

A Special issue on sustainable development assessment

Editorial

The concept of sustainable development has evolved as it has become clear that new knowledge gained and technologies developed by people are as important for survival of civilization as plentiful supplies of natural resources. Sustainability should become a priority and the key principle governing all the processes, rather than remaining an additional requirement of development. Sustainable development requires that economic, environmental and social policies should be designed and implemented in a mutually reinforcing way. This implies that new approaches to harmonizing strategies and gaining knowledge for developing plans and making decisions that should involve wide sections of the population and business communities are needed.

Sustainable development has been adopted as the main ideology for the long-term social development. The major principles of sustainable development were stated at the summit in Rio de Janeiro in 1992. The concept of sustainable development is based on three main issues: environment protection, and economic and social development. Sustainable development is perceived as a compromise among the environmental, economic and social ends, allowing the society to ensure well-being for the present and future generations without causing detrimental effects on the environment.

It is well-known that sustainable development helps to protect the ecosystem which is of vital importance for society. In practice, sustainability indicators are used to assess the condition or state of the environment in a particular area or location. Sustainability is described by conflicting criteria. Therefore, rational decision making based on these criteria is a challenging task.

The research into the problems of sustainable development in Lithuania began with the programme “Ecological Sustainability in Lithuania” (ECOSLIT: 1991–1997), supervised by Prof. Leonardas Kairiūkštis and Prof. Zenonas Rokus Rudzikas. Workshops and conferences organized in 1982–2000 at the Academy of Sciences within the framework of this programme, and a systemic approach gave a good start for holding international conferences on the problems of sustainable development in Vilnius. These conferences have been held since 1997 every three years. The period between conferences is used for implementing the recommendations provided at the last conference and preparing for a new one by discussing the most significant problems of sustainable development at workshops, seminars, lectures, on web sites, etc. The conferences on sustainable development held in Vilnius provide a forum for debate on the above problems, involving researchers, politicians, businessmen and other interested parties. These discussions are aimed at integrating economics, ecology, management and social policy into

an interdiscipline studying the problems of sustainable development and methods of achieving it.

On September 28–30, 2006, the 4th international conference “Citizens and Governance for Sustainable Development” (CIGSUD) was held in Vilnius, Lithuania, <http://www.mii.lt/CIGSUD>.

The CIGSUD conference was organized by the Baltic Ecological Information Dissemination System, National Commission for Sustainable Development of Lithuania, Mykolas Romeris University, Institute of Mathematics and Informatics and Vilnius Gediminas Technical University in cooperation with the United Nations Department of Economic and Social Affairs, United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations Development Program (UNDP), Institute for Environment & Sustainability of the JRC of European Commission, European Working Group on Human Centered Processes, European Working Group on Complex Societal Processes, ICSC World Laboratory Lithuanian Branch, Baltic 21 Senior Officials Group, Baltic University Programme, Agency for International Scientific and Technological Programmes in Lithuania.

The conference was hosted by Mykolas Romeris University, Ateities str. 20, Vilnius, Lithuania.

The Steering Committee of the CIGSUD Conference was chaired by Prof. Dr. Alvydas Pumputis, Rector of Mykolas Romeris University. The Programme Committee was chaired by Professor Walter Leal Filho from Hamburg Technical University, Germany and co-chaired by Vice-Rector Prof. Egidijus Kurapka of Mykolas Romeris University, Lithuania. The Organising Committee was chaired by Professor Leonidas Sakalauskas from the Institute of Mathematics and Informatics, Lithuania, and co-chaired by Dr. Rimantas Vaitkus, Vice-Rector of Mykolas Romeris University, Lithuania.

The representatives of various international and national organizations, famous researchers and specialists of various fields took part in the conference. Preparing for the conference, Lithuanian researchers organized several meetings and seminars. On March 31 – April 1, 2005 the 1st Baltic meeting “Education for sustainable development in the Baltic Sea region” took place. Materials of this meeting were published in 2006 by the “Technika” publishing house of Vilnius Gediminas Technical University.

The topics discussed at the conference CIGSUD covered the following fields: governance patterns of sustainable development; mobilizing citizens and business for sustainable development; education for sustainable development; information technologies for sustainable development; new approaches to

risk management and unsustainability recognition; intelligent decision support in assessing sustainable development; globalization and cultural identity issues; changes of values towards sustainable development.

