

## Comprehensive socio-ecological and economic assessment of the status and development of Southern Russia agricultural regions

Vladimir Ivanovich Trukhachev, Elena Ivanovna Kostyukova, Evgeny Ivanovich Gromov, Alexey Nikolaevich Gerasimov

Stavropol State Agrarian University, Zootechnical Lane, 12, Stavropol, 355017, Russia

**Abstract:** In today's economic realities a special attention deserves the issues on research and upgrading the methodology for assessing the sustainability of the regions; effect of various factors on the development processes; elaboration of mechanisms to improve the sustainability of the regional systems, prediction and forecasting amid the crisis. Difficulties in reaching sustainable and balanced development of the subordinate entities of the Russian Federation are largely determined by economic, social, environmental and other subsystems. One of the urgent problems in recent years has become a problem of sharp differentiation between the individual subordinate entities of the Russian Federation in terms of socio-economic development. Identification of optimal forms and implementation methods of the principles of modern socio-economic policies should be based on the diagnostic results of the causes of such imbalances.

[Trukhachev V.I., Kostyukova E. I., Gromov E. I., Gerasimov A.N. **Comprehensive socio-ecological and economic assessment of the status and development of Southern Russia agricultural regions.** *Life Sci J* 2014;11(5):478-482] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 69

**Keywords:** Socio-ecological and economic assessment, development sustainability, agrarian-oriented regions, North Caucasus Federal District (NCFD), multivariate comparison, forecasting.

### Introduction

The problems related to the study of sustainability of development are widely discussed in writings of many foreign and domestic economists. Thus, many authors consider sustainability as a category that concerns only the declared field of study, ignoring the system of social, environmental, technological and other relations, which have a significant impact on the results and balance in development of the both individual subsystems and the system under the study as a whole [1, 2]. These circumstances determine the importance of developing the methodological foundations of a comprehensive assessment and forecasting of parameters effecting sustainable development of the regions [3].

Implementation of economic and administrative reforms in Russia led to a significant transformation of the management system. An intense search for new management forms and methods of the country's socio-economic development amid of global economic crisis is currently underway [4]. In this regard the most important aspect of modern economic policy, emphasized by the government, is a "restoration of sustainable economic growth", which requires the use of development factors such as "high-quality vocational education and a flexible labor market, a favorable investment climate and modern technologies" [5].

In today's conditions the elaboration of sustainable development avenues of territories should

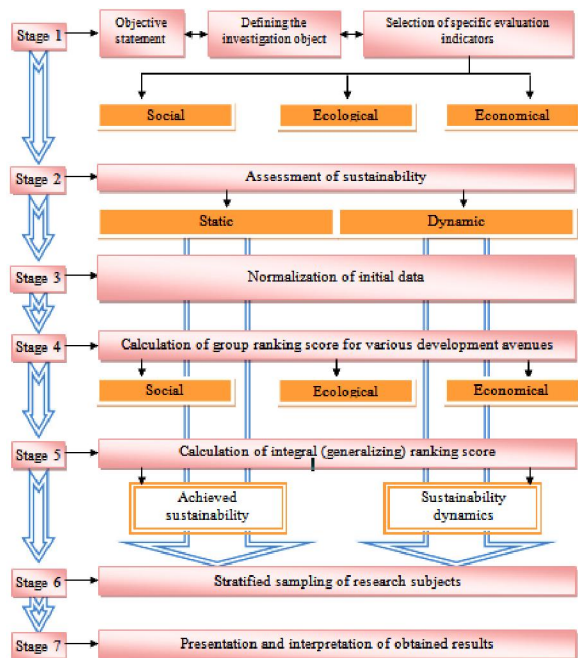
be carried out with the system approach, based on the results of a comprehensive assessment of the current situation in the social, economic and environmental spheres of a specific region [6]. From a practical point of view, the solution to the problem of improving the available potential (industrial, economic, etc.) utilization efficiency should be carried out taking into account significant aggregate of relationships in the system of "nature-society-people" that defines the features of environmental protection activities, as well as searching the ways to improve the environmental conditions [7].

