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Digital Transformation of Rural Areas in the Conditions of Innovative Development of the Western Sector of the Russian Arctic

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Abstract. Complex natural-climatic and spatial-geographical conditions, which comprehensively characterize the Arctic as a zone of absolute discomfort, create systemic barriers to the introduction of digital technologies necessary for levelling the risks of population preservation. Of particular strategic importance for the Arctic zone of the Russian Federation are rural territories that provide a presence in the vast and sparsely populated space of the Russian Arctic, including in the areas of exploitation of key deposits of mineral and biological resources. The aim of the article is to analyze the directions of digital transformation of regional development that promotes innovative development of rural territories in the Western sector of the Russian Arctic (on the example of the Arkhangelsk Oblast and the Nenets Autonomous Okrug). Along with comparative analysis of scientific publications and content analysis of normative legal documents, a systematic review of strategic planning documents and indicators assessing the level of digitalization of the Arkhangelsk Oblast and the Nenets Autonomous Okrug with a special focus on the quality of life of the population was carried out. The analysis showed that digitalization processes react sensitively to the political and socio-economic situation, primarily the COVID-19 pandemic, economic recession and sanctions restrictions. The priorities of regional policy in the field of digital transformation have been identified, and insufficient attention to rural areas in this matter has been revealed. Under the concept of regional development "center–periphery", the gap in the degree of development of digital ecosystems between urban and rural settlements is expected to increase, but the lack of official statistical indicators does not allow assessing its depth. Promising areas of state policy in the digital economy include systematic formation of digital competencies of the population, since digital literacy is the most important prerequisite for obtaining significant socio-economic effects of digitalization, as well as increasing the level of technical equipment of organizations, including through the expansion of subsidy programs for purchase of technical equipment used to provide goods, works and services of a socially oriented nature for the population.
Keywords: *Russian Arctic, digitalization, innovative development, digital economy, digital transformation, Arctic zone, regional development*

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Introduction

In accordance with the Decree of the President of Russia No. 204 dated May 7, 2018 “On national goals and strategic objectives for the development of the Russian Federation until 2024” [1], the task of digital transformation of priority sectors of the economy and social sphere was set and the national program “Digital economy of the Russian Federation” was launched [2]. One of the priority areas was the introduction of digital technologies and platform solutions to improve the quality of life of the population. The key objective of the state policy in the field of digitalization is to achieve technological and digital equality of the constituent entities of the Russian Federation. For the Arctic region, this creates the necessary prerequisites for innovative development and partial levelling of the risks of population preservation due to the insufficient level of development of social, logistical and information infrastructure and the high costs of its creation and maintenance, sparse population, remoteness and inaccessibility of settlements, natural and climatic conditions, which comprehensively characterize the Arctic as a zone of absolute discomfort. This creates systemic barriers to the implementation and development of digital technologies in this region. Therefore, its level of digitalization is still insufficient and is changing at a much more moderate pace compared to other regions of the Russian Federation.

The Arctic zone of the Russian Federation (AZRF) is of strategic importance for ensuring national energy, industrial, food and military security of the country. Its territory is 3,754.6 thousand km^2 (about 22% of the total territory of Russia). The average population density is 0.88 people per km^2. This is a consequence of the fact that the most of the population (2,147.7 thousand people) is concentrated in urban areas, where only 39 towns and 43 urban-type settlements are located. Despite the fact that only about 11% of the population of the AZRF live in rural areas, these territories are of particular strategic importance. They provide a presence in the vast and sparsely populated space of the Russian Arctic, including in the areas of development of key deposits of mineral and biological resources. Moreover, this is a multinational region with a rich cultural heritage and traditional economic activities of indigenous peoples. Therefore, the preservation of the rural population of the Arctic Zone of the Russian Federation is one of the important tasks of state policy. Improving the quality of life of its residents through the use of information and communication

[1] Decree of the President of Russia No. 204 dated May 7, 2018 “On national goals and strategic objectives for the development of the Russian Federation until 2024”. URL: http://kremlin.ru/acts/bank/43027 (accessed 01 September 2024).
[2] National Program “Digital Economy of the Russian Federation” dated July 28, 2017 No. 1632-r. URL: http://static.government.ru/media/files/9gFM4FHj4PsB79I5v7yLVuPgu4bvR7M0.pdf (accessed 01 September 2024).

technologies (ICT) in pursuance of the Decree of the President of the Russian Federation No. 474 dated July 21, 2020 “On the national development goals of the Russian Federation for the period until 2030” is one of the priority areas of economic development. The creation of a digital platform for managing the development of settlements as one of the activities within the framework of the preparation of the Strategy for the spatial development of Russia will contribute to improving the efficiency of decision-making in the field of integrated socio-economic and spatial development of cities and settlements of the AZRF.

The aim of the article is to analyze the directions of digital transformation of regional development, contributing to the innovative development of rural areas of the Western sector of the Russian Arctic (with a special emphasis on the Arkhangelsk Oblast and the Nenets Autonomous Okrug — NAO). This will make it possible to analytically comprehend the strategic approaches to digitalization and assess the expected effects of the implementation of digital economy initiatives to improve the quality of life of the rural population, as well as to determine the prospects for expanding digitalization practices in these Arctic regions. One of the key research objectives of this study is to answer the question of how strategic initiatives and regional projects are aimed at the development of rural areas (including through the development of information and communication infrastructure, the introduction of digital services, the formation of digital competencies of the population).

Theoretical approaches to the study of directions of digital transformation of rural areas in the Arctic region: methodology and research methods

Digital transformation as a process of introducing innovative technologies to improve the management system both at the level of organizations and in the sphere of public administration has become a popular subject of research over the past two decades. The introduction of digital technologies is assessed by researchers in terms of socio-economic effects at both the meso- and macro-levels and fits into the logic of perceiving these innovations as one of the important spatial factors in the theories of cumulative growth [1, Kuznetsova O.V.] of the regional economy. At the same time, this is quite consistent with the concept of changing technological structures [2, Perez K.], according to which the digital transformation of socio-economic systems is caused by a paradigm shift in the leading factors of production. Already within the framework of the previous — the fifth (1980–2020) — technological structure, the introduction of ICT into the system of socio-economic relations became the leading driver of economic development. At the next stage, these innovative technologies predetermine the logic of development of the global economy and give it a new impetus, which will become the basis for increasing the competitiveness of regions [3, Tapscott D.; 4, Brynjolfsson E., Kahin B.].

One of the conceptually important areas of foreign research in the field of regional economics is the study of the digital transformation of rural areas, namely, the analysis of the implementation of digitalization and automation to solve applied problems in the economy and social sphere in rural areas. Digitalization is widely used to manage water and land resources (using sen-

sor and controller systems, as well as artificial intelligence technologies — AI), crop and livestock management (using remote sensing systems, digital twins, unmanned technologies, machine vision, IoT), farm and supply chain management (using information management systems, e-commerce, Internet marketing, social media, online education) [5, Brunori G.].

In addition to works devoted to the direct implementation of technologies, a major area of research is the study of the consequences of digitalization for rural areas, including their impact on the quality of life. Digital transformation affects all key areas of society: economy (organization and management of production, value chains, sales markets), environment (impact on ecosystems, use of natural resources, risk management, animal health), public administration (regulatory control, including product certification, interaction of the population with public authorities), social sphere (access to public services, social interactions, access to information, social capital, labor market, education, medicine, etc.) [6, Rolandi S., Brunori G., Bacco M. et al.].

In the context of various aspects of the quality of life of the rural population, most of the published works are focused on the positive impact of digital technologies [6; 7, Ruiz R.]. Digitalization can provide tools for managing diversified agricultural systems, optimizing resource use, reducing the volume of physically difficult and routine work, simplifying administrative tasks, improving communication, and predicting risks. Automation in agriculture can significantly facilitate the life of agricultural producers, creating new employment models [8, Rotz S., Gravely E., Mosby I. et al.]. Internet marketing and digital platforms will provide small farms with access to markets. Digital technologies also contribute to improving product quality through certification and improved quality management. Digital solutions (websites, online applications) can simplify interaction with government agencies and various bureaucratic procedures. Automated information collection systems create conditions for increasing the effectiveness of state regulation of the economy (for example, through the system of compensation for damages in emergency situations).

Studies also show that the Internet facilitates the dissemination of information within rural communities and between settlements, increasing the connectivity of Arctic regions [9, Abildgaard M.S., Ren C., Leyva-Mayorga I. et al.; 10, Warf B.] and improving the quality of life of the indigenous population. Social media contribute to the development of local identity, a sense of belonging to the local community, and increase the social, economic, and political inclusion of the local population [11, Ye L., Yang H.]. The development of information and communication technologies creates conditions for the development of the labor market and expansion of opportunities for the rural population to form an offer on the world market [12, Coates K.S.] and increase its adaptation to changes in the context of globalization [13, Young J.C.], which is especially valuable for retaining youth in the Arctic region. Digitalization through telemedicine, e-commerce and online learning has a positive effect on the availability of these services for the rural population. IoT technologies enable patients to independently provide themselves with some types of assistance [14, Philip L., Roberts A., Currie M. et al.].

A review of foreign studies shows that, despite the opportunities that digital transformation creates for the development of rural areas, it is a factor that has a negative impact on the quality of life. Digitalization of various services can limit personal contacts between people, thereby contributing to the atomization of communities. For example, the introduction of digital social services may result in fewer visits of support services to the elderly and other vulnerable groups, thereby increasing their social isolation [14, Philip L., Roberts A., Currie M.]. Another risk is the growth of imbalances in the labor market and social tension, due to the widening gap between high-tech and low-skilled jobs [8, Rotz S., Gravely E., Mosby I. et al.]. The use of robotic systems in agriculture creates new ethical challenges [15, Sparrow R., Howard M.]. In general, the widespread use of digital technologies can lead to an increased dependence of the population on digital service providers who control the technologies and the information collected through them [16, Salemink K., Strijker D.].

In the context of the consequences of digital transformation, an important aspect of this issue in the scientific literature is the readiness of rural areas for digitalization. The rural world is diverse, and the formulation of strategies and specific solutions in the field of digitalization depends on such factors as remoteness from large urban centers, availability of digital competencies, readiness to accept new technologies, level of infrastructure development [17, Wolski O.]. Another important aspect is the formation of digital competencies among the rural population [18, McMahon R., McNally M.B., Nitschke E. et al.] and ensuring their cyber security [19, Salminen M., Morris L.].

The implementation of digital technologies in rural areas requires a comprehensive solution, taking into account the accumulated experience of digitalization [20, Saunavaara J., Kylli R., Salminen M.] and the creation of “smart” cities. One example of such an initiative is the diffusion of the “Smart Village” innovation [21, Zavratnik V., Kos A., Stojmenova Duh E.; 22, Spicer Z., Goodman N.] in six large regions, namely East Africa, West Africa, South Asia, Southeast Asia, South America and Central America, the Caribbean, and Mexico. It is based on an integrated approach to providing access to energy in rural areas with the involvement of government and commercial organizations. It should be noted that this experience is not being implemented in the Arctic region. However, its implementation in the AZRF conditions would be an interesting solution, allowing for the creation of “model” settlements with modern digital ecosystems by analogy, in particular, with Scandinavian countries [23, Randall L., Berlina A.]. This experience would be unique both for the Russian Arctic and for the North of Canada [24, Coates K., Holroyd C.] and Alaska and would reduce the significant gap in the development of digital technologies in rural areas compared to urban ones.

In the Russian Arctic, the digital transformation process is developing in line with global trends in the regional digitalization and faces the same barriers as other Arctic regions (primarily Alaska and northern Canada), natural and climatic conditions, spatial vastness and sparse population of which are particularly close to the realities of rural areas in the AZRF. Russian studies of ru-

ral digitalization have not yet become widespread. The challenges, trends and potential of digital transformation of the Arctic region as a whole [25, Egorov N.E., Kovrov G.S., Tishkov S.V.], its features in comparison with non-Arctic regions of Russia [26, Gladkikh E.G., Romanova I.N.] and methodological approaches to assessing the level of digital economy development in the AZRF [27, Byvshev V.I., Panteleeva I.A., Uskov D.I. et al.; 28, Kuratova L.A.] are being more broadly discussed. As a rule, urban and rural areas are not differentiated in studies; only an assumption is made about the digital inequality of the Arctic regions. Published works are mainly devoted to methodological approaches to assessing the level of formation of the digital environment and readiness for digitalization of rural areas [29, Sovetova N.P.], evaluation of the development of digital infrastructure in rural areas, reviews of the state of digitalization of rural areas in some regions of the Russian Federation [30, Kasimova Zh.V., Kasimov A.A.], opportunities for developing interaction between the population and state and municipal authorities in the digital environment [31, Karaseva A., Gavrilova K., Vasilyeva V. et al.], accessibility of education in remote settlements of the Russian Arctic [32, Dyadik N.V., Chapargina A.N.], including for indigenous peoples. The expansion of digitalization is considered as one of the tools to restrain the migration outflow of the working-age population from the rural areas of the Arctic Zone of the Russian Federation [33, Ljovkin V.E., Detter G.F., Tukkel J.L. et al.]. Key attention is paid to the potential of innovative ICT for digital transformation and monitoring the state of the transport and logistics infrastructure of the Arctic region, which ensures spatial connectivity, sustainable development [34, Didenko N.I., Skripnyuk D.F., Cherenkov V.I. et al.] and food security of remote settlements. Despite the fact that certain aspects of digitalization of rural areas related to education, healthcare, social and logistics infrastructure are fragmentarily covered in the works of researchers, a comprehensive assessment of the impact of digital transformation on the quality of life of the rural population in the AZRF has not been carried out.

As part of our study, along with comparative analysis of scientific publications and content analysis of regulatory legal documents, systematic analysis of indicators assessing the level of digitalization of the regional economy was conducted with a special emphasis on the quality of life of the population of the subjects of the Western sector of the Russian Arctic — the Arkhangelsk Oblast and the Nenets Autonomous Okrug, territorially bordering each other, but having significantly different conditions for the implementation and development of digital systems. The main sources of information were data from the Federal State Statistics Service, the Government of the Arkhangelsk Oblast, as well as regulatory documents governing activities in the Arctic zone of the Russian Federation.