154 participants from 22 countries were registered and 105 reports were submitted to the Conference from Belarus, Belgium, Denmark, Estonia, Germany, Greece, Finland, Hungary, Italy, Latvia, Lithuania, Mexico, Mozambique, the Netherlands, Poland, Russia, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, United States. The Programme Committee selected 92 reports which have been presented at two plenary sessions, 14 workshops and two poster sessions. The reporters placed special emphasis on the issues contributing to the integration of economics, ecology, management and social policies into an interdisciplinary aimed at creating a sustainable world.

Much attention was paid to dissemination of information presented at the CIGSUD Conference. The abstracts of the reports were published and distributed at the conference. Seventy selected papers, reviewed by the International Board of Reviewers, were published by Vilnius Gediminas Technical University. This issue is referenced in the ISI Master List.

The international conferences on sustainable development held in Vilnius have become an international forum for discussing the latest theoretical and practical achievements in the field. The conferences are of interest for scientists, managers, economists, sociologists, engineers and professionals working on the issues of sustainable development and in related areas.

The present issue of the journal "Ekologija" offers papers discussing the problems and methods pertaining to sustainable development assessment.

The article "Sustainable landscape planning system and landscape ecology" emphasizes the idea that effective landscape planning is a prerequisite of sustainable development as an integral part of the general planning system of the state. Landscape planning should meet the requirements of the European Landscape Convention.

An integral system of the main tasks and objectives of landscape planning should also be developed. Moreover, a new approach to landscape planning at the state and regional level, based on the development of sustainability principles, as well as functionally differentiated and environmentally oriented models, new space planning concepts and methods, is required. To improve the quality of landscape planning, environmental aspects should be given special attention and become the priority issues in developing landscape policy.

The paper "Some premises for balanced development of ecotourism on the territory of Lithuania" emphasizes the growing popularity of ecotourism in the world, indicating its share of the respective market. It is stated that ecotourism can reduce the constantly growing detrimental effect of tourism on the environment and support conservation efforts. The areas most suitable for developing ecotourism in Lithuania are described and the main principles governing the territorial distribution of environment-friendly tourism services and resources are defined. Some specific features of the Lithuanian territories that can be used for ecotourism and the legislative basis of its development are also described. Finally, some ways of creating more favourable conditions for ecological tourism development are suggested.

The paper "Some aspects of interaction between military activities and environment protection on Lithuanian military grounds" centers on the problems of military training grounds subjected to a heavy anthropogenic pressure. The authors emphasize that military training grounds are usually valuable lands making natural or semi-natural habitats for rare or endangered species. Therefore, they are very important for research and experimental purposes and are of a great ecological value. These grounds are used for various military activities (as shooting and tactical exercise grounds, restricted areas, etc.). At the same time, they are vitally important for preserving rare or endangered species. The restricted economic activity allows fairly stable ecosystem successions to be formed on these territories.

The article also emphasizes the conflict between military and ecological interests and priorities. Servicemen are interested in effective military training on the grounds, while environmentalists would like to turn the areas inhabited by rare or endangered species into protected nature reserves by eliminating any military training on these territories. Therefore, a compromise should be sought by harmonizing the interests of both parties, while giving the priority to the environment protection.

The paper "Sustainable development of Lithuanian geographic information infrastructure" emphasizes the great economic and social value of geographic information (GI) to any country and society. Geographic information is extremely useful for decision-making in the case of ecological disasters when efficiency implies saving human lives and property. The Lithuanian Geographic Information Infrastructure (LGII) aims to increase the effectiveness of policy making and helps in achieving environmental sustainability. The LGII can be also effectively used in developing the system of ecological monitoring.

The article "Assessment of sustainable development in transition" deals with changes caused by transforming the centrally planned economy into the market economy. The article provides an analysis of economic transition experience for more than a decade. The economic restructuring policies concern various economic, ecological and social aspects of development. Such policies rarely appear to be adequate to meet the requirements of sustainable development.

Researchers of the ongoing processes face a number of problems because the analysis of the aggregated criteria (indicators) usually does not correlate with the changes taking place and cannot explain them. Recently, new complex models, which are more sensitive to test the errors, have been used. They yield more accurate data allowing the researchers to make more extensive and accurate predictions.

