USING SUSTAINABLE DEVELOPMENT INDICATORS AT EUROPEAN LEVEL

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Abstract: *The continuous increasing quality of life of people held the numerous technological applications. But it emphasized the use of technological applications led implicitly to increase energy consumption and thus to uncontrolled environmental pollution, the adverse effects and unpredictable at the beginning. All these effects should be emphasized by using certain indicators, called sustainable development indicators, SDI. New and modern systems of monitoring and integrated assessment of regional sustainable development have a great strategic importance to Europe and the world, about the preservation and improvement of environment, and regional and global sustainable development. A basic component of such monitoring systems and evaluation of regional sustainable development is represented by sustainable development indicators, which contribute to understanding and modeling complex real systems. This work is to present concerns sustained in recent years in developing and using the corresponding sustainable development indicators SDI, in order to allow emphasize, quantifying and assessing the quality of sustainable development. Sustainable development indicators SDI deliver important information on the degree of achievement of objectives of sustainable development and the success of the strategies and measures introduced to achieve a sustainable development. Sustainable development indicators cover three basis areas, so they include indicators for the three main parts: indicators for the field „Environment/Ecology", indicators for the field „Economic/Technical" and indicators for the field „society". The idea of sustainable development has emerged as a possible solution to the complicated situation created by humanity, first desire for increasing living standards, on the other hand the destruction of the environment. This concept took shape as a possibility to resolve these problems, starting to be circulated to national environmental policies, especially after 1992. To address these systemic issues is passed first at the current situation analysis of national and European existing level on the monitoring and evaluation of regional sustainable development. This analysis shall be performed successfully using sustainable development indicators system, which began to be used internationally. These indicators began to be used successfully, although a number of issues arise concerning the collection of necessary data. There are special difficulties for the social field, whether in the field of technical-economic and environmental hardships arise because of the large number of data to be collected.*

Key words: *European and national sustainable development, sustainable development indicators SDI, technical-economical indicators, environmental indicators, social indicators*

INTRODUCTION

In order for operational concept of sustainable development, there must be developed Sustainable Development Indicators, SDI, with which may be formulated targets, which can then be checked and verified.

The main elements of the monitoring systems of sustainable development are the sustainable development indicators.

To assess the sustainability of economies and regions of countries were released various indicators to measure the effect of economic actions and the pressure exerted by them on the environment and society.

The sustainable development indicators which appreciate the environmental impact of economic sectors with high potential for pollution in Europe are: REACH, TERM, IRENA, BIO-IMPS.

MATERIAL AND METHODS

The main components of an indicator for sustainable development monitoring are:

- technical-economic indicators;
- environmental indicators (simple environmental indicators; aggregated environmental indicators);
- social indicators (European indicators; national indicators; local indicators).

1. Technical-Economic Indicators

These indicators refer to the energy consumption in order to get a technical product and technical-economic efficiency of a technical system.

Most use specific indicators are: primary energy consumption per capita; total CO_2 emissions per capita; emissions of other pollutants per capita; recycling rate for paper or plastic; GDP per capita; total GDP and carried on different sectors; rate of annual growth of GDP which shows the economic efficiency of a national system; inflation rate.

2. Environmental Indicators

Environmental indicators characterize environment quality in a certain area in a certain time. Environmental indicators can be aggregated from different components, depending on the environment they take into account: water, air or land. Indicators can describe an environment: the indicators for water, air or soil quality, they may be complex, characterizing two different environments: air and water, air and soil, water and soil, or can be global and characterizing all three environments: air, water and soil.

Worldwide there are different stages in the evolution of the use of environmental indicators: indicators highlighting the regional air quality; indicators highlighting the river or lake water quality; indicators highlighting the soil quality; aggregate indicators highlighting the index for air and water quality; aggregate indicators highlighting the environmental quality.

In order to define some new indicators, we have to consider certain requirements that are required to be met, namely: providing information about the described process; having a prevention and control function; responding to the purpose it was defined for; the used method to define to be transparent; aggregation method to be clear; the possibility of reproduction of aggregation method; easy to be understood; easy to be applied; to offer the possibility of comparing different alternatives.

It is important that these indicators should be simple and have a clear and concise message. They contribute to understanding and modeling complex real systems, by: concentration of existing data; description of system status and indication of deviations from the desired state; indication of evolution compared to the desired state evolution; informing users about the state reached so as to make possible correct decisions to achieve the desired state.

Environmental indicators play an important role in the development of sustainable development indicators.

Environmental indicators are classified into:

- simple environmental indicators;
- aggregated environmental indicators.

After how the phenomenon is described, there are:

- quantitative environmental indicators;
- qualitative environmental indicators.

After the degree of spatial coverage, there are:

- international indicators;
- national indicators;
- regional indicators;
- local indicators;

- sectorial indicators.

