

REGIONAL SUSTAINABLE DEVELOPMENT AND HUMAN RESOURCES REPRODUCTION: IS THERE ANY COMMON GROUND?

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Abstract

Human resources reproduction in Russia is complicated and keeps deteriorating. The purpose of the paper is to examine relationship between sustainable development and human resources reproduction in Russian regions. For this study we analyze indicators of human resources reproduction for all Russian regions and regional sustainable development indices of leading Russian rating agencies. The analysis yielded a number of results. First, ranks of regions in different rankings do not correspond to each other. Second, sets of indicators used in the rankings of regional sustainable development are very different and poorly represent human resources reproduction. Third, regional sustainable development doesn't correlate with human resources reproduction. These results allow us to draw some conclusions. First, subjective choice of indicators used in the indices and high variability of social and economic situations in the different regions raise a question about the validity of regional sustainable development assessments. Second, the theoretical concept of regional sustainable development requires some updates. It is necessary to take into account prevalent demographic trends and specifics of human resources reproduction in the regions. Third, achieving regional sustainable development should not be seen as dominating or preemptive goal for the region.

Key words: regional sustainable development, sustainable development indices, regions of Russia, human resources reproduction

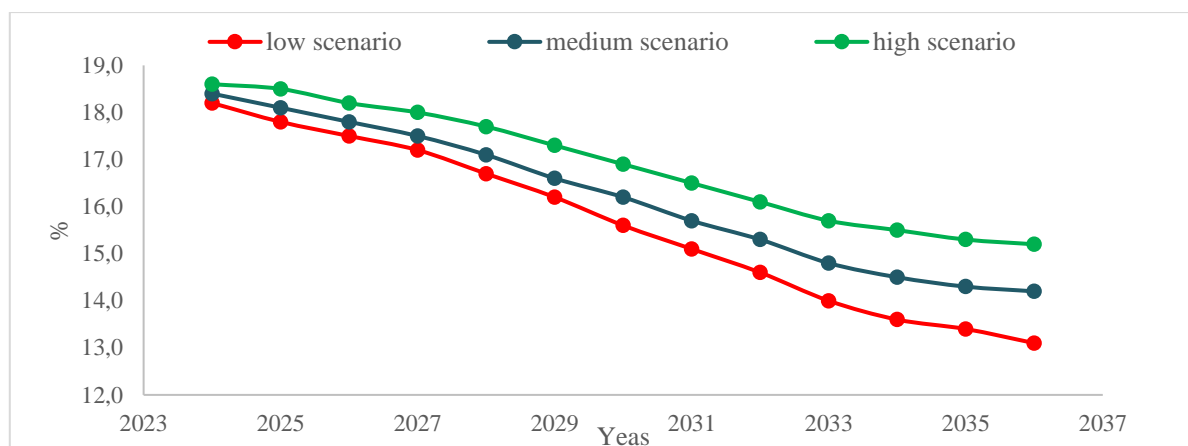
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Introduction

Human resources reproduction in Russia is complicated and keeps deteriorating. Depopulation trend becomes visible – starting from 2018 total population is declining, and in 2022 alone it dropped from 147 to 146.4 million people. Since 2015 the birth rate in Russia is also declining. In 2022 the total fertility rate was only 1.416 births per female (Population indicators, 2023), which is almost 33% lower than the replacement fertility rate. Population projections for human

resources reproduction in Russia are not optimistic – the decline of young population and its percentage in the total population is projected till 2036.

Fig. 1: Population projections of percentage of young population (under 15 years old) in the total population of Russia



Source: authors' construction based on (Demographic projections, 2023)

Against the backdrop of unfavorable trends of human resources reproduction, ensuring sustainable development of the country as a whole and its regions becomes especially relevant.

In 1987, the World Commission on Environment and Development defined sustainable development as development that meets the need of the present generation without compromising the needs of the future generations. The 1992 Earth Summit in Rio de Janeiro adopted 27 principles to guide countries on their way towards sustainable development (Chasek & Wagner, 2012). In Russia, the concept of sustainable development was adopted in 1996.

The scientists across the world actively study various problems of sustainable development of countries and their regions. Theoretical foundations of this concept are criticized in (Bautista-Puig et al., 2022), as well as the possibilities of sustainable development not only in stable economies but also in crisis situations (Bobylev et al., 2015).

The possibility of constructing composite indices for sustainable development measurement is also an important issue. Purvis and Genovese (2023) perform critical review of methodological and epistemological foundations for constructing such indices. Kwatra et al. (2020) present comprehensive critical review of indices researchers use in economic and social studies. Hirai and Comim (2022) raise the problem of disagreement and incomparability of indicators included into sustainable development indices and propose to use a partially ordered set (poset) of indicators. Sustainable development is studied not only at a country level, but also at the regional level (Yang et al., 2014) and even cities (Jorge-Ortiz et al, 2022).

