

ТРАНСФОРМАЦИЯ РОЛИ ДОБЫВАЮЩИХ КОМПАНИЙ В УСТОЙЧИВОМ РАЗВИТИИ СЕВЕРНЫХ РЕГИОНОВ КАК УСЛОВИЕ СТАНОВЛЕНИЯ «ЗЕЛЕННОЙ ЭКОНОМИКИ»

И. А. Сивоброва¹, В. В. Степанова¹, У. Е. Якушева¹

¹ Северный (Арктический) федеральный университет имени М. В. Ломоносова, Архангельск, Россия

Аннотация: рассмотрены управленческие аспекты обеспечения устойчивого развития северных территорий, в ней проанализированы подходы к роли добывающих компаний в становлении основ «зелёной экономики» и определены периоды в трансформации этой роли. При этом рассмотрены основные составляющие компоненты устойчивого развития в деятельности компаний. Авторами представлены основные направления изменений в экономической, экологической и социальной роли добывающих компаний, которые вносят существенный вклад в повышение потенциала устойчивого развития территорий: осуществление инвестиций в экологические, социальные и научно-инновационные проекты, переход к ответственной политике устойчивого развития компаний, расширение спектра получателей выгод от корпоративной социальной политики. Показана необходимость учета региональных особенностей Севера при выборе направлений и составляющих компонентов устойчивого развития, а также пересмотра роли и места заинтересованных сторон и участников в процессах управления таким развитием, необходимость переосмысления сдвига от органов государственного и муниципального управления к компаниям работающим на северных территориях, то есть достижения такого компромисса между интересами всех сторон (власти, бизнеса, населения), который не ограничивал бы возможности будущих поколений в устойчивом развитии. Позитивный аспект в таком управленческом тренде состоит в том, что компании, локализованные на северных территориях, начинают принимать на себя ответственность за устойчивость развития этих территорий, за сохранение окружающей среды и за привлекательность для жизни на них.

Ключевые слова: добывающие компании, Север, устойчивое развитие, корпоративная социальная ответственность, экологическая экономика.

Для цитирования: Сивоброва И. А., Степанова В. В., Якушева У. Е. Трансформация роли добывающих компаний в устойчивом развитии северных регионов как условие становления «зеленой экономики» // Горный информационно-аналитический бюллетень. – 2022. – № 10-2. – С. 156–165. DOI: 10.25018/0236_1493_2022_102_0_156.

Transformation of the role of mining companies in sustainable development of northern regions as a driver of green economy

I. A. Sivobrova¹, V. V. Stepanova¹, U. E. Yakusheva¹

¹ Northern (Arctic) Federal University, Arkhangelsk, Russia

Abstract: the article examines approaches in management science to the role of mining companies in achieving the Sustainable Development Goals and the formation of green economy in northern regions, identifies periods in the transformation of the corporate role and reviews the activities of companies in the context of the main components of sustainable development. The authors identify the main changes in the economic, environmental and social role of mining companies, which make a significant contribution to achieving sustainable development in the regions: investment in environmental, social, scientific and innovative projects, transition to a new corporate policy aimed at taking responsibility for sustainable development, expansion of the number of potential beneficiaries from corporate social policy. The article shows the importance of taking into account regional characteristics of the North when choosing the directions and components of sustainable development, as well as revising the role and place of stakeholders in the management of such development: the transition from state and municipal authorities to companies operating in the northern territories. Such transformation requires a compromise between the interests of all actors (state, business, local residents) that would not limit the opportunities of future generations in sustainable development sustainable development of the northern territories can be achieved when the enterprises of the major industries in the region grow steadily. companies take responsibility for the preservation of the environment and the attractiveness of life in the northern regions. This leads to the achievement of the Sustainable Development Goals and the formation of a “green economy”. Theoretical framework.

Key words: mining industry, the North, sustainable development, corporate social responsibility, green economy.

For citation: Sivobrova I. A., Stepanova V. V., Yakusheva U. E. Transformation of the role of mining companies in sustainable development of northern regions as a driver of green economy. *MIAB. Mining Inf. Anal. Bull.* 2022;(10-2):156–165. [In Russ]. DOI: 10.25018/0236_1493_2022_102_0_156.