Legal regulation of digitalization of rural areas in the economy and social sphere in the Arkhangelsk Oblast and the Nenets Autonomous Okrug

Legal regulation of the digital economy and public relations formed during the implementation and introduction of digital solutions into various spheres of society can be decomposed into two levels. The first is the level of transformation of institutions and legal norms, primarily in fed-

eral legislation. The implementation of the processes of "digitalization of law" and the creation of legal conditions for the effective and safe implementation of elements of the digital economy is the prerogative and subject of jurisdiction of the federal government (Article 71 (i) and (m) of the Constitution of the Russian Federation) [3]. The Russian Federation is currently implementing the federal project "Regulatory framework for the digital environment" within the framework of the national program "Digital economy of the Russian Federation" [4]. The objectives of the project include the development and promotion of the adoption of regulatory legal acts promoting the development of the digital economy, as well as the regulation of cross-cutting issues related to digital legal relations for various branches of legislation (identification of subjects of legal relations in the digital environment, electronic document management, data circulation, Internet of things, standardization of technologies, etc.) [5].

The second level is the level of strategic planning and formation of specific mechanisms for the implementation of digital environment solutions. For the most part, this block is consolidated by both federal and regional by-laws. The basic profile document today is the Decree of the President of the Russian Federation No. 203 dated May 9, 2017 "On the Strategy for the development of the information society in the Russian Federation for 2017–2030" [6], which regulates the main terms of the sphere, such as information society, digital economy and others.

The Russian President's instructions of 31 December 2020 became a catalyst for the intensification of normative regulation of strategic planning in the field of digitalization at the level of the constituent entities of the Russian Federation. Due to these instructions, digital transformation strategies were adopted in many regions of the country by September 2021. Thus, in the Arkhangelsk Oblast, the "Strategy for the digital transformation of key sectors of the economy, social sphere and public administration of the Arkhangelsk Oblast" was adopted [7], approved by the order of the Government of the Arkhangelsk Oblast No. 344-rp dated August 10, 2021. In the Nenets Autonomous Okrug, the "Strategy for the digital transformation of the economic sectors,

[3] Constitution of the Russian Federation. URL: http://www.constitution.ru/10003000/10003000-5.htm (accessed 26 August 2024).
[4] Decree of the President of the Russian Federation of May 9, 2017 No. 203 "On the Strategy for the Development of the Information Society in the Russian Federation for 2017–2030". URL: https://base.garant.ru/71670570/ (accessed 26 August 2024).
[5] Regulatory framework of the digital environment. Ministry of Economic Development of the Russian Federation. URL: https://www.economy.gov.ru/material/directions/gosudarstvennoe_upravlenie/normativnoe_regulirovanie_cifrovoy_sredy/ (accessed 02 September 2024).
[6] Decree of the President of the Russian Federation of May 9, 2017 No. 203 "On the Strategy for the Development of the Information Society in the Russian Federation for 2017–2030". URL: https://base.garant.ru/71670570/ (accessed 01 September 2024).
[7] Order "On approval of the strategy for digital transformation of key sectors of the economy, social sphere and public administration of the Arkhangelsk Oblast for the period until 2024" dated August 10, 2021 No. 344-rp. URL: https://docs.cntd.ru/document/578060723 (accessed 02 September 2024).

social sphere and public administration of the Nenets Autonomous Okrug" [8] was approved by the Resolution of the Governor of the NAO No. 55-pg dated August 30, 2022. The term of these strategies was determined until 2024. In the future, they are planned to be extended. The documents describe in detail the priorities and objectives, problems and challenges, expected results of the digital transformation of the Arkhangelsk Oblast and the Nenets Autonomous Okrug. The strategies provide for the implementation of projects related to education, science, healthcare, urban development, transport and logistics, public administration, social sphere, and construction. The beneficiaries of the strategy are all categories of the population of the subjects, including rural residents.

On the basis of the content of the documents, it is possible to highlight the problems of rural areas and projects planned for implementation in the Arkhangelsk Oblast and the Nenets Autonomous Okrug. The application of modern digital technologies in the fields of education, healthcare, and public administration has the potential to significantly reduce existing problems and create a more accessible environment for citizens. However, it is worth noting that the digital transformation strategy of the Arkhangelsk Oblast looks more attractive for rural areas: it highlights more problems and projects for the development of digitalization in the regions. The strategy of the Nenets Autonomous Okrug is more focused on the development of economic sectors for urban residents.

In this context, it is also worth mentioning the Strategies for socio-economic development (hereinafter referred to as the SED Strategy) [9] of both the Arkhangelsk Oblast until 2035 and the Nenets Autonomous Okrug until 2030 [10]. Both documents were adopted in 2019 and take into account digitalization processes to varying degrees. The SED Strategy of the Arkhangelsk Oblast includes the "Digitalization of healthcare" project, aimed at improving the quality of medical care and its availability for all residents of the Arkhangelsk Oblast by expanding the use of information and telecommunication technologies, as well as the "Digital infrastructure of industry" project, designed to ensure accelerated digitalization of the industrial and transport and logistics complexes of the Arkhangelsk Oblast [11]. The topic of digitalization is separately addressed in the "School education" project in the context of overcoming the problems of technological lag of general education organizations in the region, including their connection to high-speed Internet. As part of the process of modernizing rural settlements in the Arkhangelsk Oblast, the SED Strategy sets out the tasks of increasing the level of broadband Internet access throughout the Arkhangelsk Oblast, in-

[8] Resolution on approval of the "Strategy for digital transformation of economic sectors, social sphere and public administration of the Nenets Autonomous Okrug". URL: https://docs.cntd.ru/document/406224772 (accessed 26 October 2024).
[9] Strategy for socio-economic development of the Arkhangelsk Oblast until 2035. Arkhangelsk, February 18, 2019. No. 57-5-OZ. URL: https://dvinaland.ru/gov/iogv/minec/strategy/#cookies=yes (accessed 02 September 2024).
[10] Strategy for socio-economic development of the Nenets Autonomous Okrug until 2030. URL: https://dfei.admnao.ru/strategicheskoe-planirovanie/proekt-strategii-socialno-ekonomicheskogo-razvitiya-neneckogo-avtonomn/ (accessed 02 September 2024).
[11] Strategy for socio-economic development of the Arkhangelsk Oblast until 2035. Arkhangelsk, February 18, 2019. No. 57-5-OZ. URL: https://dvinaland.ru/gov/iogv/minec/strategy/#cookies=yes (accessed 02 September 2024).

cluding in hard-to-reach rural settlements, and organizing a remote system for providing social services to hard-to-reach settlements [12]. In general, the digital economy is identified as one of the priority sectors of the Arkhangelsk Oblast economy.

The SED Strategy of the Nenets Autonomous Okrug sets digital transformation of the region's economy and social life as one of the strategic goals in the field of digital economy development [13]. The document provides a systematic approach to the implementation of the stated goal. Several major tasks are highlighted, such as accelerated implementation of digital technologies in the economy, social sphere, state and municipal administration; increasing the number of organizations implementing technological innovations; increasing the volume of attracted investments in high-tech and innovative projects; developing digital skills of the population and promoting the training of specialists in the field of information technology; ensuring coverage of the population with broadband Internet access; creating conditions for providing the rural population with affordable telecommunication technologies.

To date, the implementation of the designated strategic tasks in the field of digital economy in the Arkhangelsk Oblast and the Nenets Autonomous Okrug is carried out through a program and project mechanism. The general scheme is as follows: four regional projects are being implemented within the framework of the national program "Digital economy" — "Information infrastructure", "Information security", "Digital technologies" and "Digital public administration" [14]. In the Arkhangelsk Oblast, these projects are linked to the State Program of the Arkhangelsk Oblast "Digital development of the Arkhangelsk Oblast" [15]. In the Nenets Autonomous Okrug, only the "Information infrastructure" project is linked to the State Program of the Nenets Autonomous Okrug "Information society of the Nenets Autonomous Okrug" [16].

On the basis of the analysis of existing strategies, programs and projects of the Arkhangelsk Oblast and the Nenets Autonomous Okrug, it should be concluded that there are no specialized acts regulating the processes of digitalization of rural areas. The specification of acts is determined by the criterion of "digits" rather than by spatial and territorial conditionality. An illustrative example is the state program of the Arkhangelsk Oblast "Comprehensive development of rural territories of the Arkhangelsk Oblast" [17], which does not reflect the issues of digital development of these territories. At the same time, the regulation of various aspects of the formation of digital

[12] Strategy for socio-economic development of the Nenets Autonomous Okrug until 2030. URL: https://dfei.adm-nao.ru/strategicheskoe-planirovanie/proekt-strategii-socialno-ekonomicheskogo-razvitiya-neneckogo-avtonomn/ (accessed 02 September 2024).
[13] Ibid.
[14] National Program "Digital Economy". URL: https://dvinaland.ru/gov/national_projects/digital/#cookies=yes (accessed 02 September 2024).
[15] State Program of the Arkhangelsk Oblast "Digital Development of the Arkhangelsk Oblast". URL: https://dvinaland.ru/budget/programs/27#cookies=yes (accessed 02 September 2024).
[16] State Program of the Nenets Autonomous Okrug "Information Society of the Nenets Autonomous Okrug". URL: https://dfei.adm-nao.ru/proektnyj-ofis/pasporta-regionalnyh-proektov/cifrovaya-ekonomika/ (accessed 02 September 2024).
[17] State program of the Arkhangelsk Oblast "Comprehensive development of rural territories of the Arkhangelsk Oblast". URL: https://docs.cntd.ru/document/462645039 (accessed 02 September 2024).

infrastructure and digital economy in the region is concentrated in the specialized state programs of the Arkhangelsk Oblast. For example, the integration of the service "Unified card of a resident of the Arkhangelsk Oblast" and the achievement of the indicator of increasing the share of mass socially significant services available in electronic form are included in the already mentioned state program "Digital development of the Arkhangelsk Oblast" [18]. The State Program of the Arkhangelsk Oblast "Development of healthcare in the Arkhangelsk Oblast" plans the project "Creation of a unified digital healthcare circuit on the basis of the unified state health information system" [19]. The State Program of the Arkhangelsk Oblast "Development of education and science in the Arkhangelsk Oblast" includes the project "Digital educational environment" [20].

Thus, the regulatory framework for issues of digitalization of rural areas in the economy and social sphere in the Arkhangelsk Oblast and the Nenets Autonomous Okrug is integrated into the hierarchy of federal strategic planning documents and the system of implementation of national projects, in particular, the "Digital economy of the Russian Federation". The relevant measures for the application and implementation of digital solutions in remote and sparsely populated areas are provided for in the specialized state programs of the constituent entities.

Digital development of the Russian Arctic: system of regional development indicators

The creation of an integrated digital platform for managing the digital development of regions requires the implementation of an effective system for monitoring indicators that assess the achievement of target indicators and the dynamics of digitalization of settlements in various areas. Conceptually, the digitalization of the economy is considered as a tool for transforming the process of interaction between the state, corporate sectors and households [35, Khalin V.G., Chernova G.V.]. To assess the level of digitalization of regional development and the readiness of the digital infrastructure, various methodological approaches are used, which mainly propose the systematization of statistical indicators and their processing in the form of integral indices [36, Jovanovic Milenkovic M., Brajovic B., Milenkovic D. et al.], assessed by the Ministry of digital development, communications and mass media of the Russian Federation [37, Safiullin M.R., Elshin L.A., Abdukaeva A.A. et al.]; as well as the system for monitoring the digitalization of regional economic systems of the Moscow school of management SKOLKOVO [21], etc.

Analysis of the comparability of the indicators of digital development of the Arctic Zone of the Russian Federation with the indicators assessing the regional development of digital technologies in accordance with the strategies of the constituent entities of the AZRF allows stating their

[18] State program of the Arkhangelsk Oblast "Digital development of the Arkhangelsk Oblast". URL: https://dvinaland.ru/budget/programs/27#cookies=yes (accessed 02 September 2024).
[19] State program of the Arkhangelsk Oblast "Development of healthcare in the Arkhangelsk Oblast". URL: https://dvinaland.ru/budget/programs/?CODE=01 (accessed 02 September 2024).
[20] State program of the Arkhangelsk Oblast "Development of education and science in the Arkhangelsk Oblast". URL: https://dvinaland.ru/budget/programs/?CODE=02 (accessed 02 September 2024).
[21] Monitoring of regional informatization of the Ministry of Digital Development, Communications and Mass Media of the Russian Federation. URL: https://digital.gov.ru/ru/documents/4949/ (accessed 23 March 2024).

methodological inconsistency. In general, the system of indicators at the federal and regional levels is focused on describing the conceptual model of interaction between three key stakeholders in the process of digitalization of the economy: government, business and society (Fig. 1).

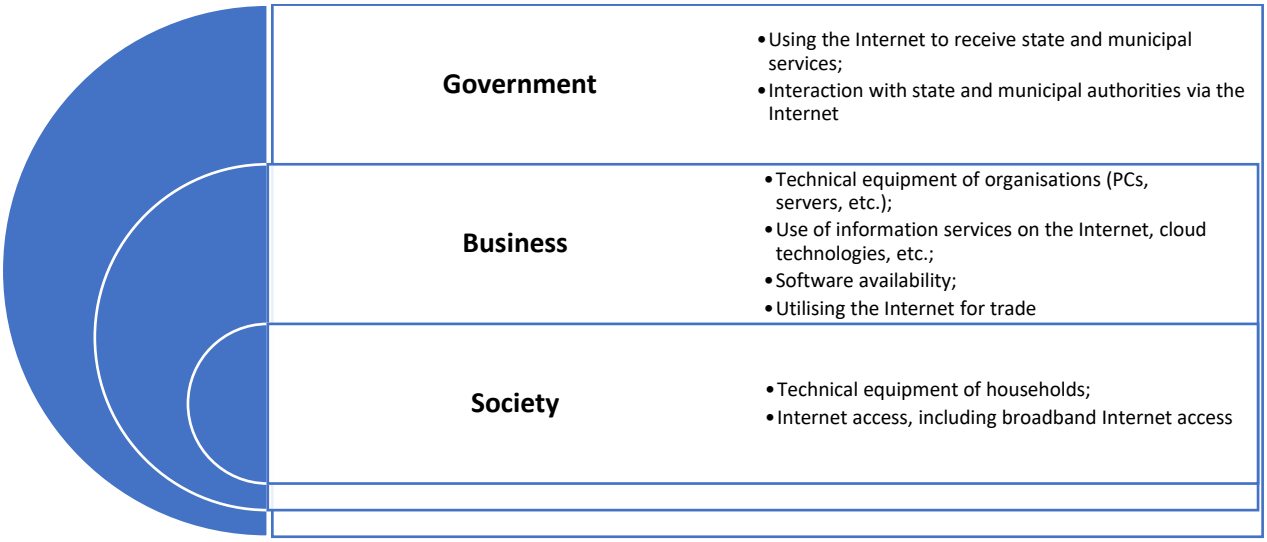

Fig. 1. Conceptual model of the system of leading indicators of digitalization of regional development in the Arctic Zone of the Russian Federation.