After the degree of temporal detail, there are:

- environmental indicators for describing a state of the considered system;
- environmental indicators for describing the considered system dynamics (make it possible to obtain information about the tendency of evolution of the system)

2.1. Simple environmental indicators

Indicators are measured sizes that provide information about a particular phenomenon, in order to serve a specific purpose. These indicators make possible the recognition, measurement, and evaluation of stronger and weaker factors of the process followed. They are used for more accurate understanding of reality.

As simple environmental indicators, we can remember: the concentration of carbon dioxide in the air, the concentration of carbon monoxide in the air, the concentration of sulfur dioxide in the air, the concentration of oxygen in water, concentration of heavy metals in water, the concentration of iron in the soil, the concentration of dust in the air.

2.2. Aggregated environmental indicators

The higher degree of aggregation, the lower detail degree directly quantified of information on indicators. The degree of aggregation of the indicator must correspond with the intended use of defined indicator.

To characterize the material efficiency nationwide, a group of scientists in Finland have defined an aggregate indicator, called Total Environmental Stress, which gather all the material flows of an economy and reports such as the GDP.

For sectorial level, there was developed an aggregate indicator called Material Intensity per Service Unit, which calculates the flow of certain materials used to manufacture goods or to use services.

Aggregated environmental indicators are those used by OECD, which is called "pressure-state-response", and include: indicators that show the pressure over the environment (storage bins, emission), indicators which characterize the system state (environmental quality by concentrations of pollutants in air, water, soil) and indicators that characterize the quality of response to environmental changes (changes in energy consumption and water).

3. Social Indicators

3.1. European level

In 2005, the European Commission adopted the Sustainable Development Indicators to Monitor the Implementation of the EU Sustainable Development Strategy. The proposed indicators are grouped in ten dimensions:

1. Economic Development
2. Poverty and social police
3. Aging society
4. Public health
5. Energy and climate change
6. Partners of production and consumption
7. Natural Resources Management
8. Transportation
9. Good governance
10. Global partnership

Among these the most important are: poverty and social police, aging society, public health and global partnership.

Poverty and social police can be monitored through the following indicators: rate risk of poverty; persistence of poverty risk; risk of poverty rate by age groups, by level of education, and type of household; inequalities in the distribution of income; long-term

unemployment; gender inequality in pay; population belonging to families unemployed by age groups; early school leavers; people with low schooling by age; quality of housing.

Size *Aging society* is associated with the following indicators: dependency ratio; households with income per person in excess of 65 years; poverty risk for people 65 years old and over; life expectancy for people over 65 years; fertility rate; international migration by age; consolidated budget as a percentage of GDP; expenditure on pensions in GDP; employment rate by age; the rate of public expenditure for social protection of elderly.

Public health dimension is covered by these indicators: life expectancy at birth by gender; the percentage of overweight people by age group; antibiotic resistance; health in 65 years by gender; health expenditure as a percentage of GDP; the rate of incidence of cancer, the gender and type of disease; suicide rates by gender and age group; jobs with high levels of stress; severe injuries to workers; deaths due to food infections; salmonella illness rates; incidence pollution with chemicals; the share of people living in homes affected by noise, vibration and pollution; air pollution caused losses as a percentage of GDP.

Good governance is monitored by the following indicators: rate of confidence in the European institutions; the number of cases brought before the Court of Justice on policy areas; administrative costs imposed by legislation; the transposition of Community legislation on policy areas; turnout in national and European parliamentary elections; the e-governance; individual use of e-Government frame.

3.2. National level

National Statistics Institute of Romania issued a set of sustainable development indicators that can be found in sizes: poverty and social police; aging society; public health.

Size *Poverty and social police* is associated to the following indicators in Romania: poverty rate by gender, by age and household types; inequalities in income distribution; long-term unemployment rate; the gender wage difference; the very long term unemployment rate; the ratio of economic dependency in households; school drop-out rate by young people; the share of population with low educational level; the poverty rate after social transfers.

Size *Aging society* is associated to the following indicators: old age dependency ratio; the poverty rate for persons 65 years and over; life expectancy at 65 years by sex; the total fertility rate; net internal migration by age group; the employment rate by group age; the average age of retirement.

Size *Public health* is associated to the following indicators: healthy life expectancy; healthy life expectancy to 60 years by sex; percentage of people overweight by age group; public expenditure on health (as % of GDP); the rate of cancer incidence per 100,000 inhabitants; suicide rates by sex and age group; percentage of current smokers by sex and age group; the number of injured at work; the rate of incidence of salmonella in humans.

