

SUSTAINABLE DEVELOPMENT INDICATORS ARE MOVING TOWARDS GREATER INTEGRATION

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The question of how much, why and how humanity is affecting the ecological balance of the planet and what could be done in that respect was raised again at the third United Nations Conference on Sustainable Development, which took place on 20–22 June 2012 (widely known as the Rio+20 conference).

The question facing statistical organisations is how to explain the processes and tendencies related to sustainable development to politicians, scientists and citizens in a simple and understandable manner. At the Rio+20 conference, the UN invited statistical organisations to integrate into official statistics such data that reflect the implementation of the principles of green economy. The UN also plans to establish simple and measurable global goals of sustainable development.

The 2010–2011 study on the relevance and quality of Estonia's sustainable development indicators highlighted the need to develop the existing indicators further and to create an analytical instrument between the layers of indicators and data, which would allow us to analyse the important linkages between the environment, economy and social sphere while heading towards sustainable development.

How has Statistics Estonia measured the various aspects of sustainable development and what could the statistical system offer in the future?

Measurement of sustainable development began on the basis of Agenda 21, using the UN's sustainable development indicators

Estonia ratified the Sustainable Development Act in 1995, being one of the first countries in the world to adopt such legislation. At that time, there was no comprehensive sustainable development strategy in Estonia and there also was no agreement in society about the indicators that should be used to monitor sustainable development. At the first UN Conference on Environment and Development in Rio de Janeiro in 1992, 179 country leaders approved Agenda 21: the programme for sustainability for the 21st century. Estonia has also adopted Agenda 21. The UN Commission on Sustainable Development^a has created a sustainable development indicator system which is related to the Agenda 21 programme. The counterpart of this indicator set, i.e. the synthesised list of Eurostat, was also implemented in Estonia. This indicator set was based on the four pillar model of sustainable development (social, environmental, economic and institutional capacity) and contained indicators reflecting the current state, human pressure and measures taken. The UN's list of indicators was used as the framework for three publications on sustainable development indicators – “Säästva arengu näitajad. Indicators of Sustainable Development” 2002, 2004 and 2006. The publications reflected the trends of indicators, offered international comparisons and outlined the links between sustainable development indicators on the basis of Agenda 21. In addition, the linkages drawn between the indicators allowed some interpretation of the aspects and factors behind sustainable development.

^a The UN Commission on Sustainable Development was established after the United Nations Conference on Environment and Development for follow-up and progress monitoring.

Indicators measuring the implementation of the strategy “Sustainable Estonia 21”

When the Estonian Parliament adopted the national strategy “Sustainable Estonia 21” in 2005, Estonia’s concept of sustainable development got a clearer focus. The main criterion of sustainable development was defined as balanced and measurable movement towards four interrelated development goals: to achieve the growth of welfare and social cohesion while maintaining the viability of the cultural space and ecological balance. To measure the attainment of these development goals, indicators were selected jointly by the ministerial working group on sustainable development created by the Strategy Unit of the Government Office in 2011 and the Estonian sustainable development commission set up in 2009. These indicators are used to analyse important development trends and characterise Estonia from the viewpoint of sustainable development. This indicator set has been defined in accordance with the development goals of “Sustainable Estonia 21”, and movement towards these goals is measured based on the focus areas that are currently politically relevant for Estonia. The domain-specific strategies and development plans were linked to the strategic goals of sustainable development; as a result, well-established indicators of the focus areas already in use in society were used as indicators of sustainable development.

The focus areas are economic welfare, innovation in society, sustainability of government finances, employment, education, quality of life, equal opportunities, participation in education, Internet use, security, use of natural resources, sustainable energy, environmentally friendly transport, environmental pollution, waste generation and management, biodiversity, use of the Estonian language, preservation of the Estonian population, and participation in culture. These politically relevant indicators provide a multidimensional picture of Estonia’s development. The number of indicators is large and the trends are rather varied. The trend of each indicator shows whether development is heading towards the goals of the focus areas. If an indicator has a target, the relevant comparison is presented. International comparison shows where Estonia ranks among the European Union (EU) countries according to the value of a given indicator. The publications include a short analysis of the trend and international comparison, and in addition to that, a discussion of the relevance of the indicator and important policy measures taken in this domain.

