

The 3rd OECD World Forum “Statistics, Knowledge and Policy”
Charting Progress, Building Visions, Improving Life
Busan, South Korea 27-30 October 2009

Sustainable development: what are the measurement challenges?

Dr. Emira Bečić
Ministry of Science, Education and Sports, Zagreb, Croatia
emira.becic@mzos.hr

Dr. Jadranka Švarc
Institute of Social Sciences Ivo Pilar, Zagreb, Croatia
jadranka.svarc@pilar.hr

Abstract: This paper presents an overview of the progress in the development of indicators of sustainable development (SDI) at the national and international levels. It highlights some challenges that lie ahead in compilation of SDI mainly driven by the OECD publication „Beyond GDP International Initiative“(OECD, 2007). It is based on the national set of sustainable development indicators developed on the EU level in comparison with other regions of the world. Key challenges include (1) comparability and aggregation variability of SDI in relation to the quality of data determined by sustainable development policies; (2) impacts and reflections of compiled SDI on different kinds of user needs; and (3) contribution of R&D to sustainability. The paper concludes with a consideration of some key lessons learned about the implementation of SDI which could be highly contextual and dependent on the needs of the end-users.

Keywords: Sustainable development, Statistics, Indicators, Measurement, Challenges,

INTRODUCTION

In 1992 in Rio de Janeiro the “Earth Summit” adopted Agenda 21¹, a plan of action to stimulate progress towards sustainable development (SD). The full implementation of Agenda 21 was strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg 2002. Chapter eight of Agenda 21 recommends that governments draw up national sustainable development strategies (NSDS). WSSD reiterated this recommendation: the Johannesburg Plan of Implementation urges countries to make progress in the formulation and elaboration of NSDS and begin their implementation by 2005. The European Council in Göteborg (2001) adopted the first EU Sustainable Development Strategy (SDS). This was complemented by an external dimension in 2002 by the European Council in Barcelona in view of the World Summit on Sustainable Development in Johannesburg (2002). Following the outcome of Johannesburg, the Environment Council conclusions of 17 October 2002, urged Member States to implement these strategies. Many European Union member states and associated countries have only recently adopted national strategies and have not yet fully implemented them, especially with regard to improving the coherence of sustainable development policies across sectors and levels of governance.

The turning point for sustainable development in the EU was in 2006 when the recognition of climate change and energy use as a threat to the social and economic life and national security has reached its peak. The problems related to the public health, poverty and social exclusion, demographic pressure and ageing, management of natural resources, biodiversity loss, land use and transport still persist and new challenges are arising. Since these negative trends bring about a sense of urgency, short-term

¹ <http://www.un.org/esa/dsd/agenda21/>

action is required, whilst maintaining a longer term perspective. The main challenge is to gradually change our current unsustainable consumption and production patterns and the nonintegrated approach to policy-making (Council of the European Union, 2006: 2).

Scientific research activities have an important role in developing and communicating sustainability to the EU policy makers and wider public. Besides, the interfaces between scientific disciplines and industry, policy and with civil society require collaboration with all contributing partners. The multiple ways through which European research contributes to global sustainable development include: improved understanding of the environment, technological solutions, changing mindsets and behaviours, bearing in mind that it is also at the roots of unsustainable trends. Moreover, today's key input to further progress in the policy making area will be to gather scientists, industry, civil society and R&D policy-makers to confront their views and stakes regarding what R&D can and cannot do for sustainability. Putting European R&D (also R&D by other region in the world) at the service of sustainable development is indeed needed from a societal point of view (European Commission, 2009).

The Concept and Measurement of Sustainability

Sustainability has to be a choice, a choice of a global society that thinks ahead and acts at any time, and ask: 'Should we be doing this and if so, are we fully aware of the risks involved in uncertainty? There are over 100 definitions of sustainability and sustainable development, but the best known is the World Commission on Environment and Development's. This suggests that development is sustainable where it "meets the needs of the present without compromising the ability of future generations to meet their own needs." (GDRC, 2009)

Most experts and organizations prefer to define sustainable development as a pattern of resource use that aims to meet human needs while preserving the environment so that these needs could be met not only in the present, but also for future generations. The term was used by the [Brundtland Commission](#) (WCED, 1987). Based on this definition and using available sustainable development strategy and group of individual indicators and composite indices, this paper attempt to assess the extent to which we can measure a country's progress. The assessments are based on comparisons between standard indicators and recently developed core indicators for sustainable development (SD).