3.3. Local level

For sustainable development of localities could be used the following social indicators:

- Income, expenditure and household consumption (income population structure, level and structure of total expenditure, the distribution of average spending level and composition of expenditure, the structure of the population average consumption);
- Poverty and extreme poverty (number of people living with an income less than $1 per day, number of people living with an income less than $2 per day, the share of poor households in total households, the share of expenditure categories, the poverty rate for people 65 and older, the number of families that need social assistance);
- Culture and Community Participation (number of cultural institutions, the number of spaces for leisure, the number of areas of spending time outdoors, the number of non-governmental organizations, clubs and associations, the number of NGOs with the objectives

of sustainable development, community development, culture, the number of events with community participation, including religious, cultural number, number of meetings with public character; number of structures involved in decision making, the number of petitions, the lists of signatures or community protests, the participation of citizens to vote)

RESULTS AND DISCUSSIONS

Table 1

National Sustainable Development Indicators

Country	National Level - National Sustainable Development Strategies			
	Priorities	Indicators	Coverage of priorities by indicators	Indicators
Austria	159 Goals: 5 Priorities: 23 Measures: 131	95 Quantitative: 92 Qualitative: 3 Target value: 5%	Goals&Priorities: 14% Goals: 80% Priorities: 0%	- Greenhouse gases - Exceeding limit values for PM10 - UV intensity - absolute and relative energy consumption GDP - materials (DMC and DMI) - changes in land - land use change - birds and orchids as indicators of habitat quality - quality of surface water - streams: ecological and chemical conditions - groundwater quality - land use - the percentage of isolated land - the index of chemicals - consumption of specific materials - sources of noise
France	75 Goals: 9 Priorities: 50 Measures: 16	12 Quantitative: 12 Qualitative: 0 Target value: 17%	Goals&Priorities: 12% Goals: 78% Priorities: 0%	- GDP growth per capita - all greenhouse gases - including renewable energy in total consumption - total energy consumption in transport - the amount of municipal waste collected - the index of common bird populations - illegal fishing - the rate of poverty at risk - population age - official development aid - readiness for e-administration
Germany	25 Goals: 4 Priorities: 21 Measures: 0	28 Quantitative: 28 Qualitative: 0 Target value: 79%	Goals&Priorities: 100% Goals: 100% Priorities: 100%	- Productivity of energy - greenhouse gases (Kyoto Protocol) - proportion of energy consumption from renewable sources - land use for residential and transport - public financing gap - the formation of capital in relation to GDP - public and private expenditure on research and development - education complete 25 years - admission to college - GDP per capita - transport intensity - the proportion of rail freight transport - organic farming - Excess nitrogen - air pollution concentration - premature mortality - health - reported cases of theft - the rate of employment - facilities on daily tasks - comparison of annual earnings of full-time employment - official development assistance - imports from developing countries - industrial products tape - an indicator of sustainability for biodiversity - water transport in the context of total freight transport

In the study „Analysis of national sets of indicators used in the National Reform Programs and Sustainable Development Strategies" is comprised a set of indicators used in different countries included in the study. The team coordinator is Ewald Rametsteiner, from the Department of Economics and Social Sciences, University of Natural Resources and Applied Life Sciences (BOKU), in collaboration with Eurostat.

The objectives of this study were to examine the policy priorities and sets of indicators used by national reform programs and national sustainable development strategies and their comparison with the indicators used in the sustainable development strategies at European level.

Background documents for the indicators used in sustainable development at European level are:

- European Council (2006): Renewed EU Sustainable Development Strategy
- European Commission (2005): Sustainable Development Indicators to monitor the implementation of the EU Sustainable Development Strategy (communication from Mr. Almunia to the Members of the Commission)
- European Commission (2004): National Sustainable Development Strategies in the European Union. A first analysis by the European Commission)
- Eurostat (2004): EU Member State experiences with sustainable development indicators
- Hass, J. L., Brunvoll, F., Hoie, H. (2003): Overview of Sustainable Development Indicators used by national and international agencies. OECD Statistics Working Paper 2002/2

The methodology approached and used for description of specific activities of sustainable development is based on the following criteria:

- Reviewing the extent to which national priorities are covered by the indicators and changes over time
- Analysis of national set of indicators compared to the European level, for each country
- Analysis of using indicators from country to country
- Comparing the two levels

CONCLUSIONS

Modern systems for monitoring and evaluation of sustainable development have a great strategic importance globally, al European level, but also for our country, about preserving and improving environmental quality and sustainable development. Thus, Romania could compete with other European nations which already have experience in this area, thereby strengthening the position of Romania in the European context.

A basic component of the monitoring and evaluation of sustainable development is represented by the sustainable development indicators that contribute to understanding and modeling complex real systems, by: concentration of existing data; system status description and the deviation indication from the desired state; indication of evolution compared to the desired state evolution; inform users about the status achieved.

To address these systemic issues, there was made an analysis of the current situation existing at European level. From this analysis, it was concluded that, at European level, there are major concerns in the general direction of modernization and evaluation using indicators related to sustainable development. In our country there are certain institutions which deal with such research, but at an early stage.

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