This set of indicators does not provide an overall assessment whether the overall trend of a given area of sustainable development is positive or negative or whether we are among the top or bottom countries in the EU regarding sustainability – the reason is that there is no agreement on the relative importance of various indicators and areas. International comparison is further complicated by the fact that we compare Estonia to other countries based primarily on indicators relevant to us.

Statistics Estonia has compiled and published the data and analysis of this indicator set twice so far: in 2009 and 2011 in the publication “Säästva arengu näitajad. Indicators of Sustainable Development”, which are available both in the print and electronic format.

In addition to that, Statistics Estonia has also published the sustainable development indicators on its website in the form of the Dashboard of Sustainability. The Dashboard of Sustainability is a graphic user interface that displays the indicator-based rankings of countries. It allows a visualisation of the information: to see the rankings of states and regions according to the chosen indicator or to display all the rankings for a given country simultaneously. It is also possible to view the positive and negative linkages between the indicators. The first version of the Dashboard allowed users to assess Estonia’s performance with regard to the targets of Agenda 21, whereas the current Dashboard displays an indicator set that measures the implementation of Estonia’s sustainable development strategy. The Dashboard software was created by the European Commission Joint Research Centre and the Consultative Group on Sustainable Development Indicators of the International Institute on Sustainable Development (IISD).

Study on the relevance and quality of sustainable development indicators and the results

The study on the relevance and quality of Estonia's sustainable development indicators – "Monitoring the national sustainable development strategies. Increasing the relevance of Sustainable Development indicator set for the Sustainable Development strategy and socio-economic conditions in Estonia" – was carried out in 2010 and 2011 with the following aims: firstly, to map the compliance of the sustainable development indicators and data with the criteria of basic quality; secondly, to determine the relevance of the indicators and data for assessing sustainable development processes. Another goal was to clarify whether the indicator set needs further development for improved assessment of sustainability or in connection with changing socio-economic conditions.

The quality and relevance of the indicators were assessed by the domain experts of Statistics Estonia and by experts and scientists from the respective fields. Eurostat's quality criteria were applied. Regarding basic quality, the following aspects were assessed: reliability, international comparability, time series comparability, preciseness, representativity, relevance, need for improvement, overall quality. To evaluate the results, up to five degrees were used depending on the quality dimension. A five-point system was used to give an overall assessment. The overall assessment of each indicator was the sum of the points for all quality aspects. The generation of quality profiles provided valuable information about the indicators and, as a result of the study, all indicators have been supplemented with metadata regarding quality. The basic quality aspects of the indicators received quite high ratings and thus there was usually no reason to exclude any indicators from the set. The good level of compliance with the basic quality criteria was logical, since the set was compiled of indicators already rather widely used in society.

Relevance is an important quality criterion of sustainable development indicators and was therefore handled separately. The study on relevance was carried out among the experts and scientists of the respective sustainable development domains (focus areas), because assessment of relevance requires in-depth knowledge of the subject area. The current structure of the sustainable development subtopics (focus topics) provided a starting point for the assessment of the relevance of sustainable development indicators. The goal was to figure out whether the relevant and important aspects of the subtopics – reflecting progress towards the development goals of "Sustainable Estonia 21" – were covered. It was also necessary to map any missing or relevant new aspects and the indicators reflecting these, and to see whether some indicators are duplicated or reflect irrelevant aspects of a subtopic (the latter was rare). In addition to the above, the study analysed the meaning of the subtopic in the context of sustainable development and studied the relevance of each indicator from the viewpoint of essential sustainable development processes: how well an indicator reflects progress towards sustainable development; whether changes in the trends of indicators reflect real changes or whether the changes in indicator trends are influenced by other factors (specifics of the calculation methodology, changes in the calculation methods, etc.). International comparability was also assessed in that respect. Based on the new, more relevant indicators (from the perspective of sustainable development) proposed by the experts, metadata were also compiled. However, the new indicators often showed a lower rating for some important aspects of basic quality, such as comparability in time series and between countries.