We find that indicators for measuring and comparing SD are commonly used for both developed and developing countries and contain information vital for assessing performance, monitoring and evaluating progress, predicting future trends, identifying priorities and for formulating policy and decision-making. However, the characteristics of developing countries' research systems are quite unlike those that gave rise to the *sustainable development standards*. The standard methodology which determines priorities for international comparability does not produce results that are relevant for policies suiting the countries' particular characteristics. Therefore, methodology for SDI statistics should be adapted to produce policies that better meet the needs of all involved countries. In addition to standard indicators, a set of indicators specially designed to take into account the very different conditions and characteristics of developing countries. The challenge is how to make and use statistics and indicators that are both cross-nationally comparable and able to adequately reflect a country's specific economic and societal features.

There are several ways to measure the overall situation of a country but three of them attract particular attention: the first extends traditional economic accounts based on GDP; the second way is to develop composite indicators of wellbeing that combine detailed information into a single measure; and the third seeks to identify a certain number of key indicators covering economic, social and environmental domains, without deriving any particular single measure (Giovannini, 2004).

The strength and weakness of indicators lie in their selection, which facilitates decision-making but also opens the door to data manipulation. SDI are more in the nature of indices that reflect the state of overall concepts or social goals such as human development, sustainable development, the quality of

life or socioeconomic welfare. Indicator lists of varying length seek to capture the different – economic, environmental, social and institutional – dimensions of sustainable development. They differ in the particular selection of ‘representative’ and/or „core“ indicators of these dimensions and related sustainability concerns. Certainly, an alternative is the aggregation of indicators into composite indices. However, different composite indices have varying definitions of sustainability since they are focused on different components of sustainability.

The fact that countries have different perspectives on sustainable development makes matters more complex. Demands for information are multiple, change over time and originate from many sources – public and private. At the same time, there is a need to maintain balance between short and long-term information needs and continuing efforts and investments to improve information quality. We can summarise the common characteristics of research systems of SDI for all countries in the following way: SDI researchers should identify the type of work they do, the institution and sectors for which they work, and whether their research work is in line with national policies and priorities.

Overview of Approaches

Today more information about guidelines for selecting and maintaining SD indicators is available for download. More information about developments, including a database of SD indicators, forums, initiatives and projects around the world are available and obtainable on websites: The Millennium Development Goals (MDGs) UN initiative and MDG Indicators², the Millennium project³, Beyond GDP – International Initiative⁴, United Nations Division for sustainable Development (UNCSD indicators)⁵, Community Indicators Consortium (CIC), The Virtual Exhibition project⁶, The Dashboard of Sustainability⁷, JRC indicators⁸, SUS.DIV (Sustainable Development in a Diverse World)⁹, The International Sustainable Development Research Society (ISDRS)¹⁰, etc.

Accordingly, many indicator projects, publications and networks have been launched by institutions such as the United Nations, OECD, the World Bank, the European Commission and its agencies (e.g. Eurostat, JRC and the EEA) and by different NGOs many more indicators than ten years ago are nowadays available. The „Beyond GDP Initiative” identifies a few key approaches, such as: Adjusted GDP; Environmental accounts; and, Quality of life measures, and indicators used in recent years at the national and international levels (Beyond GDP, 2007).

EU countries use their national strategies for sustainable development (NSSD) as the organizing framework for indicators. The EU Sustainable Development Strategy (SDS), which was renewed in June 2006, sets out a coherent approach to how the EU will more effectively live up to its long-standing commitment to meet the challenges of sustainable development. Sustainability indicators are tools helping to prepare structure, implement, assess and communicate sustainability strategies and policies. The SDI framework on the EU level is based on ten themes.¹¹ The themes follow a general gradient from the economic, to the social, and then to the environmental and institutional dimensions.

OECD countries have adopted different types of frameworks: (1) based on the Brundtland Report’s definition of sustainable development, involving four integrated themes: efficiency, contribution and equality, adaptability, and values and resources for coming generations; (2) Some countries use their

² <http://mdgs.un.org/unsd/mdg/Default.aspx>

³ <http://www.unmillenniumproject.org/>

⁴ <http://www.beyond-gdp.eu/>

⁵ United Nations Division for sustainable Development (DSD); the UN Commission on Sustainable Development (UNCSD) (http://www.un.org/esa/dsd/dsd/dsd_index.shtml)

⁶ The "Virtual Exhibition" was a project of the Sustainable Europe Research Institute (SERI).

