

Artículo de investigación

Evaluation results of reorganization of scientific organizations in the Russian Federation

Оценка результатов реорганизации научных организаций в Российской Федерации
Evaluación de los resultados de la reorganización de organizaciones científicas en la Federación de Rusia

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Abstract

The article provides an overview of the study results of the scientific organizations's reorganization in the Russian Federation, that was made at the federal level, starting in 2013, and was associated with the merging of a number of research institutes for various reasons. As a result of the study, it was found out that most of the new structures were formed by joining smaller organizations to larger research centers located in territorial proximity and performing work in close scientific fields. In some cases, merging of scientific organizations was due to the need to ensure an interdisciplinary approach to research.

Аннотация

Статья представляет собой результаты исследования вопросов реорганизации научных организаций в Российской Федерации, которая осуществлялась на федеральном уровне, начиная с 2013 года, и была связана с объединением ряда научно-исследовательских институтов по различным основаниям. В результате исследования было установлено, что большинство новых структур было образовано путем присоединения небольших организаций к более крупным научно-исследовательским центрам, расположенным в территориальной

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As a result of the assessment of key performance indicators of scientific organizations before and after the reorganization, it was concluded that at present the positive trends are not fully visible, while in some cases there is an increase in key performance indicators. The authors concluded on the need for additional research, covering the assessment of the quality level of achieved results, as well as the dynamics of indicators within 3-5 years after the restructuring.

Keywords: scientific organization, reorganization, indicator, evaluation, performance, scientific field.

близости и выполняющим работы по близким научным направлениям. В ряде случаев объединении научных организаций было обусловлено необходимостью обеспечения междисциплинарного подхода в исследованиях. В результате оценки ключевых показателей деятельности научных организаций до и после реорганизации были сделаны выводы о том, что на текущий момент не в полной мере заметны положительные тренды, при этом в ряде случаев отмечается рост ключевых оценочных показателей. Авторы делают вывод о необходимости проведения дополнительного исследования, охватывающего оценку качественного уровня достигнутых результатов, а также динамики показателей в течение 3-5 лет после проведения реструктуризации.

Ключевые слова: научная организация, реорганизация, показатель, оценка, результативность, научное направление

Resumen

El artículo presenta los resultados de un estudio sobre la reorganización de organizaciones científicas en la Federación de Rusia, que se llevó a cabo a nivel federal, a partir de 2013, y se asoció con la unificación de varios institutos de investigación por diversos motivos. Como resultado del estudio, se encontró que la mayoría de las nuevas estructuras se formaron al unir organizaciones más pequeñas a centros de investigación más grandes ubicados en las proximidades y realizando trabajos en campos científicos cercanos. En algunos casos, la asociación de organizaciones científicas se debió a la necesidad de garantizar un enfoque interdisciplinario de la investigación. Como resultado de la evaluación de los indicadores clave de rendimiento de las organizaciones científicas antes y después de la reorganización, se llegó a la conclusión de que, en la actualidad, las tendencias positivas no son totalmente visibles, mientras que en algunos casos hay un aumento en los indicadores clave de rendimiento. Los autores concluyen sobre la necesidad de investigación adicional, que cubra la evaluación del nivel de calidad de los resultados alcanzados, así como la dinámica de los indicadores dentro de los 3-5 años posteriores a la reestructuración.

Palabras clave: organización científica, reorganización, indicador, evaluación, efectividad, dirección científica.

Resumo

O artigo apresenta os resultados de um estudo sobre a reorganização de organizações científicas na Federação Russa, que foi realizado em nível federal, a partir de 2013, e esteve associado à unificação de vários institutos de pesquisa por diversos motivos. Como resultado do estudo, verificou-se que a maioria das novas estruturas foram formadas por meio da junção de organizações menores a centros de pesquisa maiores, localizados nas proximidades e realizando trabalhos em campos científicos próximos. Em alguns casos, a associação de organizações científicas deveu-se à necessidade de garantir uma abordagem interdisciplinar da pesquisa. Como resultado da avaliação dos principais indicadores de desempenho das organizações científicas antes e depois da reorganização, concluiu-se que, atualmente, as tendências positivas não são totalmente visíveis, enquanto, em alguns casos, há um aumento nos principais indicadores de desempenho. Os autores concluem sobre a necessidade de pesquisas adicionais, cobrindo a avaliação do nível de qualidade dos resultados obtidos, bem como a dinâmica dos indicadores dentro de 3-5 anos após a reestruturação.

Palavras-chave: organização científica, reorganização, indicador, avaliação, efetividade, direção científica

Introduction

The state scientific and technical policy expresses the attitude of the state to scientific and technological activities. Within the framework of this policy, the goals, directions, forms of activity of state authorities in the Russian Federation in priority areas of science, technology and engineering and the effective implementation of achievements are determined.

One of the main reasons for the heightened attention of the state to the state of national science, especially recently, is the univocal dependence of sovereignty, competitiveness, security and defense capability of the country on the achievements of science, primarily fundamental (Maltseva, Veselov and Bedenko, 2017).