On the website of the Federal State Statistics Service, the characteristics of the leading indicators of digitalization of the economy of the Arctic Zone of the Russian Federation are focused on assessing the availability of ICT and technical equipment of households and organizations; less attention is paid to the availability and quality of state and municipal services for both individuals and legal entities (Table 1) [22].

Table 1

System of leading indicators of digitalization of the economy in the Arctic zone of the Russian Federation in 2016–2023

Indicator	2016	2017	2018	2019	2020	2021	2022	2023
Share of households with a computer in the total number of households, %	84.8	74.8	83.8	80.3	80.1	77.4	76.6	77.4
For reference: Russian Federation	*74.3*	*74.4*	*72.4*	*69.4*	*72.1*	*72.6*	*73.0*	*71.2*
Share of households with access to the Internet, %	84.0	76.6	86.4	84.0	86.6	87.3	89.1	89.1
For reference: Russian Federation	*74.8*	*76.3*	*76.6*	*76.9*	*80.0*	*84.0*	*86.6*	*87.9*
Share of households with broadband access to the Internet, %	73.9	72.8	80.1	81.3	81.6	85.2	87.3	88.7
For reference: Russian Federation	*70.7*	*72.6*	*73.2*	*73.6*	*77.0*	*82.6*	*85.5*	*87.3*
Share of population actively using the Internet, %	82.9	82.9	88.4	88.5	88.6	90.3	90.5	91.4
For reference: Russian Federation	*71.5*	*74.1*	*79.3*	*81.4*	*84.1*	*87.3*	*89.8*	*91.5*
Share of population not	0.2	0.6	0.3	0.5	0.3	0.2	0.2	0.7

[22] Statistical information on the socio-economic development of the Arctic zone of the Russian Federation. URL: https://rosstat.gov.ru/storage/mediabank/arc_zona.html (accessed 01 September 2024).

using the Internet for security reasons, %								
For reference: Russian Federation	*0.5*	*0.6*	*0.4*	*0.5*	*0.4*	*0.4*	*0.3*	*0.3*
Share of the population using the Internet to order goods (services), %	38.0	44.1	55.9	57.0	51.3	61.0	62.1	69.8
For reference: Russian Federation	*23.1*	*29.1*	*34.7*	*35.7*	*40.3*	*46.6*	*53.7*	*61.3*
Number of personal computers, thousand pcs.	347.8	333.1	350.5	352.5	411.7	429.1	448.0	*
Number of personal computers with access to the Internet per 100 employees of organizations, pcs.	27	27	29	29	32	35	35	*
Expenditures on the introduction and use of digital technologies, bln. rub.	29.9	27.2	23.5	24.1	36.4	42.7	53.2	*
Share of organizations using broadband Internet access, %	82.5	83.0	85.3	86.1	62.6	74.7	79.1	*
Share of organizations that had a website in the total number of organizations surveyed, %	46.3	47.0	49.9	50.5	41.3	42.4	42.6	*
Share of organizations that used the Internet to place orders for goods (works, services), %	46.2	43.8	44.5	44.2	38.7	39.6	40.1	*

In general, it should be noted that the digitalization indicators of the AZRF are higher than the average indicators in the Russian Federation. This demonstrates the effectiveness of the implementation of state policy on the introduction of digital economy initiatives in the Arctic region. Nevertheless, the dynamics of indicators in the AZRF shows an ambiguous increase in the level of technical equipment of households (an increase in the number of personal computers by 100.2 thousand units in 2016–2022 with a simultaneous decrease in the share of households with personal computers) and the increasing popularity and availability of the Internet among individuals in the AZRF, including for ordering goods (services) online (almost twice as much). This situation probably reflects the all-Russian trend of replacing personal computers with mobile devices [23].

At the same time, the outpacing growth rates of the need to use ICT among the population do not quite correspond to the dynamics of their development in organizations, as evidenced by the decrease in the share of organizations that used broadband Internet access (by 3.4 percentage points), had a website (by 3.7 percentage points), used the Internet to place orders for goods (works, services) (by 6.1 percentage points). The development of information infrastructure has created a favorable environment for the development of the digital economy, trade turnover and the labor market. It is worth noting that the regional markets of retail trade in goods and services in the AZRF using Internet technologies remained rather inert and did not respond to the in-

[23] The share of families with computers has decreased — Rosstat. URL: https://360.ru/news/tehnologii/snizilas-dolja-semej-s-kompjuterami-rosstat/ (accessed 09 September 2024).

creased demand of the population for online resources. On the contrary, there was a downward trend in the share of organizations that had a website (by 3.7 percentage points) and used the Internet to place online orders (by 6.2 percentage points). This correlates with the all-Russian downward trend in the indicators after the peak values of 2019 [24, 25].

The dynamics and level of indicators of digitalization of regional development in different regions of the Arctic Zone of the Russian Federation are predetermined by the spatial-geographical, natural-climatic, socio-economic and ethno-cultural features of the territories. The Arkhangelsk Oblast and the Nenets Autonomous Okrug, located in the Western sector of the Russian Arctic, are characterized by spatial vastness and a significant predominance of rural areas with a low population density and the concentration of more than 70% of the population in cities and urban settlements. This creates favorable conditions, increases the effect of the introduction of digital technologies for the urban population and makes the process of digitalization of rural areas socially significant, but extremely costly.

The total area of the Arkhangelsk Oblast (excluding the Nenets Autonomous Okrug) is 589,913 km². As of January 1, 2024, there are 67 municipalities in the Arkhangelsk Oblast, including 26 first-level (7 urban okrugs; 15 municipal okrugs, 4 municipal districts); 41 second-level (6 urban and 35 rural settlements). As of January 1, 2024, the population is 955,848 people, including the urban population of 746,545 people (72%), the rural population — 209,303 people (28%) [26]. The population density is 1.69 people/km^2. The main part of the industrial and social infrastructure is concentrated in urban settlements, since the socio-economic development of the Arkhangelsk Oblast is mainly based on the development of the forestry complex, mechanical engineering (shipbuilding industry) and the infrastructure of commercial ports. This predetermines a reasonable shift of emphasis on the development of digital economy initiatives, primarily in cities and urban settlements, thereby implementing the concept of regional development “center–periphery”, which has become one of the leading in the development of the Arctic region.

The Nenets Autonomous Okrug is an independent subject of the Russian Federation, most of which is located beyond the Arctic Circle. It includes the Kolguyev and Vaygach islands, the Kanin and Yugorskiy peninsulas. The total territory of the okrug is 176.7 thousand km². This is the most sparsely populated region in the Arctic Zone of the Russian Federation with a population of 42,224 people [27] and a population density of 0.24 people/km^2. The NAO has one city (Naryan-Mar), one urban-type settlement (Iskateli) and 42 rural settlements. As in the Arkhangelsk Oblast, most

[24] Unified Interdepartmental Information and Statistical System. The share of organizations with a website on the Internet, in the total number of organizations. URL: https://www.fedstat.ru/indicator/43528 (accessed 09 September 2024).
[25] Unified Interdepartmental Information and Statistical System. The share of organizations using the Internet to place orders for goods (works, services), in the total number of organizations. URL: https://www.fedstat.ru/indicator/43530 (accessed 09 September 2024).
[26] Federal State Statistics Service. The permanent population of the Russian Federation by municipalities as of January 1, 2024. URL: https://rosstat.gov.ru/compendium/document/13282 (accessed 04 May 2024).
[27] Ibid.

of the population is concentrated in urban areas (72.8% [28]). While the main branches of industry, providing the formation of the gross regional budget (oil and gas production), are located in the Timan-Pechora oil and gas basin, there are also about 80 deposits of construction materials (sand, gravel, clay) outside the urban areas. Reindeer herding, dairy cattle breeding, greenhouse farming and potato growing are being developed on agricultural lands.

In accordance with the strategic planning documents of the Arkhangelsk Oblast and the Nenets Autonomous Okrug, there is a shift in emphasis to the digital development of economic entities. The share of organizations using ICT (2007–2018), digital technologies (since 2019) in the Arkhangelsk Oblast and the Nenets Autonomous Okrug in 2007–2022 is shown in Fig. 2–3. Compared to the Russian average [29], the Arkhangelsk Oblast and the Nenets Autonomous Okrug as a whole demonstrate a comparable or higher level of digitalization: for example, the share of organizations using personal computers (2022: Arkhangelsk Oblast — 82.8%, Nenets Autonomous Okrug — 80.1%, Russian Federation — 77.5%), local area networks (2022: Arkhangelsk Oblast — 60.1%; Nenets Autonomous Okrug — 54.7%, Russian Federation — 47.9%). Comparable values were shown by the share of organizations using fixed-line Internet (Arkhangelsk Oblast — 76.3%; Nenets Autonomous Okrug — 74.7%, Russian Federation — 75.1%). The use of mobile Internet by organizations of the Arkhangelsk Oblast (45.4%) significantly exceeded the same indicator for the Nenets Autonomous Okrug (32.6%) and the Russian average (36.4%). Besides, the organizations of the Arkhangelsk Oblast showed a higher level of Intranet use (AO — 34.3%, NAO — 28.3%, RF — 26.9%) and Extranet (AO — 22.9%, NAO — 14.0%, RF — 19.3%). Statistics record lower indicators of the Arkhangelsk Oblast and the NAO compared to Russia as a whole in terms of the share of organizations that had a website on the Internet (AO — 44.1%; NAO — 43.4%, RF — 47.4%).

[28] Federal State Statistics Service. Population by gender by constituent entities of the Russian Federation as of January 1, 2022 (taking into account the results of the 2020 All-Russian Population Census). URL: https://rosstat.gov.ru/storage/mediabank/Bul_chislen_nasel-pv_01-01-2022.pdf (accessed 16 July 2024).

[29] Share of organizations using information and communication technologies. URL: https://02.rosstat.gov.ru/storage/mediabank/IKT-2022(1).pdf (accessed 16 July 2024).

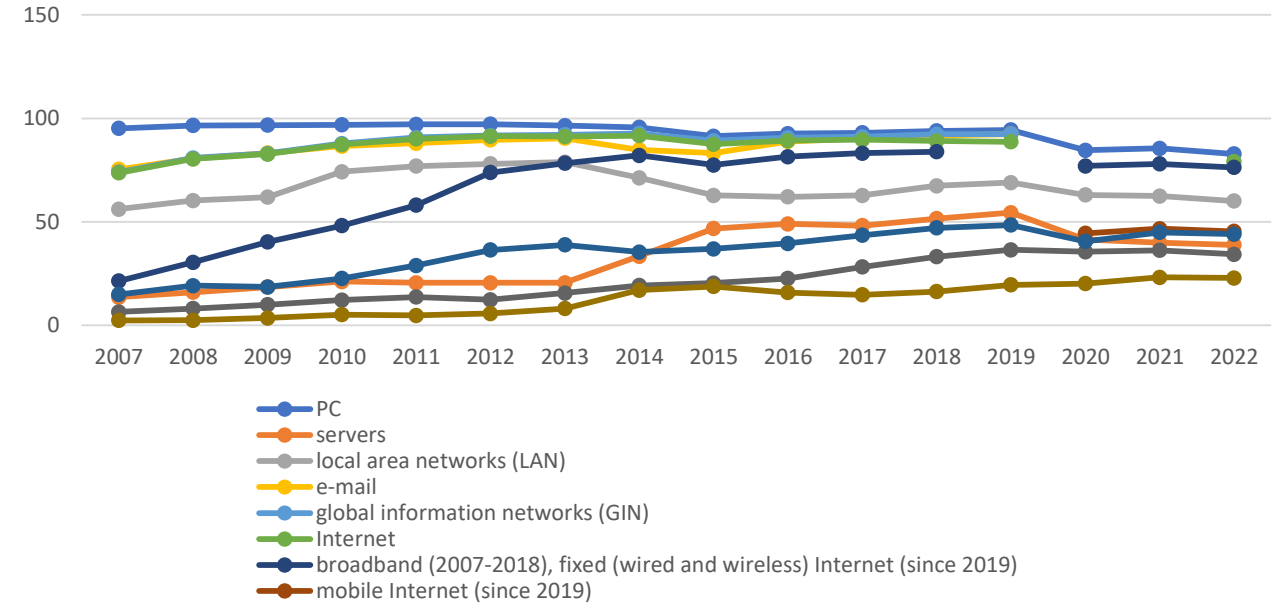

Fig. 2. The share of organizations using information and communication technologies (2007–2018), digital technologies (since 2019) in the Arkhangelsk Oblast, 2007–2022 [30] .

