Modern Methods to Sustainable Development Assessment

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Abstract

The paper offers a review of evolution approaches to the sustainable development assessment in different world countries and in Russian practice. The research is based on the analysis of world practice assessment of sustainable development effectiveness, relevant methodologies, indicators and their modifications in modern conditions. The existing problems in developing of indicators for the sustainable state measuring of various countries with different development level are characterized. The difficulties of cross-country comparison of these indicators are highlighted. The most important aspects of sustainable development assessment, such as indicators and investments are considered. The main directions of sustainable development assessment for Russia are determined at the present stage of the national economy development.

Keywords: Sustainable Development of economy, sustainable development indicators, investments, modern assessment methods, etc.

1   INTRODUCTION

The priority of economic growth to the detriment of social and environmental problems solving is a fundamental disadvantage of current development model theory and practice in the world. In this regard, an active search for new solutions for the future existence is observed. In recent years, the world community has developed a development concept for the 21st century, which is based on the sustainability paradigm [1]. Especially, it becomes topical due to the limiting factor of natural resources and environmental quality. Under the leadership of the United Nations, new models of economic development are being created, the control over the Earth's natural resource potential usage is being strengthened, new approaches to sustainable development assessment are being worked out and updated, and the questions of its investment are being raised [2]. At the same time the main goal is stable improvement of current and future generations life quality.

The questions concerning to the necessity of sustainable development indicators creation were discussed at the end of the last century, in the Global program «Agenda 21». [3]. A significant contribution to such trend development in modern economics has been made by international organizations at the global and regional levels: World Bank in the framework of the World Development Report, World Trade Organization, Organization for Economic Cooperation and Development, United Nations, UN Conference on Trade and Development, UN Regional Commissions, regional banks, etc. [1].

The issues of integrated indicators development and application are discussed at almost all conferences held in the framework of sustainable development, they were also considered in the works of world leading scientists from different points of view. Thus, an international group of practitioners formulated 10 principles, based on which the indicators selection, the progress measurement, the results interpretation and transmission of the sustainable development assessment proceeds [4]. The studies of C. Kirkpatrick and N. Lee [5] focus on several issues related to sustainability assessment in developing countries and in countries with economies in transition. Many scientists also analyse the problems of choosing and using indicators for sustainable development assessment in countries with different economy levels. [6], [7].

An important issue along with the determination of sustainable development assessment indicators is their monitoring. Many papers cover the issues of integrated information collection and integrated databases creation for obtaining of a sustainable development composite index. Based on this index it will be convenient to track an integrated information on the economic, environmental and social indicators of the system of interest [8], [9]. It allows to formulate well-defined goals for sustainable development and to offer the performance measurements, both for the current time and for the long-term period.

In 2006, the Commission on Sustainable Development proposed a set of 50 key indicators offered by a group of specialists from developed and developing countries, with a detailed methodology for their calculation [10], [11]. It was positive that these indicators could be used by all countries as reference material for their own indicator systems creating adapted to national peculiar features of development.

It should be mentioned that all the authors note the emerging problems connected with indicators calculation. For developing countries, it means incompleteness or unavailability of informative data collection, for developed ones it means inconsistency and non-standardization of statistical data despite of its availability and abundance. Such challenges have a negatively effect on the procedure of high-quality information processing operation and to the statistical indicators' measurement, and in general, that makes difficulties for a cross-country comparison holding and indicators calculation of the countries' sustainable development assessment.

Along with the development of sustainability indicators' assessment, it should not go unmentioned that there is still such an important issue as investing in sustainable development.

Currently, structural changes in character and content of production processes lead to qualitative changes in fixed assets and the need for their more frequent updates. A separate problem is IT equipment disposal, because it quickly becomes obsolete and leads to funding increase for these purposes. Investments in local development for sustainability improvement cannot be compared with the scale of investments in the elimination of catastrophes and natural disasters, the number of which is increasing due to the climate changes on the planet. Soon, the planned costs on damage elimination and preventive measures should be around 32 billion $ (data was taken on the company BP website).

These trends change the distribution structure of investment resources, as well as the traditional understanding of the term "investment". Unproductive investments, which are often made under compulsion, are not aimed at income generation, but they are rather aimed at preserving and protecting of life conditions and reproduction, responding to global natural, technogenic and other threatening occurrences. It actualizes the study of individual destructive manifestations of investment processes, statistical analysis development, accounting and control at the level of international organizations considering the global tendencies.

