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Environmental regulations in Russian food security

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Abstract: The present research features the legal effect of environmental regulation on food security in the Russian Federation. The author analyzed the system of environmental regulation together with its legal instruments, and gave a legal assessment of its efficiency in providing safe environment and food products. The efficiency of the mechanism of environmental regulation affects the safety of products. However, the system of environmental regulation is largely represented by sanitary and hygienic standards and does not fully meet modern challenges. Meant as a basis for environmental and food security, the current environmental regulation takes into account neither local conditions nor the level of aggregate anthropogenic load on environment, thus failing to ensure the production of safe, high-quality food products. The study proves that there is an inextricable link between environmental regulation and environmental safety, which has to be taken into account in state policy planning. By providing environmental safety, environmental regulation serves as the main means of food security. The author proposes to develop legislation on various types of environmental standards that would ensure food quality and security. The measures of food quality and security should be based on the principles of environmentalisation and sustainable agriculture.

Keywords: Ecology, law, environmental regulations, environmental protection, food security, food quality, environment, food, nutrition

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INTRODUCTION

Economic activity produces a negative effect on the natural environment. As a result of prolonged anthropogenic impact, soil, water and other natural resources accumulate harmful substances, which subsequently poison humans and other living organisms. Harmful substances enter human body directly, via air and water, and indirectly, when one consumes products produced in adverse environmental conditions. In the latter case, pollution can take hidden forms and accumulate. As a result, its negative effect on human health can manifest itself in the future.

Economic activity is bound to affect the environment. Thus, there are three main issues in this aspect: 1) how to measure the extent of this effect; 2) how to introduce a scientifically based criterion that would assess the effect on the natural environment and human health; 3) how to minimize the impact of agriculture, industry, energy, etc. on the natural environment and its components.

Environmental regulation seems to provide a legal instrument to handle the matters. According to Russia's 2025 Environmental Security Strategy, environmental regulation is one of its main mechanisms*. Ecological security means protection of the natural environment and vital human interests from the possible negative impact of economic and other activities, as well as emergency situations of natural and man-made character and their consequences [1]. Hence, ecological security ensures a certain level of life quality and allows people to live a full and safe life in the modern world. Ecological security exists along with other types of national security, such as economic, food, etc. No individual can be healthy and successful in an ecologically unfriendly environment. The quality of food one consumes largely depends on the natural factors connected with raw materials, e.g. how they were grown, processed, transported, etc. Even in a man-made environment, it is ecology that determines the effectiveness of all other types of safety.

* Strategiya ehkologicheskoy bezopasnosti Rossiyskoy Federatsii na period do 2025 goda 'O Strategii ehkologicheskoy bezopasnosti Rossiyskoy Federatsii na period do 2025 goda' [Strategy of Environmental Security of the Russian Federation for the period up to 2025. 'On the Strategy of the Environmental Security of the Russian Federation for the Period up to 2025']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2017, no. 17. (In Russ.).

The present study tries to solve the following conceptual problems: 1) Can environmental regulation, as the main legal instrument of environmental safety, ensure food security in modern conditions? 2) If so, what are its legal means and how effective are they?

STUDY OBJECTS AND METHODS

The study features a legal assessment of the efficiency of current environmental regulations that ensure food security in the Russian Federation.

It is based on the legislative idea of environmental regulation as a legal means of a) preserving a favourable environment, b) maintaining its safe level, c) reducing the negative impact of human activity on the environment. The methodological idea behind the research is the interaction of the natural and social environments in human habitat.

The author employed general methods, general scientific cognition methods, and such special legal methods as formal legal, comparative legal, interpretation of law, legal modelling, and legal forecasting methods.

RESULTS AND DISCUSSION

According to Art. 19 of the Federal Law 'On Environmental Protection', environmental regulation prevents and (or) reduces the negative impact of economic and (or) other activities on the environment**.

The legal institute of environmental regulation has a long history. However, disputes regarding its legal nature, legal consequences, and classification do not subside [2–4, 24].

Environmental regulation reached its peak in 1938-1991, when standards for water, air, soil, noise, and vibration were established. Their goal was to protect human health, as well as the genetic fund of flora and fauna. By the beginning of the 1990s, thousands of harmful substances had been standardized.

However, environmental regulation was limited to independent but obligatory sanitary-hygienic rules. They were so tough that business entities simply could not comply with them. As environmental problems became more acute in the late 1980s, the existing approaches to the legal regulation had to be changed.