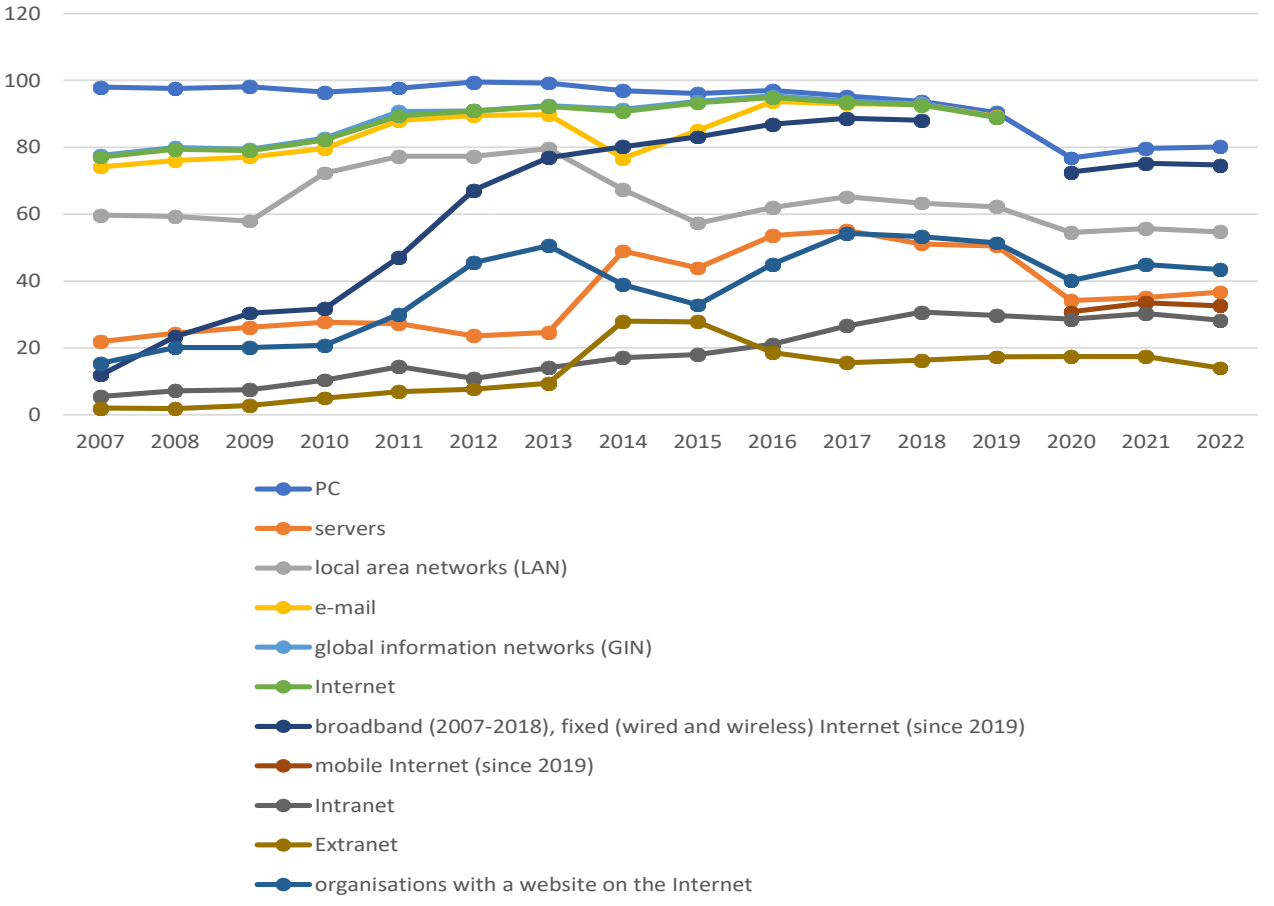

Fig. 3. The share of organizations using information and communication technologies (2007–2018), digital technologies (since 2019) in the Nenets Autonomous Okrug, 2007–2022 [31].

[30] Department of the Federal State Statistics Service for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. ICT Indicators. URL: https://29.rosstat.gov.ru/ict111 (accessed 01 September 2024).
[31] Department of the Federal State Statistics Service for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. Database for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. URL: https://29.rosstat.gov.ru/databases (accessed 01 September 2024).

This can be partly explained by the structure of the economy of the northern regions, including a significant share of small and medium-sized businesses: as of October 10, 2024 — 33,590, of which 33,509 were small and micro enterprises, including 23,160 individual entrepreneurs [32] (this is quite consistent with the all-Russian trend: the number of SMEs is 6.37 million enterprises, of which 4.2 million are individual entrepreneurs, 2.2 million are legal entities). The industry structure of both regions determines the operation of large mining and manufacturing enterprises in them, which, of course, are actively introducing and developing digital technologies. However, in the context of a crisis in the economy and rising costs due to galloping inflation, small businesses are not ready for new costs for implementing digital technologies, which are associated with long payback periods (as a rule, at least a year). In this case, it would be advisable to introduce programs for partial subsidization of these activities for small and medium-sized businesses (SMEs). At the same time, the lack of interest in the use of digital technologies in both regions can be explained by the completely natural focus of small businesses on local markets (often even within the boundaries of populated areas) and the lack of need to promote their products, goods and services in the Internet space. We admit a wider range of additional reasons hindering the development of digital technologies among SMEs in the Arkhangelsk Oblast and the Nenets Autonomous Okrug, but they require confirmation in the framework of field research (sociological surveys and expert interviews).

The coronavirus pandemic had a similar impact on the equipment with intangible assets (IA), that is, the use of special software by organizations (Fig. 6–7), reducing the popularity of even highly sought-after software for SMEs for managing purchases and sales. Organizations left the minimum intangible assets sufficient to meet the requirements of the law: reference and legal systems and software products for financial transactions in electronic form.

[32] Ministry of Economic Development and Industry of the Arkhangelsk Region. Small and Medium Entrepreneurship. URL: https://dvinaland.ru/gov/iogv/minec/entrepreneurship/ (accessed 09 September 2024).

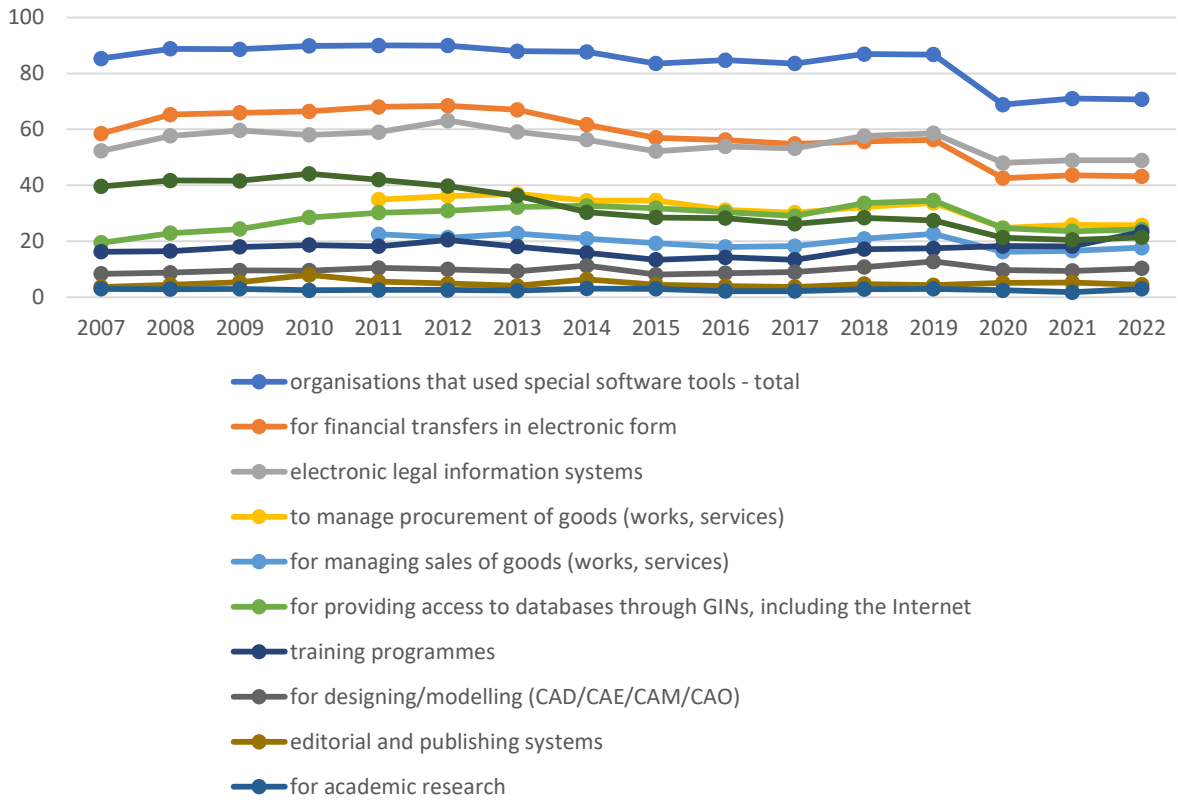

Fig. 4. Level of intangible asset provision — the share of organizations using specialized software (as a percentage of the total number of surveyed organizations) in the Arkhangelsk Oblast, 2007–2022 [33].

In contrast to the Arkhangelsk Oblast, where, starting from the pandemic period, there was a stagnation period of the level of organizations' equipment with IA, in the Nenets Autonomous Okrug there was a tendency to increase the level of provision with special software tools. However, the equipment with fixed assets and intangible assets supporting the introduction of digital technologies in the region still lags behind the all-Russian level, but practically coincides with similar indicators for the AZRF: for example, in 2022, the share of organizations using broadband Internet access in the Arctic Zone of the Russian Federation was 79.1%, in the AO — 76.3%, in the NAO — 74.7%; the share of organizations with a website on the Internet in the AZRF was 42.6%, in the AO — 44.1%, in the NAO — 43.4%.

Thus, the introduction of digital technologies in the Arkhangelsk Oblast and the Nenets Autonomous Okrug is sensitive to changes in the political and socio-economic situation in the country and the Arctic region. The slowdown of digitalization of the economy occurred during the coronavirus pandemic and has generally entered a stagnation stage at the moment, without having time to reach a sufficient level of profitability to ensure investment in the modernization and renewal of fixed assets, increasing the technical equipment of organizations. Under the conditions of sanctions, many software products are unavailable and additional financial investments are required to acquire intangible assets, which turns out to be very difficult in the context of growing inflation and an increase in the cost of borrowed funds due to an increase

[33] Department of the Federal State Statistics Service for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. Database for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. URL: https://29.rosstat.gov.ru/databases (accessed 01 September 2024).

in the key rate of the Central Bank of Russia. An appropriate solution would be to introduce measures to support SMEs and partially subsidize projects for technical modernization and digitalization of small businesses.

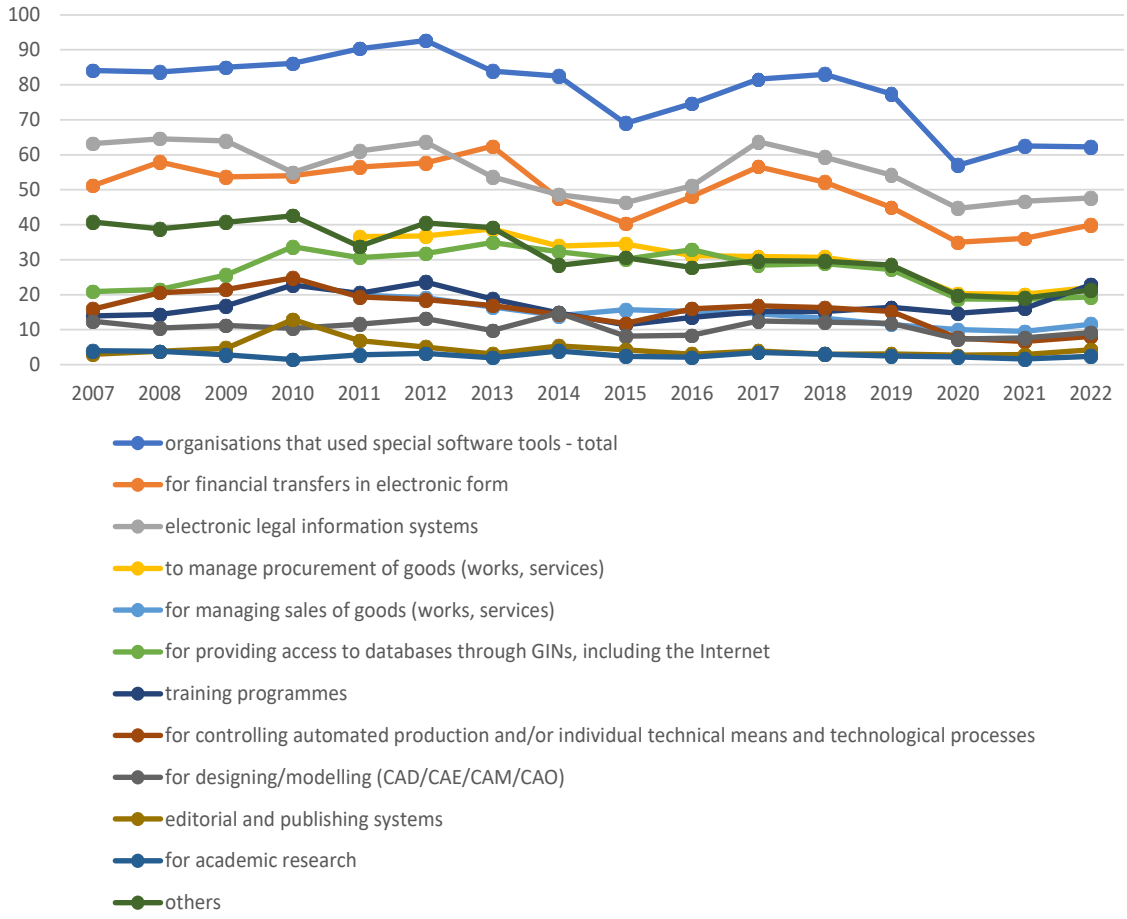

Fig. 5. Level of intangible asset provision — the share of organizations using special software (as a percentage of the total number of surveyed organizations) in the Nenets Autonomous Okrug, 2007–2022 [34].

The limitation of our study is due to the inaccessibility of official statistics data separately for rural areas, which does not allow us to fully understand the digitalization processes in rural areas of the Arctic Zone of the Russian Federation as a whole and in the Arkhangelsk Oblast and the Nenets Autonomous Okrug in particular.

Regional projects for digitalization of rural areas in the Arkhangelsk Oblast: problems and prospects

Digitalization plays a crucial role in bridging the urban-rural divide and improving the quality of life in rural areas. The main instruments of digital transformation in the Russian Federation in 2018–2024 were the national projects, the key one of which was the National Program “Digital economy”. Within the framework of this national project, as well as the state program of the Arkhangelsk Oblast “Digital

[34] Department of the Federal State Statistics Service for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. Database for the Arkhangelsk Oblast and the Nenets Autonomous Okrug. URL: https://29.rosstat.gov.ru/databases (accessed 01 September 2024).

development of the Arkhangelsk Oblast" [35], four regional projects were implemented in the region: "Information infrastructure", "Information security", "Digital technologies", "Digital public administration".