Since 2013, the Russian Federation actively began the process of reforming the structure of scientific organizations, including their restructuring, ultimately aimed at ensuring the improvement of the effectiveness of domestic science, creating conditions for the formation of interdisciplinary research projects.

The reorganization, combined with further reengineering of the internal processes of the system of scientific organizations in Russia, was mostly the joining of small research centers to large structures and the formation of large world-class research organizations on their basis, that largely took place on the basis of territorial proximity.

The implementation of the reform, including the format of measures implementation, faced active resistance to changes from the scientific community, while at the state level and from the positions of management science, the changes that were made could have a systemic effect in the long run (Maltseva & Klyushnikova, 2017).

The main question of interest to researchers and policymakers in this problem is: do mergers, acquisitions or organizational restructuring give an increase in the performance of scientific organizations?

The purpose of this research is to study the goals, objectives and approaches to the restructuring of scientific organizations in the Russian Federation, as well as results assessment of the changes that were made.

Materials and methods

Organizational change or restructuring is not a new phenomenon (Kurgat, 2016). Many studies have been devoted to the study of restructuring, since the middle of the last century (Cooperrider & Sekerka, 2006).

There are various approaches to defining term “restructuring”.

Restructuring is a process of making a major change in organization structure that often involves reducing management levels and possibly changing components of the organization through divestiture and or acquisition, as well as shrinking the size of workforce (Kurgat, 2016).

Restructuring is an organizational change that is much more significant than commonplace changes. The changes should affect at least a whole organizational sector or an entire company (European Foundation for the Improvement of Living and Working Conditions, 2014).

Restructuring is a composite of numerous interrelated activities – from diagnostics to restructuring organizational structures and business processes based on modern management approaches (Mavlutova, 2013).

Nowadays, in the economic literature, along with the concept of “restructuring”, the concepts of “reforming”, “reorganization” and “reengineering” are widely used to define changes carried out at the enterprise (Chernyatin, 2015).

Reorganization is the process of a radical change in the structural component in the form of merger, accession, partition, separation, transformation (Civil Code of the Russian Federation, article 57).

Reengineering is a fundamental rethinking and radical redesign of business processes to achieve significant improvements in key performance indicators such as cost, quality, service level and efficiency.

There are various classifications to identify types of restructuring.

Mavlutova (2013) prefers the following types of restructuring: mergers of companies, acquisitions of companies, forming strategic alliances, restructuring of property, activities to eliminate financial difficulties.

European Monitoring Centre on Change (EMCC) studying the impact of changes in companies on the socio-economic development of the European economy, uses its monitoring tool (European Restructuring Monitor) to monitor restructuring processes. Specialists of the Center propose to distinguish the following types of restructuring:

- relocation (change of location) - transfer of production (or other) units to other regions within the same country;
- offshoring (delocalization) - transfer (partial or full) of production (or other) units to other regions within the same country;
- merger of companies (acquisition) - the unification and consolidation of assets of two or more companies in the hands of one or the acquisition by companies of each other;
- internal restructuring - optimization of activities within the company, without affecting external influence factors;
- outsourcing - the transfer of some of the functions and powers of the company to external executives (for example, the implementation of accounting operations);
- bankruptcy (closure) - the transfer of the enterprise-debtor under the protection of the judiciary in order to minimize the consequences of meeting the interests of its creditors;
- expansion (business expansion) - expanding the scope of the enterprise and increasing its presence in other markets;
- other forms of restructuring.

In domestic economic history, the following stages of restructuring can be distinguished:

Stage I (mid-90s) - the restructuring involved the settlement of a company's debt (usually to the federal budget) using various financial instruments, sometimes with a corresponding change in the company's ownership structure;

Stage II (late 90s) - the restructuring was mainly limited to the use of traditional measures for crisis management;

Stage III (early 2000s to the present) - restructuring is considered a necessary and effective tool for improving business competitiveness using a set of tools that are currently used in developed countries.

The current stage of enterprise restructuring characterize by the following features:

- various forms of enterprise organization;

- flexible structure, focused on immediate response to changes in the external environment;
- development of horizontal corporations and networks; the priority of external relations and the widespread use of business logistics principles.

If the traditional approach to enterprise restructuring results from an analysis of its internal environment, taking into account the external environment, then the modern approach considers a combination of three interrelated components: the external environment, the business environment and the internal environment.

