



# АКТУАЛЬНЫЕ ПРОБЛЕМЫ ГОСУДАРСТВЕННОГО УПРАВЛЕНИЯ

## CURRENT PROBLEMS OF PUBLIC ADMINISTRATION

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### “Green” Economy in the Russian Regions’ Development Strategies

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**Abstract.** This article presents the results of the «green» economy public administration general trends study. Besides, «green» economy is characterized as a special type of economic activity based on various biotechnologies and aimed at solving urgent environmental problems. It is emphasized that according to a number of foreign publications and domestic regulatory documents, the biotechnological tools used in the «green» economy framework are largely focused on the processing of agro-industrial and household waste in combination with the biofuels production. According to the lexicometric analysis results, it is shown that the «green» economy problems are already in the field of view in almost half of the Russian Federation subjects. At the same time, special attention is drawn to four regions (two regions — Kemerovo and Kursk, as well as two republics — Buryatia and North Ossetia-Alania), where long-term state regulation of the «green» economy development is carried out within the special laws on socio-economic development strategies framework. As a result, it is noted that the «green» economy has broad application prospects in various regions of the Russian Federation, in particular, in order to reduce anthropogenic pressures on the environment and ensure sustainable development.

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## Introduction

The terms bioeconomics, “green” industry, “green” economy and “green” technologies have become widely used in the scientific literature, especially at the beginning of the third decade of the XXI century [1; 2; 3; 4]. In particular, the “green” economy is characterized as a set of measures implemented in accordance with various state projects and development programs that are aimed at improving the citizen’s quality of life while preserving or even improving the environment [3].

In many Western countries as well as the Russian Federation, the “green” economy is usually associated with the need to comprehensively solve environmental problems. Thus, a large-scale medium-term national project “Ecology” has been implemented in our country for several years, including several sections directly related to the “green” economy [5]. The cited authors presented analytical materials on the implementation of this and some other federal projects for the period 2019–2022 and additionally until 2026. In addition, there are separate regional and municipal programs for the development of a “green” economy in our country [6].

It is believed that public administration and the use of modern effective biotechnologies are of crucial importance for the development of the “green”

economy. Accordingly, the purpose of this work was to study the general trends currently developing in the public administration of the “green” economy, as well as certain aspects of applied biotechnologies in our country and abroad.

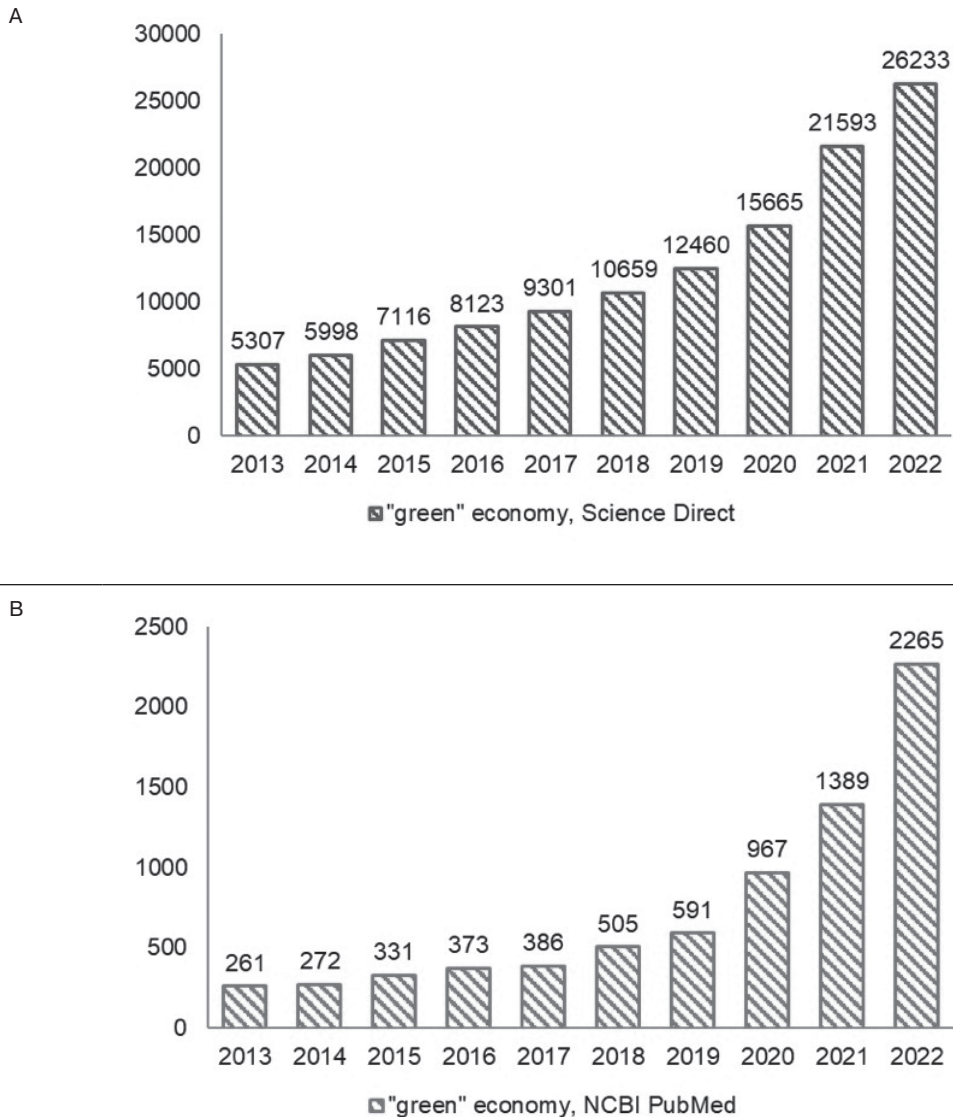
The study was conducted on the basis of information from a number of regulatory legal acts of the Russian Federation, as well as materials from domestic and foreign documents of ministries and departments. In addition, publicly available data from international associations were analyzed: the World Health Organization, the United Nations UNICEF, the World Trade Organization and others. In particular, the selection of materials was carried out in several publicly available databases (ScienceDirect, PubMed NCBI, and the national Scientific Electronic Library). The collected information was studied using expert assessment methods, as well as using bibliometric and lexicometric analysis [4; 7].