Most researchers of problems and trends of sustainable development of northern regions note that there is a need to rethink the role of such areas in the development of Russia and recognize their significant specific features. These features include, first of all, climatic conditions that create discomfort for the population and increase the risks of injury in these regions, rise vulnerability of environmental systems and other additional risks associated with, for example, soil structure or permafrost [1, 2, 3, 4]. Management processes in the transition to sustainable development should be focused not only on determining the responsible parties for economic growth, but also on environmental safety, preservation of the environment, development of a “green” economy, as well as on improving the quality of life of the population. Most studies by Russian scientists have developed the notion that state or regional authorities should bear the

responsibility for the implementation of the principles of sustainable development, and the main focus should be made on economic and social components of sustainable development. The social component of sustainable development could be embodied through introduction the green curricula in the bachelor and master programs to train highly qualified and responsible labor force for the North [5, 6].

P. M. Ivanov [7] in his monograph described the model of sustainable development management in the context of relations in the system “Center – Periphery”. In this system, the main actors are the authorities, and then the problem of sustainable development is considered only in two aspects – economic and national-territorial (ethno-environmental). Moreover, the thesis that “the ethnic aspect of the environment also manifests itself” was formulated by the author, but

not analyzed in detail. T. V. Uskova [8] investigated the management system of sustainable development of the territory, including the collaborative activities of the authorities at the federal, regional and local levels. Another omission in the studies of sustainable development is that the authors [9,10,11,12] consider in detail the relationship between sustainable development and environmental problems, analyze various industrial problems (energy, bioeconomics and others), but do not highlight managerial aspects, with the exception of the research of various regulatory legal acts, declarations, strategies and programs.

Studies of foreign scientists mainly focus on the analysis of the weight of the environmental and social components in sustainable development and skip the economic component. The process of implementation of sustainable development is frequently considered with the engagement of corporations [13,14,15]. G. Hilson and B. Murck in their work "Sustainable development in the mining industry: clarifying the corporate perspective" provided guidance for companies for the engagement of sustainable development principles and emphasized the minimization of negative impacts. The corporate contribution to sustainable development in the context of environmental aspect can be achieved by applying environmentally friendly goals, annual monitoring and publication of results in Sustainability reports, modeling the negative outcomes of production activities, implementation and modernization of cleaner production, conducting training sessions, interaction with stakeholders [13].

D. Rondinelli, M. Berry, L. Shen, K. Muduli and A. Brave focused on determining the place of corporations in sustainable development with an emphasis on the environmental component. In

particular, L. Shen, K. Muduli and A. Brave analyzed the processes of green supply chain management, and D. Rondinelli and M.A. Berry highlighted a set of corporate measures to preserve biodiversity (conservation of renewable and non-renewable resources and energy, implementation of environmental accounting system) [14,15]. V.S. Litvinenko, P. S. Tsvetkov, K.V. Molodtsov considered corporate social responsibility as a way to reach internal corporate sustainability [16].

Neither Russian nor foreign researchers see steps or a mechanism for the implementation of principles of sustainable development, because their point of view can be divided into two opposing approaches. On the one hand, "environment" is an independent component of sustainable development and should be considered separately from other components. On the other hand, "environment" can be seen as part of the economy and be integrated into economic development (for example, in an environmentally sound economy). Then, according to the first approach, the implementation of the principles of sustainable development in the region can take place in several stages:

1. Obtaining financial well-being or "financial security cushion";
2. Integration of the economic system with elements of the environmental system: for example, the use of indicators to describe the environmental system
3. Solving social problems
4. Solving environmental problems, but with emphasis on those that threaten the existence of life
5. Implementing the concept of weak sustainability [17].

The above-mentioned stages of implementing sustainability principles are partly similar to the process of corporate role transformation in sustainable development. The process of corporate

role transformation implies changing of the share of spending on social issues from achieving internal production goals to the Sustainable Development Goals. Such corporate role transformation consists of five successive stages, which can be defined by the share of company spending on the Sustainable Development Goals. Depending on the stage, such expenditures can be 1) unallowed, 2) undesirable, 3) possible, 4) desirable, and 5) necessary.

For companies starting out in the Nordic region, spending on social and environmental issues is not allowed for the reason that regular production costs have already exceeded the industry average. This leads to the risk of non-competitiveness. Spending on social and environmental issues then moves to the “undesirable” category and more recently becomes “possible”. When costs move to into the “possible” or “desirable” category, it means that the company is actively involved in the sustainable development of the region.

