Potential productivity of the territory as a factor of resource support for regional sustainable development for the North Caucasus Federal District (Russia)

El potencial productivo del territorio como factor de apoyo a los recursos para el desarrollo regional sostenible en la región del Distrito Federal del Norte del Cáucaso

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Contents

ABSTRACT:

An estimation of productive potential of the republics of the North Caucasus Federal District as a factor of resource support for sustainable regional development is given. A factor that limits the positive dynamics of the productive potential is regional differentiation, i.e. comparatively low level of development of some elements has a negative impact on the degree of efficiency on the use of the entire production potential, not allowing for a balanced self-development in these regions.
Keywords: Concept, sustainable development, innovation, region

RESUMEN:

Se proporciona una estimación del potencial productivo de las repúblicas del Distrito Federal del Cáucaso Norte como un factor de apoyo a los recursos para el desarrollo regional sostenible. Un factor que limita la dinámica positiva del potencial productivo es la diferenciación regional, es decir, el bajo nivel de desarrollo de algunos elementos frente a otros, que tiene un impacto negativo en el grado de eficiencia del uso de todo el potencial de producción, no permitiendo un autodesarrollo equilibrado en estas regiones.
Palabras clave: Concepto, desarrollo sostenible, innovación, región

1. Introduction

The sustainable development of any economic space is determined by the effectiveness

of the use of available resources and the conditions for the development of the macroregion and serves as its generalizing characteristic. There is no common definition about the aggregate resources for the development of a region in the academic literature. According to Schnieper(1993), this is the social and economic potential of the region, i.e.the aggregate complex of components of national wealth that are involved in the process of expanded production which creates the conditions for the execution of state orders for the establishment of regional integration ties, ensuring the integrated social and economic development of the macroregion. In this case Schnieper(1993) focuses attention on solving social problems in the region, the elements that ensure the regional production process, and on the effective functioning of productive cycles.

The economic potential of the macroregion is a set of:

- available natural resources on the territory;

- labor resources, professional and educational level of the able-bodied part of the population;

- production capital;

- non-production capital;

- labor force used in the industries;

- data about the current industrial relations and productive forces in the region.

It is advisable to apply the definition formulated by Pchelintsev et.al. (2000): "The productive potential of a region acts as a set of resource subsystems: economic, ecological, social, corresponding to the territorial production cycles at various levels (from national to local), ensuring the realization of the main goal of regional development - raising the living standard of the population.

Sharing the point of view of Yangirov & Yusupov (2008), we add that the fundamental difference between the productive potential and the economic one is that it not only represents a set of resources, but also "is a condition, a prerequisite and at the same time the result of the entire reproductive process, distribution, exchange and consumption" (Yangirov & Yusupov, 2008).

The structure of the productive potential of a macroregion was studied by many economists who used different approaches to its construction, not contradicting, but complementing each other, because they are based on different classification features (Shnieper, 1993; Yangirov & Yusupov, 2008; Ovchinnikov, 2009).

Each element of the productive potential is directly connected with its other components. Insufficient development of one element influences the productivity of exploitation of the productive potential as a whole, resulting in unsustainable development. In the absence of an adequate economic mechanism for self-regulation of the development in the macroregion, the proportionality of the productive interrelations between consumption and production is violated; there is a discrepancy between available resources and economic needs, and the connections of individual parts of the regional economic system are violated (Druzhinin, 2005).

 So, we can see that for developing an effective mechanism that ensures sustainable social and economic development of the North Caucasus Federal District, it is necessary to identify shortcomings and limitations through a comprehensive analysis and determination of the productive potential of the NCFD in general as well as those of its constituent regions.

2. Materials and methods

There are various definitions of the resource potential of the region (Klotsvog and Kushnikova, 1998; Miroshnikova, 2007; Popov, 2008; Lemdyaeva, 2010; Lomovtseva, 2012; Yakushkina, 2012). Thus, to assess each of the elements of the region's resource potential, it is possible to use different indicators. Natural resource potential is determined by the presence of a set of certain resources of the region to the total volume of the country's resources.

It is worth noting a few from the various methods of regional resource potential evaluation, used in Russia. The one well-known methodology is proposed by the Institute of Economics of the Russian Academy of Sciences (IE RAS, 1999). They suggested using a set of factors which directly or indirectly affect the investment attractiveness of the region. In this approach the following groups of factors are used:

- natural resource;

- demographic;

- economic;

- level of economic development;

- economic activity;

- the standard of living of the population;

- state of regional finance;

- economic reforms;

- political activity of voters;

- sustainability and influence of regional structures.

Then the total balanced evaluation value of the investment climate of the region is calculated. According to the results of calculations, we can get a ranking of regions by investment attractiveness.