The managerial system for sustainability of the regional entity with a pronounced agrarian specialization is strongly dependent on the efficient use of its economic potential; therefore selection of capabilities for development of a region and its ability to make effective use of available resources is quite viable [8]. On the one hand, natural resource factor plays a significant role in increasing the pace of development of such regions; on the other hand, this is a prerequisite for regional differentiation of the territories and subordinate entities of the federal districts [9].

### Methods

Currently, quite a lot of tools are offered for the assessment of territorial differentiation, particularly, absolute and relative variation indicators are used to some extent for this purpose, as well as various asymmetry and skewness coefficients. The most widely used methods are based on multivariate

comparison, which unlike the other known approaches allow the use of theoretically unlimited number of evaluation indicators, while the fact, whether they are represented in absolute or relative form is not essential, as well as the kind of their measurement units (if any), etc. [10].



**Figure 1. Multi-criteria socio-ecological and economic assessment technique of agricultural regions sustainability**

Investigation of existing approaches to multivariate assessment of the spatially dynamic development of individual territories showed that they differ primarily depending on the following criteria: the number of evaluation assignments; the objects and subject of ongoing research; the valuation technique of input data and calculation of the integral index; the number of source and group indicators; the degree of integral indicators differentiation into dynamic and static ones within the proposed techniques; the interpretation of obtained generalizing estimates.

Generalization and critical analysis of existing approaches to assessing the socio-ecological and economic development of the South Russia regions allowed us to offer a methodology of multi-criteria stratified sampling of territories (Fig.1) according to their development level and intensity [11].

Stratified sampling of spatial socio-ecological and economic systems will be carried out in two-dimensional space "Static assessment -

Dynamic assessment"; at that each of them has its own quality scale. Thus, in accordance with the achieved level of development, all regions are differentiated into five groups: low developed, developing, moderately developed, developed, and highly developed. In accordance with the dynamic assessment, we have allocated three subgroups, low, medium and high, depending on the development intensity.

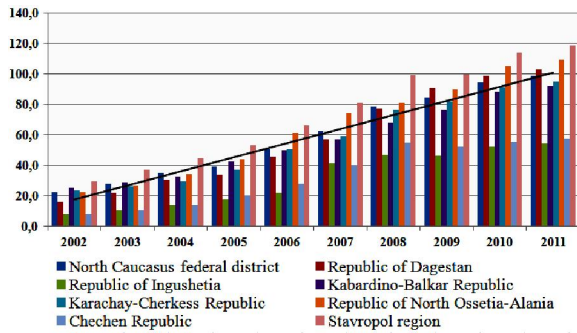
Interpretation of the results obtained is carried out by ranking the Federal District regions in accordance with the magnitude of the integral ranking score and generalizing sustainability coefficient, as well as distribution in groups and subgroups that will allow determination of their place in the total multitude of subordinate entities with a high degree of reliability. Presentation of the final results of multi-criteria assessment of spatially dynamic development of territories is possible by positioning of the objects in a coordinate system, as well as their display on the cartogram.

### Main part

The North Caucasus Federal District (NCFD) is one of the most unique and at the same time the "problematic" region of Russian Federation in a number of aspects. Over the years most subordinate entities of NCFD are recipients, because due to objective reasons they are subjected to crisis impacts (low level of industrial production, high unemployment, etc.). Despite the today's problems, the District has a number of unique features that stipulate the priorities for its further development. The development of tourist and recreational cluster, characterized by unique balneological resources and natural mineral reserves, is one of such challenging avenues.

The main indicator of economic development of the territories is the gross regional product cost parameter, according to which NCFD is traditionally an outsider compared to the other regions of Russia.

Thus, despite the significant growth in values of the GDP per capita in the North Caucasian regions during the period from 2002 to 2011 by factor of almost 4.4 that in the reporting year amounted to 98.5 thousand rubles (Fig. 2), during the study period the area remained losingest in the Russian Federation in terms of this indicator. At that, while in 2005 GDP per capita in NCFD was less by 6.5 times, compared to that for the Ural Federal District (which ranked 1<sup>st</sup> place for the whole study period), and less by 3.2 times compared to the average value for the Russian Federation, in 2011 this ratio significantly decreased down to the level of 4.5 and 2.8, respectively.

