The National Index of Sustainable Noospheric Development

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Abstract: The article presents a new model for regional sustainable development assessment, the composite Index of Sustainable Noospheric Development. It describes the principle of constructing the index, its uniqueness, and advantages compared to other criteria and evaluation methods. The index is calculated by accounting 5 sub-indices which reflect the level of region's economy greening, creativity of space, environmental compliance, the demographic development, the use of labour and time potential of the population. Analysis based on this index showed that regions that maintain environmental sustainability are more competitive in the long term than regions focused on economic development. During the analysis process, a rating was formed that divides regions into clusters of leaders and outsiders using Russia as an example. The results of the analysis indicate the need to address the balance of environmental, social and economic processes in the group of outsider regions. As important advantages of the index, it is worth noting the temporal approach, the launch of a trend towards preserving nature and the capabilities of the biosphere, tracking the consumption of resources in proportion to their production, and reflecting the values of the population.

1 INTRODUCTION

The National Index of Sustainable Noospheric Development (hereinafter referred to as the Index) presents a new model for assessing the sustainability of regional development. It represents a complex approach towards the analysis of balancing environmental, social, demographic, economic, energy, labour indicators, as well as to the use of time budget by the population (Golovin, 2020; Shamaeva, 2023).

It is built on the basis of 5 subindices which reflect the level of region's economy greening, the efficiency of scientific and educational sector, the growth of anthropogenic pressure, the demographic development, the use of labour and time potential of the population (Shamaeva, 2023). It allows us to see the key constraints and competitive advantages for transition to the management of the regional sustainable development model.

The **uniqueness** of the Index:

It is based on the methodology of the domestic scientific school of sustainable development (V.I. Vernadsky, N.N. Moiseev, P.G. Kuznetsov, etc.). The index is a sovereign measurement tool and an alternative for the UN indices (correction factor) in the sustainable development field;

It allows to evaluate the regional imbalance of environmental, social and economic aspects between the interests of business, the population, and government bodies;

It identifies clusters of regions according to the degree of proximity to the regional model of sustainable development of a noosphere-oriented type;

It forecasts changes taking into account the interests of future generations;

It helps to maintain a balance of interactions between man and nature as a guarantee of a high quality of life.

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2 WHY IS THERE A NEED FOR A NEW INDEX?

The Index offers a new perspective on measuring balanced regional development. In terms of development, there are usually two approaches. The first one deals solely with economic indicators, dismissing social and environmental aspects (Alferova, 2021; Korshunov, 2023; Kurganov, 2021; Shaikin & Omirzhan, 2023; Timofeev et al. 2020). The second one is on the contrary concerned only with the environmental component (DuBose et al. 2023) and analyses separate regions (Kern, 2011; Ozkan & Schott, 2013). Furthermore, economic indicators are measured in monetary terms (GRP per capita, income level, etc.).

However, cost indicators are volatile, loosely connected with real life processes, and do not reflect the objective dynamics of changes in various areas, including the connection between natural and social processes (Shamaeva, 2023). This ultimately leads to incorrect assessments and beget crises. A new physical and economic approach is required to develop non-subjective criteria for assessing development (Golovin, 2020; Shamaeva, 2023; Stiglitz et al., 2016).

For example, today statistics provide thousands of different indicators. The problem is to select the optimal set of indicators that characterize regional development most objectively. This is a navigation system that includes the requirements of a balance between the needs and capabilities of society, the economy and the natural environment. Each sub-index in the general rating of noospheric development has a scientific basis and allows not only to carry out a current assessment, but also to project long-term development over time.

The National Index of Noospheric Development provides the means to show the degree of balance between the economic, social and environmental aspects of regional development.

3 THE INDEX CALCULATION METHODOLOGY

The National Index is built on the basis of 5 subindices which reflect the level of region's economy greening, creativity of space, environmental compliance, the demographic development, the use of labour and time potential of the population (fig. 1).

The economic greening index takes into account the average rate of reduction in the energy intensity of regional GRP. It is clear that the production of goods and services is impossible without expending energy. Therefore, the energy efficiency of the economy is improved by reducing energy intensity. This makes it possible to talk about the level of transition to a regenerative economy, including the areas of "green" and circular economy.

The Environmental Compliance Index takes into account the average rate of reduction in anthropogenic pressure on the natural environment. The index is connected with waste generation, wastewater discharge, and air pollution. It should be noted that here that the basis of this index is not the "clean up after yourself" principle, but the principle of absence (reduction) of waste, emissions, discharges, the principle "nature has no waste."

