structure	<b>GDP per capita</b> , <b>GDP per employed</b> , <i>Structure of GDP</i> , <i>R&amp;D expenditure</i> , <i>R&amp;D personnel</i> , <i>Low qualification structure</i> , <i>High qualification structure</i> , <b>Students</b> , <b>Employed population</b> , <b>Active population</b> , <b>Employed in agriculture</b> , <b>Employed in industry</b> , <b>Employed in services</b> , <i>Qualification structure of employed</i> , <i>Daily migration</i> , <i>Unemployment</i> , <b>Unemployment (women)</b> , <i>Unemployment (youth unemployment)</i> , <i>Unemployment (long-term unemployment)</i> , <b>Depressed, underdeveloped areas</b>
Settlement structure	<b>Urban areas</b> , <i>Functional urban areas (FUA)</i> , <i>Population in densely populated settlements</i> , <i>Urban density</i> , <i>Suburban areas</i> , <b>Rural areas</b> , <i>Central place relationship</i> , <i>Strength of the urban-rural migration flows</i> , <i>Strength of the rural-urban migration flows</i>
Countryside	<i>Areas with low population density</i> , <i>Mountainous and hilly areas</i> , <i>Active rural population (age structure)</i> , <i>Active rural population (qualification structure)</i> , <i>Full-time farmers</i> , <i>Number of farms</i> , <i>Farm size</i> , <i>Biological farming</i> , <i>Supplement activities in farms</i> , <i>Employment in other activities</i>
Quality of living	<i>New apartments</i> , <i>Living standards (number of rooms)</i> , <i>Living standards (m<sup>2</sup> per inhabitant)</i> , <i>Living standards (one-dwelling buildings)</i> , <i>Health indicator</i> , <i>Safety indicator</i> , <i>Societal participation and integration</i>

Infrastructure	<i>Number of passengers, Freight transport, Roads loading, Liner connections, Traffic expenditure, Accessibility index (centre), Accessibility index (highway), Accessibility index (stopping place), State, regional, local roads (density), State, regional, local roads (new construction), Railway network (density), Railway network (new constructions), Telephone connections, Mobile telephone, Households with access to Internet, Public access to Internet, Cable connections, Production of energy, Production of electric energy, Consumption of electric energy, Consumption of electric energy per employed, Water supply, Consumption of water, Quantities of purified waste-water, Sewage system, Solid waste disposal</i>
Land use	<i>Agricultural land (extent), Fields (extent), Meadows (extent), Forests (extent), Pastureland (extent), Water areas (extent), Build-up area (extent)</i>
Protected areas	<b>Protected areas (national, regional, landscape, natural parks, protected forest, natural environment, cultural heritage), Protected areas (Natura 2000), Protected agriculture land (extent), Protected water resource areas (extent), Land care index</b>
Degraded areas	<i>Degraded industrial and mining areas (extent), Damaged forests (extent), Polluted soils (extent), Air polluted areas (extent), Water pollution, Underground water pollution</i>
Endangered areas	<i>Inundation areas, Landslide and erosion areas, Snow slide areas, Estimated costs of natural disasters</i>

Source: Čerme et al, 2004a; Nordio, 2005.

## 4.2. Forecast indicators for measuring development potentials

Measuring future spatial trends and structure is of great importance in spatial planning to measure spatial potentials for future development. Inputs for the elaboration of forecast indicators for measuring development potentials of the CONSPACE project region are results from all pilot actions and work packages carried out in CONSPACE project, proposals sent by partners and some additional scientific literature. Indicators are used for measuring existing spatial potentials and for the identification of future (planned, proposed, projected) spatial potentials. They are arranged into 6 groups with altogether 29 indicators.