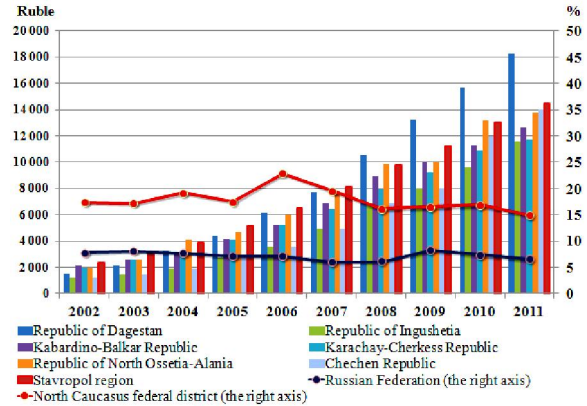


**Figure 2: Gross Regional Product per capita, thousand rubles**

During the study period, the per capita investments in NCFD were 3-2.5 times lower compared to the national average. This fact cannot be explained by the low investment attractiveness of NCFD regions, since until the recent years the investments into the fixed assets were carried out mainly at the expense of state, municipal and mixed Russian funds [12].

The volume of per capita investments in NCFD in 2011 amounted on average to 36,580 rubles that is 7.6 times higher than that in 2002. The highest values of this index were noted in the Republic of Dagestan (46,171 rubles), while the lowest values were indicated in Ingushetia (10,570 rubles). In Stavropol Territory this indicator in 2011 amounted to 38.3 thousand rubles. To achieve the main strategic goal on overcoming the underrun of NCFD subordinate entities and creation there an adequate economic potential, it is needed, above all, to bring the per capita capital stock to the average national level. Only then we can expect further economic growth, improvement of living standards, reduction of unemployment and a balanced budget [13].

By the end of 2011, the volume of employment in the NCFD economy was 3,374 thousand people that is by 24% more compared to that in 2002. The greatest increase in employment was noted in Chechen Republic, where, by the end of the analyzed period, this indicator was 312.9 thousand people (Fig.3). The maximum level of employment, more than 53%, was recorded in the Stavropol Territory, whereas the minimum level was indicated in Ingushetia (26%). Development of national projects aimed at improving the living standards in agricultural areas has led to the fact that many residents of the North Caucasus region have been intensively engaged in private farming and growing small livestock.



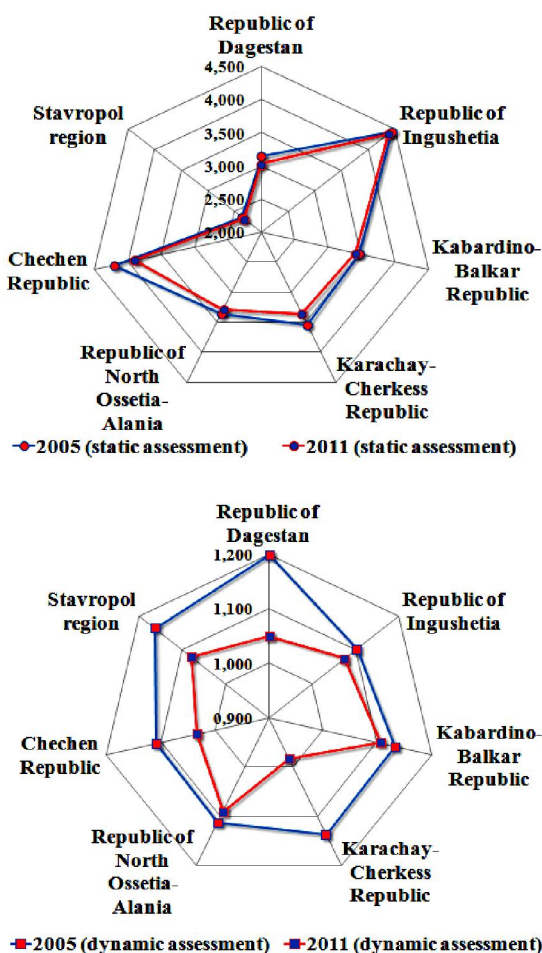
**Figure 3. Analysis of the relationship between the per capita income of the NCFD population (left axis) and unemployment rate (right axis)**

The unemployment rate in the NCFD regions is one of the highest in the country and makes up 15%. At that, the highest unemployment rate is in the Republic of Ingushetia (48.8%) and the Chechen Republic (36.7%), and the lowest unemployment rate was recorded in the Stavropol Territory (6.0%). In 2011, per capita income in NCFD regions was 15,050 rubles, which is 7.8 times higher than that in 2002. The highest income was recorded in the Republic of Dagestan (148,278 rubles), while the lowest income was noted in the Republic of Ingushetia (11,562 rubles). In the Stavropol region this indicator has increased by 6.2 times and in 2011 amounted to 14,440 rubles.