As a result, 'a compromise was reached between economics and ecology' [5], which was reflected in the Law of the Russian Soviet Federative Socialistic Republic adopted on December 19, 1991, no. 2060-1 'On the Environmental Protection'***. Chapter IV 'Quality regulation of the environment' included the following standards:

– maximum permissible concentrations of harmful substances;
– maximum permissible emissions and discharges of harmful substances;
– maximum permissible levels of noise pollution, vibration, magnetic fields, and other harmful physical factors;
– maximum permissible level of radiation exposure;
– maximum permissible norms for the use of agrochemicals in agriculture;
– maximum permissible residues of chemicals in food;
– maximum permissible norms of environmental load;
– environmental requirements for products, i.e. standards for new equipment, technology, materials, substances, etc.;
– standards for sanitary and protected zones.

However, the standards for the use of natural resources provided by Art. 19 were not directly included in the system of environmental regulation. They were part of the system of limits set up for environmental management.

Most of the standards listed in the law still had a sanitary-hygienic character and defined environmental quality indicators in terms of its safety for human health. Others concerned various activities of economic entities and set environmental restrictions and other requirements for public health hazards. Their goal was to protect the environment and human health [4].

According to Petrov [6], the system of environmental regulation included three groups of standards. The first group included sanitary and hygienic standards. The second group presupposed production and economic standards, which included technology, construction, and urban planning. The third group involved complex standards, e.g. maximum permissible environmental standards, standards for sanitary and protective zones, etc.

Crassov [7] allocated the following types of standards:

1) Environmental standards for maximum permissible concentrations of harmful substances. They included maximum permissible levels of physical impacts on the environment; standards for maximum permissible emissions and discharges of harmful substances; maximum permissible norms of environmental load; standards for sanitary protection zones.

2) Sanitary and hygienic standards. Those stipulated by the Law 'On Environmental Protection' included norms for the use of agrochemicals and standards for maximum permissible residual quantities of chemicals in food. Others were provided by the Law 'On Sanitary-Epidemiological Well-Being of the Population and Sanitary Rules and Norms'.

3) Construction and urban planning regulations. They were part of regulatory and technical documents in the field of construction and included various rules, practices, and standards.

Brinchuk [8, 9] studied the legislation of the period of the Law 'On Environmental Protection' and existing state standards. He defined the following groups of environmental standards:

1) Environmental quality standards, such as maximum permissible concentrations of harmful substances, maximum permissible levels of harmful physical effects on the environment;

2) Standards for maximum permissible harmful effects on the environment, i.e. standards for maximum permis-

** Federal'nyy zakon № 7-FZ 'Ob okhrane okruzhayushchey sredy' [Federal Law No. 7-FL 'On Environmental Protection'. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2002, no. 2, Art. 133. (In Russ.).

*** Zakon RSFSR № 2060-1 'Ob okhrane okruzhayushchey prirodnoy sredy' [Law of the RSFSR No. 2060-1 'On Environmental Protection']. *Vedomosti S"ezda narodnykh deputatov i Verkhovnogo Soveta Rossiyskoy Federatsii* [News of the Congress of People's Deputies and the Supreme Council of the Russian Federation], 1992, no. 10, Art. 457. (In Russ.).

sible emissions and discharges of harmful substances;
3) Standards for levels of noise, vibration, magnetic fields, and other harmful physical effects; standards radiation exposure;
4) Maximum permissible norms for the use of agrochemicals and waste disposal limits;
5) Standards for the use of natural resources, established by natural resource acts, which took into account the specifics of individual natural resources, as well as limits on environmental management;
6) Environmental standards, i.e. such environmental requirements as standards for products and services;
7) Regulations for sanitary and protective zones, including security of industrial facilities.

Currently, environmental regulations and state standards in the field of environmental protection are separated from each other by the Federal Law 'On Environmental Protection'. It seems logic enough, in spite of the fact that both have a common goal, i.e. to define certain mandatory rules of conduct or requirements aimed at providing environmental security. Environmental regulation and standards are designed to ensure the quality of the environment and the permissible level of exposure. In this sense, they serve as a criterion for this quality. State standards act indirectly, through mandatory requirements for products, services, technologies, etc. Standards are one of the ways to ensure the normal operation of regulations. They help to ensure the quality, minimize the negative impact on the environment, and contribute to the stabilization of its quality.