The transformation of the corporate role in achieving the Sustainable Development Goals is reflected in its role in the three major components of sustainable development: economic, social and environmental. Therefore, the aim of the study is to determine the stage of the process of transformation of the corporate transformation role (mining industries) in the context of the three aspects of sustainable development. The scope of study is mining companies operating in the Arctic zone and North of the Russian Federation. The research method is content analysis, and the main source of information is secondary data from corporate reports and official websites of companies.

Transformation of the economic role of mining companies

Economic and population growth increases pressure on ecosystems and

natural resources. The future demand for reliable, affordable and sustainable energy requires from companies significant and timely investments in resource-efficient and climate-friendly activities. Changes in the investment profile of mining companies are the first sign of their commitment to sustainable development. Two directions of changes can be distinguished: in terms of amount or scope of investment, such as addressing environmental issues and supporting advanced scientific innovation. Mining companies in the Arkhangelsk region (part of the northern regions of Russia) are analyzed as an example of such changes.

In May 2019, eight investment projects were approved by the regional government, but two of them account for 61.8% of the total investment volume. These projects are developed by mining and primary processing enterprises: Mining and Processing Plant (MPP) at the Lomonosov diamond deposit of PJSC Severalmaz, MPP at the Pavlovskoye lead-zinc ore deposit and the port complex of JSC First Ore Mining Company. Another project of JSC AGD DIAMONDS, worth nearly 20 million rubles, aims at technical re-equipment of the concentrating plant at the V.Grib MPP, including the construction of a drainage system and a reservoir [18].

Mining companies show good examples of R&D investment profile. For instance, JSC AGD DIAMONDS is implementing a project worth 307.2 million rubles. The idea of the project is the organization of high-tech production for synthesis of diamond mono crystals by the temperature gradient method and manufacture of monocrystalline diamond plates with specified characteristics for research and development in the field of quantum sensing, X-ray optics and other promising areas of scientific and technological development. And JSC First Ore Mining Company launched a project

for 19 million rubles, taking into account the needs of its employees. The project focuses on a software and hardware solution based on robotics and virtual reality for telemedicine, which allows to automatically collect anamnesis of employees (patients) and organize virtual online consultations in healthcare [19].

PJSC Lukoil also responds to all modern trends in the digitalization of the economy and started operating a comprehensive large-scale digital model of the Vatyeganskoye oil field, which is part of the “Intelligent Field” corporate project. Digital twins have been created for more than 3,000 wells and 12 production facilities, covering the entire production chain [20].

The above cases provide arguments about the transformation of the economic role of mining companies. Corporations invests not only in increased production and profits, but also in programs that contribute to sustainable development of northern territories.

Transformation of the environmental role of mining companies

The transformation of the corporate environmental role of mining companies in the context of sustainable development is also determined by the transition from passive and rather formal activities to active and responsible policies. This translates into a shift from compliance with minimum environmental requirements and emission limits to the implementation of preventive environmental actions to reduce environmental risks. These methods of reducing and transforming environmental risks include:

- active monitoring based on indicators
- attracting scientists for research on the corporate impact on the environment
- supplementing additional initiatives or policy briefs to existing development strategies

- implementation of specific projects to increase biodiversity, save resources, waste recycling, etc.

As an example, changes in the structure of Sakhalin Energy Investment Company Ltd.’s (Sakhalin Energy) operations were examined. Sakhalin Energy is the major operator of the Sakhalin-2 Project and has been in operation for more than 9 years. The company is a leader in the Environmental transparency rating of oil and gas companies operating in Russia in 2019 [21]. Analysis of sustainable development reports of Sakhalin Energy shows that the main environmental activities in 2012 correspond to management control functions, such as standards for air emissions, water use, water discharge, waste disposal, and monitoring performance in the mentioned fields. And only a few activities are related to the monitoring of flora and fauna in the areas where the company operates. For instance, in 2012, Sakhalin Energy conducted environmental inspections at 21 tested areas in the Prigorodnoye Production Complex (PPC) and at 35 sites in the zone of potential impact of the integrated onshore technological complex near PPC [22]. But in 2016, Sakhalin Energy officially announced that the company is participating in the implementation of all Sustainable Development Goals [23]. In 2020, electric and gas-powered vehicles were purchased for cargo and passenger transportation to reduce emissions, which is part of the corporate policy of switching to an environmentally friendly vehicle fleet. Moreover, Sakhalin Energy conducted acoustic monitoring of gray whale feeding to measure the level of anthropogenic noise from the company’s offshore facilities as part of the development of an ecological biodiversity monitoring program [24].