Modern socio-ecological and economic system of the macro-region is a highly complex system, which has to be managed in unstable transformational conditions. Successful management of such a system requires research of multivariate reproductive and socio-economic processes taking place in the macro-region, as well as the development of planning technique on this basis [14, 15]. To accomplish the main goal of the current research, consisting in stratified sampling of the territories in accordance with the results achieved, and taking into account the intensity of the socio-economic development, we must address a number of specific problems associated with the formation of the required system performance indicators, as well as defining the process for producing an integral generalizing indicator, standardization of the original data, etc. Within the proposed methodology, we consider it necessary to take account of not only the achieved development level, which is reflected by the set of indicators, but their dynamic changes during the test period that largely determines the possible potential of future development of a particular region.

The performance indicators for the period of 2002-2011 were taken as the initial database for the

further research. Stratified sampling of the socio-ecological and economic systems was conducted considering the achieved level of development of the regions in three areas, each of which was assessed using five the most important indicators. Stratified sampling of NCFD regions was carried out in two lines of investigation: "Static assessment - Dynamic assessment", at that, each of them has its own quality scale. Interpretation of the results obtained was carried out by ranking the regions according to their integral ranking score and generalizing sustainability coefficient that made it possible to determine with a high degree of reliability their place in the overall set of objects (Fig. 4).



**Figure 4. Results of the multivariate socio-ecological and economic assessment of sustainability of the North Caucasus Federal District subordinate entities.**

#### Final part

In accordance with the assessment of the environmental development level the leading positions are given to the Kabardino-Balkar Republic (KBR) and the Republic of North Ossetia-Alania,

which together with the Karachay-Cherkess Republic (KChR) are related, based on the results of 2011, to the moderately developed subordinate entities of the NCFD.

This is primarily due to the growth of indicators such as expenditure on environmental protection (which for KChR increased by almost 2 times compared with 2008 and amounted to 148.6 million rubles; for KBR the increase made up 13.4%), investments in fixed capital for environmental protection and rational use of natural resources (which for the Stavropol Territory increased by 83.8% and amounted to 681.6 million rubles in 2011).

According to the analysis based on multicriteria assessment of the economic development of the NCFD regions it can be noted that the crisis has significantly affected the economy of the regions, in particular the Stavropol region, being a leader in the NCFD by almost all indicators, compared with 2005, appeared to be in the group of developed regions with the ranking score of 0.634. Noted tendency is typical for most subordinate entities of the District, though there are the entities that have managed to significantly improve their status in this regard. Thus, the integral ranking score of the achieved level of economic development in the Republic of Dagestan has qualitatively improved from 1.225 in 2005 to 1.031 in 2008, though growth rates of performance indicators in concerned group decreased (from 134.8 % down to 113.0%).

According to the analysis of the social component of the development level of the NCFD subordinate entities, it can be noted that the group of highly developed entities within the concerned issue includes just one region, which is the Republic of Dagestan; though in the test period it is observed both a significant deterioration of the integral indicator of the achieved level of social development (from 0,626 in 2008 to 0,886 in 2011) and the slowdown in dynamics of performance indicators (which in general decreased from 111.6 to 105.3 % over the same period). Stavropol region, being traditionally a leader in this area, was only in the second place; at that, there was a general reduction of social development, which was complicated by the slowdown in performance indicators dynamics.