In the modern institute of environmental regulation, the system of environmental standards is presented from the standpoint of the Federal Law 'On Environmental Protection'. It includes:
1) Environmental quality standards, e.g. standards established for chemical, physical, and biological indicators of the state of the environment, etc.;
2) Standards for permissible environmental impact of economic and other activities. They include standards for permissible emissions and discharges; technological standards; technical standards; standards for waste generation and limits on their disposal; standards for permissible physical impacts; standards for permissible removal of environmental components; standards for permissible anthropogenic load on the environment; and
3) Other environmental standards.

Art. 28 of the Federal Law 'On Environmental Protection' allows for the establishment of other types of environmental standards. It does not specify which kinds of standards belong to this group. They can be established both by the regulatory legal acts of the Russian Federation and the normative legal acts issued by the constituent entities of the Russian Federation.

The science of environmental law reveals no consensus on which standards can be attributed to this group. These may include both standards that are not named directly and those that meet the goals of ensuring environmental security and, thus, food security.

For instance, water quality objectives play an important role in maintaining a favourable environment****. They are established by schemes of integrated use and protection of water pools and include chemical, physical, biological, radiation, and bacteriological indicators. They are based on a) the maximum allowable concentrations established according to the type of water use; b) estimated conditional background concentrations of pollutants, determined by the results of systematic monitoring; c) environmental standards, actually reflecting the state of the water body in the water sector.

Other types of environmental standards may also include:
1) Maximum permissible norms for the use of agrochemicals, e.g. mineral fertilizers, plant protection products, growth stimulants, etc.;
2) Standards for chemical residues in food. Food must meet the requirements for the permissible content of chemical, biological substances and their compounds, microorganisms, and other biological organisms that pose a threat to the health of current and future generations.

The establishment of a non-exhaustive list of legal environmental standards has a number of advantages. First of all, it is impossible to predict what specific standards should be introduced with every new source of public hazard. Second, a flexible mechanism can make it possible to take into account not only the state of the environment in a particular area, but also such local factors as the state of human health, the standard of living, and the need for food products of some particular quality.

In populated areas, the level of anthropogenic pressure on environmental components and initial resources of food production can be extremely high. It is impossible to reduce the amount of harmful substances in the air, water, and soil without taking into account the cumulative or caused harm and its specifics. As a result, food security depends on how effective the mechanism of environmental regulation is.

The harmlessness of products consumed by the population is an important quality of life factor and a quality element of food security in general. The state of food security in Russia is determined not only by the availability of sufficient food resources, but also by the economic and physical availability of food for all groups and categories of the population. As follows from the Doctrine of Food Security of the Russian Federation*****, the safety of food supplied to the market ensures food security in general [10].

The problem of food security is believed to belong to the sphere of economic science [11, 12]. However, food safety issues are currently moving into the legal sphere and need to develop a legal support system adapted to modern challenges.

Very often, food security problems are considered

**** Vodnyy kodeks Rossiyskoy Federatsii [Water Code of the Russian Federation adopted]. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2006, no. 23, Art. 2381. (In Russ.).

***** Doktrina prodovol′stvennoy bezopasnosti № 120 'Ob utverzhdenii Doktriny prodovol′stvennoy bezopasnosti Rossiyskoy Federatsii' [The Doctrine of Food Security no. 120 'On the Approval of the Doctrine of Food Security of the Russian Federation']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2010, no. 5, Art. 502. (In Russ.).

from the point of view of food availability [13, 14]. According to legal literature, food security should be understood as a state of protection of citizens and the state from external and internal food threats. Domestic needs should be satisfied by guaranteed agricultural production, which provides every citizen with physical, economic, and social access to high-quality and safe foods for active and healthy lifestyle [15, 16].

Threats to food security are related both to global food security trends and domestic issues. Thus, the World Health Organization defines the following problems of global food safety: a) microbiological hazards; b) chemical food contaminants; c) new food technologies, e.g. genetically modified foods; d) unstable food safety systems in many countries that fail to ensure a safe global food chain [17].

