

Indicators of sustainable development and SIDS

Introduction

Indicators of Sustainable Development are intended to measure the extent to which society is moving towards or away from sustainable development. The main attraction of indicators is that they can be used to represent complicated phenomena in a measurable format and this permits comparisons over time within a particular country or region or across countries or regions.

Sustainable Development Indicators, as their name implies, require some workable definition of Sustainable Development. Although it is frequently argued that such development is difficult to define¹, there is, in reality, widespread consensus that its aim is to improve the quality of life of human beings and that it is multifaceted, in that it has environmental, economic and social dimensions. This implies, amongst other things, that if society promotes economic growth that leads to environmental and social degradation, society will be winning one battle and losing another, with the possibility of ending up worse-off in the long run. At the same time, it is generally agreed that sustainable development is not compatible with economic and social backwardness – the term development itself implies improvement in material wellbeing. These general notions relating to Sustainable Development lead to the conclusion that a holistic approach needs to be adopted to attain a balance between the different dimensions of such development.

It is also generally agreed that Sustainable Development has ethical underpinnings, involving inter- and intra-generational equity and effective stakeholder participation in decision-making, and other matters which lead one to take into consideration the quality of life of persons other than oneself.

Sustainable Development Indicators generally relate to these notions, and as such they tend to cover a wide spectrum of actual and potential realities.

This chapter is organised as follows. The first section, which follows this introduction, presents the *raison d'être* of Sustainable Development Indicators, while the next section deals with function, desirable criteria and problems in the formulation of indicators. The third section considers the special characteristics of small island developing states, and argues that Sustainable Development Indicators for such states should take these special characteristics into consideration. There then follows a case study, the Sustainable Development Indicators proposed by the Maltese National Commission for Sustainable Development. The chapter concludes with an overview of the main arguments proposed.

Indicators of Sustainable Development

Background

Bruntland laid down a definition of Sustainable Development which was formulated in more practical terms at UNCED (2002) in the form of Agenda 21², which in article 40 called on governments as well as on non-governmental organisations to develop and identify Sustainable Development Indicators that can provide a solid basis for decision-making at all levels.

In 1996, the UN Commission on Sustainable Development (UN-CSD) responding to this call, proposed a set of 134 indicators (United Nations, 1996), defined by reference to the principles and policy guidance provided by Agenda 21. As a result of this exercise Sustainable Development Indicators and related methodologies were developed, and these were made available to national governments.

In 2001, at its ninth session, the UN-CSD decided to recommend indicators of sustainable development and amongst other things encouraged further work on indicators 'for the purpose of sustainable development in line with national conditions and priorities in defining and implementing national goals and priorities for sustainable development, including integration of gender aspects' (Decision 9/4, 3d)³. The Commission also encouraged the involvement of all national stakeholders, as appropriate.

The Johannesburg Plan of Implementation (JPOI), adopted at the World Summit on Sustainable Development in 2002, referred to this decision and encouraged further work by governments on Sustainable Development Indicators (articles 130 and 131).

In 2005, the UN-CSD in resolution 13/1 again encouraged Member States to continue to work on the development and application of Sustainable Development Indicators at the national level, including integration of gender aspects, on a voluntary basis in line with their national conditions and priorities, and in this regard invited the international community to support the efforts of developing countries.

Indicator frameworks

Generally speaking, Sustainable Development Indicators are intended to measure variables related to areas of concern to which society should be alerted, such as poverty, pollution, waste generation, loss of biodiversity, health problems and related issues assumed to affect the quality of life of the population. Each indicator is supposed to show whether the country or region to which the indicator is applied is moving towards or away from Sustainable Development. Sometimes, the indicators are accompanied by targets or goals to be attained within a specific time period.

Interest in Sustainable Development Indicators has grown in recent years and many countries have developed or are in the process of developing such indicators. Indicator sets have also been developed at the global and regional levels, including those proposed by the United Nations⁴ and the European Union⁵. Another set was developed by the Mediterranean Commission for Sustainable Development, where the special features of countries bordering the Mediterranean Rim are taken into account⁶. These three sets have been developed follow-

ing extensive consultation and are meant as guidelines for countries who are members of the relative organisations.