#### Conclusions

It was determined during the analysis that Stavropol region is the leading one, which against the other regions is identified as a highly developed with the moderate growth rate of performance indicators. Thus, the integral rating score of the achieved level of sustainability in 2011 was 2,318 against 2,366 in 2005. The Republic of Dagestan ranks second. Its



integral rating was just 3,025; at that, growth rate of performance indicators was also significantly reduced from 112.3 to 104.9%. The same approach can be used to trace the dynamics of qualitative transformations in NCFD subordinate entities over the period from 2002 to 2011.

The presented methodology can become quite an important tool for monitoring and control the situation in the regions by public authorities, since it allows one not only obtaining a general assessment of the overall level of socio-ecological and economic development of the NCFD subordinate entities, but also to identify the reasons that cause their changes, based on the results of a multivariate assessment, which can be used for analyzing various aspects. This methodology can also be widely used in the practice of regional forecasting at different levels that is an important instrument of state planning of the development parameters of both the country as a whole and its individual regions. Forecasting provides the possibility to identify priority avenues and scenarios of economic development aimed at smoothing the inter-regional conflicts and growing human wellbeing.

#### Corresponding Author:

Dr.Trukhachev Vladimir Ivanovich  
Stavropol State Agrarian University  
Zootechnical Lane, 12, Stavropol, 355017, Russia

#### References

- Vasilyeva, M.V., 2011. Strategic avenues and milestones of socio-economic development of regions. National interests: priorities and security, 2: 30-38.
- Sklyarov, I.Y., 2013. Development of Small Forms of Entrepreneurship and Agricultural Production in Russian Village. Middle-East Journal of Scientific Research, 17(4): 424-428.
- Trukhachev, V.I., 2013. Technique of socio-ecological and economic evaluation of sustainability of Southern Russia agricultural regions. Economy and Entrepreneurship, 12-3 (41-3): 299-304.
- Bobryshev, A.N., Y.V. Golchenko and M.Y. Kazakov, 2014. Directions of municipal territorial and economic transformation in a monopolar highly urbanized region. Actual Problems of Economics, 2(152): 230 – 238.
- Putin: Presidential Address to the Federal Assembly. Date Views 15.12.2013, [www.kremlin.ru/news/19825](http://www.kremlin.ru/news/19825) # sel =
- Sidorov, L.G., 2013. Systematic approach to government control of the economy at regional level. Actual problems of modern science, 27, pp. 55-64.
- Gromov, E.I., 2013. Principles of management and planning of socio-ecological and economic system of macro-region. Terra economicus, 11 (1): 140-144.
- Tomilina, E.P., I.I. Glotova and I. P. Kuzmenko, 2013. Development of Integration Processes in the Traditional Sectors of Agriculture. Middle-East Journal of Scientific Research (Socio-Economic Sciences and Humanities), 13: 178-182.
- Uglitskikh, O.N. and J.E. Klishina, 2013. Modeling Interregional Inter-Branch Relations as an Element of Interaction between the Branches of the Agroindustrial Complex. Middle-East Journal of Scientific Research (Socio-Economic Sciences and Humanities), 13: 183-190.
- Gerasimov, A.N., Y.I. Gromov, S.A. Levchenko, O.P. Grigorieva and N.P. Oboturova, 2014. Features of the spatial socio-economic systems development in the North Caucasus Federal District. World Applied Sciences Journal, 29 (5): 699-705.
- Trukhachev, V.I., 2013. Evaluation of socio-ecological and economic development of agricultural regions of Southern Russia. Business in law, 6: 291-295.
- Pshenicnii, P.P., A.N. Gerasimov and E.I. Gromov, 2012. Macro-region economic management system. Stavropol: AHRUS, pp: 116.
- Tyaglov, S.G., 2010. Reducing the negative effects of market transformation of the regional economy: theory, methodology and implementation tools. Rostov-on-Don: South Federal University Publishing, pp: 272.
- Gerasimov, A.N., E.I. Gromov and Y.S. Skripnichenko, 2014. Development of spatially localized economic systems in traditionally agrarian regions of the Russian Federation. Actual Problems of Economics, 6 (156).
- Gerasimov, A.N., Y.I. Gromov, S.A. Levchenko, T.V. Skrebtsova and M.A. Kobozev, 2013. Modeling and forecasting of key indicators of socio-economic development of traditionally agrarian regions. World Applied Sciences Journal, 27 (10): 1282-1287.

4/24/2014