Results

During the study the authors analyzed the process and results of the reorganization of the institutional structure of the Russian Academy of Sciences, where the Federal Agency for Scientific Organizations (FASO of Russia) created new types of scientific organizations (Decree of the Government of the Russian Federation of October 25, 2013 No.959):

- 1) federal research centers (FRC) - are created by combining several institutes to carry out breakthrough research and practical developments in strategic importance areas for the country, including the achievement of significant results in the implementation of national priorities;
- 2) national research institutes (NRI) - are designed to perform basic research; are created on the basis of existing academic institutions - leaders in certain scientific areas;
- 3) federal scientific centers (FSC) - are primarily innovative, are created to develop and provide scientific support for the introduction of critical technologies for the modernization of industrial production;
- 4) regional scientific centers (RSC) - should be aimed at ensuring the integrated development of territories, including various industries, are created by combining separate scientific institutions located in the same territory;
- 5) higher schools of public (humanitarian) knowledge (higher schools of the Russian Academy of Sciences) - conduct research in the field of humanitarian, political, philosophical, historical sciences, as well as provide expert and analytical support

for the activities of public authorities (Guidelines for the participation of scientific organizations subordinated to the Federal Agency of Scientific Organizations in restructuring projects, 2017).

The restructuring of the network of scientific organizations was initiated under the instructions of the President of the Russian Federation of December 27, 2014 following the meeting of the Council for Science and Education under the President of the Russian Federation of December 8, 2014 and provides for the integration of intellectual resources and scientific infrastructure.

Following the meeting of the Council for Science and Education under the President of the Russian Federation of 01.21.2016, the President of the Russian Federation instructed to take measures to accelerate the restructuring of the network of scientific organizations subordinate to the Federal Agency for Scientific Organizations of Russia.

The Federal Agency for Scientific Organizations of Russia highlighted the following main problems in its responsibility area that necessitated the need for systemic changes:

- negative dynamics of reproduction of scientific personnel;
- lack of a system order for the results of scientific activities;
- general deterioration of scientific equipment;
- insufficient financing of academic science;
- isolation of professional communications of scientific organizations;
- lack of goal-setting in the planning of science to achieve national priorities (Mindeli & Chernykh, 2015).

The Federal Agency for Scientific Organizations of Russia has sent to the heads of the institutions the Guidelines for the participation of scientific organizations subordinated to the Federal Agency of Scientific Organizations in restructuring projects (2017), where explained

** the 3rd category - organizations that do not show significant scientific results and are not unique in the according industry, that has lost their scientific activities as the main activity.

* the 1st category is the scientific organizations – leaders of the industry (scientific

the procedure for the implementing measures for the preparation and conduct of restructuring:

1. Plan of restructuring of organizations of the Federal Agency for Scientific Organizations.
2. Algorithm for coordinating restructuring projects initiated by organizations.
3. Stages of restructuring.
4. Forms of submission of structural changes' drafts.

These recommendations set the goal of structural transformations - the formation of effective research teams, large centers of competence, ensuring the implementation of new interdisciplinary research and scientific and technical projects, the consolidation of scientific infrastructure.

The main principles of restructuring are:

- 1) focus on state priorities;
- 2) program-oriented and project approach;
- 3) geographical localization in the interests of solving region's significant socio-economic problems;
- 4) scientific infrastructure's effective use;
- 5) administrative costs reduction;
- 6) restructuring is made on the basis of proposals of the scientific institutions themselves, open public discussion of their programs;
- 7) interdisciplinarity and multidisciplinary of scientific and scientific and technical projects;
- 8) the possibility of joining the scientific institutions, attributed to the 3rd category as a result of their performance evaluation** to the leading organizations*, is taken into account.

The conditions for restructuring are:

1. Equal rights of all institutions involved in restructuring.
2. Carrying out restructuring with the consent of research teams of scientific institutions.
3. Preservation of scientific schools.

direction) in the Russian Federation, the results of the scientific organization significantly exceed the values for the reference group, correspond to the world level, and it has the potential for further development and improvement of its activities.

4. The accession of scientific institutions to another scientific institution, the latter should have significant human, material and technical and management potential (the leading organization).

Restructuring was made in several stages:

- 1) The first 5 pilot federal research centers were organized on the basis of the Federal Agency for Scientific Organizations' orders dated 2014 (Federal Research Center N. I. Vavilov All-Russian Institute of Plant Genetic Resources, Federal Research Center Institute of Cytology and Genetics of Siberian Branch of the Russian Academy of Sciences, The Federal Research Centre "Fundamentals of Biotechnology" of the Russian Academy of Sciences, Federal Research Center Informatics and Management of the Russian Academy of Sciences, Federal Research Center Research Institute for System Studies of the Russian Academy of Sciences);
- 2) 13 centers were organized on the basis of the Federal Agency for Scientific Organizations' orders dated 2015, 3 of which were additionally restructured: 1 - in 2016 (Federal Scientific Center "All-Russian Research and Technological Institute of Poultry" of the Russian Academy of Sciences), 1 - in 2017 (Federal Research Center "Kola Scientific Center of the Russian Academy of Sciences") and 1 - in 2018 (Federal Research Center for Nutrition, Biotechnology and Food Safety);
- 3) 17 centers were organized on the basis of the Federal Agency for Scientific Organizations' orders dated 2016, 3 of which were additionally restructured: 1 - in 2017 (All-Union Research Institute of Agricultural Mechanization) and 2 - in

2018 (I.V. Michurin Federal Research Center, Federal Altai Agrobiotechnology Research Center);

- 4) 29 structures were organized on the basis of the Federal Agency for Scientific Organizations' orders, dated 2017;
- 5) 4 structures were organized on the basis of the Federal Agency for Scientific Organizations' orders dated 2018 (A.K. Chaika Federal Research Center for Agrobiotechnology of the Far East, Federal Agricultural Research Center of the Republic of Dagestan; Orenburg Federal Research Center of the Ural Branch of the Russian Academy of Sciences, Federal Research Center for Bast Crops).