Various frameworks have been proposed for sustainability indicators. Initially there was a tendency to adopt a pillars-based framework with each pillar typically relating to environmental, economic and social concerns, and the indicators themselves were classified in terms of pressure, state or response (PSR)⁷. Recently, more importance has been given to the policy relevance of the indicators, and to the fact that certain issues do not fall exclusively under one of the three pillars of Sustainable Development. For example, the set of indicators developed by the UN-DSP are grouped by themes, and are not classified in terms of the environmental, economic and social pillars. The PSR framework has also been done away with. Moreover, there is a deliberate attempt to relate the indicators to the Millennium Development Goals.

Indicators of Sustainable Development and SIDS

The need for indicators has been echoed in major documents relating to small island developing states (SIDS). The Barbados Programme of Action for the Sustainable Development of Small Island States (BPOA)⁸, adopted in 1994, recognised that a major sustainable development constraint with regard to SIDS was economic vulnerability and in Articles 113 and 114 called on SIDS, in co-operation with national, regional and international organisations and research centres, to continue work on the development of vulnerability indices and other indicators that reflect the status of small island developing States and integrate ecological fragility and economic vulnerability.

The Mauritius International Meeting on the 10-Year Review of the BPoA, held in 2005, adopted the so-called Mauritius Strategy⁹ which in article 74(c) called for the development of appropriate national targets and Sustainable Development Indicators that can be incorporated into existing national data-collection and reporting systems in order to, *inter alia*, respond to the requirements of the internationally agreed development goals, including those contained in the Millennium Declaration and other relevant global and regional targets.

Functions and desirable criteria of Indicators

Indicators for Sustainable Development, like other indicators, need to be constructed on the basis of desirable criteria, in line with their functions, to render them useful and credible. However, for various reasons indicator construction faces a number of problems which sometimes render the exercise difficult. This section discusses these issues.

Functions

The literature on Sustainable Development Indicators (see for example Pintér et al., 2005; Shah, 2004; Briguglio, 2003; European Commission, 2001; Bossel, 1999; European Community (1998); Moldan et al., 1997; Hardi & Zdan, 1997; and United Nations, 1996) identifies various functions associated with such indicators, including the following:

- **Supporting decision-making.** Sustainable Development Indicators can produce systematic and coherent data to enable the government and other authorities to take

informed decisions. The indicators may also be used to identify priority areas for action.

- **Setting targets and establishing standards.** The fact that indicators are often quantitative permits the setting of targets or goals. For example, the reduction of emissions of greenhouse gasses can be measured and targets sets for their gradual reduction over time.
- **Monitoring and evaluating developments.** Indicators could be useful in assessing whether a given policy or decision is yielding the desired results and to assess whether changes of direction are needed. In this way, decisions are not taken blindly or based only on hunches and feelings, but will be based on scientific information presented in indicator format.
- **Dissemination information.** Indicators can be used to make the public more aware of certain problems. In this regard, indicators can be used to alert stakeholders about dangers, failures and success stories associated with Sustainable Development.
- **Focusing the discussion.** Indicators that require quantitative estimation have to be clearly defined and this can help to develop a common language for discussion, resulting in a more focused discussion.
- **Promoting the need for a holistic approach.** The fact that Sustainable Development Indicators attempt to capture the different dimensions of Sustainable Development could help to foster an awareness of the need for a holistic approach to development and to the need for integrated action.

Desirable criteria

The literature also identifies a number of criteria which should underpin the construction of Sustainable Development Indicators¹⁰. These can be synthesised as follows:

- **Relevance.** The indicators should relate to Sustainable Development and to the realities of the country or region using them. For example, indicators pertaining to the mountainous regions will not be relevant to countries without mountains. Likewise, important specificities should be taken into account when constructing such indicators. This argument is very relevant for small island developing states, as we shall argue below.
- **A clear guiding vision.** Sustainable Development Indicators should be based on an underlying guiding vision of sustainability. If it is agreed that the ultimate goal of sustainable development is improvement in people's quality of life, the indicators chosen should relate to this vision.
- **Transparency.** The indicators should be replicable and the data used should be verifiable by persons other than those producing the indicators. This criterion is important to foster trust and credibility in the indicators.
- **Simplicity.** The indicators should be easy to understand and not overly complicated to construct. Simplicity, however, is a matter of degree, and in reality the exercise involves some sort of trade-offs between rigour and simplicity.
- **Holistic approach.** Sustainable Development Indicators should capture the multidimensionality of Sustainable Development. A holistic approach requires that

due recognition is given to the interrelationships between environmental, economic and social concerns, and the quality of each element.

