Efficient production system as part of sustainable environmental management

I V Botantsov 1, K M Mensah2, K G Svarchevsky1 and D D Sayafarova3

1 North-West Branch of the Russian State University of Justice, 5, Alexander Park, g. St. Petersburg, 197046, Russian Federation
2 University of Maribor, Slomškov trg 15, Maribor, 2000, Slovenia
3 Stolypin International Institute of Informatization and Public Administration, 11/2, st. Malaya Semyonovskaya, Moscow, 107023, Russian Federation; RUDN University, 6, st. Miklukho-Maclay, Moscow 117198, Russian Federation

E-mail: botansoff@mail.ru

Abstract. Rational use of natural resources is an integral part of building a production system in conditions of modern limited natural benefits and increasing the value of the quality of the natural environment around man. An efficient production system is at the heart of ensuring rational environmental management and the implementation of the UN's global goal of ensuring the transition to sustainable consumption and production patterns. The article is aimed at disclosing the concept and potential possibilities of using efficient production systems not only within the framework of environmental preservation, but also within the framework of ensuring the most rational use of state resources when pursuing a policy of import substitution. The authors of the article formulate a conclusion about the current state and prospects of using efficient production systems in the Russian Federation.

1. Introduction
Rational nature management is a relatively new term in science and journalism, which came into use in the 70s of the twentieth century. The essence of rational nature management lies in transforming the environment in order to more economically exploit natural resources to ensure a reduction in the negative impact on the environment. Such system will ensure the most optimal functioning of the production and consumption cycle, since much attention is paid to such parameters as the use of secondary resources, preservation of non-renewable and reproduction of renewable natural resources [1]. However, the implementation of the concept of rational use of natural resources has a number of difficulties. The complexity of maintaining the normal functioning of ecosystems under production load, the coordination of economic and natural cycles, the formation of the priority of the ecological factor over the economic one in manufacturing organizations and society determine the relevance of this study. The world is constantly looking for the most effective ways to increase production efficiency with minimal costs based on the principles of rational environmental management, therefore, the formation of theoretical ones for their future practical application is an important task for the implementation of the state's environmental policy in the context of a sustainable development system. The resolution of issues of nature management in all spheres of life is of great importance,
which is why the problems considered in the proposed article should find greater understanding and interest from other researchers.

2. Materials and methods
The methodological basis of this article is a systematic analysis, comparison and generalization of relevant literature on the study of rational nature management in the context of the production process in various fields.

3. Results
So, in our opinion, initially it is worth paying attention to the legal regulation of the environmental sphere, since the implementation of the concept of rational environmental management largely depends on the regulatory component. Legislative norms are the basis for the implementation of environmental policy aimed at the preservation and reproduction of natural resources and the environment in general. The provisions enshrined in the Constitution, codes, federal laws and other acts regulate the timeliness and correctness of the execution of the relevant operations, establish the fundamental principles of environmental legislation. Moreover, the principles of rational nature management are closely related to Article 3 No. 7-FZ “On Environmental Protection”. For example, one of the principles enshrined in the article defines the protection, rational use and reproduction of natural resources as a necessary condition for ensuring environmental safety. Also, the limit indicators of environmental impact, the procedure for monitoring, restoration work, etc. have been established. In a number of countries, there is a mandatory procedure for obtaining a permit for nature use, which assumes that an individual or legal entity, at the start of a project, undertakes to reduce pollution and reduce harmful production processes. The issued permit regulates the maximum permissible values of the types of pollution, including a list of measures to compensate for harm or damage to the environment and to preserve it [2]. It is noted, that on the territory of the Russian Federation, a large-scale work was carried out to systematize wastes from many industries, and “waste banks” were created in the field of metallurgy, petrochemical and other harmful industries [3]. Nevertheless, in a number of production areas, there are pressing issues, that require resolution. For example, an increase in the share of food grain crops with the existing sowing system, the negative factors of which are expressed in a high amount of clean fallow, insufficient soil moisture, the absence or Wednesday. Since the beginning of the 90s of the last century, a negative balance of elements of mineral nutrition has developed in the field of agriculture [4].