The reorganization of all institutions of science was made by joining the other scientific organizations to the base one. As a result, almost all created structures were assigned new names. The exception was the State Public Scientific-Technical Library of the Siberian Branch of the Russian Academy of Sciences and the Federal State Budgetary Institution "Institute for Problems of Regional Economics" of the Russian Academy of Sciences, that retained the names of the basic organizations to which the Siberian Scientific Agricultural Library and the St. Petersburg Economics and Mathematics Institute of the Russian Academy of Sciences were joined, respectively.

Scientific organizations from 58 subjects of the Russian Federation were involved in the process of restructuring. About 28% of organizations were located in the Central Federal District, while Moscow accounted for 10.5% of all restructured organizations, 17.9% and 17.3% of organizations were in the Siberian and Volga federal districts, respectively (figure 1).

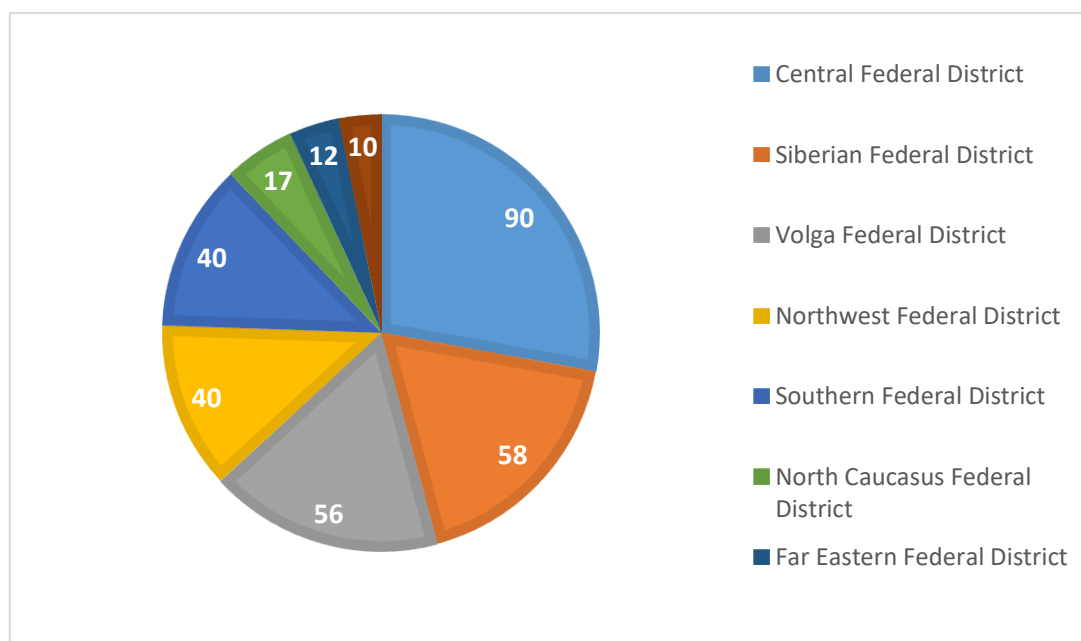


Figure 1. - Distribution of scientific organizations that were involved in the restructuring, by federal districts

In terms of regions, Moscow has the absolute majority of restructured organizations - 34 organizations have been restructured. It should also be noted that scientific institutions from many regions were actively participated in restructuring: from the Moscow region - 23 organizations, from the Novosibirsk region - 20 organizations, from the Republic of Bashkortostan - 15 organizations, from the Rostov region and the Krasnodar region - 14 organizations each, the Primorsky, Altai and Krasnoyarsk regions - 12 organizations each. In the remaining 49 regions whose academic institutions have been participated in the restructuring process, less than 10 organizations were involved.

46 structures formed as a result of the restructuring consist of scientific organizations from one region, 8 structures consist of organizations from several nearby regions, one structure consist of organizations from one subject of the Russian Federation, that has in its structure the another subject of the Russian Federation (Nenets Autonomous district is the part of the Arkhangelsk region) and 13 structures consist of the organization from unrelated territorial localization of regions.

After the reform, the scientific structures of various organizational and legal forms (68 structures) were created (figure 2).