Another case of the corporate environmental role transformation

demonstrates LLC Lukoil-Komi. The transformation implies a transition from mere compliance with environmental legislation to restoration of biodiversity of northern water bodies and compensatory reforestation projects in the Komi Republic as part of the National Projects in Russia [25].

The dissemination of the practice of participation mining companies in various environmental activities contributes not only to the implementation of the Sustainable Development Goals, but also the strategic goals and priorities of socio-economic policy of the Russian Federation at the state and regional levels, the formation of a “green” economy.

Transformation of the social role of mining companies

In the last decade, the focus on sustainable development has led to a transformation of corporate policies in the region where the company operates. In particular, mining companies that have adopted a social responsibility policy have begun to more active in publishing data about conducted social events in the region. For instance, LUKOIL Group has been publishing its Sustainability Report once every two years since 2003, and annually since 2015. The Sustainability Report of LUKOIL Group consolidates the information on the activities of all companies in the Group. The first Sustainability Report was rather formal and general in nature, covered such issues as economic contribution, interaction with local authorities, personnel support activities and environmental issues. [26]. LUKOIL Group focused on disclosing the approaches and principles of operating in the regions, confirming the information with aggregated statistical data. The 2020 Sustainability Report contains detailed and in-depth information on the ongoing activities. The Corporation discloses the

issues of building the entire management system with the main focus on reducing negative impacts, energy conservation, occupational health and safety. The document includes analytics on a wide range of safety aspects, with a strong focus on the development of local communities and Indigenous Peoples of the North [27]. Quality education, gender equality and partnerships could be the further priorities for the company in achieving the Sustainable Development Goals [28]

We can conclude that the entire policy of goal-setting of mining companies has changed. At the start of the corporation’s activity, the goal of social activity was “gaining trust”. Lately, it had been transformed to “corporate citizenship” (Fig. 1). Corporate citizenship means that companies take over some of the social functions of the state. This leads to significant investment by companies in the construction of social infrastructure facilities, which significantly increases the social potential of the region and strengthens protection against social risks. It should be noted that in the Northern regions there is a lack of social infrastructure facilities, their high wear and tear, old technical equipment and lack of modern technology. Another problem is also the excessive concentration of social facilities in the largest settlements (e.g., cities), which, in fact, sharply limits their use by part of the population living in rural areas. Initially, the target audience for corporate social activity was only the company’s personnel, and, in part, the Indigenous Peoples of the North. Currently, corporate social activity has extended to schoolchildren, youth and the elderly. This indicates the transformation of the corporate policy to an understanding of the idea that the harsh climatic conditions of the North must be compensated. In short, the attractiveness of the territory for living becomes the

environmental legislation and pollution control to environmental, remediation and ensuring preventive action. These activities are implemented in such projects as increasing biodiversity, resource conservation, waste recycling, clean energy and etc.

The transformation of the corporate role in the social sphere occurred in the awareness of responsibility for ensuring the quality of life not only for the company's employees, but also of the entire population living in region where company operates. And if initially the Indigenous Peoples of the North were the main target group, now the sphere of corporate responsibility extends to schoolchildren, students, the elderly and other people who require special care.

The transformation of the role of corporations in the sustainable development of northern regions is so obvious that not only the leaders and management of the companies but also scientists and other actors are paying more and more attention to this issue. This can be confirmed by the emergence of the Polar Index project created by Project Office for Arctic Development (the PORA Expert Center) and the Faculty of Economics of Lomonosov Moscow State University [30]. The Polar Index project was presented by its developers [31], but

so far this work is the first attempt to assess the role of companies in sustainable development of northern regions.