Table 2: The list of indicators for measuring (spatial) development potentials  
Preglednica 2: Seznam kazalcev za merjenje (prostorskih) razvojnih potencialov

Group of indicators	Indicators
Transportation networks	Transportation connections (existent, planned), Transportation junctions (existent, planned), Stations (existent, planned), Transportation multimodal nodes (existent, planned), Passenger and freight traffic (existent, planned), Passenger and freight traffic: multimodal nodes (existent, planned)
Infrastructure for tourism and recreation	Tourism sector share in GDP, Centres of tourism and recreation (existent, planned), Areas for tourism and recreation (existent, planned), Infrastructure for winter and summer tourism and recreation (existent, planned)

Economic zones/ development sites	Industrial and service sector share of GDP, Employed in industrial and servicesector, Economic zones/development sites (existent, planned), Commercial zones (existent, planned), Industrial sites (existent, planned), Commercial/ industrial zones (existent, planned), Technological and industrial parks (existent, planned), R&D parks (existent, planned), Warehouse/storehouse (existent, planned), Other specialized areas (existent, planned)
Urban networks	Urban networks (existent, planned)
Landscape areas and areas of natural and cultural heritage	Landscape areas and areas of natural and cultural heritage (existent, planned)
Social infrastructure	Universities (existent, planned), Educational and qualification structure (existent, planned)

Source: Černe et al, 2004b.

### 4.3. Indicators of spatial development

Indicators of spatial development are result of the WP 2 pilot action *Indicators of spatial development* (see Lenarčič, 2005). The aim of the proposed list of indicators for measuring spatial efficiency of the system is to achieve more diverse living environments, better territorial organization, improved public and private transportation services, less land absorption, lower energy consumption, reduced constructional, operational and maintenance costs of settlement, transportation, and other infrastructural networks. In the proposed set of indicators information about the efficiency of these systems are viewed as possible input, status and output variables and feedbacks concerning former, formerly planned, current and currently planned attributes of different parts of systems networks and their spatial relationships at various levels of spatial resolution: national, macroregional, regional, subregional and local (Lenarčič, 2005).

The proposed system of indicators could and should be able to describe and measure spatial efficiency of the present state of spatial development of systems in the CONSPACE area. It should be able to describe and measure spatial efficiency of future states of spatial development of systems in the same area put forward in various recommendations (Lenarčič, 2005).

This set of spatial indicators is presented in 5 groups of indicators with altogether 29 indicators.

Table 3: List of indicators of spatial development

Preglednica 3: Seznam kazalcev za merjenje prostorskega razvoja

Group of indicators	Indicators
Territorial networks	ISSE Index I1 measuring regions area size, ISSE Index I2 measuring regions area shape, ISSE Index I3 measuring regions landscape territorial formation, ISSE Index I3 measuring regions landscape space-time formation, ISSE Index I3 measuring territorial and space-time landscape formation of regions

Settlement networks	ISSE Index 14 measuring territorial distribution of primary settlement networks, ISSE Index 14 measuring space-time distribution of primary settlement networks, ISSE Index 14 measuring territorial and space-time distribution of primary settlement networks, ISSE Index 15 measuring territorial distribution of secondary settlement networks, ISSE Index 15 measuring space-time distribution of secondary settlement networks, ISSE Index 15 measuring territorial and space-time distribution of secondary settlement networks
Transportation networks	ISSE Index 16 measuring territorial distribution of primary transportation networks, ISSE Index 16 measuring space-time distribution of primary transportation networks, ISSE Index 16 measuring territorial and space-time distribution of primary transportation networks, ISSE Index 17 measuring territorial distribution of secondary transportation networks, ISSE Index 17 measuring space-time distribution of secondary transportation networks, ISSE Index 17 measuring territorial and space-time distribution of secondary transportation networks
Settlement and transport network	ISSE Index 18 measuring territorial relations between primary settlement and transportation networks, ISSE Index 18 measuring space-time relations between primary settlement and transportation networks, ISSE Index 18 measuring territorial and space-time relations between primary settlement and transportation networks, ISSE Index 19 measuring territorial relations between secondary settlement and transportation networks, ISSE Index 19 measuring space-time relations between secondary settlement and transportation networks, ISSE Index 19 measuring territorial and space-time relations between secondary settlement and transportation networks
Other combined index	ISSE Index 11 measuring functional attributes of systems settlement nodes, ISSE Index 11 measuring functional attributes of systems transportation nodes, ISSE Index 11 measuring functional attributes of systems settlement and transportation nodes, ISSE Index 12 measuring physical attributes of systems settlement nodes, ISSE Index 12 measuring physical attributes of systems transportation nodes, ISSE Index 12 measuring physical attributes of systems settlement and transportation nodes

Source: Lenarčič, 2005.