The purpose of our research is to examine relationship between sustainable development and human resources reproduction in Russian regions.

1 Data and Methods

In our study we analyze three sustainable development indices that are based on different methodological approaches. First two indices are composed by leading Russian rating agencies, and the third one was developed by a group of Russian researchers. Short description of the indices we use is presented below.

ESG-rating from NRA. This rating is composed by National Rating Agency (Sustainable development, 2023). Ratings from this agency are considered quite reliable and are used by large companies as well as state authorities. Official data of the Federal State Statistics Service of Russia as well as data from federal and regional ministries and departments are used to compose this rating. ESG uses three key blocks of sustainable development indicators:

- Environmental – 14 indicators, representing environmental protection;
- Social – 17 indicators, characterizing regional social policy and demography;
- Governance – 14 indicators, evaluating quality of regional governance.

SMART rating of regions. This rating is composed by Association of Innovative Regions of Russia (Rating of regions, 2023) with the purpose to help public authorities to develop anti-crisis measures for regions. This rating uses wide range of data sources, and most of the indicators are constructed based on the official Russian statistics.

Indicators of this rating are grouped as follows: S – science policy; M – media policy; A – anti-crisis policy; R – regional policy/resilience; T – technological policy. In our study we use sub-rating R (hereafter SMART_R) which characterizes sustainability of regional development.

SDI_DE rating. This rating was proposed by Ershov et al. (2022). We use this rating due to the depth and wide variety of indicators authors propose to measure regional sustainable development. The methodological foundation of this rating is adjusted for developing economies, and allows to measure not only the level of regional development sustainability, but also the achievement of the sustainable development goals. The rating includes wide variety of indicators of economic development (7 indicators), social sphere (15 indicators) and ecology (4 indicators). This rating is based on official Russian statistics as well as International Monetary Fund's statistics.

In our study we use four indicators of human resources reproduction in Russian regions: total population growth, natural population growth rate, total fertility rate and life expectancy at birth. All these indicators are provided by the Federal State Statistics Service of Russia (Population indicators, 2023).

We analyze data from 2021 and apply descriptive statistics, correlation analysis based on Kendall's rank correlation coefficient, and comparative analysis.

2 Results

The analysis yielded a number of significant results.

First, region's ranks in different ratings do not correspond with each other. Kendall's rank correlation coefficients show a very weak relationship (see Table 1).

Tab. 1: Kendall's tau_b for ranks of Russian regions in sustainable development ratings

		Rank in SMART_R	Rank in ESG	Rank in SDI_DE
Rank in SMART_R	Correlation Coefficient	1.000	0.317	0.299
	Sig. (2-tailed)	.	0.000	0.000
Rank in ESG	Correlation Coefficient	0.317	1.000	0.469
	Sig. (2-tailed)	0.000	.	0.000
Rank in SDI_DE	Correlation Coefficient	0.299	0.469	1.000
	Sig. (2-tailed)	0.000	0.000	.

Source: authors' calculations

The difference between region's ranks in three ratings is meaningful. For example, if we compare ranks in SMART_R and ESG, then the rank's difference is 17 or more positions for half of the regions (see median in table 2), and 27 or more positions for one third of the regions (see 67th percentile in table 2). This rank difference in some cases reaches 74 positions.

Tab. 2: Region's rank difference in three studied ratings

Statistics		Rank difference between SMART_R and ESG	Rank difference between SMART_R и SDI_DE	Rank difference between ESG and SDI_DE
Median		17	18	13
Minimum		1	0	0
Maximum		59	74	58
Percentiles	25	8	9	6
	50	17	18	13
	67	27	25	19
	75	34	32	24

Source: authors' calculations

Second, sets of social and population indicators used in the ratings are very different and poorly represent human resources reproduction in Russian regions. For example, among 15 such indicators in SDI_DE the only one characterizing population dynamics is population mortality rate. SMART_R does not include population indicators at all. A wider range of population indicators is found in ESG rating.

Third, regional sustainable development ranks do not correlate with human resources reproduction indicators. Correlation coefficients are not statistically significant and do not confirm the relationship (table 3).

Tab. 3: Kendall's tau_b for indicators of human resources reproduction and regional sustainable development

		SMART_R	ESG	SDI_DE
Total population growth, %	Correlation Coefficient	0.040	0.200	-0.109
	Sig. (2-tailed)	0.602	0.008	0.148
Natural population growth rate, per 1000 population	Correlation Coefficient	-0.021	0.068	-0.050
	Sig. (2-tailed)	0.776	0.358	0.502
Total fertility rate	Correlation Coefficient	-0.051	-0.035	0.053
	Sig. (2-tailed)	0.496	0.635	0.475
Life expectancy at birth, years	Correlation Coefficient	0.058	0.154	0.090
	Sig. (2-tailed)	0.438	0.038	0.226

Source: authors' calculations

A comparative analysis confirmed the lack of relationship between sustainable development and human resources reproduction in Russian regions. For example, Table 4 presents the values of human resources reproduction indicators for SMART_R leaders and outsiders.