According to available data, organic losses per hectare of arable land are more than 1 ton per year. Most of the enterprises of the agro-industrial complex do not observe or violate the recommended proven zonal farming systems and crop rotation techniques, due to the peculiarities of the climate and nature, as well as the specifics of the activities of the farms. A large percentage of fallow fields provoke the development of water and wind erosion; violation of the water and heat balance of working areas; soil degradation, aridization, gradual desertification [5]. The livestock sector also has a significant negative impact on the environment. First of all, this concerns a large amount of animal waste. There is an acute issue of harmless disposal, storage and recycling of waste [6]. Only a small proportion of enterprises have sufficient land plots to apply manure to the soil as fertilizer. In this regard, the development and selection of the most effective technology for the elimination and maintenance of manure are of particular importance. As a result of production, ammonia, hydrogen sulfide, carbon dioxide and other chemicals are formed that negatively affect the ecosystem. An insufficient level of production processes leads to an increase in waste, a decrease in animal productivity, increased feed consumption, and equipment wear [7].

4. Discussion
Based on the research materials presented by us, a number of conclusions can be drawn. Thus, it should be noted that the normatively dictated measures to ensure the safety of the environment and aimed at rational use of natural resources do not have sufficient efficiency. We can say, that there is a
need for stricter supervision of compliance with the provisions of the legislation by monitoring (biological, geochemical, geographical and others), inspections, regular revision of current permissible pollution indicators in accordance with the state of the environmental situation in a particular area [8]. Also, a positive role can be played by public coverage of improving and maintaining the optimal state of nature as one of the highest values facing society and nature users in particular. It is advisable to improve the methodological component of environmental research on the basis of the risk management concept [9].

In the context of private spheres of production, then, speaking, for example, of animal husbandry, there is already a list of measures that allow you to minimize the percentage of pollution, for example: the use of closed systems for transportation, disposal and storage of animal waste; use of intensive filters and sealed containers for feed; disinfection of premises, etc. However, these technologies need to be improved, and there is also a need to create new technologies to minimize emissions. In the agricultural sector, it seems a good step to reduce the number of fallow fields to the amount actually required for the established production rate.

5. Conclusion
The large scale of Russia with a large number of forests makes it difficult to assess the damage to the environment. Soil erosion and desertification on one piece of land is speculatively compensated by a huge territory, local waste dumps do not look like a significant threat. However, without due attention to the ecological situation, we will be able to feel the consequences of production in the near future. The priority of environmental safety with a long-term perspective is also important [10-11]. The concept of waste-free production seems utopian and has many critics, but it is necessary to change the fight against the investigation to the fight against the cause of harm [12]. Taking into account modern conditions, it is necessary to clarify, supplement and transform the existing methodological, theoretical and methodological foundations for the implementation of the concept of rational environmental management in the context of efficient production [13].

References
[1] Valiev V N and Kosolapov O V 2012 Resource saving and its role in ensuring rational environmental management. Economics and efficiency of production organization 17 3-6
[2] Kirillov S N 2017 Principles of rational use of natural resources. In the collection: Rational use of natural resources: traditions and innovations. Materials of the II International Conference 30-32
[3] Frolov A N 2018 Land management - the basis for the development of agricultural production and rational environmental management. Modern problems of territorial development 2 1-6
[4] Pashentsev D A, Rudakova E N, Matvienko S V, Shutikova N S, Shchebrenko E D 2020 History of the establishment and activities Food and agriculture organization of the United Nations (FAO). Voprosy Istori 5 140-145
[5] Khomyakov D M 2011 Grain production in Russia and rational environmental management. Agrochemical Bulletin 1 765
[6] Bak T, Kardis M, Valco M, Kalimuthu A M and Galushkin A A 2019 A philosophical-sociological diagnosis of youth subcultures in the context of social changes. XLinguae 12(2) 163-85
[7] Bazykin V I, Trifanov A V 2018 Minimizing the negative impact of pig enterprises on the environment. MNIZH 76 22-25
[8] Kupryushin A P and Martynov Yu I 2017 Effective import substitution and rational environmental management: reality and prospects. Sciences of Europe 18-2(18) 15-23
[9] Vashalova T V 2014 The concept of rational environmental management and its development at the present stage. Bulletin of RUDN 1 37-46
[10] Sukhorukova S M, Pogorely A M, Samorokov A V 2014 The vitality of the planet and the theory of economic growth. Vestnik MITHT. Series: social sciences and humanities and
ecology 3 68-74

[11] Smakhtin E S, Klimova I I, Arkhipova V S, Andrievskii K V, Shalamova O O and Sidorova N A 2018 Verbalizing emotions in texts of economic mass media. *XLinguae* 3 103-113

[12] Rekus I G and Shorina O S 2001 *Fundamentals of ecology and rational nature management: Textbook* (Moscow: Publishing house MGUP) 146

[13] Vikulov V E 2018 Rational nature management: from theory to practice. *Bulletin of the Buryat State University. Biology. Geography* 3 54-61