Digitalization is also a cross-cutting theme for regional policy. Financing of the activities of the Strategy for digital transformation of key sectors of the economy, social sphere and public administration of the Arkhangelsk Oblast for the period until 2024 is provided for in a number of state programs of the Arkhangelsk Oblast [36]: "Development of healthcare in the Arkhangelsk Oblast", "Development of the transport system of the Arkhangelsk Oblast", "Development of education and science in the Arkhangelsk Oblast", "Economic development and investment activity in the Arkhangelsk Oblast", "Social support of citizens in the Arkhangelsk Oblast", "Promotion of employment of the population of the Arkhangelsk Oblast, improvement of working conditions and safety", "Improvement of public administration and local self-government, development of civil society institutions in the Arkhangelsk Oblast", "Provision of high-quality, affordable housing and engineering infrastructure facilities to the population of the Arkhangelsk Oblast", "Environmental protection, reproduction and use of natural resources of the Arkhangelsk Oblast" and "Formation of a modern urban environment in the Arkhangelsk Oblast".

It is worth emphasizing that rural areas, despite their more vulnerable position in comparison with urban districts in terms of digitalization development, were not singled out for "special production" in regional state programs and projects. However, within the framework of the federal project "Information infrastructure" of the national project "Digital economy", measures were taken to create a communications infrastructure in small and hard-to-reach settlements, including the construction of land-based communication channels and the placement of base stations of cellular operators (the so-called project for eliminating digital inequality in accordance with the contract of the Ministry of digital development of Russia with PJSC Rostelecom). As a result of the project, 64 settlements in the Arkhangelsk Oblast with population from 100 to 500 people were connected to cellular communication, and 113 settlements with similar population got free access to the Internet using Wi-Fi access points.

An analysis of individual regional projects (Table 2) implemented from 2018 to 2024 showed that key attention was paid to the development of information and communication infrastructure, as well as ensuring access to state and municipal services in digital form. Among the three key elements of the digital transformation strategy (ICT infrastructure, digital services, digital competencies), the least emphasis in regional projects is placed on the latter. Only the project passports for the projects "Information security" and "Creation of a unified healthcare circuit on the basis of the unified state health information system" contain training events for employees of the regional executive authorities and medical workers, respectively.

[35] State program of the Arkhangelsk Oblast "Digital development of the Arkhangelsk Oblast". URL: https://docs.cntd.ru/document/462645471 (accessed 30 September 2024).
[36] Order "On approval of the strategy for digital transformation of key sectors of the economy, social sphere and public administration of the Arkhangelsk Oblast for the period until 2024" dated August 10, 2021 No. 344-rp. URL: https://docs.cntd.ru/document/578060723 (accessed 02 September 2024).

Table 2

Typology of digitalization activities in regional projects of the Arkhangelsk Oblast (2018–2024)

Regional project	Activities		
	Development of ICT infrastructure	Providing access to state and municipal services in digital form	Development of digital competences
Information infrastructure [37, 38]	+	+	-
Information security [39]	+	+	+
Digital technologies [40]	+	-	-
Digital public management [41]	+	+	-
Digital education environment [42, 43]	+	-	+
Creation of a unified healthcare circuit on the basis of the unified state health information system [44]	+	+	+
Digital culture [45, 46]	+	-	-
Employment promotion [47]	+	-	-

The development of digital competencies of the population of the Arkhangelsk Oblast is carried out within the framework of the regional program “Improving the level of financial literacy of the population and developing financial education in the Arkhangelsk Oblast”. The goal of the

[37] Passport of the regional project “Information infrastructure (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/c3d5899ea0081e55d48e1a965800b4e5/default/?& (accessed 09 September 2024).

[38] Report on the progress of the regional project for the second quarter of 2024 “Information infrastructure (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/c3dfcced217619ed6a177a54fa469ce7/default/?& (accessed 09 September 2024).

[39] Passport of the regional project “Information security (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/787a0379cfeb5cd9721b6fe36d1115d0/default/?& (accessed 09 September 2024).

[40] Passport of the regional project “Digital technologies (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/44f4c085e3a80893f85ae7ee3ec4ac75/default/?& (accessed 09 September 2024).

[41] Passport of the regional project “Digital public management (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/0b49c7e4812332cf83e7de46cb8ae601/default/?& (accessed 09 September 2024).

[42] Passport of the regional project “Digital education environment (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/40253064617c6a928327729c5052b384/default/?& (accessed 09 September 2024).

[43] State program of the Arkhangelsk Oblast “Development of education and science of the Arkhangelsk Oblast”. URL: https://dvinaland.ru/budget/programs/?CODE=02 (accessed 02 September 2024).

[44] Passport of the regional project “Creation of a unified healthcare circuit on the basis of the unified state health information system (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/35ea34f595a56ea677486b0426eeb6cf/default/?& (accessed 09 September 2024).

[45] Government of the Arkhangelsk Oblast. National project “Culture”. URL: https://dvinaland.ru/gov/national_projects/culture/#cookies=yes (accessed 09 September 2024)

[46] Report on the progress of the regional project for the second quarter of 2024 "(25) Digitalization of services and formation of the information space in the field of culture (“Digital Culture”) (Arkhangelsk Oblast)”. URL: https://office.dvinaland.ru/docs/pub/c8787fd54221983a3698247114900342/default/?& (accessed 09 September 2024).

[47] Resolution “On the state program of the Arkhangelsk Oblast “Promoting employment of the population of the Arkhangelsk Oblast, improving working conditions and safety” dated October 8, 2013 No. 466-pp. URL: https://docs.cntd.ru/document/462604790 (accessed 09 September 2024).

program (*to promote the formation of key elements of financial culture (values, attitudes and behavioral practices), expanding practical skills and experience in making financial decisions that contribute to the financial well-being of the population of the Arkhangelsk Oblast* [48]) does not explicitly imply the formation of digital competencies, but its passport indicates the growth of "digital inequality" in the generational context and the growth of cyber fraud threatening national security among the challenges. According to the report on the implementation of the program, 4.3 thousand events on financial literacy were held in 2023, covering 101.1 thousand non-unique participants [49]. However, most of the events were held in urban areas, practically not covering rural areas.

The non-profit sector of Arkhangelsk Oblast is involved in improving the digital literacy of the population to a limited extent, but training is mainly provided to residents of urban settlements. The Arkhangelsk regional public organization for the development of computer sports and digital technologies is implementing a series of projects to develop digital competencies among elderly people in Arkhangelsk, Nyandoma, Plesetsk, Koryazhma and Kotlas, as well as children from orphanages in Arkhangelsk [50, 51, 52]. As part of the project "People's university of the silver age" of the Northern (Arctic) Federal University, classes are held for people aged 60 and over on how to use a smartphone and protect themselves from cybercriminals [53].

Thus, the main share of state policy measures in the field of digitalization in the Arkhangelsk Oblast is aimed at developing the information and communication infrastructure in the region and ensuring access of the population and legal entities to state and municipal services. However, only a few regional projects and programs provide for measures to develop digital competencies of the population, and therefore, in further planning of state policy in this area, it seems necessary to provide a comprehensive solution to this problem, since digital literacy is the most important prerequisite for obtaining significant socio-economic effects of digitalization.

[48] Resolution "On approval of the regional program of the Arkhangelsk Oblast "Increasing the level of financial literacy of the population and developing financial education in the Arkhangelsk Oblast" dated August 21, 2014 No. 33-pp. URL: https://docs.cntd.ru/document/462609613 (accessed 09 September 2024).

[49] Results of the implementation of the regional program of the Arkhangelsk Oblast "Increasing the level of financial literacy of the population and developing financial education in the Arkhangelsk Oblast" (hereinafter referred to as the Program) for 2023. URL: https://vk.com/@minfin29-itogi-realizacii-regionalnoi-programmy-arhangelskoi-oblasti (accessed 09 September 2024).

[50] Arkhangelsk regional public organization. AROO for the development of computer sports and digital technologies. URL: https://aresf.ru/ (accessed 09 September 2024).

[51] Governor's Center of the Arkhangelsk Oblast. Projects. Project "Digital Mentor" URL: https://грантыгубернатора.проразвитие29.рф/public/application/item?id=e7c1cdd6-e440-4125-8724-9437cf9b1d24 (accessed 01 October 2024).

[52] Governor's Center of the Arkhangelsk Oblast. Projects. Project "Digital Youth of Body and Soul". URL: https://грантыгубернатора.проразвитие29.рф/public/application/item?id=48f163fd-330b-4486-b778-06775f0951ae (accessed 01 October 2024).

[53] People's University of the Silver Age (NArFU). URL: https://vk.com/nusv_narfu (accessed 01 October 2024).

Conclusion

The spatial vastness, geographical remoteness, inaccessibility and sparse population of many rural areas in the Arkhangelsk Oblast and the Nenets Autonomous Okrug limit the possibilities of creating a social infrastructure that would ensure the quality of life of the local population at the all-Russian level. Digital technologies make it possible to partially compensate for the impact of these spatial-geographical and natural-climatic factors and provide the population with access to state and municipal services, information, goods, and create conditions for the formation of a convenient and accessible digital ecosystem of state and municipal management of rural areas in these Arctic regions.

Despite the fact that the digitalization indicators for the Arctic zone of the Russian Federation as a whole and for the Arkhangelsk Oblast and the Nenets Autonomous Okrug in particular correspond to and exceed the national level, high costs of technical equipment and software products create risks for the digital transformation of organizations. Accordingly, increasing the level of technical equipment of organizations selling goods, works and services to the population of the Arctic regions should become one of the priority measures for the development of rural infrastructure in the Arkhangelsk Oblast and the Nenets Autonomous Okrug. It would be advisable to introduce programs for partial subsidies and compensation for the costs of acquiring technical equipment used to provide goods, works and services of a socially oriented nature to the population.

An analysis of legal regulation, a system of indicators of advanced innovative development reflecting the level of digitalization, and a set of regional projects aimed at developing the digital economy allows us to conclude that insufficient attention is paid to the development of digital technologies in rural areas. Rural areas are not singled out as a separate object of digital transformation, with the exception of the project to eliminate digital inequality, which provides for the creation of communications infrastructure in small and hard-to-reach settlements, including in the Arkhangelsk Oblast. A promising continuation of the research of regional policy in the field of digitalization can be the analysis of the activities of digital transformation managers in the regions of the AZRF, which allows assessing the quality of management in this area, including in relation to rural areas [38].

Taking into account the lag of rural areas in the level of digitalization compared to urban settlements and their strategic importance for the AZRF, it is proposed to provide for appropriate measures at the level of national and regional projects and programs. In addition, at the level of strategic planning documents and project activities, it is necessary to ensure an increase in the digital literacy of the rural population as one of the key conditions for digital transformation.

Due to the lack of digitalization indicators for rural areas in official statistics, it is currently impossible to assess the depth of the gap in the level of digital technology development between urban and rural settlements. The development of scientifically based recommendations for rural

areas of the Arctic Zone of the Russian Federation requires field research, which can be a logical continuation of this article.

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Impact of Fisheries Exports on the Participation of Fisheries in Ensuring Food Security of the Country and the Arctic Region

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Abstract. The article examines the impact of fish products export by fishermen of the Murmansk Oblast on the realization of two main indicators prescribed in the Food Security Doctrine: the volume of products supplied to the domestic market and their economic accessibility to the population. As a result of the study, it was found that the main indicator of the Doctrine implementation — the threshold value of fish products supply to the domestic market — is not met due to its excessive export. The level of under-supply, compared to the recommendations of the Doctrine, amounted to 53.4% in 2021. Fish is supplied to the Murmansk Oblast and other regions in volumes that ensure its sale at high wholesale prices set by fishermen and with little competition. The bulk of the Arctic fish catch — up to 75%, and over 90% of cod and haddock — is exported, which is facilitated by high world prices and the low rate of the Russian ruble. Even when Russian fish is sold abroad at a discount, fish producers prefer to export it. In the absence of incentives for the supply of fishery products to the domestic market, it is advisable to increase the legal status of the Doctrine and make the implementation of its recommendations mandatory, or change the rules for allocating fishing resources to economic entities. The economic availability of cut fish for the population of the producing region — the Murmansk Oblast — is lower than the Russian average. There is a declining level of consumption. This is a consequence of the use of high prices set in the domestic market in a non-market way. There is a need to establish prices for fish products on the domestic market using auctions or exchange trading.

Keywords: *export, Food Security Doctrine, threshold values, implementation, food, availability, auctions, exchange trading*

Introduction

Food security is an integral part of national security and is closely interrelated to other types of security and its aspects. The industries that ensure it are agriculture and fisheries.

The Russian fishery, along with agriculture, is a supplier of animal proteins and essential amino acids for the population's nutrition. In the total balance of animal protein consumption, the share of fish proteins currently amounts to about 10%, in meat and fish — ~25% [1].

In terms of energy value, 1.5 kg of fresh fish is equivalent to 1.0 kg of meat. Fish is a unique natural product in terms of the macro- and microelements content. In countries with a developed

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[1] Order of the Federal Agency for Fisheries dated 30.03.2009 No. 246 "On approval of the Strategy for the development of the fisheries complex of the Russian Federation for the period until 2020". Appendix. URL: https://sudact.ru/law/prikaz-rosrybolovstva-ot-30032009-n-246-ob/prilozhenie/1/ (accessed 14 December 2023).

fishing industry, fish products satisfy the population's needs for iron by 25%, phosphorus — 60–70%, magnesium — 20%, iodine — 90% [2].

According to our calculations, based on the data from the above source, the volume of fish and seafood catch in Russia in 2022 corresponded to ~12 million heads of cattle in terms of protein content. At the same time, the number of cattle raised for meat in Russia in 2022 was 10.1 million heads.

Fish processing waste is used to produce fodder meal, which is used in livestock farming and is the main component of feed for salmon and trout farming in aquaculture. It contains 50–67% protein, which is digested by animals and poultry by 85–90%. For comparison, plant feed has a protein content of 10–12% and is digested by 30–40% [3].

The main document, the implementation of which is designed to ensure the country's food security, is the Food Security Doctrine (FSD) for 2020–2029, approved by the Decree of the President of the Russian Federation dated January 20, 2020. It was developed in accordance with the "Rome Declaration on World Food Security" [4].

The FSD uses the achievement of threshold values of domestic product supplies to the domestic market as the main indicators for ensuring the country's independence and assessing food security. For fish products, until 2020, it amounted to 80% of the medical norm of its consumption, equal to 22 kg per person per year in whole form, from 2020 — 85%, that is, 18.7 kg per person per year. The volume of products prescribed by the document should be physically and economically available on the market for the population [5].