Another technique proposed in (Roizman et al, 2001) deserves special attention. This technique is complex in the sense that it clearly traces the relationship of investment attractiveness and investment activity. The authors propose to consider investment activity as dependent on investment attractiveness. In other words, the more investment-attractive a region is, the more investment activity it has.

In (Sivelkin and Kuznetsov, 2003) a statistical evaluation of the investment climate with four levels of the hierarchy of statistical estimates is considered. The first level deals with private estimates, absolute and relative indicators. The second deals with generalized assessments. On the third, the partly integrated evaluations, and on the fourth level, a general integral estimate is considered.

In other approach (Yakushkina, 2012) a "Resource Potential Index" (RPI) is proposed for the use as an integral indicator of assessing the potential of the region's resources. It includes several private indicators: the development of human, informational, financial and natural-ecological potentials.

The studied macroregion (North Caucasus Federal District of Russian Federation) lacks sufficient mineral resources to increase the contribution of the mining industry to the regional economy. According to statistics, in the total amount of proven reserves of basic minerals in the Russian Federation, the district's share of tungsten is 41%, molybdenum 11%, oil 4.8%, gas 2.1%, titanium-lead- copper-zinc 1-2% (Regiony Rossii, 2018).

An important factor in the sustainable social and economic development of the NCFD is the effective use of regional production potential, which is determined by the state of social, production and market infrastructure, production volumes and its structure, the effective use of production capacities and funds.

It is obvious that the dynamics and level of development of regional productive potential are more clearly defined in the study of the gross domestic product per capita dynamics (Regiony Rossii, 2018). Through a comparative analysis of this indicator in the Russian Federation as a whole, and the North Caucasus Federal district for the last 10 years, we have discovered the existence of negative trends in the decrease in the level of gross domestic product in all North Caucasus regions, excluding the Republic of Dagestan, in comparison with the average Russian indicators (table 1).

Table 1
Gross domestic product per capita for the North-Caucasian
Federal district (in rubles). (Regiony Rossii, 2018)

	2005	2010	2011	2012	2013	2014
GRP by subjects of the Russian Federation - total	125658,7	263828,6	317515,3	348641,5	376383,0	403178,9
North-Caucasian Federal District	39050,8	94915,3	112647,6	127042,1	142102,8	164905,9
The Republic of Dagestan	33839,8	94883,6	113034,2	127528,7	145351,7	180824,4
The Republic of Ingushetia	17435,1	48239,2	63569,7	85737,9	100910,7	113791,2
Kabardino-Balkaria Republic	42253,1	89668,3	105412,7	124226,6	131866,1	137437,3
Karachay-Cherkess Republic	36971,7	91782,3	103462,3	124058,6	133175,0	147396,9
Republic of North Ossetia-Alania	44127,2	105781,6	120824,3	137721,8	159050,5	179992,7
Chechen Republic	20038,4	55995,7	67220,5	77877,2	88462,4	104019,2
Stavropol region	53414,6	118920,6	142409,2	154811,0	171295,6	193489,4

One of the main problems of productive potential development and utilization in the North Caucasus Federal District is the weak updating of the main capital stocks. The cost of fixed assets per capita in the Russian Federation and in the North Caucasus varies from 1.9 times-the gap between the average Russian level and the indicators of the Stavropol territory, to 6.9 times – the gap between the average Russian level and the indicators of the Republic of Dagestan. Moreover, there is a tendency to increase this gap, for example, in 1990 the fluctuation of this indicator was from 1.4 to 2.4 times (Regiony Rossii, 2018).

The state of the production potential of the North Caucasian republics is affected by the presence of morally and physically obsolete equipment and machinery. Some enterprises still use equipment which exploitation is 2 to 4 times longer than all reasonable operating times, to absolute physical wear. To solve this problem, a comprehensive reorganization of production, the reconstruction of production buildings and the renewal of equipment and machinery are needed. At the same time, as long as the situation with low investment attractiveness for domestic and foreign investors, the lack of own funds that can be used to modernize production, an inefficient technological investment structure remains in the macro-region, the problem cannot be solved.

The key element of the financial potential of any territory is the budget and tax potential. A distinctive feature of the budget-tax potential of the North Caucasus Federal District is imbalance, high level of subsidies and extremely low investment in budget expenditures. The republics of the NCFD take priority positions in the federal horizontal alignment of budgetary provision from the Fund for Financial Support of the Subjects of the Federation. The federal budget for 2017 provided a 4% of transfers to the North Caucasian republics, while their share in the overall structure of the population of the Russian Federation is 6.6% (table 2).(Regiony Rossii, 2018) The level of subsidies per capita in the North Caucasus region for federal horizontal equalization of budgetary provision is half that of the all-Russian level.