Models of aggregated indicators, taking into account their correlation and transformation in time, are presented. Analysis is based on empirical data on the income, power consumption, pollution and some other criteria relating to inhabitants of Lithuania. In this way, environmental, economic and social aspects of development are analysed and transformation models taking into account the priorities of sustainable development are constructed.

The article "Framework indicators for monitoring implementation of interrelated targets of EU sustainable development strategy" analyses the strategy of sustainable development in the European Union, which was revised in 2006, giving the priority

to the energy sector. This strategy is primarily aimed at reducing global warming effects and developing environment-friendly methods of getting energy, as well as achieving sustainable traffic, consumption and manufacture. The priority targets also embrace effective use of natural resources, provision of health care services, solution of demographic, migration and other social problems, as well as decrease of global impoverishment.

The priority targets in energy sector development may be described by a set of sustainability criteria. A set of such criteria, reflecting the strategic sustainable development priorities in the EU and the integrated priorities of energy sector development, is suggested in the paper. The above strategy takes into account the interrelationships among the indicators and helps to carry out tasks aimed to achieve the outlined goals. It also allows the researchers to establish an interrelation among various political measures and to determine their effectiveness in achieving the goals of sustainable development.

In the paper "Complex evaluation of the sustainable development of state regions with emphasis on ecological and dwelling conditions", the idea that ecology is one of the major aspects of economic and social development of the state regions is emphasized. The authors claim that quantitative evaluation of the environmental conditions in particular regions of the country is needed for developing plans of environment protection. The analysis and evaluation of the sustainable development of regions is often complicated because the number of evaluation criteria is large. To solve this problem, the authors propose the evaluation methods allowing a structured system of criteria to be described by a single integrating criterion.

These methods can be used for a quantitative evaluation of the environmental conditions in particular regions. Calculations confirmed the validity of the proposed methodology for practical applications.

The article "Urbanistic assessment of city compactness on the basis of GIS by the COPRAS method" considers the problem of sustainable development based on the principles of urban sustainability of a compact city and other theories. Analysis of urban structure is performed from the sustainability perspective of a compact city which is described as a multidimensional entity.

The urban area is subdivided into "cells" based on individual features. The multicriteria complex proportional evaluation method COPRAS (Complex Proportional Assessment) is suggested for assessing the sustainability of the cells. This method is used in combination with GIS to calculate more accurately the parameters under study and represent visually a city's compactness. The database of the Geographic Information System includes data on the inhabitants, addresses, bus and trolley-bus stops, public institutions, etc.

The proposed methods will help urban planning institutions and specialists to identify densely populated urban areas, to pro-

mote integral planning and to make more effective decisions aimed at sustainable urban development. The model analysed in the paper was implemented in Kaunas.

The article "Vilnius urban sustainability assessment with an emphasis on pollution" aims to assess the strategy of Vilnius development from the perspective of sustainability, relying on a particular set of evaluation criteria or indicators.

Sustainable urban development depends on the political, economic and social situation in the country as well as on cultural, institutional, technological, environmental, legal / regulatory and other interrelated factors. The list of urban sustainability indicators is not complete because every year hundreds of social, economic and environmental indicators are suggested. To select an effective sustainable urban development strategy, multicriteria decision methods can be used.

The problems of choosing adequate sustainability criteria and methods of assessing the sustainable development strategy are analysed. The analysis of Vilnius urban sustainability is based on such criteria as air pollution (caused by transport), noise, microclimate and allergens. A relation between air pollution and sickness rate and the impact of air pollution on the market value of real estate are highlighted. Taking into account traffic flows in particular districts, recommendations concerning reduction of air pollution by motor vehicles are provided.

The article "Sustainable development assessment of cities and their residential districts" is focused on selecting assessment criteria of sustainable urban development. The commonly used sets of criteria are discussed, and 22 criteria have been chosen for assessing the development sustainability of Vilnius residential districts. The assessment of the districts is based on the available conditions for living and business development. The weight of the criteria was determined by experts.

The application of the multicriteria evaluation method COPRAS helped the authors to establish the priority order of residential areas in respect of their sustainability. The results of assessment can be used by city authorities to ensure and efficient allocation of resources for developing particular districts.

The international conferences regularly held in Vilnius have become a significant event in the Baltic Sea area. They provide a forum for discussing various theoretical and practical problems of sustainable development and are becoming a tool for promoting new effective policies and knowledge-based technologies in the field.

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