2 METHODOLOGY

The world experience shows that the sustainable development assessment should be carried out on the principle of indicators' system building, where each indicator reflects a separate aspect of economic development. According to this approach, within the framework of the general system, subsystems of indicators are often distinguished: environmental, economic, social and institutional, and then an integral (aggregated) indicator is created on their basis.

The indicators selection, as a rule, is carried out according to the scheme proposed by the OECD [12], where 4 types of environmental indicators are highlighted: pressure (anthropogenic factor), state parameters, influence factors, reaction (necessary measures). The final list is formed from 134 types of indicators. Such several indicators complicate the work at the national level; therefore, the number of indicators is reduced in a system called "topic - subtopic - indicator" [13]. In such a system, key topics are defined initially for each area, which are detailed by subtopics, and then the data is reduced to the minimum set of indicators.

The problems of integrating indicators diverse into a single index were considered in the report of the UN Commission on Sustainable Development [13]. The main difficulty in the process of integrating information into indexes is to determine the weight contribution of the initial indicators without significance losing and without excessive subjectivity. With increase of the aggregation level of information, the complexity of incomparable quantities weighting grows, and inter-country compatibility becomes more complicated.

To identify the weight or separate indicator importance in the integral index in the social sciences, it is advisable to use the Delphi method or multi-criteria analysis. Another method called "Distance to the Goal", allows using indicators, agreed by international or other legal documents, as a desired goal. At the same time, weighting factors can be obtained both based on a public opinion polls (Eurobarometer - European Commission), or also according to the Delphi method, which is a group method (to hold an individual opinion poll of an experts' group). The public or individual polls are repeated several times and after coincurring opinions begin to appear, the results are used as an assessment.

At the same time, it is necessary to rely on various laws, international conventions, norms. Moreover, the following criteria are applied: long-term or short-term aspect, global - regional - local level of the problem, depth and complexity of the impact, irreversibility degree of the process, etc. In general, it is not recommended to focus on the same significant indicators (equal weights).

3 RESULTS

Amongst various methods which are currently available for integral indexes calculating, we have identified and considered some of them, based primarily on environmental parameters. Adjusted net national income per capita ($), calculated by the World Bank for 100 countries, including Russia [14], is quite popular nowadays.

Human Development Index developed by the Bureau which prepares Human Development Reports, which are published under the auspices of UNDP, is widely used [15].

Also, the Environmental Performance Index (EPI) is of interest. It is a method for quantitative assessment and comparative analysis for the world's countries environmental policy measurement.

The integrated indicator, which is an alternative to GDP, is the Genuine progress indicator (GPI). It's an index of economic progress, which gives more accurate assessment of sustainable economic well-being.

The aggregated Living Planet Index (LPI), which was introduced to assess the state of the planet natural ecosystems, is calculated in the framework of the annual report of the World Wildlife Fund [16].

The Environmental Sustainability Index (ESI) is also representative. It was developed by a group of scientists from Yale and Columbia Universities for the World Economic Forum in Davos in 2001. It can be noted that the index of real progress (Genuine Progress Indicators (GPI) and the index of sustainable economic well-being (Index of Sustainable Economic Welfare) [17] become an attempt to create an adequate measure of economic well-being and improve the GDP index taking into account external effects.

Table 1. Comparison of some countries on various sustainable development indicators

Country Human Development Index, 2017	Rank	Country Environmental Performance Index, 2018	Rank	Country Sustainable Development Goals, 2017	Rank	Country Adjusted net national income per capita ($), 2017	Rank	Country Gross national income, 2017	Rank
Norway	1	Switzerland	1	Sweden	1	Norway	61,95	China	1
Switzerland	2	France	2	Finland	3	USA	48,68	USA	2
Australia	3	Finland	10	Norway	4	Canada	34,93	India	3
Germany	5	Germany	13	Germany	6	Germany	34,78	Germany	5
USA	13	Norway	14	France	10	Finland	34,52	**Russia**	6
Oman	48	USA	27	USA	42	France	30,41	Brazil	7
Russia	49	Venezuela	51	Singapore	61	Argentina	11,74	Indonesia	8
Montenegro	50	**Russia**	52	**Russia**	62	Brazil	7,62	Italy	11
Brazil	79	Brunei Darussalam	53	Albania	63	**Russia**	7,31	Mexico	12
China	86	Brazil	69	China	71	China	6,09	South Korea	14
Colombia	90	China	120	Brazil	56	India	1,37	Saudi Arabia	15

Source: according to international reports [2], [14], [16], [19], [20].

