

On assessing the sustainable development of industrial regions results

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Abstract. At present in Russia there is no unified generally accepted concept for assessing the results of sustainable development of industrial regions. In the paper, based on a review of Russian and foreign research, the authors have made an attempt to generalize modern concepts, and also present their vision of assessing the results of industrial regions sustainable development. The urgency of the research is due to the need for the practical implementation of the sustainable development concept. The authors see the essence of sustainable development of industrial regions in an organization of current activities and meeting the needs of modern residents of the region, which would not harm natural environment. It has been noted that large industrial plants, evaluating the results of sustainable development, are beginning to use foreign methods. As the influence of large enterprises forming an industrial cluster in the region on the economy, society and natural environment is great, the authors consider it expedient to use their developments in the field of assessing the results of sustainable development. To assess the results of sustainable development of industrial regions, it has been proposed to use 33 indicators of GRI Standards which include economic, environmental and social “thematic standards”.

1 Introduction

The relevance of the research is due to the need for the practical implementation of the concept of sustainable development. With regard to the subject of the paper, the essence of sustainable development of industrial regions lies in organizing current activities and meeting the needs of its inhabitants that would not harm future generations, enterprises, and the state of the natural environment. Thus, sustainable development of an industrial region implies a balance between the production and economic interests of enterprises, the needs of residents and rational use of natural resources.

In the functional structure of the Russian regions, the dominant ones remain those on the territory of which enterprises of the basic industries have formed powerful industrial

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clusters. Such regions traditionally not only provide their own socio-economic development, but are resource and financial donors for other regions of the country as well.

Currently in Russia there are no unified approaches to assessing the results of sustainable development of industrial regions. In this paper the authors have made an attempt to summarize various modern concepts and present the authors' vision of assessing the results of sustainable development of industrial regions as well.

At the same time, large industrial enterprises, evaluating the results of sustainable development, increasingly begin to use foreign recommendations and methods. As long as the influence of large enterprises forming industrial clusters on the territory of the region on the economy, society and the natural environment is great, it seems expedient to use their developments in the field of assessing the results of sustainable development.

The purpose of the research is to summarize various modern concepts for assessing the results of sustainable development of industrial regions, as well as present the authors' vision of a comprehensive assessment based on the recommendations of the Global Reporting Initiative.

Specific research objectives:

1. Give an empirical review of modern concepts for assessing the results of sustainable development of industrial regions based on the measurement of private indicators.
2. Present the set of indicators recommended by the Global Reporting Initiative to assess the sustainability of industrial enterprises.
3. To substantiate the possibility of using the GRI Standards indicators to assess the sustainable development of the regions where enterprises have formed industrial clusters.

2 Materials and methods

The research is based on a systematic approach, which considers industrial regions as socio-economic systems, on the territory of which a sufficiently large number of enterprises, organizations, infrastructure facilities for production and non-production purposes are located. The enterprises of an industrial region are united by material, technical, financial, informational, energy, resource and other flows into a single functional object – an industrial cluster. Such clusters constitute the material and technical basis of industrial regions.

The positive influence of the clusters lies in the fact that they ensure the socio-economic development of the regions of their presence. The negative impact manifests itself, first of all, in significant, most often irreversible, anthropogenic changes in the natural environment.

Sustainable development reporting is now becoming mandatory for most enterprises united in clusters in an industrial region. Many of them use the recommendations of the Global Reporting Initiative (GRI) to assess sustainable development. The methodological basis for assessing the results of sustainable development GRI Standards consists of 4 key components:

- general guidelines that describe the structure and content of the reports;
- description of various components of sustainable development;
- calculation procedure, adapted taking into account the industry specifics of the economic activities of enterprises;
- specific methods for calculating sustainable development indicators [1-3].

The recommendations of the Global Reporting Initiative and other tools used in foreign research are increasingly being used in assessing the sustainable development of Russian industrial enterprises [4]. But international standards are not widely used in assessing the sustainable development of Russian industrial regions.

3 Results

There are a variety of approaches to assessing the sustainable development of industrial regions, taking into account various factors. In our study, we focused on only a few of them, which, in our view, are best suited to the practical implementation of the concept of sustainable development. The analysis of Russian and foreign researchers' opinions made us possible to identify several main special approaches to measuring the results of sustainable development of industrial regions.

First of all, these are methods based on particular indicators of the results of sustainable development of industrial regions: resource, production, economic, social and environmental, etc.