With the current population of Russia at 146.2 million people (152.0 million people, taking into account new territories), the Russian fisheries sector should supply at least 2733.9–2842.4 thousand tons (54.7%–56.8%) of the catch to the Russian coast to ensure the threshold level of fish consumption. Fulfilment of these indicators under rational management is guaranteed by self-sufficiency, which is about 190% due to catches of 5.0 million tons and aquaculture products of 350–400 thousand tons.

The presented data indicate the importance and great potential of the fisheries industry in solving problems related to ensuring food security in Russia. Despite this, the supply of fish prod-

[2] Economy of the industry. Lecture course. 3.2. Current state of fisheries and its role. URL: sudact.ru›law/prikaz-rosrybolovstva-ot-30032009-n… (accessed 14 December 2023).
[3] Ibid.
[4] Rome Declaration on World Food Security. URL: https://ecfs.msu.ru/Low_documents/International/Rome%20Declaration%20on%20World%20Food%20Security%201996.pdf (accessed 14 December 2023).
[5] Food Security Doctrine of the Russian Federation (approved by Decree of the President of the Russian Federation dated 21.01.2020 No. 20). URL: 3e5941f295a77fdcfed2014f82ecf37f.pdf (mcx.gov.ru) (accessed 08 December 2023).

ucts to the Russian domestic market for the purpose of fulfilling the FSD in 2010–2019 was fulfilled on average by 76.8%, over two years of the new Doctrine — by 61.2% [6].

Level of fulfilment and measures to ensure threshold values of the Doctrine of Food Security for the supply of fish products to the domestic market by fishermen of the Northern Basin

The main commercial and production unit of the country's fisheries is the Far Eastern fishery basin, which produces from 70 to 73% of the total volume of fish and seafood. Consequently, the solution of the problem of supplying fish products to the domestic market of Russia largely depends on the use of Far Eastern fish resources. However, there is an opinion that it is more profitable to sell fish caught in the Pacific Ocean to neighboring countries, and to buy the necessary amount of fish products for the European regions of Russia in Norway and other nearby countries. However, the events of recent years have shown the riskiness and unreliability of this option.

The Northern Basin, which includes the Murmansk and Arkhangelsk oblasts and the Republic of Karelia, exploits fishing stocks in the Western Arctic (about 95% of the total catch) and produces insignificant volumes of hydrobionts in the North-West and Central Atlantic. The share of the Northern Basin in Russia's total catch is 12–15%. The main fishing region of the Northern Basin is the Murmansk Oblast, which accounts for about 72% of the total catch.

Based on the consolidated responsibility for the implementation of the Food Security Doctrine, the fishing enterprises of the Northern Basin, at the current level of catches, should deliver 475.0–493.0 thousand tons of fish to the Russian shore (868.7 thousand tons * 54.7%; 56.8%), including enterprises of the Murmansk Oblast — 340.3–353.4 thousand tons (622.2 thousand tons * 54.7%; 56.8%). The Doctrine does not define the species composition and assortment of products supplied. As a result, the domestic market is provided by fishermen mainly with fish that have low prices on the external market, insignificant demand among the population, as well as fish caught in insignificant volumes as by-catch: blue whiting, capelin, herring, wolffish, flounder, ruff, small-sized cod, haddock and perch. At the same time, fish products of Murmansk enterprises are annually supplied to 57–70 regions of the Russian Federation [7]. The noted volumes of fish products supplies to the domestic coast, necessary to fulfil the obligations prescribed by the Doctrine, were observed by the fishermen of the Murmansk Oblast until 2013. The reason for the growth of fish exports by 10% in 2013 and the failure to meet the threshold values of the Doctrine was the increase in the catch quota for the main export hydrobiote — cod — by 28.9% compared to 2012 and the desire to improve the financial results of fishing activities [8]. The stimulating factors for a

[6] Scientific and applied foundations of sustainable development and modernization of marine economic activities in the western part of the Arctic Zone of the Russian Federation: research report (interim): 0226-2019-0022 / G.P. Luzin Institute of Economic Problems of the Federal Research Center "Kola Research Center of the Russian Academy of Sciences"; research advisor Vasilyev A.M.; responsible executives: Vasilyev A.M., Vopilovskiy S.S., Fadeev A.M. [et al.]. Apatity, 2020, 128 p. (In Russ.)

[7] Fishing activities in the Murmansk Oblast. Federal State Statistics Service, Territorial body of the Federal State Statistics Service for the Murmansk Oblast. Murmanskstat, 2016-2022, 48 p. (In Russ.)

[8] State of raw biological resources of the Barents Sea and the North Atlantic in 2014. Murmansk, PINRO, 2014. 110 p. (In Russ.)

further increase in the volume of Arctic fish exports abroad were the growth of export prices for cod by 81.3% in 2014 and by another 40.0% in 2015; for haddock — by 89.0% in 2014 [1, Vasiliev A.M., p. 28], as well as the change in the exchange rate of the ruble to the US dollar from 31.85 to 38.47 rubles in 2014 and to 61.0 rubles in 2015. In the subsequent period, export prices for fish also had an upward trend, which stimulated its export, and the recommendations of the Doctrine did not serve as a restraining factor. In the last year of the analyzed period — in 2021 — export prices for cod were 4.1 times higher than the 2013 level, for haddock — 2.7 times.

In addition, the growth of exports was also facilitated by the instruction of the Ministry of Agriculture's instruction for Rosrybolovstvo (Federal Agency for Fisheries) to increase revenue from fish exports from $5.1 billion in 2018 to $8.0 billion by 2024, allegedly following from the Decree of the President of the Russian Federation No. 204 of May 7, 2018 "On the national goals and objectives of the strategic development of the Russian Federation". In accordance with this Decree, the agro-industrial complex was instructed to increase export revenues from $24 billion to $45 billion per year. The Ministry of Agriculture, in turn, assigned part of the task to Rosrybolovstvo, instructing it to increase export revenues from $4.1 billion in 2017 to $8.0 billion in 2024. This instruction was another factor stimulating export growth, despite the need to fulfil the FSD. Rosrybolovstvo, according to its management, intended to address the issue of increasing export revenues by increasing the production of deep-processed products. Speaking at the round table "Export of fish products: from the depths of the sea to the depth of processing" in 2018, the head of the Rosrybolovstvo Ilya Shestakov said: "We have to increase it (export — author) almost twofold. The task is quite serious and ambitious, we realize that we will not be able to increase the volume of production in such quantities. It is necessary to look for other sources, other resources to increase the value of exports. Therefore, the main task is to increase the cost per ton of exported products" [9]. From the methodological point of view, this is a correct statement of the question. it should be taken into account that during "deep" processing, the consumption of raw fish (catch) increases significantly, and compensation for losses in product weight by increasing its cost depends on market conditions for different types of fish and does not always occur to a sufficient extent. As a result, the cost of processing the same volume of fish may not increase.

Our calculations show that for the main export fish of the Arctic seas — cod and haddock — the cost benefit of filleting depends on market conditions, and it is not always possible to obtain it. Thus, fillet production reduces the weight of the product by half compared to gutted headless fish. In addition, it is known that importers, including those in Europe and in the Asia-Pacific markets, prefer to buy less processed fish. In the EEC countries, a duty of more than 7% is set on cod fillets. There are also problems with fillet sales in the Asia-Pacific countries [10].

[9] Fish exports ordered to become more expensive. URL: https://fishnews.ru/news/34894?ysclid=lq55q4mn83620906296 (accessed 14 December 2023).
[10] Fish Courier-Profi: weekly bulletin on the international fish business. 2023, no. 9 (939), 67 p.

As a result of this and high wages in the Norwegian fishery, the production of cod fillets on fishing vessels is considered unprofitable and is allowed only if a license is obtained [11].

In Russia, the composition of items and the cost of fillet production differ from those in Norway. Its production is stimulated by economic measures by the state. Despite this, fillet production in the first 9 months of 2023, compared to 2022, decreased by 17% due to reduced demand in domestic and foreign markets [12].

As a result of the above factors, the value of fishery exports is increasing due to rising prices for Arctic fish and seafood, as well as increased catches sent abroad. The share of Murmansk Oblast fishermen's catches exported increased from 47.1% in 2010 to 74.5% [13] (Table 1).

The article "Relationship between the Russian fishing fleet and domestic ports as the core for performing its state mission" shows that excessive export of fish products has become the main factor restraining their supply to the domestic market since 2013. In the previous period, 2009–2012, exports averaged 48.5% of production volume, which ensured the entry of fish into the domestic market in volumes roughly corresponding to the Doctrine recommendations [2, Vasiliev A.M., p. 3].

Table 1

Level of fulfilment of the recommendations of the Food Security Doctrine by the fishery of the Murmansk Oblast, export value [14]

Indicators	2017	2018	2019	2020	2021
Catch, thousand tons	698.1	663.4	665.8	574.2	622.1
Production of fish products, thousand tons	579.7	563.4	576.1	490.3	549.2
Volume of exported fish products, thousand tons	337.4	335.8	297.3	272.6	319.1
Volume of products supplied to the domestic market, thousand tons	242.3	227.6	278.8	217.7	230.1
Volume of exported fish in terms of unprocessed fish, thousand tons	513.8	469.0	473.0	410.0	463.5
Share of catch supplied for export, %	73. 6	70. 7	71.5	69.5	74.5
Required volume of supplies to the domestic market in accordance with the recommendations of the Doctrine, thousand tons	381.9	362.8	364.2	314.1	340.3
Actual volume of supplies to the domestic market in round form, thousand tons	184.3	194.4	192.9	164.2	158.6
Volume of undersupply to the domestic market in unprocessed form, thousand tons	197.6	168.4	171.3	149.9	181.7
Level of undersupply to the domestic market, %	51.7	46.4	47.0	47.7	53.4
Value of exports, million dollars	1010.3	1137.8	1182.5	1098.5	1697.9
Value of exports, billion rubles	61.60	71.60	76.39	79.44	125.10
Value of 1 ton of exports, dollars	3142.6	3383.6	3977.5	4029.7	5320.9

[11] Økonomiske og biologiske nøkkeltal frå dei norske fiskeria — 2020. Economic and biological figures from Norwegian fisheries — 2020. URL: nokkeltall-2020.pdf?sequence=1 (yandex.ru) (accessed 15 December 2023).
[12] Fish Courier-Profi: weekly bulletin on the international fish business. 2023, no. 9 (939), 67 p.
[13] Scientific and applied foundations of sustainable development and modernization of marine economic activities in the western part of the Arctic Zone of the Russian Federation: research report (interim): 0226-2019-0022 / G.P. Luzin Institute of Economic Problems of the Federal Research Center "Kola Research Center of the Russian Academy of Sciences"; research advisor Vasilyev A.M.; responsible executives: Vasilyev A.M., Vopilovskiy S.S., Fadeev A.M. [et al.]. Apatity, 2020, 128 p. (In Russ.)
[14] Source: Compiled by the authors on the basis of: Fishing activities in the Murmansk Oblast. Federal State Statistics Service, Territorial body of the Federal State Statistics Service for the Murmansk Oblast. Murmanskstat, 2019–2021.

Value of 1 ton of exports, rubles	182573.2	213156.3	257026.0	291427.9	392021.8
Economic turnover in fisheries, billion rubles	73.6	83.7	100.5	91.7	127.6

Chain stores in Murmansk have not been selling fish products for several years. There are small counters for frozen fish, but it is not bought. The reason for this is uncompetitive prices. In addition, haddock is usually not available for sale, cod is available, but small in size, and some other types of fish are also unavailable. Fish is packed in non-standard volumes of different weights.

In our opinion, the main indicator characterizing the impact of fishery exports on the participation of the Arctic region's fisheries in ensuring food security for the country is the undersupply of fish products to the domestic market. On average, for 2017–2021, it is 173.8 thousand tons (49.2% of the total volume of required supplies).

It should be noted that the need to supply fish products to the domestic market within the threshold values prescribed in the Doctrine is designed to restrain exports. Therefore, since 2020, in the new version of the Doctrine, the Government of the Russian Federation has decided to consider the level of self-sufficiency in products, that is, the availability of resources in comparison with needs, as the main indicator of its implementation. The threshold values for the supply of fish products to the domestic market are still indicated in the Doctrine, but they are not reported. Besides, there are no scientific publications on this topic.

This procedure allows not showing the actual level of the country's provision with fish. An example can be given: in 2022, in the materials prepared "for the government hour" of the 530th meeting of the Federation Council, with significant undersupply of fish to the domestic market, the fulfilment of the Food Security Doctrine was stated on the basis of a high level of self-sufficiency [3, p. 53].

Fishermen of the Northern Basin, as well as in the whole Russia, work in contradictory legal conditions. On the one hand, it is necessary to fulfil the Doctrine and supply most of the catches to the domestic market, on the other hand — to fulfil the order of the Ministry of Agriculture to increase foreign exchange earnings and sell more products for export. Taking into account their own economic interests, they prefer to export most of the catches abroad to the detriment of fulfilment of the Doctrine. Since the task of the President of the Russian Federation to increase export income was addressed to the Ministry of Agriculture, and Rosrybolovstvo was not mentioned in it, we believe that fishermen should fulfil the Food Security Doctrine first of all.

The head of Rosrybolovstvo I. Shestakov spoke in favor of the priority implementation of the Doctrine in the media. This decision is also correct from the perspective that the participation of fisheries in the implementation of the food program, as shown in the introduction to the article, is much more important than foreign currency revenues.

Currently, the Government of the Russian Federation economically stimulates the export of certain types of deep-processed fish products by allowing deductions from the fee for the provision of fishing resources. Since export sales in the context of a weak ruble are already profitable for fishermen, then, on the contrary, it is advisable to exempt bioresources, the products of which

are supplied to the domestic market, from fees in order to stimulate the implementation of the Doctrine.

"State participation in resolving this issue can also be realized by establishing tariff quotas for export of fish products and changing the mechanism of distribution of quotas for the extraction of aquatic biological resources" [4, Kolonchin K.V., p. 30].

As noted in the article above, fishermen of the Western Arctic region fulfill the requirements of the Doctrine for the supply of fish to the domestic market mainly due to the so-called "social fish". In particular, the article by Karlina E.P. and Arslanova E.R. "Place and role of fishery complex in food security system of Russia" is devoted to solving the issues of expanding the range and improving the quality of the balance of fish supplied to the domestic market [5].