Thus, the study shows that the stages of transformation in the corporate contribution to sustainable development are a possible or desirable. Based on the analysis of corporate policies, as well as investments in environmental goals or additional financing for environmental and social activities, we can state a new positive trend in the processes of sustainable development management: the subjects of such management are now not the state and municipal authorities, but corporate structures and their stakeholders. The direction of further fundamental and applied research should be focused on the assessment of the potential, level and obstacles in the sustainable development of the northern regions, the analysis of participation of mining companies in achieving the Sustainable Development Goals in order to improve the managerial decision-making process at the national, regional and local levels. Such scientific approaches and assessments will help to develop the principles of sustainable development for northern territories and form various elements of the "green economy" based on new management approaches and technologies.

REFERENCES

1. Bedritsky, A. (2018). Sustainable development of the Russian Arctic zone and climatic aspects of environmental and hydrometeorological security. *Energy Policy*, 4, 3–10.
2. Nilolaev, A. (2021). Model for Assessing Sustainable Development Potential of the Russian Arctic Territories *Economics and Management*, 3, 109–113.
3. Gendler, S., Prokhorova, E. (2021). Risk-based methodology for determining priority directions for improving occupational safety in the mining industry of the Arctic zone *Resources*, 21100808642, 10, 1–14. DOI: 10.3390/resources10030020.
4. Rybak, Y. (2021). Resource-saving technologies for development of mineral deposits, *Sustainable Development of Mountain Territories*, 13(3), 405–415. DOI: 10.21177/1998-4502-2021-13-3-406-415.
5. Rybak, J. (2017). Some remarks on experience based geotechnical education. *International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM*, 17(12), 1003–1012. DOI: 10.5593/sgem2017/12/S02.127.

6. Myaskov, A. V. (2018) The future of mining engineers: interdisciplinary and digitization work. *Gornyi Zhurnal*, 2, 13–17.
7. Ivanov, P. (2016) Sustainable development of the region: concept, management model, strategy: monograph. (Moscow: Ltd «EKZ «Proffesor»), 254.
8. Uskova, T. V. (2020). Territories' Sustainable Development and Modern Management Methods Problems of territory's development, 2(106), 7–18. DOI: 10.15838/ptd.2020.2.106.1.
9. Bobylev, S.N. (2019). Green Economy and Sustainable Development Goals for Russia: Collective Monograph (Moscow, Economics Faculty of Lomonosov Moscow State University), 284.
10. Tcvetkov, P., Cherepovitsyn, A., & Fedoseev, S. (2019). The Changing Role of CO2 in the Transition to a Circular Economy: Review of Carbon Sequestration Projects. *Sustainability*, 11(20), 5834. DOI: 10.3390/su11205834.
11. Yurak, V. V. (2020). Vs sustainable development: scenarios for the future, *Journal of Mining Institute*, 242, 242–247. DOI: 10.31897/pmi.2020.2.242.
12. Dmitrieva, D., Romasheva, N. (2020). Sustainable development of oil and gas potential of the arctic and its shelf zone: The role of innovations, *Journal of Marine Science and Engineering*, 21100830140, 8, 1–18. DOI: 10.3390/jmse8121003.
13. Hilson, G., Murck, B. (2000). Sustainable development in the mining industry: clarifying the corporate perspective. *Resources Policy*, 26, 227–238. DOI:10.1016/S0301-4207(00)00041-6.
14. Rondinelli, D., Berry, M. (2000). Environmental citizenship in multinational corporations: Social responsibility and sustainable development. *European Management Journal*, 18, 70–84. DOI:10.1016/S0263-2373(99)00070-5.
15. Shen, L., Kamalakanta, M., Akhilesh, B. (2013). Developing a Sustainable Development Framework in the Context of Indian Mining Industries: AHP approach, *Resource Policy*, 46(1), 15–26. DOI: 10.1016/j.resourpol.2013.10.006.
16. Litvinenko, V. S. (2020). The social and market mechanism of sustainable development of public companies in the mineral resource sector. *Eurasian Mining(Business and International Management)*, 1, 36–41. DOI:10.17580/em.2020.01.07.
17. Turner, R. (1993). *Environmental Economics: An Elementary Introduction* (The John Hopkins University Press), 54–62.
18. The register of priority investment projects of the Arkhangelsk region, approved by the order of the Ministry of Economic Development of the Arkhangelsk region dated May 21, 2019 no. 42-r. URL: https://dvinainvest.ru/upload/dok/%D0%A0%D0%B5%D0%B5%D1%81%D1%82%D1%80%20%D0%9F%D0%98%D0%9F_01.12.2020.pdf (Access date: 10.02.2022).
19. Investment Portal of the Arkhangelsk Region 2021 Official web-page. URL: <https://dvinainvest.ru/en/> (Access date: 10.02.2022).
20. LUKOIL Group 2021 Official web-page LUKOIL – Company. URL: <https://www.lukoil.com/Company> (Access date: 10.02.2022).
21. Knizhnikov, A. et. al. Environmental Transparency Rating of Oil and Gas Companies Operating in Russia WWF report, 28.
22. Sakhalin Energy Investment Company Ltd. (2012). Sustainable Development Report, 117.
23. Sakhalin Energy Investment Company Ltd. (2016). Sustainable Development Policy, 16.
24. Sakhalin Energy Investment Company Ltd. (2020). Sustainable Development Report, 300.
25. LUKOIL – Komi. (2021). Official web-page. URL: <https://komi.lukoil.ru/ru/> (Access date: 10.02.2022).
26. LUKOIL Group. (2004). Sustainability Report for operations in the Russian Federation, 102.
27. LUKOIL Group. (2020). Sustainability Report, 214.
28. LUKOIL Group. (2021). Our contribution to the UN sustainable development goals Official web-page. URL: <https://www.lukoil.com/Sustainability/sustainabledevelopmentmanagement/> (Access date: 10.02.2022).