⁷ <http://esl.jrc.it/envind/dashbrds.htm>

⁸ <http://esl.jrc.it/envind/index.htm>

⁹ <http://www.susdiv.org/>

¹⁰ <http://www.isdrs.org/>

¹¹ <http://epp.eurostat.ec.europa.eu/portal/page/portal/sdi/introduction>

national strategies for sustainable development (NSSD) as the organizing framework for indicators; (3) and a “capital” approach where the focus of measurement is on the stocks and flows of different national assets: natural capital, financial capital, produced assets, human capital, etc (Stevens, 2005: 2).

In OECD countries the concern has mainly been on ecological/environmental sustainability. A review of sustainable development indicators assembled by OECD countries, however, shows great diversity in the measures selected under each of the categories and themes proposed by the UNCSD (OECD, 2002).

Due to a different approach and different set of themes / indicators mentioned above, some dimensions of sustainable development (such as human development/human rights and democracy) are difficult to measure from the statistical point of view and in the form of comparable numerical statistics. The presented practices present serious challenges to the quality of results from different SD surveys, and this must be taken into account when designing data collection procedures and analyzing their results., Cross country comparisons and in international relations provide a platform for analysis of the key factors explaining successes (and failure) in the many practices of implementation of governance at the national, sectoral and regional level for sustainable development across the world.

Sustainable development indicators: the „state of the art“in Croatia

Development of the conceptual frameworks of SD indicators and related set of key indicators are provided in Croatia at the national level by the Croatian Environment Agency (<http://www.azo.hr/>). The first national lists of indicators by thematic fields (fresh and sea waters, soil, agriculture, air, climate change) have been worked out for the period 2005-2007. In the next period from 2006 to 2007 the Agency for Environment Protection has started the preparatory activities on the provisional list of the national indicators (NLI) by thematic fields. The final list consists of 15 thematic fields and data sheets for a total of 266 indicators. The NLI are coherent with the objectives and priorities of the National Strategy for Sustainable Development of Croatia (NSSD) adopted in February 2009.¹²The responsible institutions have taken part in compilation of indicators in each of the thematic fields (AZO, 2009: 501). The following issues have been taken into account:

- The Driving force-Pressure-State-Impact-Response (DPSIR) methodology;
- EEA (Core Set I indicators)¹³;
- obligation of the Republic of Croatia to follow EU standards in data collation coming from the accession negotiations of Croatia and EU;
- obligation of the Republic of Croatia to follow international legal acts, conventions and protocols;
- specific national indicators.

The Final NLI, after several months of public discussions, was adopted in May 2009. The structure of the Croatian National List of SDI suggests that Croatian priorities are focused on environment and social welfare.

Findings and lessons to be learned

Sustainable development encompasses three different pillars of policies - economic, environmental and social values. These different perspectives make matters more complex. Demands for information are multiple, change over time and originate from many sources – public and private. At the same time, there is a need to maintain balance between short and long-term information needs and continuing efforts and investments to improve information quality.

¹² Available at: http://www.mzopu.hr/doc/Strategy_for_Sustainable_Development.pdf

¹³ <http://themes.eea.europa.eu/indicators/>

In addition to international organizations, many countries and groups have elaborated sets of indicators for monitoring sustainable development. The process of construction the indicators is exposed to many difficulties which usually obstruct unprejudiced considerations regarding SD. The difficulties are mainly related to the following issues:

- *Aggregation of indicators* -The problem of more or less lengthy indicator lists is comparability and aggregation. Integrative concepts of sustainable development or the state and trend of the environment require evaluation or combination of indicators capturing the ‘gist’ of these concepts
- *Compilation and publication of indicators* - It is hardly possible to give a reasonable overview of the large variety of national and international programs of compiling and publishing social, environmental and sustainable development indicators. In general these programs include some or all of the following topics (Bartelmus, 2008: 2-3):
 - population (growth, migration, refugees);
 - human needs (health, food, housing, education, equity, security, etc.);
 - renewable and non-renewable natural resources;
 - environmental quality (air, water, land);
 - ecosystems (acidification, eutrophication, biodiversity),
 - economic sectors (and their impacts, including emissions, natural resource use, production and consumption patterns, technologies);
 - natural and man-made disasters;
 - global environmental problems (climate change, ozone layer depletion);
 - globalization;
 - institutions.
- *Use and usefulness of indicators and indices* – There is no universal set of environmental indicators. Although many indicators appear to be the same, most indicators are developed narrowly by an agency or organization for specific, mission-oriented needs. *Composite indices* are the ‘nutshell’ indicators favoured by policy makers. However, they suffer in most cases from limited and subjective indicator selection, conducive to supporting more or less transparent agendas.
- Finally, the term 'Sustainable Development' has been used (and misused) in a variety of ways by different groups and entities - and there is a constant needed to rethink its basic meaning, and adopt/contextualize it to different situations and scales. Therefore, it is important to take into consideration how different countries make revision of existing indicators and indices and develop new ones. The national priorities for management of sustainable development usually have an important role in construction SD indicators. For example, national policies usually determine whether these indicators will be developed within the *accounting framework* or within the *analytical framework*.