Table 2
Federal horizontal alignment of budgetary security in the
North Caucasus Federal District. (Regiony Rossii, 2018)

	Population (thousand people)	Subsidies from the federal budget to equalize the budgetary provision in 2014 (thousand rubles)	Per capita subsidies (rubles)
The Republic of Dagestan	2990	9246930	3092,6
The Republic of Ingushetia	464	2430280	5237,7
Kabardino-Balkaria Republic	861	3009830	3495,7
Karachay-Cherkess Republic	469	2078220	4431,2
Republic of North Ossetia-Alania	706	2705180	3831,7
Chechen Republic	1370	7175890	5237,9
Stavropol region	2799	9894020	3534,8
North-Caucasian Federal District	9659	36540350	3783,0
Russian Federation	146267	935330000	6394,7

The low innovative potential of the sustainable development of the North Caucasus macroregion is caused by the state of its investment potential, because venture investment is practically impossible due to excessively high investment risks. Table 3 presents data confirming the insignificant innovative potential of the subjects of the NCFD. (Regiony Rossii, 2018)

Table 3
Indicators characterizing the innovative potential for sustainable development of the NCFD regions. (Regiony Rossii, 2018).

Region	Domestic expenditure on R&D, mln. rubles	Employment for R&D, persons	Adv. Prod created	Adv. Prod used	Innov. Cost, mln rubles	SOIF,%	SOIP,%
The Republic of Dagestan	972,2	1548	13	431	527,6	12,2	0,6
The Republic of Ingushetia	48,1	130	...		77,3	20,0	0,2
Kabardino-Balkaria Republic	606,6	744	6	252	221,7	6,7	2,4
Karachay-Cherkess Republic	403,7	561	...	84	77,5	3,6	0,1
Republic of North Ossetia-Alania	470,9	669	...	...	176,0	6,6	0,1

Chechen Republic	344,0	593	8	322	108,6	0,5	1,6
Stavropol region	1351,7	2383	-	1126	8557,2	8,3	11,0
Russian Federation	146401,9	732274	1409	204546	12119329	9,9	8,7

In our opinion, it is possible to ensure sustainable social and economic development of the North Caucasus Federal District only through a long-term managed breakthrough of the region, in the direction of accelerated innovation growth at a faster rate than in the Russian average. In addition, it is necessary to significantly increase investment flows to the region, not only from the federal budget, but also from the Russian financial and credit system.

The level of labor potential development depends on a number of factors, the main one of which, as we consider, is the state and nature of labor resources production. Extended production of labor resources begins with the process of their formation, which can be studied by such indicators as the natural movement of the population, i.e. fertility and mortality, mechanical movement, population migration, professional and qualification training of labor. When studying the nature of labor resources in the subjects of the North Caucasus District, it is necessary to take into account the high population density, which is 6.35 times higher than the Russian Federation average (Ovchinnikov, 2010). This can be explained by the favorable natural conditions for life activity, mild climate, fertile lands, and a high level of economic development of the territory (Druzhinin, 2005).

Since 1990, there has been a steady increase in the proportion of the population of the North Caucasian republics in the total population of the Russian Federation. In our opinion, this is due to the lower intensity of depopulation processes that have characterized the Russian Federation since 1992, while in the North Caucasus the population decline began to occur later.

Natural population growth and migration processes are of great importance for the formation of labor resources and ensuring expanded production in the NCFD, although in 1996 the migration attractiveness of the North Caucasus republics significantly decreased (table 4). (Regiony Rossii, 2018)

Table 4
Population change (annual growth, %)(Regiony Rossii, 2018)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Russian Federation	-0,5	-0,4	-0,1	-0,1	0,2	0,02	0,1	0,2	0,2	0,2
The Republic of Dagestan	0,7	0,7	1,1	0,9	1,1	1,6	0,6	0,5	0,6	0,9
The Republic of Ingushetia	1,1	1,2	1,4	1,7	1,2	0,7	3,9	2,7	2,4	2,4
Kabardino-Balkaria Republic	-0,3	-0,3	0,004	0,1	0,06	0,03	-0,1	-0,01	-0,1	0,3
Karachay-Cherkess	-0,7	-0,6	-0,3	-0,1	0,2	0,8	-0,6	-0,6	-0,4	-0,2

Republic										
Republic of North Ossetia-Alania	-0,3	-0,1	0,1	-0,1	0,1	0,1	-0,5	-0,4	-0,3	0,2
Chechen Republic	1,9	1,8	2,1	2,4	2,1	2,0	2,1	1,7	1,6	1,8
Stavropol region	-0,3	-0,3	0,1	0,1	0,2	0,3	0,1	0,1	0,1	0,2

As we can see, the key condition for the effective formation of human potential is the provision of stable renewal of labor resources, which includes demographic, economic and social aspects. At the same time, the evidence of its unproductive use is the stably high level of unemployment observed in the North Caucasus republics and the low wages of practical workers in all spheres of activity.