De-environmentalisation of Russian legislation seems to be the main current national threat to domestic food security. Unfortunately, environmentalisation is one of the most vulnerable links in a food security system. According to the Economic Security Strategy******, excessive environmental requirements are considered as a threat to the national economic security of the Russian Federation. Therefore, it is extremely difficult to find a balance between environmental, economic, and social interests in this closed cycle of legal relations. It is very hard to determine when the environmental requirements are justified and when they are overcharged.

For many decades, Russia exercised a sanitary-hygienic approach to environmental regulation. Formally and legally, it resulted in a split in the legal regulation of the establishment of environmental requirements in the field of food security. There were two directions: 1) requirements for the primary state of the potential raw material (soil, water, etc.) in natural conditions; 2) requirements for the so-called result, i.e. extracted natural resource, products, and other anthropogenic objects. At the same time, there remains a general trend of substituting environmental requirements with sanitary and hygienic standards. It can be seen from the 2030 Strategy for Improving the Quality of Food Products in the Russian Federation*******.

Neither Russian science nor legislation has a clear view of the relationship between the concepts of 'product quality' and 'product security'. The Federal Law 'On the Quality and Security of Food Products' does not see them as equivalent. According to Art. 1, food quality refers to a set of characteristics of food products that can meet human needs for nutrition under normal conditions of their use. Food safety refers to a state of reasonable confidence that food products, under normal conditions of use, are not harmful and pose no health risks to current and future generations********.

At the same time, the abovementioned Strategy for Improving the Quality of Food Products does not see the concepts of quality and security of food products as identifiable. However, the document states a different relationship between them: the quality of food products, as a set of relevant characteristics, includes its security in order to preserve human health.

In any case, a question arises: what criteria are used to determine food quality, as well as its security? Approaches to the legal regulation of food quality requirements, including security, have changed.

According to the Federal Law 'On Technical Regulation'********, it is mandatory to observe technical regulations on food security for all producers, while it is optional whether food quality should comply with national standards or not. This general rule is valid unless there are established exceptions. There are currently many obligatory sanitary and hygienic requirements for quality and security of food products. Their violation may trigger administrative and other measures.

Undoubtedly, voluntary execution is the main disadvantage of the current legal regulation of quality and security of food products. The situation is getting even more aggravated since the mechanisms of state supervision and control in this area are highly inefficient. It seems advisable to tighten the existing requirements since the lifespan of every individual depends on the quality of food products.

The quality and security of food products is also affected by the state of the natural environment in which raw materials are produced. The lower environmental risk factors, the healthier the raw materials and food production conditions. Ecological regulation serves the purpose of preventing and minimising the negative impact on the environment and its components. It helps to minimize the accumulation of harmful substances in food raw materials.

The individual provisions of the Federal Law 'On Environmental Protection' contain environmental requirements at various stages of economic and other activities, as well as in various fields. According to Art. 47 of the Federal Law and Art. 14, 43 of the Federal Law 'On the Sanitary-Epidemiological Well-Being of the Population'********, production and handling of potentially hazardous chemicals, including radioactive, and microorganisms are regulated by law. The Articles also

****** Strategiya ehkonomicheskoy bezopasnosti Rossiyskoy Federatsii na period do 2030 goda № 208 [Strategy for Economic Security in the Russian Federation for the period up to 2030 No. 208]. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2017, no. 20, Art. 2902. (In Russ.).

******* Strategiya povysheniya kachestva pishchevoy produktsii v Rossiyskoy Federatsii do 2030 goda № 1364-r [Strategy for Improving the Quality of Food Products in the Russian Federation for the period up to 2030 No. 1364-p]. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2016, no. 28, Art. 4758. (In Russ.).

******** Federal'nyy zakon № 29-FZ 'O kachestve i bezopasnosti pishchevykh produktov' [Federal Law No. 29-FL 'On the Quality and Safety of Food Products']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2000, no. 2, Art. 150. (In Russ.).

******** Federal'nyy zakon № 184-FZ 'O tekhnicheskom regulirovanii' [Federal Law No. 184-FL 'On Technical Regulation']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2002, no. 52 (part 1), Art. 5140. (In Russ.).

******** Federal'nyy zakon № 52-FZ 'O sanitarno-ehpidemiologicheskom blagopoluchii naseleniya' [Federal Law No. 52-FL 'On Sanitary and Epidemiological Well-Being of the Population']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 1999, no. 14, Art. 1650. (In Russ.).

provide the necessary toxicological and hygienic studies of these substances, establish the procedure for handling them, set up environmental regulations, and state registration rules for potentially dangerous chemical and biological substances and certain types of products.