Several experts pointed out that the sustainable development indicators currently in use in Estonia simplify the reality too much and reflect the reality only through the lens of highly aggregated indicators, which might cover only the areas that more or less reflect recent political priorities. As a solution, it was proposed that the assessment of sustainable development requires more detailed analysis and more knowledge for decision-making, in order to understand the changes in trends and the causes of these changes, and to develop suitable measures and monitor the effectiveness of the measures taken.

The need for greater integration between various domains was highlighted. As one of the main deficiencies, experts pointed out that the current indicators have been well established to

measure the success of various domain-specific strategies and hence they cannot be used to describe the important aspects in relation to sustainable development. These indicators also do not allow the establishment of crucial linkages and interactions between various critical social, economic and environmental aspects of sustainable development: the indicators are based on different surveys and registers, which are usually not linked, and therefore (because of this underlying structure) the indicators do not provide the analytical basis necessary for sustainability assessments. It was pointed out that the same problem – limited linkage between environmental, social and economic data – is an obstacle to the planning and monitoring of an ecological tax reform in Estonia (Nömmann 2007).

Experts pointed out that separate indicator sets should be used for the assessment of sustainable development and various domain-specific strategies (e.g. economic competitiveness), as these processes have their own specific focus and hence also a different logic and relations between the indicators. The primary objective of the indicators of this indicator set has a priori been the reflection of the thematic problems and initiatives which have been targeted at activities on different levels. Thus, the inconsistency of the structure of the dimensions of sustainable development was also pointed out by experts. For example, in the area of ecological balance, some of the focus topics were oriented towards environmental pressure or its aspects, while some other topics focused on the sustainability aspects of a specific activity (energy, transport), including some of the previously mentioned aspects.

The opinion of the experts was that the creation of the set of sustainable development indicators in Estonia is a task which should be carried out in cooperation between scientists and politicians. The creation of an indicator set by simple co-presentation of the indicators was not considered a good solution. The OECD green growth indicator set was pointed out as a good example of a contemporary advanced indicator set by the experts of the domains “ecological balance” and “economic welfare”. Derived from the OECD green growth strategy, the indicator system reflects important economic, environmental and social aspects of green economy, and the indicators themselves can be linked to statistical accounts as well.

An analysis of the experts’ opinions revealed two main tasks for the future. On the one hand, it is important to continuously improve and update the current set of sustainable development indicators used in Estonia. The results of the study together with the explanations could serve as a basis for future changes in this set. On the other hand, it is even more important to create and systematically build a more detailed analytical level (below the level of indicators) which is currently missing; and to regularly collect data for this in the future and further expand and develop the analytical layer. In addition, it is important to develop green growth indicators that are relevant for Estonia and to create the conditions for the production of these indicators.

Integration of datasets related to the implementation of green growth principles into the statistical system

The goals of sustainable development and green growth are similar: to secure better living conditions for all while enhancing economic opportunities and reducing the negative effects of economy on the environment. The biggest promoters of green growth are UNEP (United Nations Environmental Programme), OECD (Organisation for Economic Cooperation and Development), EEA (European Environment Agency) and ILO (International Labour Organization – the aspect of green jobs).

At the United Nations Conference on Sustainable Development (Rio+20), which took place in June 2012, the UN defined green growth as the key instrument for achieving sustainable development, and in the final document “The future we want. Outcome of the Conference.” it invited governments and international organisations to integrate into the national statistics systems data reflecting the implementation, constraints and job trends of green growth strategies. The document set the goal to develop the methodologies for assessing the success of policies for green economy. It was also noted that the costs and benefits of policies for green economy in the

context of sustainable development should be taken into account, and that the consideration of social, economic and environmental factors in the decision-making process has to be ensured.