Table 1 presents some of these indicators and comparisons which are made for some world countries according to 2017 and 2018.

In the world practice, many different indicators are widely used to assess the sustainable development, such as a comparison by Gross national income, or the Adjusted net national income per capita (Global Footprint Network) indicator [18] and many others.

According to the rating indicators which are presented in the table for some countries of the world, it can be noted that there are certain incompatibility problems in countries' positions comparison in terms of the aggregated indicator. If, for example, Norway occupies a leading position upon the Human Development Index in the rating of the Environmental Performance Index, but it is only 14th, in terms of sustainable development 4. Russia is far from the first positions in all ratings. The fact of irregularity is visible in other countries, for example, in Brazil. Therefore, there is a question whether it is necessary to use so many complex indicators in conducting of sustainable development assessments at the global level.

The calculations for individual countries based on various methodologies showed a huge gap between traditional economic and environmentally adjusted indicators. Thus, for many countries of the world, the situation becomes topical when in conditions of formal economic growth the environmental degradation is observed, and environmental correction can lead to a significant reduction in traditional economic indicators, up to negative values of their growth (for example, in Russia in 2000, when GDP grew by 9% "true savings" indicator was "–13%") [18].

This makes difficulties for data comparison for countries with different development levels, inconsistencies in statistical databases, since many countries keep records differently, and some parameters are not considered at all.

The evaluation of investments in sustainable development is also difficult, since countries have different levels of economic development, and many countries often ignore this issue. Although, as it was noted, current trends in investment changes require the maintenance of new claims for investments accounting in environmental and sustainability programs. In Russia, the investment indicators in fixed assets aimed at environment protection and rational use of natural resources are reflected on the national accounts. And it should be noted that over the past 18 years, at the period of 2000-2018, a growth trend, as it is shown in Figure 1, can be observed. It indicates that Russia is actively involved in sustainable development processes and aims to participate in various programs and activities directed on living standards improvement and environment health increasing.

Russia has an experience in sustainable development indicators systems creating. Based on international methodologies, as well as on priority basic environmental-economic indicators of sustainable development (Development of indicators in the framework of a project of the World Bank and the Ministry of Economic Development of the Russian Federation for applying in Russia), a number of Russian regions have developed their own indicators in the framework of scientific research:

- Tomsk and Voronezh regions - sustainable development indicators system (the development was carried out by the British consulting firm ERM and was funded by the Department for International Development of the United Kingdom (DFID) by order of the Ministry of Economic Development and Trade of Russian Federation);

- Kemerovo region - a system of socio-economic and economic indicators, including the Integral Index of the Adapted Net (true) Savings;

- Samara region - key indicators of environmentally sustainable development;

– Millennium Development Goals (MDG) –7 (adapted for the region).

All regional systems of sustainable development indicators include the human development index, indicators reflecting the population's incidence, the biodiversity's preservation, people incomes' differentiation, the renewal of fixed assets. Additional indicators reflecting the specifics of the region were included in addition to the main indicators system. Unfortunately, the use of different indicators' systems eliminates the possibility of conducting a comparative analysis for the regions of Russia - each region developed and used its own systems to assess the development dynamics of its territory only. Also, there is no practice of the region's comparison according to already approved basic sustainable development indicators.

4   CONCLUSIONS

It should be noted that the measurement of the development progress achievements in countries, including Russia, must constantly be explored, new measuring ways of country's state of development should be found, its development trends and opportunities should be assessed. Because Russia is a country with vast territories and significant natural potential, but with irregular socio-ecological and economic regional development, it is necessary to monitor and evaluate indicators of sustainable development at the regional level.

The creation of regional and territorial database is required. There are certain gaps here, since a number of even traditional indicators are not calculated at the regional level of the country. It is advisable to calculate the integral environmental and economic indexes annually, in particular, the Ecological Net Domestic Product and the Index of Adapted Net Savings, which are important for the national economy, since they correct traditional macroeconomic indicators by taking into account depletion of resources, including energy, and environmental pollution. It will help to make more accurate assessment of the country's national wealth.

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