Ecological regulation is an important legal instrument that regulates the production and handling of potentially hazardous chemicals. However, as far as the content in food is concerned, it is mostly reduced to sanitary and hygienic standards. According to The Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing (Rospotrebnadzor), the content of harmful substances in products in 2017 did not exceed the figures for 2016. On the contrary, there was a slight decrease in the total share of domestic and imported products that did not meet the regulations for chemical and microbiological pollutants. However, 2017 saw an increase in certain types of products that did not meet the standards for microbiological indicators, namely meat and meat products, flour and cereals, bakery products, canned food, and vegetables [18].

State registration is an effective legal instrument that prevents production, transportation, purchase, storage, sale, and use of potentially dangerous chemical and biological substances, as well as certain types of products. The Federal Register of Potentially Hazardous Chemicals and Biological Substances reflects potentially dangerous chemical, biological substances, and preparations, introduced into production or previously unused. It also reflects potentially dangerous products as well as certain types of products, including foods, imported into the territory of the Russian Federation for the first time.

The current plurality and fragmentation of legal norms is a significant drawback of the legal mechanism for regulating the production and handling of potentially dangerous chemical and biological substances. The ongoing debate on legal regulation does not make it easier. It seems expedient to expand the scope of legal regulation of environmental legislation. It should cover the protection of the natural environment, the favourable state of which contributes to the life quality, as well as to the protection of human life and health from adverse environmental risks. There is still a need to develop a special legislative act that would regulate the production and handling of potentially hazardous chemical and biological substances in the Russian Federation.

Art. 49 of the Federal Law 'On Environmental Protection' provides special requirements and environmental measures for the use of chemicals in agriculture and forestry. They are further developed in the Federal Law 'On the Safe Handling of Pesticides and Agrochemicals'********, as well as in registration tests, examinations, licensing, standardization, certification, state supervision, and control of pesticides and agrochemicals.

Agricultural lands are one of the most valuable categories of land and a strategic resource for ensuring food security. Legal measures for their protection are the main means of achieving the goals of food quality and security. Population obtains the overwhelming majority of food products (up to 99%) from agricultural soils. However, the basis of agricultural production is destroyed in the process of their exploitation, together with the environment. Hence, the National State Programme for the development of agriculture and the regulation of markets for agricultural products, raw materials, and food******** is ecologically oriented. It is aimed at preventing the effect of natural and anthropogenic factors on land, water, and other natural resources, including those involved in agricultural circulation. The mechanisms of state support which the Programme provides for agriculture are aimed at ensuring the quality of agricultural products. The Programme increases environmental safety, preserves the resource potential of soil, prevents water pollution, improves drainage and cultivation systems, and prevents uncontrolled breeding of plants and animals.

Soils are the most vulnerable type of land. The Federal Law 'On State Regulation of Ensuring Fertility of Agricultural Lands'******** has failed to improve the state of Russian soil. According to the Ministry of Agriculture of the Russian Federation, 35% of arable lands have high acidity, 31% demonstrate low humus content, 22% have phosphorus deficiency, and 9% reveal potassium deficiency. Large areas of land are subject to water and wind erosion, salinization, acidification, overgrowing by shrubs and underbrush, desertification, and other negative processes [19].

The agrochemical condition of the soil was aggravated by natural and man-made factors, including the low level of environmental management in the field of agriculture in 1990–2007. For instance, organic fertilizers were introduced into the soil twice as rarely as before. The area of pesticide-laden agricultural land is increasing. The Federal Law 'On the Safe Handling of Pesticides and Agrochemicals' seems to be of no help. So are the measures of legal liability, including criminal liability, for deterioration of land and for not conducting mandatory improvement activities.

Apparently, the reasons lie in the absence of real action on the implementation of agrarian policy and a lack of state support for environmental-oriented economic entities and agricultural producers. According to Ignatieva [20], the fragmented nature of economic regulation does not give positive practical results. The norms of environmental legislation are nothing but declarations that express the future intentions of the state.

******** Federal′nyy zakon № 109-FZ 'O bezopasnom obrashchenii s pestitsidami i agrokhimikatami' [Federal Law No. 109-FL 'On the Safe Handling of Pesticides and Agrochemicals']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 1997, no. 29, Art. 3510. (In Russ.).