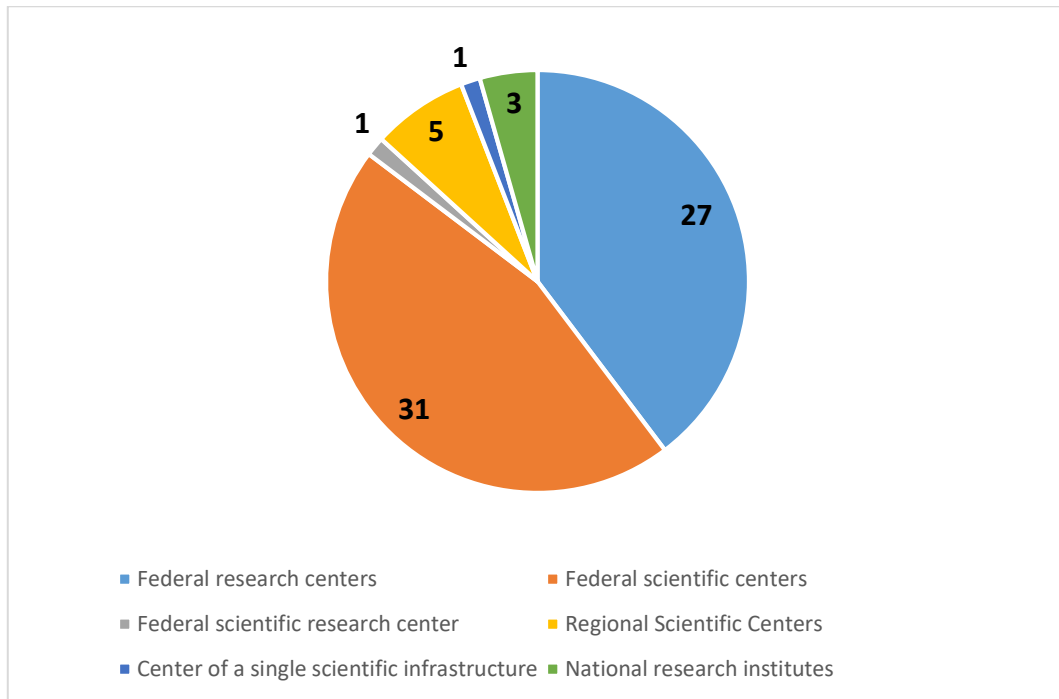


Figure 2. - Distribution by organizational forms

According to the data available in the Federal Monitoring System on the Performance of Scientific Organizations (address, research directions, category), the following key principles and conditions for the structural

transformation of scientific organizations were identified: low performance of a number of scientific organizations, geographical localization, interdisciplinarity of research, close / complementary research topics (figure 3).

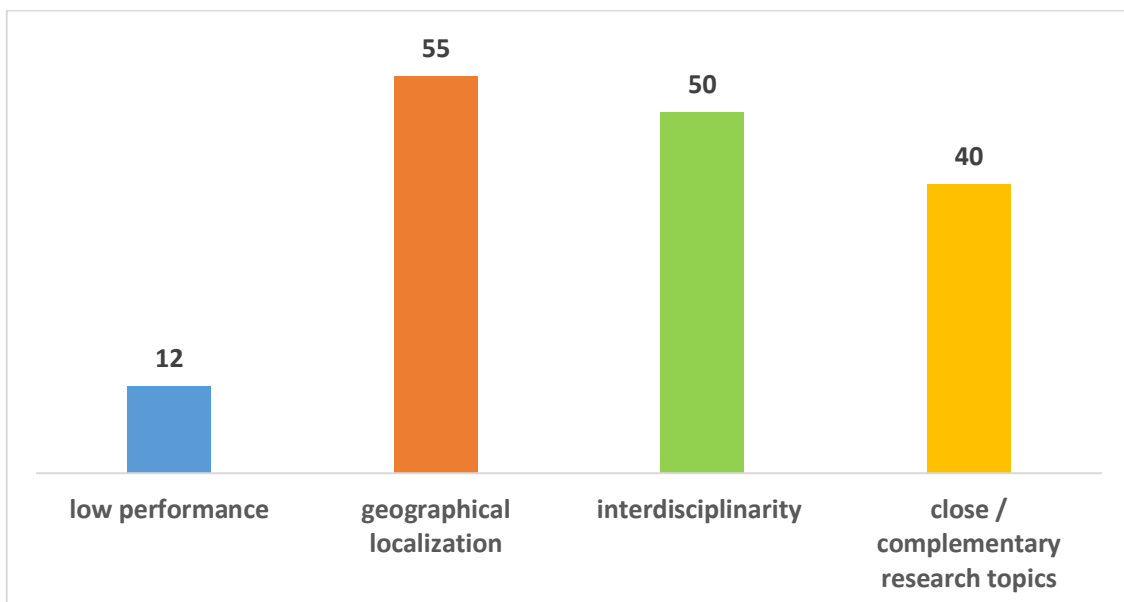


Figure 3. - Key principles and conditions for the structural transformation of scientific organizations

The bulk of the transformation of the ongoing restructuring took place in such areas as biotechnology and research for the agro-industrial complex, medicine, and interdisciplinary research.