At the heart of the production and economic approach – the development trends of industrial regions are determined mainly by economic and production indicators. Industrial achievements such as the volume of mined ore, oil, other minerals, or the volume of mined-out products, also quite often form the basis for assessing the development of regions [5; 6]. However, financial results are still main production and economic characteristics in the market economy.

The sustainability of the development of industrial regions from the standpoint of achieving economic and primarily financial, results is considered, in particular, in the works of [7]; Sánchez, F., Hartlieb, P. [8] and others. Analyzing financial flows, J. De Valck, G. Williams and S. Kuik defend the opinion that the large industrial enterprises is the main form of attracting investment to regions [9]. The specifics and patterns of financial and economic results of the activity of industrial regions in Russia were also studied in our research [10]. The importance of financial and economic results is recorded in the Concept of National Security of the Russian Federation where it is said that the development of the country and its regions is largely based on the financial system, which is determined by "the level of the budget deficit, price stability, normalization of financial flows and settlement relations".

We agree that the balance of material and cash flows and financial resources provision is necessary for the sustainable development of individual mining enterprises, corporations and clusters. That is, the financial security is a prerequisite for achieving the development of regions. But it is not sufficient as long as the development of territories presupposes the balance of economic, production, social and environmental characteristics.

The authors think that using only the production and economic block of indicators to assess the results of sustainable development of industrial clusters is not entirely successful. For example, according to these methods, northern and north-east Russian territories with high GRP indicators and small population fall into the category of economically and industrially developed regions. However, our research reveals the presence of serious environmental and social problems in these territories [11; 12].

The proponents of the resource-based approach first of all put emphasis on the assessment of raw material reserves. In old industrial regions, which specialization is largely predetermined by mining clusters, the resource approach is implemented through the estimation of ore and nonmetallic raw materials reserves [13]. The works in which the prospects for the development of territories with significant resource potential that have not been realized at present are of particular interest. For example, the prospects for the development of the Arctic or the Far East. However, the territories of promising development are most often located in hard-to-reach places, deprived of a developed transport network, with a lack of labor resources [11; 14]. Therefore, in case of the development of a new mineral deposit, it is difficult to ensure the growth of production and economic indicators quickly. It would be a mistake to expect rapid development of social sphere.

The importance of environmental factors in assessing the results of sustainable development of industrial regions, repeatedly noted by the authors [11; 15], is confirmed by an increasing number of research on this topic. The set of environmental indicators depends on the objectives of the research and usually includes data on the amount of emissions and discharges of pollutants, state of soils and surface waters of the region of presence, air pollution, landscape transformation [16-18]. Obviously, the emergence and development of industrial clusters is based on the systemic change in the environment. Cluster enterprises have a complex negative impact on the environment. The complexity of the impact lies in the fact that anthropogenic transformations simultaneously pollute all elements of the natural environment - from the atmosphere to groundwater and changes in the landscape. Nevertheless, all industrial regions are concerned with finding ways to solve the accumulated environmental problems.

An ecological approach to assessing the results of sustainable development of industrial regions is inherent, first of all, in studies of natural science. The main methodological problem of assessing the results of sustainable development in terms of environmental indicators is as follows. As a rule, the category of territories with sustainable development includes those ones that experience the least anthropogenic load. However, most often the reason for the favorable ecological situation is the absence or insignificance of economic activity. As a result, for the population living in such territories, the situation can be called favorable with great reserve: the lack of production and social infrastructure, the inability to get work and earnings leads to an extremely low standard of living.

Among the supporters of the social approach to assessing the results of sustainable development of industrial regions, two areas of research can be distinguished. Some assess the level of industrial safety at the enterprises of a cluster. Among such works, we note J. J.H. Gruenhagen and R. Parker's articles [19]; D.Yu. Savon's article [20]. Others analyze indicators reflecting the quality of life of the population in the regions where enterprises of industrial clusters take place. The minimum of subsistence, the level and growth rate of the population's nominal income, life expectancy, mortality, the number of health care institutions, culture, sports per capita, food consumption per capita, poverty index, etc. are used as indicators [21; 22].

The indicators are often compared with other territories' ones which do not have industrial clusters. As long as industrial clusters have a significant impact on the regions of presence's population, some authors consider them as a factor in the formation of human capital: for example, A.A. Korczak et al analyze the Arctic's human capital [23]; L. B. Mejía assesses the impact of the Colombian mining industry on the formation of human capital [24]; G. Williams, R. Nikijuluw, studying the socio-economic performance of miners' settlements in Australia [25].