******** Postanovlenie Pravitel′stva Rossiyskoy Federatsii № 717 'O Gosudarstvennoy programme razvitiya sel′skogo khozyaystva i regulirovaniya rynkov sel′skokhozyaystvennoy produktsii, syr′ya i prodovol′stviya' [Resolution of the Government of the Russian Federation No. 717 'On the State Programme for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials, and Food Markets']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2012, no. 32, Art. 4549. (In Russ.).

******** Federal′nyy zakon № 101-FZ 'O gosudarstvennom regulirovanii obespecheniya plodorodiya zemel′ sel′skokhozyaystvennogo naznacheniya' [Federal Law No. 101-FL 'On State Regulation of Ensuring Fertility of Agricultural Lands']. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 1998, no. 29, Art. 3399. (In Russ.).

The Ministry of Natural Resources and Environment of the Russian Federation reported on the state of the environment and proposed some directions for improving the environmental security in the field of agriculture:
– to consider natural and climatic features while improving the legislation in the sphere of the agro-industrial complex;
– to recognize natural and environmental factors as critical for effective agriculture and rational distribution of agricultural production;
– to give priority to environmental management over traditional, short-term benefit-oriented agricultural economy;
– to set up balance between agricultural activities and the ecological capacity of a specific area, i.e. sustainable agriculture;
– to increase the amount of perennial grasses and legumes;
– to ensure stability of agricultural production by improving soil fertility with the help of natural perennial protective cover;
– to develop the system of agrolandscape-ecological zoning;
– to optimise the type and structure of cultivated areas by analysing local climatic conditions, landscape features, and soil properties;
– to subsidise some agricultural producers to let them undertake measures for land care and soil fertility recovery;
– to issue state orders for the development of new-generation agricultural technologies in the system of adaptive landscape farming;
– to restore the management system of agricultural land resources, introduce new functions and improve the existing ones, i.e. land management, agro-ecological monitoring of land, inventory, agro-ecological regulation, development and updating of targeted schemes for the use and protection of land in various regions of the Russian Federation and municipalities;
– to prioritise protection of valuable agricultural lands;
– to adapt agriculture to global climate change;
– to create an assessment system of agro-climatic resources for their rational use; and
– to develop and improve scientific research in the system of agrochemical services, including environmental risk assessment, regulations, chemical safety, etc.

Environmentalisation and sustainable agriculture are the main principles of the system of measures aimed at improving the efficiency of organization and farming. Without them, food quality and security cannot be improved.

Other documents on the socio-economic development of the Russian Federation and its regions also feature environmentalisation of socio-economic development. Environmentalisation is meant to create a unified system of economic mechanisms for environmental management and environmental protection. It should result in innovative projects, energy efficient and resource-saving technologies, and environmentally safe technological processes. In addition, environmentalisation is aimed at developing scientifically based environmental norms and standards. Environmental legal mechanisms have to be introduced into the system of state policy measures in agriculture. The natural environment is the basis of life and human activities. It provides opportunities for the socio-economic development of every individual. Thus, natural environment and resources deserve respect and careful attitude. Clean environment provides safety and life quality, which includes food.

Legal regulation in environmental sphere is extremely complex – for two reasons. First, it should make the established patterns of environmental relations favourable both for the environment and the population. Second, it has to resolve socio-economic problems identified by strategy-planning.

The principle of sustainable agriculture reflects the global trend towards balanced and harmonious social, economic, and environmental development. 'Sustainable development' means continuously supported, self-sustaining, admissible, and balanced development. The term was introduced by the United Nations International Panel on Environment and Development in 1987. This kind of development meets the needs of the present without compromising the ability of future generations to meet their needs [1].

At the International Conference in Rio de Janeiro (1992), sustainable development was recognized as a process of environmental changes in which economy, exploitation of natural resources, investment, science and technology, and personality development work together to strengthen the present and future potential of humanity to meet its needs********. This is how the term was explained in the final document of the Conference, after which it became global [21]. However, the term can be interpreted differently and remains dynamic, open, and changing. There are more than 80 uses of the term 'sustainable development' in scientific literature.

The principles of sustainable development have been put into practice in different countries – with variable success. Nevertheless, as it was noted at the RIO+20 Conference *The Future We Want*, people must continue to fulfil the tasks set in 1992 to harmonize the relations between the society and the nature, economic and social development in the interests of present and future generations.