#### 4.4. Environmental indicators

The decision to incorporate environmental indicators in the system of indicators for assessing regional structure, potentials and development of the CONSPACE region was based above all on the concept of sustainable development as an integration of economic, social and environmental aspects stated in ESDP through basic goals of economic and social cohesion, sustainable development and balanced competitiveness of the European territory. Spatial approach not only confirms absolute necessities of these basic goals, but should also be seen as a way to assist sustainable development. Spatial development which concentrates only on one of these basic objectives would be unsuccessful in promoting effective, balanced and harmonious spatial development.

The proposed list of environmental indicators consists of 10 groups of indicators with altogether 37 indicators.

Table 4: The proposed list of environmental indicators

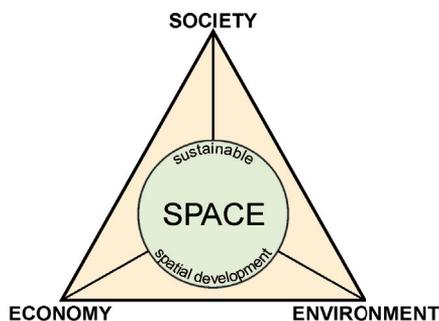
Preglednica 4: Predlagan seznam okoljskih kazalcev

Group of indicators	Indicators
Agriculture	ea under organic farming, Gross nutrient balance
Air pollution and ozone depletion	Emissions of acidifying substances, Emissions of ozone precursors, Emissions of primary particles and secondary particulate precursors, Exceedance of air quality limit values in urban areas, Exposure of ecosystems to acidification, eutrophication and ozone, Production and consumption of ozone depleting substances
Biodiversity	Designated areas, Species diversity, Threatened and protected species Climate change, Atmospheric greenhouse gas concentrations, Global and European temperature, Greenhouse gas emissions and removals, Projections of greenhouse gas emissions and removals
Energy	Final energy consumption by sector, Renewable electricity, Renewable energy consumption, Total energy consumption by each fuel, Total energy intensity Fisheries Aquaculture production, Fishing fleet capacity, Status of marine fish stocks
Terrestrial	Land take, Progress in management of contaminated sites
Transport	Freight transport demand, Passenger transport demand, Use of cleaner and alternative fuels
Waste	Generation and recycling of packaging waste, Municipal waste generation
Water	Bathing water quality, Chlorophyll in transitional, coastal and marine waters, Nutrients in freshwater, Nutrients in transitional, coastal and marine waters, Oxygen consuming substances in rivers, Urban waste water treatment, Use of freshwater resources

Source: Černe et al, 2006.

Figure 2: The concept of sustainable spatial development

Slika 2: Koncept trajnostnega prostorskega razvoja



## 5. CONCLUSIONS

The prime objective of the system of indicators is to set up an operational system of indicators of regional development. It should facilitate the measurement, documentation and description of the state and progress in region as well as its position in relation to other regions, from the point of view of the spatial, socio-economic and environmental aspects of sustainable development. It is an instrument by which we measure and evaluate regional and spatial structure, its changes and development, and progress toward regional development goals and objectives. The multi-dimensional framework of measuring, monitoring and evaluating regional development cause many theoretical, methodological and practical problems in the elaboration of the system of indicators, with which it would be possible to evaluate regional structure, potentials and development.

If we want to achieve that the system of indicators is transparent, open and evolutionary, the system should fulfil the following requirements:

- it should be constructed around a systematic framework (methodological sheets);
- indicators should be included in the methodological sheets according to a transparent and duly documented selection procedure;
- it should be possible to identify sub-groups;
- it should present indicators in an attractive way;
- it should indicate whether region is on the right path for achieving development goals and objectives within the principles of sustainable development.

The set of indicators hasn't been tested yet, since there is a lack of appropriate data on regional and subregional level. The analysis of regional development, structure and potentials of the CONSPACE region, its subregions and comparative analysis between CONSPACE and average of the European Union is therefore planned to be done in the next programming period.