17 of the 68 created complex centers are agrarian. Such centers provide scientific support for major agricultural sectors.

In addition, there are centers for computer science and computing (4), medicine (3), economics (2), genetics (2), and others, as well as complex centers for problems of individual regions (Kola, Vladikavkaz, Kabardino-Balkaria, Krasnoyarsk, Komi, North Caucasus, Udmurt, Krasnodar, Vologda, Kazan, Perm, Tyumen, East Asia, Ufa, Karelian, South, etc.).

When the Russian Academy of Agricultural Sciences and the Russian Academy of Medical Sciences were included in the Russian Academy of Sciences, all organizations of the scientific infrastructure turned out to be there - breeding stations, medical clinics, etc. As a result of the restructuring, these organizations were mainly attached to the institutions they previously worked for. Their task, for example, in the case of the Russian Academy of Agricultural Sciences, is to maintain the fields, equipment, seeds, keep track of the breeding animals, and engage in selection. Naturally, not all of them, performing the functions assigned to them, remained commercially successful. In addition, such organizations has not active publish activity, did not fulfill scientometric indicators and, for the most part, were ineffective.

49 stations were restructured during the reform. The largest number of them is in the same organization at the N. I. Vavilov Federal Research Center All-Russian Institute of Plant Genetic Resources - 8 experimental stations; at the Federal Scientific Center for Agroecology, Integrated Land Reclamation and Protective Forestry of the Russian Academy of Sciences and at the Federal Scientific Center for Vegetable Growing - 7 stations, respectively.

Additionally, an analysis of organizations by fields of science was made. The distribution of scientific structures created by restructuring by areas and branches of science was also made according to the Federal Monitoring System Of Scientific Organizations data, where each organization chooses itself the list of rubricator codes reflecting its scientific directions, and thus determines its own industry group (or several groups where organization was assessed).

The largest number of created structures perform researches by the fields of science from the enlarged groups "Natural and Exact Sciences" (44) and "Agricultural Sciences" (44), the smallest - in the fields of sciences from the enlarged group "Humanities" (10).

Biological sciences (34) prevail among natural sciences; electrical engineering, electronic

engineering, information technologies (8) prevail among in the Technique and Technology group; fundamental medicine (9) prevail among Medical Science and Public Health group; agriculture, forestry and fisheries (35) prevail among the agricultural sciences group; economics and business (15) prevail among the social sciences group; history and archeology (8) and the humanities (8) prevail among the humanities group.

To analyze the impact of the restructuring on the performance of scientific organizations, the reporting data of these organizations from the Federal system of monitoring the performance of scientific organizations performing research, development and technological work for 2013-2017 were analyzed.

It was proposed to compare the total reporting data of organizations on key scientometric, financial and personnel indicators from 2013 till restructuring time and data provided by the reorganized structure over the next (at least two) years to assess the nature of the impact.

The sample included 101 scientific organizations that were transformed into 22 structures. For the analysis, those organizations were selected for which complete data are available for the entire study period and that were restructured in 2014-2015.

For all indicators of organizations, their dynamics were evaluated, which allowed them to be included in the following groups:

- stable growth - a gradual increase in the indicator throughout the period under consideration;
- relative growth - immediately after the reorganization, a decrease in the indicator may be observed, while its value in the reporting period is higher than it was before the organizational measures;
- dynamics is absent - the value of the indicator has not changed, in some cases it remains equal to zero;
- relative decrease - immediately after the reorganization, an increase in the indicator may be observed, while its value in the reporting period is lower than it was before the organizational measures;
- stable decrease - a gradual decrease in the indicator throughout the period under consideration.

Let's combine for convenience the categories of stable and relative growth into "growth" group,

and a stable and relative decline into “decline” group. The results are shown in Table 1.

Table 1. - Estimation of scientific organizations number by the dynamics of changes in key indicators

Indicator	Stable growth	Relative growth	Dynamics is absent	Relative decline	Steady decline
The number of organization's publications in the Web of Science	12	4	1	3	2
The number of organization's publications in the Russian Science Citation Index	5	6	0	5	6
Citedness in the Web of Science	10	5	2	2	3
Citedness in the Scopus	9	8	2	3	0
Citedness in the Russian Science Citation Index	20	2	0	0	0
Aggregate impact factor of journals where organization's articles were published	5	5	0	7	5
The total number of scientific, engineering and technological works	3	6	1	7	5
The number of created intellectual activity results	1	2	2	12	5
The number of used results of intellectual activity	2	6	7	5	2
The number of small innovative enterprises created with the organization participation	1	1	14	6	0
The total average number of employees of small innovative enterprises	0	2	9	8	3
The financial performance of a scientific organization by sources of income aimed at financing science, including funds received:	0	6	0	9	7
<i>to fulfill state assignments</i>	3	6	0	6	7
<i>on a competitive basis from budgets of all levels</i>	5	7	1	4	5
<i>on a competitive basis from extrabudgetary sources</i>	1	3	3	10	5
<i>from foreign sources</i>	3	3	9	5	2
<i>from extrabudgetary sources for other purposes</i>	1	5	0	10	6
Financial performance of a scientific organization by types of performed work and rendered services, including					
<i>research and development</i>	6	8	0	5	3
<i>scientific and technical services</i>	1	4	4	11	2
<i>from the use of intellectual property</i>	0	1	15	5	1
<i>educational services</i>	4	8	4	5	1
<i>goods, works and services of an industrial nature</i>	1	3	9	6	3
<i>other incomes not related to scientific, scientific and technical services and developments</i>	2	3	1	11	5