Russia adopted the traditional approach to sustainable development as a balanced, environmentally sound social and economic development. As evidenced in practice, the implementation of legal norms on sustainable development is extremely inconsistent, and their mere formal legal fixation is not enough.

There are independent legal regulations concerning environmental requirements for genetically modified organisms in the Federal Laws 'On Environmental Pro-

******** Deklaratsiya Rio-de-Zhaneyro po okruzhayushchey srede i razvitiyu. 3–14 iyunya 1992 g. Povestka dnya na XXI vek (Povestka 21) [Rio de Janeiro Declaration on Environment and Development. June 3-14, 1992, Agenda 21]. Available at: http://www.un.org/ru/documents/decl_conv/declarations/riodecl.shtml. (27 March 2019).

tection' (Art. 50) and 'On State Regulation of Genetic Engineering Activities'********. The rapid development of genetic research in biology and medicine makes it possible to use their results in agriculture, food industry, and pharmacy. Hence, the direction has acquired particular relevance. Since the very onset of genetic engineering, scientists all over the world have been discussing the possible risks for the natural environment and humans. Abroad, the legal regulation of GMOs is developing in different directions. On the one hand, the emphasis is on the legal regulation of their production. On the other, the focus is on the legal regulation of the product and its properties.

In spite of the fact that the GMO issue remains unresolved, the Russian legislators have developed a whole range of legal instruments for handling GMOs. These include licensing certain types of GM activities, certification, registration of GMOs, and legal liability (including criminal) for violating the rules.

In Russia, GMOs cannot be used for some categories of population and products. For instance, GMOs cannot be included in dairy products and juices designed for children. Also, there are the technical regulations complied by the Customs Union on the safety of certain types of specialized food products********. They ban GMO from foods meant for pregnant and lactating women, as well as from dietary therapeutic and prophylactic foods.

Thus, if a direct ban on the use of GMOs is not installed, their use is permissible. However, it is the matter of consumer rights protection. Producers must inform the consumer on the presence of GMOs in the raw materials or products. Consumers then choose by themselves whether to purchase such products or not. As a result, consumers are made responsible for their health, regardless of whether they are aware of the possible benefits or harms of GMOs or not.

This is a matter of a deeper legal problem. According to the constitutional provision of Art. 42, everyone has the right for a favourable environment, reliable information about its condition, and for compensation for health or property damage caused an environmental offence******** [22]. In addition, the use of GMOs is also related to environmental legislation. GMOs might damage the natural properties of ecological systems and their elements or upset the natural balance. This may lead to previously unknown direct or indirect risks to the natural environment and human health. Considering various aspects of the nature – man sphere [23], it seems incorrect that the legislator appeals to civil law and shifts the burden of responsibility for their health to the consumers themselves.

In the framework of the current legislation, Rospotrebnadzor regularly checks economic entities for the use of GMOs in their food products. According to Rospotrebnadzor, 26,019 food samples were examined for the presence of GMOs in 2017. Of these, 17 were found to contain GMOs, which is a little more than in 2016. In 2017, the share of samples with identified GMOs was 0.07%, in 2016 – 0.05%. At the same time, the share of samples in imported products in 2017 increased significantly from 0.06% to 0.77%, compared to 2016. In the vast majority of cases, producers inform about the content of GMOs: only one product out of the abovementioned 17 samples lacked information on the presence of GMOs. In 2012, there was no GMO-related information in 13 cases out of 22 [18].

According to the idea of sustainable development, food security should be environmentally oriented. It means that not only the so-called environmentally friendly raw materials should be used, but also that waste generation should be avoided.

Art. 24 of the Federal Law 'On Environmental Protection' establishes standards for production and consumption waste and its disposal. The negative impact of production and consumption waste cannot be underestimated. Its causes soil, air, and water pollution and affects human health via pollution of natural resources and biological contamination. Huge areas of forested, agricultural, and populated lands are occupied by landfills. The legislation regarding the disposal of production and consumption waste is currently undergoing some changes. It is important to restructure the existing landfills to improve waste storage and disposal. However, it is of even greater importance to eliminate accumulated harm and prevent it in the future.

The efficiency of production and consumption waste management requires well-coordinated and progressive work in relevant areas and depends on the following factors.

1) Environmental factor takes into account: a) the natural characteristics of regions and municipalities, b) the state of the local environment and its components, c) the anthropogenic load on the environment and its components according to the population size, etc.