- **Affordability.** The objectives or targets accompanying indicators should be attainable at reasonable cost in terms of money and time. Here again, affordability is a matter of degree and varies from one country to another and from one institution to another. This criterion however is important because overly ambitious indicator construction may be counterproductive. It is important to note that objectives that are often set without reference to costs and to the technological requirements are difficult to attain.

Problems in indicator construction

Indicator construction is strewn with difficulties which render the exercise problematic in practice.

- **Data problems.** An indicator without accompanying data will not be of much use, given that a main purpose of indicators is to monitor changes. In practice, some important indicators are difficult to back with data. The EU system of indicators, for example, is divided into two categories, namely 'best available' and 'best needed'. The best available indicators are those for which data exists, but some of these are not the 'best needed' ones. The latter, in fact, include indicators for which data does not exist.
- **Number of indicators.** There is no ideal number of indicators within a particular framework. Hart (2007) argues that if the indicators are to be used to keep the public informed, a small number of 10 to 20 indicators would make sense as long as they cover all the issues that are important to the community. A problem often encountered in this regard is that when a broad spectrum of society is consulted, different interest groups push for their pet indicators to be included, and it may not be easy to achieve consensus as to which indicators are to be left out. Another problem in this regard relates to redundancy – a particular indicator is redundant when it replicates another indicator or captures the same tendency. It may be possible to identify which indicators are redundant through correlation analysis, but this requires appropriate time series data.
- **Time factor.** When Sustainable Development Indicators relate to human time scales there is the problem of how to factor in the concerns of future generations. The problem becomes even more pronounced when ecosystem time scales are involved. Here we may be talking of thousands of years, rendering the indicators as not very relevant to current users.
- **Policy relevance.** Sustainable Development Indicators should be policy relevant. As such they should not measure inherent realities, namely those which cannot be changed as a result of policy, even if these are harmful. For example, exposure to natural disasters, such as earthquakes or lack of precipitation in a desert should not feature as indicators, given that these are inherent features and not changeable by human action. In such cases the indicators could be related to policy measures intended to mitigate the harm caused by the inherent realities or which enable the

affected country or region to adapt to or withstand the negative effects of such realities.

- **Participation and access.** Participation by stakeholders has two major benefits. Firstly, participation can empower people both individually and collectively and reduce social exclusion and alienation. Secondly, decisions taken through participatory processes are based on a broader spectrum of knowledge and may be easier to implement when they are owned by a wider group of people. However, such participation often ushers in problems associated with vested interests and time delays when, as often happens, stakeholders' conflicting views are difficult to reconcile.
- **Lack of capacity.** The drawing up of Sustainable Development Indicators, and the process of using them to monitor changes and to conduct continual assessments of the indicator requires appropriate knowledge and expertise as well as adequate technological and institutional capacity. This poses serious constraints for developing countries, particularly small island states.

Sustainability indicators for SIDS

There is now a considerable body of literature showing that SIDS have special characteristics, arising mostly from their small size and insularity, which constrain their development options (see for example Briguglio, 1995; Atkins et al. 2000; United Nations, 1994; 2005).

It would of course make a lot of sense if these special characteristics were given importance in indicator sets pertaining to SIDS. For this reason, transposing global sets like those of the EU and the UN-CSD, lock stock and barrel, may give rise to two problems, namely:

- 1 certain indicators included in global or regional frameworks may not be applicable for SIDS, and
- 2 certain indicators relevant to SIDS may not be included on global or regional sets.

The first type of problem was encountered by the Malta Observatory for Sustainability Indicators (SI-MO)¹¹ when it tried to transpose the 130 indicators proposed by UNEP-MAP for Mediterranean countries. The indicators used for assessing the extent of threatened species was not applicable to Malta due to the fact that the area associated with threatened species was larger than the total area of the Maltese Islands.

The second type of problem is probably more serious for SIDS, given their special sustainable development constraints. For example, problems associated with small economic size and insularity do not generally feature in global indicator sets. Table 13.1 proposes a list of some special considerations that should be made when devising sustainability indicators for SIDS.

In many cases, SIDS encounter problems similar to those faced by large states, but with a higher degree of intensity. For example, the economy of many SIDS depends heavily on activities which occur on or near the coast, such as tourism, and therefore sea-level rise occurring as a result of climate change is likely to result in a very high degree of harm to the economy of SIDS. The coastal areas of SIDS are also associated with socio-cultural developments in these states and sea-level rise will therefore also have an impact on their

cultural assets. Sea-level rise will therefore lead to heavy material and cultural losses for SIDS and will affect practically all aspects of life in such states. This problem is of course particularly severe for low-lying islands, the very existence of which may be threatened by sea-level rise. This reality is particularly harsh for SIDS because greenhouse gas emissions produced by these states are negligible when compared to those emitted by larger developing and developed countries.