The definition of green growth varies to a certain extent across organisations. The United Nations Environmental Programme (UNEP) defines green economy as “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” (UNEP... 2012). The European Environment Agency (EEA) applies UNEP's definition (EEA ... 2012). The OECD defines green growth as “fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies” (Towards ... 2011a). There are other similar initiatives as well, for example, the EU strategy “Europe 2020” for smart, sustainable and inclusive growth.

The OECD has developed a conceptual framework and indicators for measuring green growth (Towards ... 2011b) and suggests focusing on the following synthesised aspects: environmental and resource productivity, asset base, environmental aspects of quality of life, economic opportunities and political measures.

The OECD green growth indicators try to answer the following questions about sustainable growth:

- Is the growth greener (i.e. does economic growth bring about lower environmental pressure)?
- Can we expect a shock (i.e. a sharp decline) in growth?
- Do people benefit from green growth?
- At whose expense is green growth taking place?

The OECD framework of green growth indicators has been created in accordance with indicator and accounts based concepts.

The compilation of the OECD green growth indicators is feasible if the datasets are linked via the system of national accounts. In order to assess the success of green economy and determine ecological efficiency, many datasets linked on the economic activity level are needed – data on fuel use, emissions, environmental expenditure and taxes. For example, the OECD indicator for carbon dioxide (CO₂) intensity outlines not only nationally produced CO₂ emissions but also emissions generated in the lifecycles of goods. The latter contain emissions generated in the production and transport of imported goods (emissions generated in the life-cycle before import) and emissions generated afterwards, during the consumption of goods.

Accounts – a means to integrate the various dimensions of sustainable development?

The European Commission has emphasised the need to further develop the measurement of the progress of sustainable development and green economy, both by setting indicator goals (i.e. sustainability targets) and by developing accounts which would link the environmental sphere with the economic and social spheres. The general guidelines for this are provided in the Stiglitz-Sen-Fitoussi report (Stiglitz et al 2009) and the Commission Communication “GDP and Beyond” (GDP ... 2009), which emphasises the need for other measures alongside GDP. Based on these guidelines, Eurostat developed tasks and recommendations for the European statistical system by the end of 2011, for the creation of indicators that measure specific subfields of sustainability – environmental sustainability, multidimensional quality of life, and the household perspective and distributional aspects of income, consumption and wealth.

Eurostat's recommendation is to develop the indicators reflecting sustainable development and green growth in cooperation with the main users, keeping in mind that the indicators should be derived from an internationally harmonised consistent framework. Eurostat considers only the system of national accounts to have this status. In 2012, the United Nations Statistical

Commission (UNSC) adopted the UN system of environmental-economic accounts (System...2012) as an international standard for environmental accounts.

Eurostat has made it a priority to develop more than 10 accounts modules in the environmental domain alone, and to elaborate the accounts for analysis, indicator construction, modelling and assessments. Already now Eurostat is applying the EU regulation on European environmental-economic accounts (Euroopa ... 2011) to regulate the broadening of the national accounts system with six modules of environmental accounts: the obligatory production of air emissions, material flow, environmental taxes, energy, environmental expenditure and environmental goods and services accounts will be the first step. In recent years, Statistics Estonia has carried out environmental accounts pilot studies on air emissions, environmental taxes, forestry and fishing; and has prepared material flow accounts.

The demand for more detailed and linked databases (on the environmental, economic and social spheres) has also emerged in Estonia. The study on the monitoring mechanism of Estonia's ecological tax reform emphasises that, in addition to the abovementioned international initiatives, it is imperative to develop sustainability aspects on the economic activity level based on the national accounts system (Nömmann ... 2007: 58). This kind of a transparent system could be used for the elaboration of alleviation measures for environmental policies.

Nömmann believes that the mechanism for monitoring the implementation of economic instruments can only be successful if the indicators of the mechanism are rooted in the environmental, economic and social accounts created in the framework of official statistics.