******** Federal′nyy zakon № 86-FZ 'O gosudarstvennom regulirovanii v oblasti genno-inzhenernoy deyatel′nosti' [Federal Law No. 86-FL 'On State Regulation of Genetic Engineering'. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 1996, no. 28, Art. 3348. (In Russ.).

******** *Reshenie Soveta Evraziyskoy ehkonomicheskoy komissii № 34 'O prinyatii tekhnicheskogo reglamenta Tamozhennogo soyuza 'O bezopasnosti otdel'nykh vidov spetsializirovannoy pishchevoy produktsii, v tom chisle dieticheskogo lechebnogo i dieticheskogo profilakticheskogo pitaniya' (vmeste s 'TR TS 027/2012. Tekhnicheskiy reglament Tamozhennogo soyuza. O bezopasnosti otdel'nykh vidov spetsializirovannoy pishchevoy produktsii, v tom chisle dieticheskogo lechebnogo i dieticheskogo profilakticheskogo pitaniya')* [Decree of the Council of the Eurasian Economic Commission adopted No. 34 'On the adoption of the technical regulations of the Customs Union 'On the safety of certain types of specialized food products, including dietary medical and dietary preventive foods' (together with TRCU 027/2012 'Technical Regulations of the Customs Union 'On the safety of certain types of specialized food products, including dietary medical and dietary preventive foods')]. Available at: http://www.tsouz.ru. (27 March 2019).

******** Konstitutsiya Rossiyskoy Federatsii, prinyata vsenarodnym golosovaniem 12.12.1993 [Constitution of the Russian Federation adopted by popular vote on December 12, 1993]. *Sobranie zakonodatel'stva Rossiyskoy Federatsii* [Collected Legislation of the Russian Federation], 2014, no. 31, Art. 4398. (In Russ.).

2) Financial and economic factor includes: a) real state support of environmentally oriented businesses; b) targeted expenditure of environmental fees; c) co-financing of waste management measures.
3) Legal factor requires adoption of a significant number of legal acts on a) national standards aimed at turning the sphere of waste disposal into an innovation industry; b) reclaiming disturbed lands; c) a stricter legal liability for violations in this area; d) garbage sorting, e) role of municipalities in solving the problems of waste disposal and landscaping.
4) Social factor establishes the partial responsibility of local citizens for cleaning adjacent territories from wastes and maintaining them in proper condition.

Methodological invariance remains a significant drawback of environmental regulation development. Unfortunately, current environmental legislation takes components of the natural environment and the sources of environmental hazard separately. The severe anthropogenic load on the environment results in the fact that there is no differentiation between environmental hazards from various sources. Taken together, the consequences cause a greater damage to environment and human health than if the standards were observed separately. These specifics are not taken into account when establishing environmental and sanitary standards. The combined effects of chemicals and other substances may cause more harm to nature and human health, both directly and indirectly, including via food consumption.

CONCLUSION

The research resulted in the following conclusions:
1) Ecological regulation is a legal way of determining the quality of the environment and regulating the permissible impact of economic and other activities on the environment. It maintains the ability of nature to restore itself. Ultimately, ecological regulation provides favourable conditions for human life, prevents harm to human life and health, thus contributing to food security.
2) Environmental regulation and food security are closely and inextricably linked. Environmental regulation ensures the state of environmental security and, as a result, is the main means of ensuring food security.
3) To be efficient, food safety measures should be ecological. When establishing standards that ensure environmental and food security, it is necessary to take into account local natural and geographical conditions, the amount of accumulated harm and the total anthropogenic load on the territory. Such precociousness will make it possible to calculate the prospective environmental risks and their consequences for the nature and human health in a certain area.
4) Legislative and law enforcement practices show that most of the existing standards in food security are of sanitary and hygienic character. They form the quality of the human environment to protect human health. However, the current state of affairs requires unification of legal regulation in the field of environmental and sanitary-hygienic regulation. A unified system will extend environmental regulation into all types of environmental standards, including those that ensure the food quality and security.
5) Agriculture is a strategic resource for ensuring food security. Thus, the idea of sustainable development in agriculture fits perfectly into the general world trend of modern socio-economic development, which is based on an ecological approach. This provision should be taken into account when shaping the state policy in the sphere of food security.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to this article.

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