In the current conditions, in order to comply with the standards of the Doctrine, it is necessary either to change its legal status or to take measures to change the procedure for allocating commercial bioresources.

Issues of economic accessibility of fish products and proposals for their solution

The second most important indicator that characterizes the participation of the fishing industry of the Arctic region in ensuring food security of the Russian Federation and which is dependent on exports is the economic availability of fish products. On the one hand, it is determined by self-sufficiency, catch and supply of fish to the domestic market, and on the other hand — by the purchasing power of the population.

Russian fish producers (owners of fishing enterprises), despite market factors influencing the prices of goods — high self-sufficiency in fish in Russia as a whole and the Arctic regions in particular, and Russia's GDP, approximately 2 times smaller in terms of purchasing power parity compared to the main countries importing Russian fish (the USA, the main EEC countries) [15] — determine wholesale prices for fish products on the domestic market, focusing on the level of export prices. As a result of the increase in export prices in 2014 for the main foreign exchange-intensive species of Arctic fisheries — cod and haddock — and their use as wholesale prices on the domestic market, there was a decrease in the purchasing power of the population of the Murmansk Oblast by 18.0%, compared to 2013, and by another 16.7% for frozen processed fish and by 12.1% for frozen unprocessed fish in 2015, despite an increase in household income by 5.9% and 8.8%, respectively (Table 2, Fig. 1).

The data presented in Table 2 and Fig. 1 show that the purchasing power of the population of the Murmansk Oblast in 2014–2015, calculated for the purchase of frozen processed fish, decreased by 25.8%, and unprocessed fish — by 40.0%. At the same time, fish prices increased by 2.6–2.8 times with income growth of only 1.6 times. In Russia as a whole, there are data on the purchasing power of the population only for frozen fish without assortment division. They correspond approximately to the average value of the data for the Murmansk Oblast.

[15] Russian statistical yearbook. 2022: Stat.dig. Rosstat. R76. Moscow, 2022. 691 p.

At the beginning of the stage of fish price increase — in 2014–2015 — the Government of the Russian Federation could not allow a one-time large increase in fish prices, since fish industry companies had no reason to sell fish products on the domestic market at international prices. In accordance with the "Law of One Price... identical goods sold in different places must be sold at the same price when prices are expressed in the same currency" [16].

Table 2

Purchasing power of average per capita money income of the Murmansk Oblast population [17]

Indicators / years	2013	2014	2015	2017	2019	2020	2021	Ratio of 2021 to 2013, %
Average per capita income of the MO population, thousand rubles	31.9	33.8	36.7	39.3	44.3	46.6	51.2	160.5
Average consumer prices for fish, rubles/kg								
processed (except for salmon and fillets)	147.3	169.7	221.7	256.3	325.9	319.5	318.3	2.6 times
unprocessed	65.7	84.8	105.0	125.5	149.1	153.5	175.6	2.8 times
Purchasing power of the MO population, kg/month								
frozen processed fish	216.6	199.1	165.7	153.2	135.8	146.0	160.7	74.2
frozen unprocessed fish	485.6	398.4	350.0	312.9	296.8	303.7	291.4	60
Basic indices, processed fish	100.0	82.0	76.5	70.7	62.7	67.4	74.2	74.2
Basic indices, unprocessed fish	100.0	82.0	72.1	64.4	61.1	62.5	60.0	60.0
Purchasing power of the Russian population, kg/month								
frozen fish	248.2	236.4	192.5	186.3	182.3	177.8	165.2	66.5

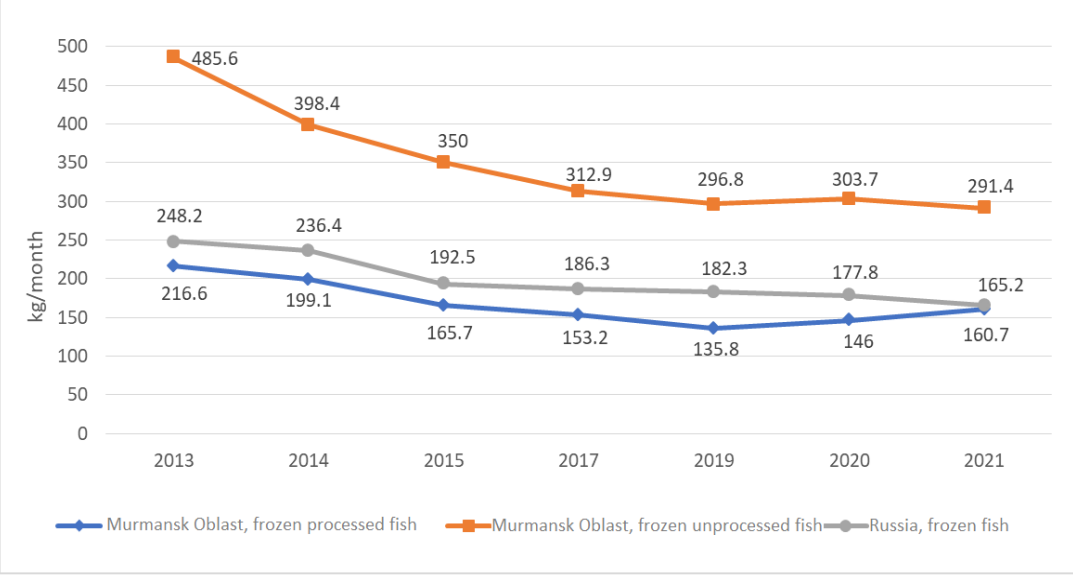

Fig. 1. Purchasing power of the population of the Murmansk Oblast and Russia [18].

[16] The law of one price. URL: https://investors.wiki/ru/law-one-price (accessed 15 January 2024).

[17] Sources: Fisheries activities in the Murmansk Oblast. Federal State Statistics Service, Territorial body of the Federal State Statistics Service for the Murmansk Oblast. Murmanskstat, 2016, 2017, 2020; Average per capita family income in the Murmansk Oblast. URL: https://gogov.ru/average-income/mrm#data (accessed 15 January 2023); Comments on the state and business No. 400 of 03.12.2021. URL: https://www.hse.ru/mirror/pubs/share/direct/536488680.pdf (accessed 15 January 2023) [3, p. 53].

In this case, the currencies of the importing countries and Russia had different values, and domestic prices for fish in Russia should be determined taking into account other factors.

The theory of changes in domestic prices taking into account exchange rates is considered in the article by Prokopyev M.G. "Transfer effect of import and export prices changes into the prices of home market: methodical aspects". It notes that the effect of transferring export prices to domestic prices is insignificant if the share of imports in the aggregate demand is relatively small [6, Prokopyev M.G., p. 113]. Consequently, for the fishing industry, which is an export-oriented sector of the economy, the effect of transferring changes in export prices to domestic prices is insignificant.

In the article by Korneychenko E.N. and co-authors "Consumer prices in Russia: effects of the exchange rate shocks" an attempt is made to determine the impact of exchange rate changes on domestic consumer prices of various goods in Russia, including fish products. It is shown that in the period 1997–2008, the impact of changes in the ruble exchange rate on the price of frozen processed fish was 29.8% after 12 months from the event, 40.8% — after 24 months, on the price of frozen unprocessed fish — 49.8% and 70.6%, respectively. Estimates for the periods 2008–2014 and 2014–2018 are significantly lower [7, Korneychenko E.N. et al., p. 11].

Since demand for imported products is usually taken into account to a greater extent than for exports, and prices for imported fish products are usually significantly higher than Russian ones, it can be argued that the increase in prices was mainly influenced by imports.

According to the theory, differences in setting the levels and dynamics of world and domestic prices for exported and imported goods based on exchange rates result from the gap between the official exchange rate of the currency in which they are expressed and the real exchange rate. If the market exchange rate of a currency moves over a long period of time in accordance with the real one, calculated on the basis of purchasing power parity, then the price dynamics will be reflected quite objectively and reliably [19].

In this case, it is known that the real exchange rate of the ruble to the US dollar at purchasing power parity in Russia is underestimated by about 2 times [20]. As a result, domestic national prices for fish products should be lower than external ones and should be determined taking into account the costs and purchasing power of the population. The instrument for setting prices on the domestic market is exchange trading. The current wholesale prices published in the Weekly Bulletin of International Fishing Business cannot be called market prices, as they are set by fish industry companies.

After a large one-time increase in fish prices in 2014–2015, the Government of the Russian Federation and legislative bodies developed some measures to reduce fish prices, mainly related

[18] Sources: Fisheries activities in the Murmansk Oblast. Federal State Statistics Service, Territorial body of the Federal State Statistics Service for the Murmansk Oblast. Murmanskstat, 2016, 2017, 2020, 2022.
[19] The relationship between domestic and foreign trade prices, the reasons for their discrepancy. URL: https://helpiks.org/6-54071.html (accessed 03 January 2024).
[20] Russian statistical yearbook. 2022: Stat.dig. Rosstat. R76 Moscow, 2022. 691 p.

to the organization of exchange trading and limiting trade margins, but they have not yet been put into practice. The Izvestia newspaper has published a report that in 2024, exchange trades in fish will be held on the St. Petersburg International Mercantile Exchange (SPIMEX), which, according to the authorities, "will reduce the cost of products and increase competition in the market". It is also reported that the Ministry of Finance has drafted a law allowing such trading [21].

Exchange trading should reduce administrative regulation of the market, take into account supply and demand, and reduce prices, which imply an increase in fish consumption by the population. Fish trading on the exchange will allow retailers to purchase it directly without intermediary markups and make prices more transparent.

At the same time, the Izvestia newspaper's report contains information that "the exchange has organized fish product trades several times in recent years, but it has not been possible to launch them on a large scale, since many market participants are reluctant to do this and do not want additional pricing transparency". The official reason for the fishermen's refusal to trade on the exchange is the statement that fish products are not exchange goods. This is despite the fact that fish exchanges and auctions operate successfully in many countries, including the main importers of Russian fish — South Korea and Norway [8, p. 4]. In this regard, the authorities may need to stimulate the process of attracting fishermen to sell products on the exchange.

Regional authorities are mainly responsible for practical solution of the issues of high prices for fish products and increasing their availability. However, their rights in these matters are limited. For example, in the Murmansk Oblast, there is a governor's program "Our Fish" for selling cod and haddock with the consent of suppliers at reduced prices on weekends. The sales volume is about 400 tons per year, which corresponds to about 2 kg of fish per year per citizen. In Sakhalin, the "Regional product 'Affordable Fish'" is being implemented to ensure greater availability of fish to the population. "Despite the fact that the production of processed fish products in the region is increasing, consumption of these products by the population tends to decrease due to the outpacing growth of prices compared to incomes" [9, Pitilyak D.A., p. 103].

Similar projects, according to our data, exist in all coastal regions, but they solve local problems. In general, fish prices in Russia continue to rise, while the purchasing power of the population is declining. According to Rosstat, fish consumption in 2022 decreased by another 10% — to 19.2 kg per person per year. Apparently, given the current situation, in August 2023, Russian President V.V. Putin, at a meeting with members of the Government, once again set the task of developing a set of measures to stimulate domestic consumption of fish products [22].

Analysis of proposals for the formation of a "road map" to increase fish consumption by the population, published in the latest issues of the Rybny Kurier Profi collections and in other

[21] Bashlykova N., Voronov V. Nibble accent: Russia will start selling fish on the exchange. Izvestia, 2023, no. 183. URL: https://iz.ru/1581230/natalia-bashlykova-valerii-voronov/klevnyi-aktcent-v-rossii-nachnut-prodavat-rybu-na-birzhe (accessed 16 January 2024).
[22] Putin instructed to consider how to stimulate fish consumption in Russia. URL: https://ria.ru/20230816/ryba-1890460181.html?ysclid=ln35gfgrhl820170512 (accessed 03 January 2024).

publications, indicates the lack of new effective proposals. Thus, the head of Rosrybolovstvo I. Shestakov gave a large interview on this topic to Rossiyskaya Gazeta newspaper, in which he calls the main economic and organizational tools for increasing the availability of fish to the population: compliance with existing standards for transportation, storage, display of products, reduction of trade markups, branding, marketing activities, popularization of fish, state and municipal orders for the supply of fish products. At the same time, he admitted that supplies are limited by the high cost of domestic fish, which confirms the need to reduce wholesale prices. I. Shestakov also recognized the appropriateness of introducing state subsidies for products, "which should make products more accessible to the population, including pensioners and low-income families" [23].

The head of Rosrybolovstvo listed measures to increase the availability of fish products for the population, which are not the function of the Ministry of Fisheries and should be carried out by other participants in the process of selling fish products. The President of the Russian Federation drew attention to this shortcoming at the meeting of the State Council of the Russian Federation on October 15, 2015, as a result of which one of the Instructions was issued as a proposal "on the formation of a unified system of management and coordination of the activities of state bodies and organizations, including those involved in the extraction (catch) of aquatic biological resources, production, storage, transportation and sale of fish products". It can be concluded from the interview that the order of the President of the Russian Federation has not been fully fulfilled, although it states that Rosrybolovstvo "takes action in its area of responsibility and initiates work in related areas".

Similar additions to the functions of Rosrybolovstvo, in order to fulfil the main trends of fisheries development, determined by the state, including the Food Security Doctrine, are proposed by Kolonchin K.V. and co-authors [10, Kolonchin K.V. et al., p. 8].

Much attention is paid to foreign trade in fish products in the country. Along with the Law "On the fundamentals of state regulation of foreign trade activity" No. 164 and other documents regulating it; there is an authoritative All-Russian Association of Fisheries Enterprises, Entrepreneurs and Exporters. At the same time, the coordination of activities of the most important fish markets of the country is not given an appropriate attention. In this regard, we would like to note that in Norway, which has extensive experience in organizing the activities of the fishing industry, one of the functions of the semi-governmental body, the Export Council, is "implementing the marketing of fish products at the national and international levels".

Conclusion

Provision of the population with fish products can be considered as complying with the Food Security Doctrine, if fish supplies are carried out in volumes not less than those specified in this document. The study of fish product sales indicates a systematically low level of its supplies to

[23] The head of the Federal Agency for Fisheries spoke about caviar prices and the risks of a salmon shortage. Fish Courier-Profi, 2023, no. 45 (975).

the domestic market. The fulfillment of the above indicator in 2021 was 46.6%. The insignificant availability of products on the market and weak competition do not contribute to reducing prices and increasing the purchasing power of the population, although the high level of profitability of sales of Arctic fisheries makes this possible. In the context of a low ruble exchange rate, fish sales abroad are preferable.