### **“Green” economy for achieving sustainable development goals**

The United Nations Conference on Sustainable Development and the resolution of the UN General Assembly adopted in 2015 contributed to a qualitative change in attitudes towards the “green” economy in the second decade of the XXI century. This resolution contained the wording of seventeen goals (“Sustainable Development Goals”), the achievement of which could reduce the existing problems associated with a high anthropogenic load on the environment Wednesday. It was assumed that the formation of a “green” economy was required for a number of designated purposes.

As a result, the “green” economy was to become an important component in the economic activities of many states, contribute to increasing the level of national welfare and bring the national economy closer to achieving the Goals of Sustainable Development. The results of the relevant work related to the state management of the “green” economy in the Russian Federation and abroad are reflected in various publications, for example [5; 6; 8]. In general, over the ten-year period (2013–2022), the number of annual publications containing the keywords “green economy” in the large publicly available databases (ScienceDirect, PubMed NCBI) increased by a multiple (Fig. 1). Thus, in the ScienceDirect database there is an almost fivefold increase

(from 5,300 publications in 2013 to 26,200 in 2022), and in the PubMed NCBI database — more than eight-fold (from 260 publications in 2013 to 2260 in 2022). At the same time from Fig. 1 it is also evident that over the three-year period (2020–2022), the growth in the number of annual publications began to acquire an exponential character.

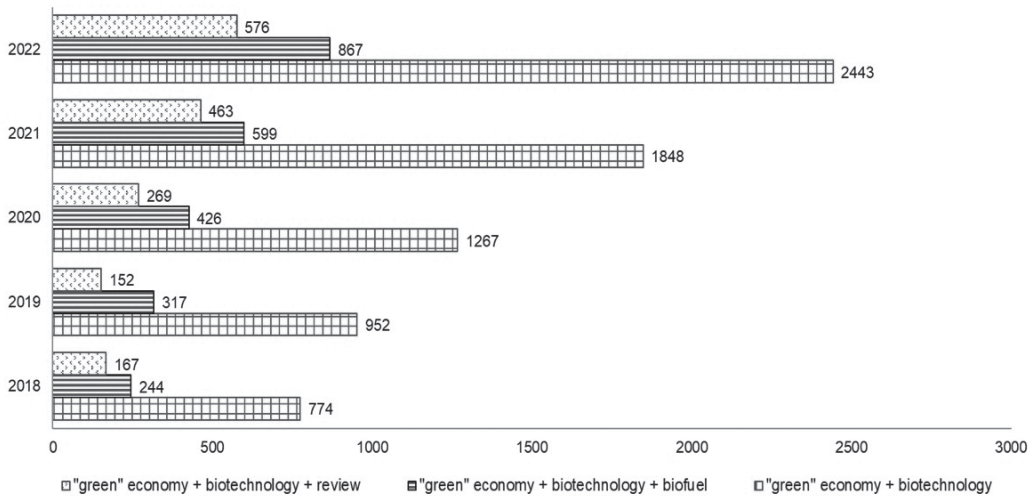


**Fig. 1.** Annual publications containing the keywords «green» economy» number dynamics (on databases), 2013–2022

Source: own research, 2023.