Tab. 4: Human resources reproduction indicators for SMART_R leaders and outsiders

Subjects of the Russian Federation	Rank in SMART_R	Annual population growth, %	Natural population growth rate, per 1000	Total fertility rate	Life expectancy, years
Moscow region	1	0.8	-6.8	1.460	70.35
Moscow city	2	-0.2	-3.3	1.597	74.55
Nizhny Novgorod Oblast	3	-1.0	-11.6	1.324	68.93
Nenets Autonomous District	83	0.3	0.4	2.072	69.39
Republic of Tyva	84	0.7	10.9	2.942	66.87
Karachay-Cherkess Republic	85	-0.30	-2.5	1.351	73.47
Russian Federation		-0.4	-7.1	1.505	70.06

Source: authors' calculations

As follows from the presented data, the leading regions can show rather depressive trends in the reproduction of human resources. For example, in Nizhny Novgorod Oblast (one of the leading regions) the values of most human resources reproduction indicators are much worse than the average values for Russia. On the other hand, such an outsider region as the Republic of Tyva has a situation with the reproduction of human resources significantly better than the average Russian trends.

3 Discussion

The obtained results raise a number of debatable questions. First, the discrepancy in regional development sustainability ranks in different ratings is obviously a consequence of the fact that different ratings use different sets of statistical indicators. These sets are formed on the basis of subjective perceptions of the rating developers about the significance of certain indicators, their availability, and the importance of achieving sustainable development goals. The diversity of regions with their different social and economic opportunities for development, their specific problems, and environmental situations also increases the variability and methodological uncertainty of different ratings. All this together leads to a significant difference in the position of regions in different sustainable development ratings. This situation, of course, raises the question about the validity of regional sustainable development assessments. This observation is particularly important for Russia, since the results of regional sustainable development rankings are part of the information and analytical base that is used for the distribution of subsidies and other forms of financial support of regions by the federal government. The results of such ranking also determine the investment attractiveness of the regions and determine investment flows.

Second, the fact that the analysis did not reveal the relationship between regional sustainable development and human resources reproduction in the regions, actualizes the need to revise the concept of sustainable development. The lack of interrelation raises the question of whether achieving or striving to achieve the Sustainable Development Goals can truly ensure the sustainability of the region's development. It is obvious that without a stable, effective reproduction of human resources, the sustainability of the region's development cannot be achieved. However, the ratings we have considered do not use indicators that directly characterize human resources reproduction, or use them to a minimum extent.

At the same time, we do not consider it necessary to "inflate" the set of such indicators as part of sustainable development indices. It seems to us that a different approach would be more productive both for achieving sustainable development and for ensuring the stability of

human resources reproduction in any region. Sustainable development should be considered not as a certain ultimate goal, but as a kind of context or background for solving the problems with human resources reproduction that are relevant for a region (for example, the problem of increasing the birth rate, the development of demographic potential, etc.). This will make it possible to develop more effective mechanisms for solving social, economic and demographic problems in the Russian regions. It should be noted here that the discussion about how sustainable development goals can be localized and translated into policy and practice is often raised in scientific research (Stoddart, 2023). In (Balanzo et al., 2020) a systematic review of scientific research on regional sustainability issues around the world is provided.

The lack of correlation between regional development sustainability and human resources reproduction may be a consequence of hysteresis, when the change in indicators of human resources reproduction does not occur simultaneously with changes in social and economic indicators, but lags behind them. It may be necessary to compare sustainable development ratings with human resources reproduction indicators for subsequent years. Determining the magnitude of such a lag, as well as assessing the strength of such a potential interaction, is the subject of our further research.

Conclusion

Our research has shown great variability and methodological uncertainty of reviewed regional sustainable development indices and lack of correlation with human resources reproduction indicators. This shows that existing approaches to regional sustainable development focus too much on economic, social and ecological indicators and neglect human resources reproduction which is the cornerstone of sustainable development implicitly included in the very definition of sustainable development as it is impossible without future generations in mind. Human resources reproduction needs to become an explicit part of any successful sustainable development program.

In general, the conducted research has yielded results that actualize the revision of the concept of sustainable development. In the conditions of negative demographic trends that are developing in many European countries (low and declining birth rate, population decline), ensuring sustainable development of countries and regions will increasingly depend on human resources reproduction.

We'd like to note that evaluation and monitoring of human resources reproduction needs to become part of the essential functionality of the regional public authorities to allow more informed development of effective programs for sustainable regional development.

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