Conclusions

We can conclude that a number of challenges and consequent limitations are present in SDI collection and international comparability. This includes distinction between the levels of indicators and how each organization’s description of indicators reflects to different kinds of user needs. The set of SD indicators also describes indicators which are not yet fully developed but which would be necessary to get a more complete picture of progress. The difference between indicators that are expected to become available within two years, with sufficient quality ('indicators under development'), and those to be developed in the longer term ('indicators to be developed') should be taken into account. The key challenges in comparability of SD indicators can be summarized in the following way:

- coverage, definition and statistical validity;
- variability in the quality of data available in the context of adopted sustainable development policies;
- absence of harmonization of socio-demographic variables for some data;
- issues arising on how the compiled SDI indicators should reflect different kinds of user needs;
- implementation of indicator(s) in comparison on national, regional and international levels;
- issues arising on how research contributes to sustainability.

Due to a different approach and a slightly different set of indicators in many countries, especially the poor ones, individual capacity building should be embedded in a framework of building the SD specifically. Weaknesses in countries' statistical systems and practices present serious challenges to the quality of results from different SD surveys. It should be taken into account when designing data collection procedures and analyzing their results. International initiatives and organizations may play a significant role. They should involve local staff and address local issues and assist in building up new and more effective ways of linking local knowledge with the sustainable development of nations.

References:

- Croatian Environment Agency (AZO), (2009). *Final draft the National list of indicators*, (Available at: <http://www.azo.hr/Default.aspx?art=1721&sec=71>)
- Stevens, C., (2005). *Measuring Sustainable Development*, OECD Statistics Brief No.10 September 2005, Paris (Available at: <http://www.oecd.org/dataoecd/60/41/35407580.pdf>. accessed: 12. May 2009).
- Bartelmus, P., (2008). *Indicators of sustainable development*, Encyclopedia of Earth (EOE). (Available at: http://www.eoearth.org/article/Indicators_of_sustainable_development, Accessed: June 8, 2009.)
- Jakobsen, S., et al. (2008). *Environmental indicators*, In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Available at: http://www.eoearth.org/article/Environmental_indicators, Accessed: June 1, 2009)
- OECD (2000). *Towards Sustainable Development Indicators to Measure Progress*, OECD Conference, OECD, Paris.
- OECD (2002). *Overview of Sustainable Development Indicators Used by National and International Agencies*, OECD, Paris.
- OECD, European Commission, European Parliament, Club of Rome and WWF (2007). *Beyond GDP: Measuring progress, true wealth, and the well-being of nations*, International Conference and Initiative, 19 & 20 November 2007, Brussels (Available at: <http://www.beyond-gdp.eu/indicators.html> Accessed: July 13, 2009)
- European Commission (2009). *Sustainable development a challenge for European Research*, EC DG RTD News Alert 26/05/09, Brussels. (Available at: <http://www.wbc-inco.net/object/news/50794.html>. accessed: June 6, 2009)
- Giovannini, E. (2004). *Progress measuring progress*, OECD The first World Forum on Key Indicators Statistics, Knowledge and Policy”, Palermo, Italy, November 2004. (Available at: <http://www.oecd.org/dataoecd/45/27/36422528.pdf>. accessed: June 2009-06-05)
- Council of the European Union (2006). *Review of the EU Sustainable Development Strategy (EU SDS) – Renewed Strategy*, Brussels, 9 June 2006. (Available at <http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf>. Accessed: May 2009-05-05).
- GDRC (The Global Development Research Center) (2009). Sustainable developments (website for Environment sphere by themes (Available at: <http://www.gdrc.org/sustdev/index.html>; <http://www.gdrc.org/sustdev/definitions.html>, accessed: June 5, 2009)
- UNWCED (United Nations World Commission on Environment and Development), (1987). *Report Our Common Future* (Available at: <http://www.un-documents.net/wced-ocf.htm> Accessed: May 5, 2009)
- United Nations (1992). Earth Summit, *Agenda 21*, the United Nations Programme of Action from Rio, (available at: <http://www.un.org/esa/dsd/agenda21/>)