Thus, from the data presented in Fig. 1, it follows that by now there has been a steady trend towards expanding research on various aspects of the “green” economy.

Naturally, the observed growth of such work is based on the need to solve urgent environmental problems (In particular, the processing of agro-industrial waste and the production of biofuels). At the same time, special technological tools (represented by numerous biotechnologies) are used in combination with appropriate effective management mechanisms [9]. Hundreds of publications, including profile reviews, are devoted to this issue every year (Fig. 2).



**Fig. 2.** Bibliometric analysis of the results on the ScienceDirect database materials (by keywords), 2018–2022

Source: own research, 2023.

From the diagram presented in Fig. 2, it can be concluded that in the world literature for the period 2018–2022 there was a clear trend of increasing attention to biotechnologies that are focused on solving the problems of the “green” economy, including the production of biofuels.

## Biotechnologies for the “green” economy

In the second decade of the XXI century, certain ideas have developed that it is the complex of biotechnologies that are being created that can ensure global economic growth, create new jobs, and prevent environmental degradation due to anthropogenic activities, in other words, create conditions for sustainable development. For example, Gartland K.M. et al. [10] in their review paper with the telling title “Moving towards the ‘Golden Age’ of biotechnology” noted that biotechnologies use renewable resources — substances, materials or extracts obtained from living cells, thanks to which 22 million jobs have already been created for Europeans.

The biotechnological tools used in the framework of the “green” economy are focused on solving many environmental problems. Among them, efforts to recycle plastic and organic waste (agro-industrial and household), to treat wastewater with the production of economically valuable by-products, including biofuels, as well as the utilization of greenhouse gases [2; 11] and bioremediation [12] are particularly noted.

Describing the role of biotechnologies in the development of the “green” economy, it seems important to emphasize that the scale of environmental degradation due to anthropogenic activities has now reached such limits that require solving not only issues related to the accumulation of various wastes, but also the organization of effective systems for their processing [13]. Moreover, the current situation is beginning to threaten people’s health. For example, it became known that particles of the so-called “microplastics” (which is formed from polyethylene products, as well as from other sources) are able to penetrate into the human body with water, food and air. As a result, “microplastics” are already found in the lungs and blood of people [14].

The analysis of numerous publications that appeared over the period 2018–2022 with the keywords “green economy” and “biotechnology” (Fig. 2) [13; 14; 15], gave grounds to identify two main approaches that differ in some accents in the use of biotechnologies for the “green” economy. One of them has a direct technological focus and ensures the development of the “green” economy by expanding the range of objects that can be processed and the resulting by-products. The second is characterized by an emphasis on the raw

materials used. Thanks to this raw material approach, there is a fundamental change in the nature of the materials used in the production of goods, for example, biodegradable raw materials are being used (as an alternative to plastics obtained from fossil raw materials).

Modern biotechnologies have provided a wide range of tools focused on solving many environmental problems within the framework of the “green” economy. At the same time, existing biotechnological approaches allow both to process unclaimed resources to obtain economically valuable by-products (that is, to ensure a closed production cycle) and to form a specific industrial symbiosis [16]. It is believed that industrial symbiosis is formed as a special direction in the organization of economic activity and involves the development of associations of economic entities to achieve a competitive advantage through the exchange of materials, by-products and other products for subsequent processing.

Apparently, in the near future, significant progress can be expected from the development of biotechnologies, taking into account the achievements of modern life sciences (omics technologies, methods of metabolic engineering, synthetic biology, microbial engineering, etc.). Accordingly, the “green” economy will also receive a new impetus to development in many countries, including Russia.

### **State management of the “green” economy in certain regions of Russia**

To assess the state of the “green” economy in certain regions of Russia, a lexicometric analysis was carried out (according to [7]) to determine the frequency of occurrence of the corresponding keywords. The analysis covered the current strategies of socio-economic development of 85 subjects of the Russian Federation. The results are presented in Figure 3. In general, the selected keywords were found in 44 of the 85 analyzed strategies.