Separately, there are the research of city formation factor. The enterprises of industrial clusters in most cases perform city-forming functions [14; 25; 26]. The city-forming enterprises pay stable and rather high wages in the regions. As a rule, the average salary at the enterprises of the cluster is higher than in regions as a whole. In addition, employees of industrial cluster enterprises have the opportunity to receive loans and interest-free loans; preferential vouchers to sanatoriums for themselves and their families' members, children's recreation camps; partially compensate for the costs of travel and meals in canteens, etc. City-forming enterprises often finance cultural and recreational institutions, specialized clinics; provide financial support to educational institutions. Thus, the enterprises of the industrial cluster not only provide their employees and their families with a sufficiently high and stable income, but also improve the quality of life of the population in the regions where they operate.

4 Discussion

Despite the diversity of approaches to assessing the results of sustainable development of industrial regions, more and more researchers agree that sustainability is achieved not only through ensuring a high standard of living for the population of the regions of presence while protecting the natural environment, but also through financial stability, ensured by a regular increase in production indicators [5; 13; 19]. Thus, an opinion of the need for a comprehensive assessment of the sustainable development of industrial regions, taking into account the achievement of certain economic, social and environmental indicators is formed. The problem of a comprehensive assessment of the sustainable development of industrial regions arises from the need for the practical implementation of the concept of sustainable development.

The most important thing for our research, is the following: foreign practice of assessing the results of sustainable development of various economic systems is increasingly being applied in Russian conditions. First of all, this applies to industrial enterprises. This is due to the fact that many Russian industrial enterprises are simultaneously production components of transnational corporations that have assets in Russia and abroad. Thus, the global principles and criteria for assessing sustainable development extend in Russian industry.

At present in order to assess sustainable development, many enterprises united in clusters in an industrial region are beginning to use the recommendations of the Global Reporting Initiative (GRI) [1; 3; 4]. GRI Standards recommends a comprehensive assessment of sustainable development based on 33 reporting indicators (“material subjects”) included in three “thematic standards”: economic, environmental and social (Figure 1). At the same time, the GRI Standards instructions are not mandatory for enterprises and are of a recommendatory nature.

Industrial clusters form the material and technical basis of industrial regions, ensuring their socio-economic development. We propose to extend the GRI Standards recommendations to assess the results of sustainable development in industrial regions. As can be seen from the table, the GRI Standards to the greatest extent presents indicators combined into a social standard – 19 significant thematic standards. The social standard can also become the basis for assessing the sustainable development of industrial regions, as long as the fulfillment of social commitments is the main task of governmental authorities at the regional level. In terms of the number of indicators, the environmental standard is in second place - 8 significant thematic standards. Ensuring an environmental standard is also extremely important for the sustainable development of industrial regions, since the environment on their territory has undergone significant transformation. The economic standard includes 6 essential thematic standards. It is also important for assessing the sustainable development of industrial regions, as long as the economy provides the material and financial basis for regional development.



Fig. 1. The list of indicators for assessing the sustainable development of industrial clusters.

4 Conclusion

The carried out research it possible to draw the following conclusions:

1. The analysis of the Russian and foreign researchers' opinions allowed us to reveal several main special approaches to measuring the results of sustainable development of industrial regions, which are based on particular indicators: resource, production, economic, social and environmental ones.

2. The problem of a comprehensive assessment of the sustainable development of industrial regions arises from the need for practical implementation of the concept of sustainable development. The comprehensive assessment should take into account the achievement of certain economic, social and environmental indicators.

3. Foreign practice of assessing the results of sustainable development of various economic systems is increasingly used in Russian practice. First of all, this applies to large industrial enterprises, many of which are part of transnational corporations.

4. At present in order to assess sustainable development, many enterprises united in clusters on the territory of industrial regions are beginning to use the recommendations of the Global Reporting Initiative, the methodology of which is based on a comprehensive assessment based on 33 indicators included in three "thematic standards": economic, environmental and social.

5. We propose to extend the recommendations of the Global Reporting Initiative to assess the results of sustainable development in industrial regions, the material and technical basis of which are industrial clusters. It is the enterprises united in industrial clusters that ensure social and economic development of industrial regions. The achievement of economic, environmental and social thematic standards can serve as the main assessment of sustainable development of industrial regions.

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