Indicators of sustainable development move towards greater integration

The final document of the UN Rio+20 conference encourages national statistics organisations, on the one hand, to integrate into official statistics the data sets which reflect the implementation of green growth principles; on the other hand, it was agreed that simple and measurable global sustainable development indicators will be established on the UN level in the near future. It has not been decided yet whether these two tasks (development of the green growth dimension in the official statistical systems and establishment of new global sustainable development targets/indicators) will be realised as a uniform task for the whole world.

The study on the relevancy and quality of Estonia's sustainable development indicators, the guideline documents of Eurostat and UN and the experiences of other international organisations have all emphasised that two aspects are essential in the monitoring of sustainable development processes – firstly, the indicators; and secondly, a more detailed level of accounts linking various domains below the indicator level.

Karl Schoer, a leading expert in environmental accounts at the Federal Statistical Office of Germany, has outlined his vision of the differences and the possible fusion of the sustainable development indicator and accounts systems (Schoer 2006), visualised as the diagram “Two separate worlds” in Figure 1 (p. 50).

Karl Schoer has presented the systems of sustainable development indicators and accounts as pyramids: the top of the indicator pyramid floats in the air and the accounts pyramid lacks a top. The left-hand pyramid (indicators) lacks a solid accounts layer which would bind the indicator data into a unified system. The accounts pyramid lacks an internationally approved sustainable development indicator set (the top of the pyramid). The OECD green growth indicator set could be appropriate for the top (especially from the ecological balance viewpoint). The left-hand pyramid also characterises the current situation in Estonia where sustainable development indicators are aggregated directly from the basic data level. The indicator-based approach has been implemented in Estonia since 2002. Satellite accounting systems are still in the development stage.

According to Karl Schoer's diagram and the concept of the developers of the UN system for environmental-economic accounts, the indicator and accounts pyramids should fuse: as the statistical system develops, these two “worlds” get closer (The system ... 2012). The direction of

development is towards greater integration: environmental data will be integrated with social and economic data through the use of common classifications.

However, many of the sustainable development indicators currently in use in Estonia cannot be aggregated from the level of accounts. While the indicators reflecting measures and environmental pressures can be linked to accounts, the state-type indicators are much more difficult to integrate. In the social sphere as well there are many indicators which reflect the effectiveness of measures taken but cannot be linked to the accounts. These indicators concern, for example, deaths caused by various external causes, crime, the condition of cultural heritage, language, health, education etc. In the environmental domain, it is difficult to associate the indicators reflecting environmental behaviour – share of public transport in total passenger turnover, firsthand sales of less-polluting cars, waste recycling indicators – but also indicators in the area of biodiversity, reflecting the creation of protection areas for species and ecosystems and the trends in the area of managed semi-natural communities. The reason is that these indicators are based on the data of independent registers and surveys.

Another question is whether we need to link all current sustainable development indicators to the national accounts system. On the international level, a shift towards “green growth” and/or “green economy” has taken or is taking place as concerns the concept of sustainable development. Is it justified to expect a paradigmatic change in the sustainable development concept and hence also in the measurement concept in Estonia as well? The need to tighten the focus of the “measurement instrument” of sustainable development was also pointed out by the experts that participated in the study on the relevance and quality of Estonia’s sustainable development indicators (see above).

Eurostat has so far kept the sustainable development indicators and the accounts mostly separated – this includes the practical concepts, defined indicators as well as data used – despite the recommendations of the guidance documents to merge the two.

The targets set by politicians for the achievement of a desired state cannot necessarily be (and often are not) allocated to accounts. If we look at environment, as one of the domains of sustainable development, and the structure of environmental statistics and accounts, we can see that environmental statistics cover all components of the cause-and-effect model (driving forces, pressure, state, impact, response). The accounts used in practice have been developed only for some components of the cause-and-effect model: environmental pressure, measures and driving forces. The currently used accounts reflect mainly the borderland between economy and environment, i.e. the flows between the environment and economy. So, the focus of environmental statistics is wider than environmental accounts. This is illustrated in Figure 2 (p. 51).