Considering the results of lexicometric analysis, four regions of Russia were selected for further research — leaders according to the results of lexicometric analysis (two regions — Kemerovo and Kursk, as well as two republics — Buryatia

and North Ossetia-Alania), whose socio-economic development strategies contained indications of the priority of the formation of a “green” economy. In these regions, since the second decade of the XXI century, long-term state regulation of the development of the “green” economy has been carried out within the framework of special regulatory legal acts [17; 18; 19; 20].



**Fig. 3.** Lexicometric analysis of the Russian Federation regions socio-economic development strategies results

Source: own research, 2023.

So, in the Kemerovo region in 2018, the Law of the Kemerovo region — Kuzbass “On approval of the Strategy of socio-economic development of the Kemerovo region — Kuzbass for the period up to 2035” was adopted [17]. In accordance with this strategy, this region is planned to be turned into a “center of new competencies and jobs of the green economy”. To achieve this goal, it is planned to introduce a number of changes to the legislation of the region. The approved strategy involves the creation of agro-industrial enterprises of waste-free production, as well as the charging of electric energy obtained with the use of “green” technologies, and the placement of “green” bonds. The necessity of forming new, “green” industries and diversification of chemical products obtained from coal was noted.



At the same time, among the regional priorities, the promotion of innovative technologies for water and wastewater treatment using microorganisms and biological reactors, biochemical technologies against micro-pollutants and the construction of enterprises to produce appropriate equipment has been identified, the use of biogas production technologies has been determined. It is gratifying to note that the achievements of biotechnology are supposed to be used in the agro-industrial complex (AIC) of Kuzbass. The development of eco-oriented agriculture is strategically determined, and the use of “green” technologies is declared among the results of the transformation of the agro-industrial complex in 2021–2022.

In addition, it is expected to implement a set of relevant educational and educational activities.

Thus, the adopted Kuzbass development strategy indicates that the state management of the “green” economy is aimed at reducing the negative consequences of the extraction of coal and coking coal — that is, “green” technologies are used in this connotation. It is important to note that legislators, adopting the Strategy of socio-economic Development of the Kemerovo region, considered the development of a “green” economy as a way to improve the quality of life of the local population by overcoming the existing serious environmental problems of the region. For this purpose, the strategic initiative “Clean Coal — Green Kuzbass” is also being implemented within the framework of an appropriate integrated scientific and technical project (CSTP), which is discussed in detail in the work of I.A. Ganieva and co-authors [6].

In the Kursk region, in accordance with the adopted Law “On the Strategy of socio-economic development of the Kursk region for the period up to 2030” [18], the use of “green” technologies is envisaged to increase the productivity of the agro-industrial complex (AIC) and soil reclamation, which is due to the specialization of the economy of this region. At the same time, legislators have planned various public administration measures to implement the principles of a “green” economy.

The chosen strategy (called “Green and Safe region”) is aimed at the implementation of “integrated greening” and the introduction of a system of values for sustainable development. Considering the agricultural profile of the region, the construction of facilities for processing organic waste into biofuels at agricultural enterprises is among the key measures. It is expected that the planned production

will not only allow the disposal of accumulated waste but will also provide energy to areas of the region with decentralized energy supply. It is important to emphasize that the organization of such production will open the way to the disposal of some municipal waste with the production of energy. Moreover, in the Kursk region, it is planned to use bioremediation methods for water, soil and atmosphere purification, as well as the transition to the use of biodegradable analogues of some traditional types of plastic.

The Law of the Republic of Buryatia “On the Strategy of socio-economic development of the Republic of Buryatia for the period up to 2035” [19] states that this region has a number of important conditions for the development of a “green” economy. The proposed strategy was based on the principle of “the trinity of nature, man and economy”, which provided for the widespread use of renewable energy sources and the introduction of new technologies in the agro-industrial complex. At the same time, special attention was paid to the production of biofuels from low-grade wood and sawmill waste.

The adopted strategy focused, in particular, on the use of “green” technologies in animal husbandry, which was considered as a means of strengthening economic ties with border territories, including foreign ones. According to the developers, such cooperation could become a special “point of growth” and help attract investment. An important distinctive element of the strategy of socio-economic development of the Republic of Buryatia is undoubtedly the section on the application of “green” principles to the creation of ethno-cultural centers on Lake Baikal.