The number of students performing qualifying work on the organization's basis	1	4	0	9	8
<i>graduate students</i>	1	3	0	10	8
<i>doctoral students</i>	0	2	13	5	2
The number of defended dissertations, including	0	2	13	5	2
<i>candidate's dissertation</i>	1	3	3	10	5
<i>doctoral dissertation</i>	1	3	10	7	1
Number of articles prepared jointly with foreign organizations	3	10	1	8	0
Number of scientific conferences with international participation held by the organization	0	1	10	8	3
Number of popular science publications made by organization's employees	0	2	3	14	3
The number of positive and neutral references to the organization in the media of the federal level	6	5	0	9	2
Average number of employees	3	7	0	3	9
The number of employees performing research and development, including:	7	8	0	3	4
<i>Researchers, among them</i>	1	6	0	6	9
<i>candidates of science</i>	4	4	0	8	6
<i>Doctors of Science</i>	4	2	1	9	6
<i>under the age of 39</i>	4	3	0	8	7
The cost of fixed assets and intangible assets, including:	1	0	0	17	4
<i>buildings and structures</i>	1	2	0	4	15
<i>machines and equipment</i>	1	2	0	15	4
<i>intangible assets</i>	2	4	2	7	7
Inner current expenditure on research and development, including:	5	4	0	5	8
<i>basic research</i>	4	7	0	8	3
<i>exploratory research</i>	0	1	13	8	0
<i>applied research</i>	3	6	1	9	3
<i>experimental development</i>	1	7	4	7	3
External research and development costs	1	4	4	7	6
Labor costs for employees performing research and development	10	4	0	4	4

The table data analysis shows that most of the studied indicators show a negative trend, which indicates that the reorganization measures at the first stage did not give a positive effect, moreover, they show negative trends on a quantitative level. This may be associated with the stage of adaptation and the presence of internal organizational difficulties in management, which is due in some cases to the merger of substantially different structures that has their own organizational culture, environment, management style.

Detailing the analysis of the calculations, most of the studied organizations show an increase (relative growth) of indicators:

- the number of organization's publications in the Web of Science;
- citedness in the Web of Science, in the Scopus, in the Russian Science Citation Index;
- amounts of funding received on a competitive basis from budgets of all levels;

- the amount of funding for research and development;
- the volume of provided educational services;
- number of articles prepared jointly with foreign organizations;
- number of employees performing research and development;
- labor costs for employees performing research and development.

The growth of indicators characterizing the publish activity is noted in the majority of the studied organizations, first of all, in the citedness of publications, that is an objective trend. At the same time, the dynamics of the number of publications in the Russian Science Citation Index is negative, which shows negative trends to a certain extent.

As for the created results of intellectual activity, their number has decreased in the overwhelming majority of the studied organizations, while the number of used ones is increasing in half of them. This trend can be explained by the fact that scientific reserves are formed in the newly created structures, and the use of previously created results indicates their relevance for the purposes of commercialization.

The indicators characterizing the financial performance (funding), as well as internal expenditures on research and development, in aggregate decreased in the majority of the studied organizations, that is associated with a general reduction in state funding of science, while indicators that were above has been higher in the most of the combined organizations. These include, in particular, the amounts of funding received on a competitive basis from budgets of all levels. On the one hand, this characterizes the higher competitiveness of the united structures, since it is necessary to demonstrate scientific groundwork in the format of the work performed (services rendered), availability of publications on the issue, objects of intellectual property in order to win the contests. At the same time, it is noted that in the country on the whole, there is the dynamics of the shift of the financing vector of scientific activities towards the competitive one.

It is noted that the majority of scientific organizations have increased the number of employees performing research and development, that is a positive trend, since often reorganization measures are accompanied by a reduction in staff. In this case, a decrease in the values of indicators characterizing the average

number of employees in most scientific organizations is stated, which, respectively, is due to the reduction of administrative and managerial and support staff and can be assessed as a positive trend from a management point of view.

The increase in labor costs is due to the need to fulfill the "May decrees" of the President of the Russian Federation to ensure high remuneration of research workers, and is also associated with an increase in research staff in most scientific organizations that have been reorganized.

A decrease in the value of fixed assets and intangible assets is observed in the overwhelming majority of the studied organizations, that is associated with their deterioration and insufficiently active updating after the reorganization measures. This raises certain concerns, since most of the reorganized structures conduct research and development in areas that require modern scientific equipment, which using determines the quality and competitiveness of the research.