The vitality index is based on the median age of the region's population, average life expectancy and birth rate. The index shows the level of life preservation and development, demographic vitality.

The Creative Society Index characterizes the scientific and educational potential of the region. It is related to the level of investment of the region's budget in the development of education and science.

The constructive society Index is associated with the possibility of creative development and self-realization of the population. This opportunity is determined by the presence or absence of free time among citizens and the degree of realization of labour potential.

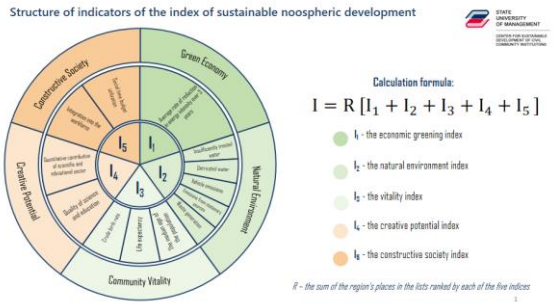

Figure 1: Structure of indicators of the index of sustainable noospheric development.

4 CALCULATION RESULTS AND ANALYSIS OF REGIONAL RATING

Using available national statistics data (Shamaeva et al., 2023), the rating of regions for 2019-2021 was calculated. The calculation of the rating revealed the subjects with the greatest potential

for forming balanced connections between the needs of the economy, society and nature (Fig. 2).

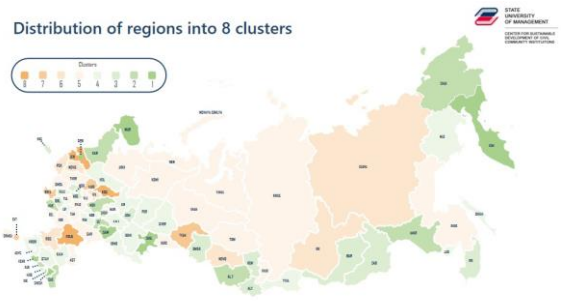

Figure 2: Distribution of regions into clusters based on the results of calculating the index of sustainable noospheric development (using the example of Russian regions).

The conducted analysis has shown that the regions with high demographic indicators which were able to preserve environmental sustainability are beginning to overtake the regions which have high economic indicators but dismiss environmental and demographic issues. Therefore, in the index, the cluster of leading regions for 2021 includes, in addition to the self-sufficient Sverdlovsk region, St. Petersburg, Nizhny Novgorod region, such regions as the Chechen Republic, Karachay-Cherkess Republic, Kamchatka Territory, Amur Region, etc., while such regions as Leningrad region, Volgograd region, Yaroslavl region, Rostov region, etc. in the overall ranking were in the group of outsider regions. That is, despite the fact that according to a number of indicators these subjects of Russia may be in the middle, in integral terms, due to the comparability of data, they ended up at the bottom of the list. This indicates the need to focus on the balance of environmental, social and economic processes in these regions (Fig. 3).

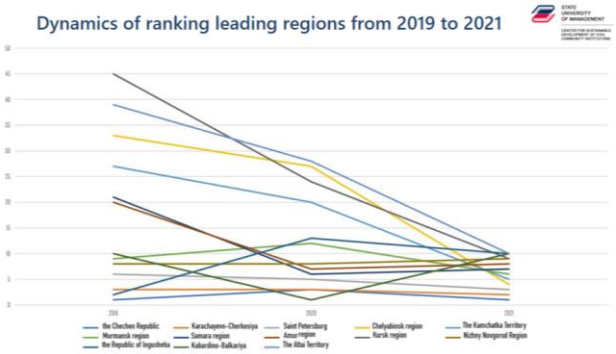

Figure 3: Dynamics of ranking leading regions from 2019 to 2021.

5 THE DISCUSSION OF THE RESULTS

The National Index of Sustainable Noospheric Development demonstrates that economic development can not be considered as the sole factor in improving the quality of life of the population. To form a new model of regional development, a request is being made for an ecologically clean environment, opportunities for self-realization for children and youth, and a creative space for harmonious social relations.

The Index comprises a number of features: the use of temporal approach, that is, taking into account the speed of economic, environmental and social processes in addition to the absolute values of indicators; setting trends in preserving nature and the capabilities of the biosphere; tracking resource consumption in proportion to their production according to the principle of the UN sustainable development goals “to live by meeting present needs without compromising the chances of future generations to meet their needs”; reflection of the population’s values enshrined in Decree of the President of the Russian Federation of November 9, 2022 No. 809 “On approval of the Fundamentals of State Policy for the Preservation and Strengthening of Traditional Russian Spiritual and Moral Values.”

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