The strategy of socio-economic development of the Republic of North Ossetia Alania (RSOA) set out in Law No. 60-FZ of 18.09.2019 [20] proceeds from the need to form an economy based on knowledge and the development of the so-called sixth technological order (with nano- and biotechnologies). Among the general tasks to combat the manifestations of negative anthropogenic impact on the environment, this strategy places special emphasis on work related to reducing carbon dioxide emissions and reducing the economy’s dependence on hydrocarbon raw materials. The solution of this task is supposed to be provided through the implementation of the “Green Energy Cluster” program (wind, hydro, solar and geothermal energy), which should be based on the production of appropriate equipment and the

introduction of new methods of managing energy networks. At the same time, it was expected to achieve the overall goal of greening industry through the widespread use of agro- and biotechnologies.

Special attention in the strategy under consideration deserves sections (for example, “Industrial ecology and biotechnology”), which provide targeted training of personnel with the necessary knowledge of biotechnology in secondary and higher education programs.

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A comparison of the four regional programs discussed above, containing plans for socio-economic development, indicates the presence in each of them of tasks that are proposed to be solved with the help of a “green” economy. At the same time, each of these programs has characteristic differences due to the prevailing conditions of economic activity in the region and its geographical features.

However, most of the documents studied indicate the emergence of significant financial burdens necessary for the development of a “green” economy, the implementation of appropriate innovative solutions and their implementation in practice. As a result, it is expected that effective public administration will overcome the existing difficulties, which include, in particular, the lack of special industrial equipment for mass production of “green” products, insufficient level of infrastructure development and interregional ties.

### **Conclusion**

The “green” economy, which is described as a special type of economic activity based on a variety of biotechnologies and aimed at improving the quality of life of people while preserving or even improving the environment, has been the subject of numerous studies published in 2018–2022. These studies are actively conducted both abroad and in the Russian Federation. They, as a rule, have an interdisciplinary character, which is reflected in the studied issues related to postgenomic scientific disciplines and/or applied tasks directly related to industrial production.

Based on the results of the analysis of works reflecting the development of the “green” economy, it was possible to distinguish two approaches that differ in the

target settings in the application of biotechnologies. One of them (technological) is focused on expanding the range of products obtained, and the second (raw materials) is associated with the involvement in the processing of fundamentally new materials, for example, biodegradable raw materials as an alternative to chemically inert plastic. At the same time, agro-industrial enterprises of waste-free production are being created, electric energy is being obtained using “green” technologies and preferential conditions for attracting investments are being provided. Accordingly, to effectively solve various tasks of the “green” economy, adequate public administration is required, both in the form of general large-scale programs and regional projects

In our country, the problems of the “green” economy are in the field of view in almost half of the subjects of the Federation, and some of them consider certain aspects of the “green” economy as priorities in socio-economic development strategies.

Thus, it is obvious that the “green” economy has broad prospects for application in many regions of the Russian Federation, which will contribute to reducing anthropogenic pressures on the environment and achieving sustainable development goals.

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## «Зелёная» экономика в стратегиях развития регионов России

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**Аннотация.** Представлены результаты изучения общих тенденций, складывающихся в государственном управлении «зелёной» экономикой, которую характеризуют как особый вид хозяйственной деятельности, базирующей на разнообразных биотехнологиях и направленной на решение актуальных экологических задач. Подчеркивается, что по ряду зарубежных публикаций и отечественных нормативных документов биотехнологический инструментарий, используемый в рамках «зелёной» экономики, ориентирован во многом на переработку агропромышленных и бытовых отходов в сочетании с производством биотоплива. По результатам лексикометрического анализа показано, что проблемы «зелёной» экономики уже находятся в поле зрения практически у половины субъектов РФ. При этом особое внимание привлечено к четырем регионам (две области — Кемеровская и Курская, а также две республики — Бурятия и Северная Осетия-Алания), где многолетнее государственное регулирование развития «зелёной» экономики осуществляется в рамках специальных законов о стратегиях социально-экономического развития. Как следствие, отмечается, что у «зелёной» экономики имеются широкие перспективы для применения в различных регионах РФ, в частности, в целях снижения антропогенных нагрузок на окружающую среду и обеспечения устойчивого развития.

**Ключевые слова:** зелёная экономика, биотехнологии, биотопливо, стратегии развития, регионы России, промышленный симбиоз, государственное управление

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