Up to now, the general practice in the environmental domain has been to develop the indicators first and the accounts systems after that. In Estonia as well as in other countries, the key environmental and sustainable development indicators for some areas have been chosen from the state-type indicators. State indicators constitute a third of the environmental indicators of sustainable development used in Estonia, and more than a half of the social indicators of sustainable development. In case of the UN’s Agenda 21 indicators, state indicators constitute a third in the environmental domain and the majority in the social domain. Hence, unless there is a paradigmatic shift towards green growth in the concept of sustainable development (see above), the state-type indicators not linked to accounts could still have a long lifespan in the context of sustainable development.

The operational level (for policy intervention and monitoring) is the borderland between economy and the environment. An accounts system supplemented with environmental accounts would provide linked databases on that operational level; these linked databases could be used to construct a more relevant, new generation of green growth indicators. If this level were achieved in accounts systems, it would probably lead to an explosive growth in the relevant indicators and the analytical capacity.

The separate integration of households, foreign trade and other important players into the analysis enables the assessment of the environmental effects of the various aspects of production and consumption as well as the impact of the measures on households. It would also help to link the goals and relevant aspects of sustainable development to the political measures taken: politically relevant indicators would be, for example, raw material productivity, emissions hidden in foreign trade. The development of energy accounts would allow us to link data on taxes, subsidies, prices, investments into the energy system, and would enable an assessment of energy efficiency.

Answers could be provided to various key questions of green economy, like how much waste and emissions are generated and how much resources are used per production unit; how many jobs does the environmental goods and services sector provide; how much carbon is bound in the products. But also: who benefits from the resource use; do the environment and resource taxes influence the poorer part of the population; is the rent of resources optimal, and so on.

Visually, one could compare environmental accounts with a tent and the state indicators with the tent pegs which help to put up the tent of accounts: changes in environmental pressures and measures (pressure-type indicators, accounts) should be connected to the real changes in the environment (measurable state-type indicators reflecting the state of the environment, no directly measurable accounts); on the other hand, the measures taken (response-type indicators, accounts) should allow justification (this is reflected by state-type indicators).

Conclusion

The indicator-based approach to the assessment of sustainable development has been implemented in Estonia since 2002. The indicator set currently in use gives a certain picture of the trends of sustainability, but this picture is not complete. The suggestions given by Estonian experts – to increase the relevance of sustainable development indicators; and to create an analytical accounting level between the indicator and basic data levels – match the guidelines provided by international organisations in this area.

The demand for satellite accounts has been steadily increasing both on the international and national levels, precisely due to the need to monitor the development processes. The green growth strategy, the recommendations of the Rio+20 conference regarding the measurement of sustainable development and green growth, the Stiglitz report, the European Commission's and Eurostat's recommendations for measurement of sustainable development, the monitoring mechanism of the ecological tax reform in Estonia, and the study on the relevance of Estonia's sustainable development indicators – all these initiatives require the implementation of environmental accounts, in one way or another.

Thus, more detailed environmental accounts have started to develop in Estonia as well, alongside the indicators of the sustainable development strategy.

Theoretically, the indicator-based approach and the satellite accounts centred approach both have their benefits. The benefits of the indicator-based approach are that these indicators are quite often well-known, the quality of basic data is rather good and the production of the indicators is cost-efficient, especially if the indicators are based on already existing development plans and strategies. The benefits of the accounts system (and the indicators based upon this) are the presence of a concise internal structure, meaning that the indicators are based on a strong theoretical basis; and the potential to provide rich linked analytical material for the planning and assessment of sustainable development issues, green growth and the ecological tax reform.

After all, the central problem of the implementation and assessment of green growth and sustainable development strategies is the balancing of links and interactions and finding compromises while moving towards the often quite contrasting goals of the environmental, social and economic spheres.