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## **REGIONALNI, PROSTORSKI IN OKOLJSKI KAZALCI ZA VREDNOTENJE REGIONALNEGA RAZVOJA, STRUKTURE IN POTENCIALOV**

### **Povzetek**

Sistem regionalnih, prostorskih in okoljskih kazalcev je namenjen opredeljevanju značilnosti regionalne strukture. Skupaj z drugimi kazalci, ki jih lahko uporablja posamezna država ali regija, zagotavlja kakovostno primerjalno podlago za vrednotenje regionalnega in prostorskega razvoja ter omogoča spremljanje napredka pri doseganju ciljev regionalnega in prostorskega planiranja. Izbor kazalcev je zato še posebej pomemben, pri čemer je potrebno upoštevati dostopnost podatkov, razumljivost kazalcev in njihovo uporabnost pri odločanju. Pri planiranju je najbolje izbrati tiste kazalce, ki v največji meri odražajo uravnoteženo kombinacijo gospodarskih, socialnih, prostorskih in okoljskih ciljev.

Prikazani sistem kazalcev je bil razvit v okviru Interregovega projekta CONSPACE, natančneje drugega delovnega paketa (vodilo ga je Ministrstvo za okolje in prostor Republike Slovenije), ki je bil namenjen prikazu harmonizacije planerskih orodij in procesov v projektni regiji (partnerji v projektu so navedeni na sliki 1).

Za vsak kazalec iz celotnega sistema gospodarskih, socialnih, prostorskih in okoljskih kazalcev je bil pripravljen metodološki list. Slednji služi kot metoda za poenotenje izrazoslovja, opredeljevanje povezanosti kazalcev s planerskimi cilji, metodološki list pa vključuje tudi jasno strokovno/znanstveno obrazložitev izbora vsakega posameznega kazalca. Vsi metodološki listi skupaj naj bi predstavljali kakovostno primerjalno podlago za vrednotenje regionalnega razvoja, strukture in potencialov.

Sistem kazalcev s področja regionalnega razvoja naj bi meril regionalno učinkovitost in razvojne težnje. Kazalci so razvrščeni v 10 skupin s skupaj 104 kazalci. Z njimi opisujemo regionalno strukturo in merimo napredek pri doseganju regionalnih in prostorskih ciljev na podlagi opredeljevanja demografske strukture, socialno-ekonomske strukture, mreže naselij, podeželja, kakovosti bivanja, infrastrukture, rabe tal, zavarovanih območij, degradiranih

območij in ogroženih območij. Kazalci so glede na stopnjo njihove dostopnosti razvrščeni v 24 ključnih (key), 18 temeljnih (core) in 62 raziskovalnih (research) kazalcev.

Kazalci za merjenje obstoječih prostorskih potencialov in za identifikacijo prihodnjih (načrtovanih, predlaganih) prostorskih potencialov so urejeni v 6 skupinah (prometno omrežje, gospodarske cone/razvojna območja, urbana mreža, infrastruktura za rekreacijo in turizem, krajinska območja in območja naravne in kulturne dediščine ter socialna infrastruktura), s skupaj 29 kazalci.

Prostorski kazalci (teritorialne mreže, omrežje naselij, prometno omrežje, omrežje naselij in transporta, ostali kombinirani kazalci) opisujejo in merijo prostorsko učinkovitost sedanjega prostorskega razvoja v regijah. Z opisovanjem in merjenjem prostorske učinkovitosti prihodnjega prostorskega razvoja se lahko uporabljajo tudi za pripravo različnih planerskih predlogov.

Okoljske kazalce sestavlja prav tako 10 skupin kazalcev (kmetijstvo, onesnaženje ozračja in izginjanje ozona, biotska pestrost, podnebne spremembe, energija, ribištvo, kazalci kakovosti tal, transport, odpadki, voda), s skupaj 37 kazalci.

Predstavljen sistem kazalcev še ni bil preizkušen v praksi, saj je bilo za to na voljo premalo ustreznih podatkov. Zbiranje podatkov, regionalne in prostorske analize na ravni CONSPACE regije in njenih subregij ter primerjalne analize med CONSPACE regijo, povprečjem Evropske unije in drugimi evropskimi regijami je predvideno v novem programskem obdobju.