Another common problem relates to the degree of domestic competition. Import and distribution channels in SIDS can be easily controlled by one or a few dominant firms. Monopolistic or oligopolistic structures are common in telecommunications, energy generation and distribution and in transport. These realities arise because of the small size of the domestic market, and can lead to the curtailment of competition to the detriment of the consumer.

A problem that arises with regard to the special features of SIDS is that many of them are inherent and permanent, and not easily subject to reversal. For this reason, indicators related to these features should not measure the incidence of the features themselves but should relate to policy measures aimed at withstanding or mitigating the negative effects of these features. Table 13.1 presents a number of policy related indicators that can be utilised for this purpose.

Table 13.1. Special features of SIDS and possible indicators

| | Special feature | Possible (policy related) indicator |
|-----------------|--|--|
| Economic | High exposure to external economic shocks due mainly to the high degree of economic openness and dependence on a few categories of exports. | Score on the economic resilience index (see Briguglio et al., 2006). |
| | High incidence of indivisibilities leading to high overhead costs per capita, especially those relating to government services and infrastructure. | Score on a Government Efficiency index (see IMD, 2007). |
| | High incidence of market failures leading to the need for economic instruments to rationalise demand and supply. | Number of economic instruments effectively in use to reduce negative environmental externalities and to rationalise demand for environmental goods and services. |
| | Limited ability to reap the benefits of economies of scale leading to high per unit costs of production. | Score on the Producer Price Index (IMF, 2006). |
| | High incidence of monopolistic or oligopolistic structures. | An index measuring the effectiveness of competition legislation. |

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| Environmental | High proneness to sea-level rise. | An index of expenditure on measures leading to adaptation to climate change as a ratio of total government expenditure. |
| | High rate of endemism and biodiversity threats. | An index of the ratio of the built/developed areas to total land area. |
| | High incidences of water shortages. | An index of demand for freshwater per capita of population, in relation to precipitation, reflecting the degree to which water resources are used efficiently. |
| | High generation of waste per square kilometre of land due to higher population density. | An index of expenditure on waste management, as a ratio of total government expenditure. |
| Social | Overcrowding, congestion and other social pressures, due to higher population density. | An index of population per square kilometre in urban areas, reflecting government policy regarding land use. |
| | High proportion of the population exposed to natural disasters. | An index of expenditure on preparedness for natural hazards, as a ratio of total government expenditure. |

Malta's Sustainable Development Strategy

Location and major characteristics

Malta is a small island state located in the middle of the Mediterranean Sea. It has a population of just over 400,000 and a land area of about 320 km², rendering it one of the most densely populated states in the world, with about 1,200 persons per square kilometre.

Malta became a member of the European Union in 2004. Between 1992 and 2004 it formed part of the Alliance of Small Island States (AOSIS) and participated actively in many meetings that sought to promote the Sustainable Development of SIDS, including the Barbados Global Conference held in 1994.

Like many other small island states Malta is highly dependent on coastal zone activities, notably tourism, and has a very fragile ecosystem. Its high population density ushers in major problems associated with waste management and land-use. It also has a small domestic market, which can be easily dominated by one or a few firms, and is highly dependent on exports and imports. A small market is also characterised by high overhead costs due to the problem of indivisibility. The Sustainable Development Strategy of Malta assigns major importance to these realities.

Figure 13.4. Map of Malta



Drafting the Strategy

The process of drafting the Malta Strategy for Sustainable Development was initiated during the 5th meeting of Malta's National Commission for Sustainable Development (NCSD), held in December 2002. This decision was taken in line with the functions of the Commission, as indicated in Article 8(7) of the Environmental Protection Act (2001).

A consultation process was set in motion involving major civil society and governmental stakeholders and focus groups, culminating in two national conferences. The NCSD adopted the strategy for the period 2007 to 2016 in December 2006,¹² which was endorsed by the Cabinet of Ministers of the government of Malta a year later. It is currently being revised and updated.