29. World Economic Forum. (2015). Arctic Investment Protocol Guidelines for Responsible Investment in the Arctic (CH-1223 Cologny/Geneva Switzerland), 10.

30. The Expert Center Project Office for Arctic Development. (2021). Polar Index Official web-page. URL: <https://porarctic.ru/en/projects/p-index/> (Access date: 10.02.2022).

31. Nikonorov, C., Papenov, K., (2019). Conceptual approaches to building a sustainable development rating for constituent entities of the Russian Federation and companies in the Arctic zone of Russia. The Spatial Development Potential of Russia: Unlearned Lessons and Challenges for the Future. Collection of scientific papers of the participants of the International Scientific Conference XXVI, 278–285. **ГИАБ**

ИНФОРМАЦИЯ ОБ АВТОРАХ

*Сивоброва Ирина Анатольевна*¹ — канд. экон. наук, доцент, заведующий кафедрой государственного и муниципального управления Высшей школы экономики, управления и права,

e-mail: i.sivobrova@narfu.ru,

ORCID ID: 0000-0002-2592-3763;

*Степанова Вера Владимировна*¹ — докт. экон. наук, доцент, профессор кафедры государственного и муниципального управления Высшей школы экономики, управления и права,

e-mail: v.stepanova@narfu.ru,

ORCID ID: 0000-0001-5385-6636;

*Якушева Ульяна Евгеньевна*¹ — канд. экон. наук, доцент кафедры государственного и муниципального управления Высшей школы экономики, управления и права,

e-mail: ylich.zz@rambler.ru,

ORCID ID: 0000-0002-0807-7796;

¹ Северный (Арктический) федеральный университет имени М. В. Ломоносова.

Для контактов: *Якушева У. Е.*, e-mail: ylich.zz@rambler.ru.

INFORMATION ABOUT THE AUTHORS

*Sivobrova I. A.*¹, Cand. Sci. (Economics), Head of Department of State and Municipal Management, Higher School of Economics, Management and Law,

e-mail: i.sivobrova@narfu.ru,

ORCID ID: 0000-0002-2592-3763;

*Stepanova V. V.*¹, Dr. Sci. (Economics), Professor at Department of State and Municipal Management, Higher School of Economics, Management and Law,

e-mail: v.stepanova@narfu.ru,

ORCID ID: 0000-0001-5385-6636;

*Yakusheva U. E.*¹, Cand. Sci. (Economy), Associate professor at Department of State and Municipal Management, Higher School of Economics, Management and Law,

e-mail: ylich.zz@rambler.ru,

ORCID ID: 0000-0002-0807-7796;

¹ Northern (Arctic) Federal University, 163002, Arkhangelsk, Russia.

Corresponding author: *Yakusheva U. E.*, e-mail: ylich.zz@rambler.ru.

Получена редакцией 20.03.2022; получена после рецензии 15.07.2022; принята к печати 10.09.2022.

Received by the editors 20.03.2022; received after the review 15.07.2022; accepted for printing 10.09.2022.