Despite the growth of the indicator characterizing the volume of provided educational services in the majority of organizations, it is noted that the number of defended dissertations, as well as students in postgraduate and doctoral studies, has been decreased. This can be explained by the fact that the reorganization measures affect the system of dissertation councils, as well as by the fact that postgraduate studies, recognized as the third level of higher education, are subject of accreditation expertise conducted by the Federal Service of Supervision in the Sphere of Education and Science, to which scientific organizations in some cases are not ready.

There is also a negative trend of reducing the number of scientific conferences held by organizations and the number of popular science publications, that is due to the objective adaptation period of new structures, as well as, probably, in some cases, the integration of individual events into larger and higher status ones.

Thus, the preliminary results of the reorganization of scientific organizations, which was made by the Federal Agency for Scientific Organizations of Russia, demonstrate ambiguous trends, including in most cases a decrease in individual quantitative indicators characterizing the activities of the structures. As it was noted, for this there are both objective and subjective factors that must be taken into account in the

analysis. At the same time, it is stated that the time period is not long enough to ensure the adequacy of the estimates for summing up the results of taken measures.

Discussion

The restructuring of the network of S&T organizations has been conducted by many countries in the world during the long history of S&T development.

Bach (2018) described the restructuring of a network of scientific organizations in China and Japan, the key area of which was the organization of structures integrated with the real sector of the economy. In fact, public sector research organizations (it is universities in Japan) were transferred to companies that were provided with state support for the development of specialized research.

The author, in particular, indicates that liquidation and merger measures are most often applied to those scientific and technical organizations that function inefficiently or do not work in priority sectors for the state, that is also characteristic of reorganization activities in the Russian Federation (Bach, 2018).

Issues related to the consequences of restructuring for the of organizations' staff remained beyond the scope of the study, since changes and the situation of uncertainty has the bad effect on the creative activity of employees, which is especially significant for scientific organizations (Maltseva et al., 2017).

As noted in Shah (2006) studies, organizational restructuring will bring some uncertainty, especially initially, due to unfamiliarity with new administrative structures and work systems.

There are different and varying results, from organizational studies done on restructuring, show that the effects of organizational restructuring on employees are far from straightforward (Kurgat, 2016).

Restructuring or any change in organizational structure can be threatening and can be harmful due to actual or perceived loss which incites emotional distress and can leave the individuals unmotivated (Fleming, 2017).

Conclusion

Thus, as a result of the analysis of the scientific organizations restructuring that were previously

been under the jurisdiction of the Federal Agency for Scientific Organizations of Russia and provided information to the Federal Monitoring System of Scientific Organizations, the following conclusions can be made:

- 68 complex centers created on the basis of academic institutions were identified. After the restructuring this centers included 323 scientific institutions that were previously been under the jurisdiction of Federal Agency for Scientific Organizations of Russia and provided information to the Federal Monitoring System of Scientific Organizations;
- restructuring was made in several stages on the basis of orders of Federal Agency for Scientific Organizations of Russia, dated 2014-2018;
- reorganization of all institutions of science was made by joining the other scientific organizations to the base one;
- scientific organizations from 58 subjects of the Russian Federation were involved in the process of restructuring, moreover 10.5% of all restructured organizations were located in Moscow;
- the structures created after restructuring include organizations from one region, organizations from several nearby regions, organizations from regions that not connected with the territorial localization;
- created scientific structures has the following organizational forms: the federal research center (FRC), the federal scientific center (FSC), the federal scientific research center (FSRC), the regional research center (RRC), the national research institute (NRI) and the center of a unified scientific infrastructure; the federal scientific centers were created most of all – 31 centers and 27 federal research centers were created;
- the following key principles and conditions for the structural transformation of scientific organizations were established: low performance of a number of scientific organizations, geographic localization, interdisciplinarity of research, close / mutually complementary research topics; the principle of geographical localization played an important role more often than others principles, and it was the guide during the creation of 55 complex centers;
- the main volume of transformations during restructuring was in the agro-industrial complex; 17 of the 68 created complex centers are agrarian;

- restructuring of academic organizations was aimed at creating conditions for the creative work of scientists and conducting interdisciplinary research;
- 40 of the 68 scientific organizations (centers) created during the reform has similar scientific topics, some of this centers were organized according to the principle of uniting specialized institutions;
- after the restructuring the most scientific organizations has the resulting indicators lower than the total values of individual structures before the restructuring measures, that is associated with objective and subjective factors.

Thus, the reorganization of scientific organizations in the Russian Federation, caused by objective prerequisites and subjective factors, ensured the creation of fundamentally new types of research structures, and the results of the activities that were made cannot be fully evaluated, since the time period since their implementation is not sufficient for adequate conclusions about effectiveness. It is required a complete qualitative and quantitative study in 3-5 years of the results of the activities that were made.

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