The strategy and the need for indicators

The Malta Strategy for Sustainable Development states that the effective monitoring of the strategy requires the compilation of appropriate indicators, and calls for the establishment and funding of an entity responsible for compiling and evaluating sustainability indicators¹³ working closely with the National Commission for Sustainable Development and the National Statistics Office. The strategy recommends that the entity should establish targets based on sustainability indicators for key sectors and use the indicators to assess the extent to which these targets are being reached.

Strategic directions

The strategy sets out a number of strategic directions with regard to five main themes, namely economic, environmental, social, cross-cutting issues and implementation of the strategy itself. In all 245 strategic directions are set, of which 20 are identified as meriting priority.

The environmental priority strategic directions are mostly associated with problems common to small island states, including waste generation, sea-level rise, coastal zone management, loss of biodiversity, land use and water shortage.

The economic strategic directions refer to major problems commonly occurring in small states, including the problem of indivisibilities of overhead expenditure (such as expenditure of government) and monopolistic/oligopolistic practices due to the small size of the domestic market.

All priority strategic directions are accompanied by indicators (labelled headline indicators), by targets to be attained in a specific time frame, and by 'policy-drivers' namely the government documents or institutions relating to the target set. This ensures that the targets set are coherent and consistent with existing policies and with government commitments to the EU and to other international/regional organisations.

The non-priority strategic directions are intended to serve as guidelines for the government and civil society and to inform policy-makers for the attainment of sustainable development goals. Again here, matters with high negative impacts on Malta, as a small island state, are highlighted.

Malta's sustainable development strategy acknowledges that small states have problems similar to those of larger states, including the need to generate economic growth and employment, which in turn have environmental and social repercussions. However, it also assigns major importance to the issues, discussed above, which are of special relevance to small island states.

Conclusion

This chapter has briefly reviewed the functions and desirable criteria which should underpin Sustainable Development Indicators. The chapter argues that indicators are needed for a systematic identification of problems, to enable the government and civil society to take informed decisions, and to set targets in this regard. It was argued that one of the main functions of such indicators is to alert stakeholders about dangers, failures and success stories associated with Sustainable Development.

The chapter also describes the special characteristics of SIDS and argues that these characteristics require specially devised indicators. A few examples of relevant indicators in this regard were proposed.

It was argued that many of the special features of SIDS are inherent and therefore permanent or quasi-permanent. For this reason, the relative Sustainable Development Indicators should not attempt to measure the incidence of the features themselves but should be related to policy measures aimed at mitigating or withstanding the negative effects of these features.

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Notes

- 1 The Bruntland Commission defines sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.
- 2 <http://earthwatch.unep.net/agenda21/contents.php> This and other cited web pages have been accessed on 9 August 2009.
- 3 This was reiterated in 2005, at the 13th session of the UN-CSD, in resolution 13/1 which again encouraged Member States to continue to work on the development and application of indicators for sustainable development at the national level, including integration of gender aspects, on a voluntary basis, in line with their national conditions and priorities, and in this regard invites the international community to support the efforts of developing countries.
- 4 The set contains 96 indicators, including a subset of 50 core indicators. The methodology is available at: <http://www.un.org/esa/sustdev/natlinfo/indicators/factSheet.pdf>
- 5 <http://themes.eea.europa.eu/IMS/CSI>
- 6 See <http://www.planbleu.org/actualite/uk/MediterraneanStrategySustainableDevelopment.html>
See also Plan Bleu (2006).
- 7 A discussion on the PSR framework is available at <http://www.virtualcentre.org/en/dec/toolbox/Refer/EnvIndi.htm>
- 8 <http://www.unohrrls.org/UserFiles/File/SIDS%20documents/Barbados.pdf>
- 9 http://www.sidsnet.org/docshare/other/20050622163242_English.pdf Other major meetings related to the sustainable development of SIDS included the regional and inter-regional meetings in preparation for the Barbados Global conference and the Mauritius International Meeting.
- 10 A interesting list of criteria that may be used to evaluate Sustainable Development Indicators, accompanied by references to relevant literature, is given in Reed and Dougill (2003).
- 11 See <http://www.um.edu.mt/islands/si-mo/>
- 12 http://www.um.edu.mt/data/assets/pdf_file/0003/64812/SD_Strategy_2006.pdf
- 13 Although sustainability indicators have been compiled for Malta (<http://www.um.edu.mt/islands/si-mo/>), there are still a number of issues that need to be addressed, in particular regarding the institutional set-up for ongoing development of such indicators.