3. Results

To determine the ability of the North Caucasus Federal District to create conditions for sustainable socio-economic development, in our opinion, it is necessary to conduct not only an exploratory but also a comprehensive assessment of the productive potential of the macroregion. In the economic literature, various methods of integral evaluation are proposed, but in general, they are aimed at evaluating only one of the elements of the productive potential, or, it is difficult to apply them in practice due to complexity of the calculations and the lack of a necessary statistical database (Makhosheva, 2014; Makhosheva & Ivanova, 2014; Tumenova et.al., 2018).

We propose an improved methodology for the integrated assessment of productive potential, based on the methodology for calculating the index of human development.

The index of development of productive potential is the arithmetic mean of the partial indices. To translate any indicator, for example, x, into an index whose values are in the range from 0 to 1, which will allow us to sum up different indicators, we use the formula:

$$x - \text{index} = \frac{x - \min(x)}{\max(x) - \min(x)}$$

where max (x) and min (x) are the maximum and minimum values of x of the subjects of the macroregion under consideration. The closer the index of the potential productivity development is to 1, the greater the regional economic potential is.

Private indices are calculated using a system of dominant indicators, which are selected by such criteria as:

- minimum required number of indicators, the most important ones, which are of fundamental importance being objective at the same time, and having the ability to compare them;

- quantitatively expressed, relatively independent and most representative;

- amenable to analysis in dynamics and in a certain period of time;

- based on the existing statistical system and not requiring significant costs in the calculation and collection of information (Stuhlberg, 2002).

For our calculations, we selected the indicators we examined above when analyzing the main components of the potential productivity, and supplemented them with such comparative indicators as the number of credit institutions and their branches; the level of tax revenues of budgets at all levels per capita; the condition and density of roads and railways in the macroregion; the degree of human impact on the natural environment.

Table 5 presents the data obtained as a result of a comprehensive assessment of the productive potential of the North Caucasus regions and the effectiveness of its use in 2016, which indicates the differentiation of factors constraining the development of productive potential in the republics. For example, in Dagestan, the main deterrent

factors in its development are insignificant volumes of accumulated investments per capita, insufficiently developed transport infrastructure, reduction of the balanced financial result of the activities of organizations and enterprises of the republic and low tax potential.

Table 5
Comprehensive assessment of the potential productivity of the North Caucasus regions and the effectiveness of its use in 2016. (normalized results from applying method, described above in the paper, based on latest revision of official statistical data from Regiony Rossii, 2018)

	Productive capacity	Financial capacity	Innovation capacity	Labour potential	Integral productive potential
The Republic of Dagestan	0,468	0,429	0,554	0,941	0,598
The Republic of Ingushetia	0,220	0,105	0	0,018	0,086
Kabardino-Balkaria Republic	0,535	0,196	0,278	0,491	0,375
Karachay-Cherkess Republic	0,403	0,338	0,611	0,413	0,441
Republic of North Ossetia-Alania	0,566	0,357	0,221	0,536	0,420
Chechen Republic	0,537	0,377	0,024	0,384	0,331
Stavropol region	0,506	0,649	0,412	0,999	0,641

In Kabardino-Balkarian Republic, sustainable development is limited by a low level of its financial potential, which is exacerbated by the slow growth rate of investments in fixed assets. In the majority of the republics in the NCFD, the innovative potential is the most common factor hampering their productive potential development.

A unique soft climate, the sea, mountainous and flat areas, mineral springs in the North Caucasus regions creates favorable conditions for living and improving, forming the tourism industry, developing the electric power industry and various branches of agriculture.

But as the study of the functional purpose of the components of the productive potential of the macroregion clearly shows, the difference of their development levels is inadequately high.

4. Conclusions

As it is shown, current structuring the regional production potential in North Caucasus Federal District regions violates the integral organization of the expanded innovative production process, which includes social components that provide aggregate production of labor resources, knowledge, skills, abilities, etc., in other words, the human capital. We believe that it is impossible to distinguish between the resources of local productive cycles and extended production at the regional level, since it is formed in the process of interaction and functioning of productive cycles concentrated in different places.

The results of an integrated assessment of the productive potential of the subjects of the North Caucasus Federal District lead us to the conclusion that the sustainable social and economic development of the macroregion is impossible with the available productive potential. At the present stage, the main task in all the constituent entities of the NCFD is, as we consider, the need to seek internal reserves and new sources of development, to implement effective interregional integration that will unite the productive potential of the North Caucasus republics and thereby obtain a lasting synergistic effect.

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