The systematic failure to fulfil the quantitative indicator for assessing the degree of food security — 85% of fish product supplies to the domestic market — indicates the need to increase the legal status of the Doctrine or change the rules for the allocation of commercial bioresources.

The second important factor for organizing the sale of fish products at market prices is the use of exchange or auction trading. This problem has long been discussed in Russia at the initiative of the Federal Antimonopoly Service (FAS). There are both supporters and opponents of the development of exchange trade in fish. Surprisingly, the idea is not particularly favored by the Fish Union, whose members — fish processing enterprises of Murmansk city and the Oblast — are experiencing a shortage of fish raw materials due to its excessive export and are purchasing raw materials at high prices [24, 25].

The study of foreign experience shows that the auction form of trading used in Norway and South Korea is more suitable for Russia. In our opinion, this form of trade is less expensive and takes into account the interests of buyers to a greater extent.

In accordance with the instructions of the Head of State dated August 16, 2023, the Government of the Russian Federation should develop a “road map” by February 1 to increase domestic consumption of fish products by 2030. It is necessary to establish annual target indicators for its implementation and provide for measures to increase the availability of fish products to the population.

Analysis of proposals for the formation of a “road map”, published in available documents and scientific sources, indicates a lack of effective proposals. Leaders of various ranks and deputies of the Federal Assembly repeat proposals that have been used for many years, but have not produced results.

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Formation of Technological Sovereignty in the Implementation of Strategies for the Development of Hydrocarbon Fields in the Russian Arctic

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Abstract. The study examines the substantive components of the formation of technological sovereignty by key industries in Russia in the current geopolitical and economic conditions. The directions of state management on creation of institutional basis for implementation of innovative technological projects, production of domestic high-tech products within the framework of the concept of guaranteed independence of the Russian economy in critical infrastructure areas are defined. Promising directions for the implementation of projects aimed at large-scale development of carbon deposits in the Arctic zone of the Russian Federation in the medium- and long-term perspective from the perspective of achieving technological sovereignty are identified. The interconnection of strategic plans of government and business structures, training centers and manufacturing enterprises, scientific and industrial institutions for building procedures for further strengthening the technological development of the country is presented. Examples of testing individual domestic components to achieve technological sovereignty in the fuel and energy complex of the Arctic zone of the Russian Federation, in the construction of ice-class ships, industrial engineering, etc. are outlined. The implementation of natural gas liquefaction projects in the Russian Arctic is becoming a strategically important and relevant topic for the development of carbon deposits. The created and implemented domestic technologies for liquefying natural gas "Arctic Cascade", "Modified Arctic Cascade", as well as the new technology "Arctic Mix", which will be implemented in the future at the new Murmansk LNG terminal, are a good foundation for the innovative and technological development of Russia.
Keywords: *technological sovereignty, economics, Arctic, strategy, innovation, shipbuilding, fuel and energy complex*

Introduction

The Russian Federation owns about 74% of the Arctic shelf, which causes increased interest among Western, Eastern and Southern partners of our country in the natural resources located there. The global economy is and will continue to be oil and gas dependent for its development both in the medium and long term, therefore, the explored and potentially predicted hydrocarbon reserves of the Arctic shelf put pressure on the world market. When looking at the structure of Northern Sea Route (NSR) traffic in 2020 presented by the State Commission for Arctic Development [1], it can be seen that the percentage of cargo was distributed as follows:

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[1] Northern Sea Route: 2020 Results. URL: https://arctic.gov.ru/wp-content/uploads/2021/02/2020.pdf (accessed 25 October 2023).

- import-export and cabotage structure: liquefied natural gas (LNG) — 59%, oil — 24%, general cargo — 11%, as well as several percent of gas condensate, oil products and coal;
- transit traffic structure: iron ore — 78%, general cargo — 7%, cellulose — 5%, mineral fertilizers — 5%, bulk cargo — 2%, equipment — 2%, petroleum products — 1%, frozen fish — 0.5%.

Currently, the political and economic pressure exerted by unfriendly countries aimed at reducing the production, processing and shipment of hydrocarbons in the Arctic Zone of the Russian Federation (AZRF) has led to the implementation of technological projects to level out import dependence, create domestic high-tech products / goods within the framework of achieving the technological sovereignty of the country. The production and export of liquefied natural gas in the AZRF is one of the priority areas of the national energy industry.

Technological sovereignty and its elements

Technological sovereignty is a government program to ensure the independence of the Russian economy from external economic factors and global political trends — it is the most important condition for the prosperity of the country. The concept of technological sovereignty is being formed and gradually implemented [1; 2]. An important role is assigned to the state in creating the institutional basis for technological sovereignty [3], in particular, the state government launches key megaprojects [2].

The issues of technological sovereignty for the implementation of projects aimed at large-scale development of carbon deposits in the Arctic zone of the Russian Federation deserve special attention due to their heterogeneity, complexity, and extreme nature of the entire range of works [4; 5]. In the existing natural and climatic conditions, construction and development of the Far North infrastructure continues; federal infrastructure facilities are being commissioned according to the plans of the State Corporation Rosatom: in 2022, the construction of the Utrenny terminal was completed; in 2023, the Bukhta Sever terminal was built; in 2024 — the Severnaya Zvezda terminal; In 2026, the construction of the Mys Nagleynyn terminal and an energy port in the East Siberian Sea is planned to be completed to accommodate four modernized floating power units (MFPU) to provide energy to the Biamskaya ore zone [3]. JSC Nevskoe Design Bureau, by order of JSC Atomenergomash, developed the working design documentation for the MFPU of Project 20871. According to experts, the construction of domestic small NPPs is a good solution for northern regions, since their carbon-free nature creates conditions for environmental safety and ensures long-term predictability of electricity prices during the implementation of large-scale industrial facilities [6]. The commissioning of the terminals will contribute to the development of a year-round transportation route along the Northern Sea Route.

[2] Government launches mega-projects of technological sovereignty. URL: https://ac.gov.ru/news/page/pravitelstvo-zapuskaet-megaproekty-tehnologiceskogo-suvereniteta-27609 (accessed 25 October 2023).
[3] Construction of the cargo terminal “Mys Nagleinyn”. URL: https://portnews.ru/news/342846/ (accessed 25 October 2023).

Strategic components of technological development

The current state of import substitution in the country's industry structures is determined by timely actions by government agencies and business communities [7; 8]. Particular attention in matters of creating the technological sovereignty is paid to the regulatory framework, strategic plans of government and business structures, the implementation of which creates competitive advantages for domestic enterprises and is a solid foundation for the development of the country's economy [9]. The creation of new and the development of existing institutions and centers, the main focus of which is the sphere of high technologies, is carried out taking into account the strategies of technological development of the Russian Federation, strategies of spatial development, territorial and industry planning schemes, plans in the areas of information technology and scientific and technical activities of companies, the general goal of which is to provide production with industrial products, the introduction of new products/services and technologies to the market that contribute to ensuring the technological sovereignty of the Russian Federation [10; 11].

Table 1 presents the level of equipment dependence on imports in the oil and gas sector of Russia, developed by specialists of the Institute of Economic Forecasting of the Russian Academy of Sciences [12].

Table 1

Level of equipment dependence on imports in the oil and gas sector of Russia

Indicators	Year							
	2014	2015	2016	2017	2018	2019	2020	2021
Import, bln rub.	*155*	*155*	*170*	*181*	*191*	*212*	*204*	*229*
Drilling rigs and platforms	8	15	26	8	13	10	7	8
Pipes and fittings	23	17	24	32	29	49	24	17
Pumping and compressor equipment	68	75	76	89	85	85	98	120
Separators for oil and gas purification	43	30	30	35	40	49	48	56
Storage tanks for oil, oil products and liquefied gas	8	6	6	7	10	9	15	16
Catalysts	5	12	8	9	15	10	12	13
Investments in machinery and equipment, bln rub.	*594*	*648*	*516*	*694*	*642*	*738*	*684*	*581*
Oil and gas production	265	317	240	308	264	303	285	244
Services in the field of oil and natural gas production	80	97	85	115	125	143	117	117
Production of petroleum products	186	146	113	171	148	164	187	150
Production and distribution of gaseous fuel	6	7	6	9	34	72	42	25
Pipeline transportation of oil and petroleum products	45	62	60	73	44	37	34	35
Pipeline transportation of of gas and its processed products	12	19	12	18	27	19	19	10
Level of dependence on imports, %	26	24	33	26	30	29	30	39

Prioritization of domestic products and technologies is a complex, expensive process with a large time lag [13]. The measures taken and the launched mechanism of state support for compa-

nies producing high-tech products that can replace foreign equipment/products/services allow speaking confidently about the implementation of the set goals and objectives [14; 15].

In particular, within the framework of implementation of the Strategy for scientific and technological development of the Russian Federation and the National Security Strategy, the Government of the Russian Federation approved the Program of activities of the National Research Center (NRC) "Kurchatov Institute" dated 06.02.2023 No. 263r [4] for 2023–2027, aimed at developing promising technologies, forming a technological base for Russia to achieve leadership in priority areas of scientific and technological development, for the implementation of which budget funding in the amount of more than 185 billion rubles was allocated. The Program's target indicators include: fundamental and applied research in the field of creating materials for marine equipment; new technologies for the production of materials and coatings with anti-icing and wear-resistant properties for anti-corrosion protection with reduced ice adhesion to the surface for underwater and surface marine equipment; innovative technologies for producing powder materials from titanium alloys for marine use and manufacturing products from them with specified properties. The Kurchatov Institute will conduct applied research to create the foundations of a new-generation full-electric propulsion system technology using direct thermoelectric energy conversion and superconductivity technologies, which will result in the creation of promising nuclear power plants for transport purposes, including for nuclear icebreakers [16; 17].

Testing of certain components in ensuring technological independence

The construction of the Russian icebreaker fleet for the development of the Northern Sea Route (NSR) is one of the main priorities for domestic shipbuilders. In particular, two (out of five planned) universal nuclear icebreakers of Project 22220, Arktika and Sibir, are already operating on the NSR lines, Yakutia is undergoing ship trials in the Gulf of Finland, and Ural and Chukotka are in the active stage of construction. These 60-megawatt icebreakers of the Baltic Shipyard will increase the existing transportation potential in the Arctic zone of the Russian Federation (AZRF).

The Zvezda shipbuilding complex is constructing 35 vessels to ensure large-scale year-round work along the NSR. The contracts include the construction of the lead nuclear icebreaker of Project 10510 Lider, four multifunctional ice-class supply vessels, more than 10 Afromax tankers, 10 Arc7 ice class Arctic shuttle tankers, one Arctic shuttle tanker with a deadweight of 69 thousand tons, product tankers with a deadweight of 51 thousand tons, equipped to operate on gas fuel, etc. [5] The order portfolio of Zvezda SC is quite large, and in order to reduce the deadlines for commissioning the Russian ice-class fleet for work in the AZRF, FSUE Rosmorport has implemented the option of transferring the contract for the construction of two Project 22740 shallow-draft icebreakers of the consortium of JSC Rosneftegaz, PJSC Rosneft and JSC Gazprombank from

[4] The program of activities of the Federal State Budgetary Institution "National Research Center "Kurchatov Institute"" for 2023-2027, approved by the Order of the Government of the Russian Federation dated 06.02.2023 No. 263r. URL: http://publication.pravo.gov.ru/Document/View/0001202302090033 (accessed 25 October 2023).
[5] Zvezda shipbuilding complex. URL: https://sskzvezda.ru/ (accessed 25 October 2023).

Zvezda SC to JSC Onezhskiy Shipbuilding Plant (OSP) [6]. In May 2023, the construction of the lead shallow-draft icebreaker of Project 22740M began at the OSP, the general designer is the St. Petersburg branch of JSC Central Design Bureau Lazurit, the second icebreaker of Project 22740M is planned to be started in 2023.

The Iceberg Central Design Bureau, together with the Krylov State Research Center, has developed a project of a nuclear multifunctional offshore icebreaker 10570, designed to operate in shallow areas of the Arctic shelf — its propulsion is based on the RITM-200B reactor plant (modernized version). The project is equipped with two full-turning steerable propellers, a central propeller and bow thrusters; the thickness of the ice to be overcome is up to 2.4 m. It is noteworthy that the adopted domestic concept suggests the possibility of creating various types of multifunctional offshore icebreakers with specialized equipment.

In November 2023, the Vyborg Shipyard laid down the first diesel-electric icebreaker of Project 21900M2, in which everything is made in Russia. Project 21900M2 is a 120-meter Arc7 ice class vessel with a propulsion system with a total capacity of 18 MW — the engines were developed and manufactured at the Kolomenskiy Shipyard. This project assumes a high degree of automation and a modern electronic integrated control system, a helipad and the ability to place 33 containers on the deck (12 of which can be refrigerated with the ability to connect to the on-board electrical network), and is capable of breaking through ice up to 1.5 m thick. The experience of building the Project 21900M2 icebreaker without the participation of foreign suppliers will be important for the entire shipbuilding industry of our country.

According to Rosatom's forecasts, to ensure full-scale year-round navigation along the Northern Sea Route, it is necessary to have at least 7, and optimally 14 icebreakers (including conventional ones) in service by 2030. The icebreaker fleet is a real driver for increasing cargo traffic along the NSR, as stated in the Strategy for developing the Russian Arctic Zone and ensuring national security until 2035 [7]. The cargo turnover of the Arctic basin ports is presented in Table 2 for 2021 [8], 2022 [9] and January — June 2023 [10].

Table 2

Cargo turnover of Arctic ports, million tons

No.	Arctic ports	2021	2022	January–June 2023
1	Murmansk	54.5	65.3	30.5
2	Sabetta	27.9	28.4	13.9
3	Varandey	4.6	5.9	2.7

[6] JSC Onezhskiy Shipbuilding Plant. URL: http://onegoshipyard.ru/ (accessed 25 October 2023).
[7] Decree of the President of the Russian Federation of October 26, 2020 No. 645 "On the Strategy for developing the Russian Arctic Zone and ensuring national security until 2035". URL: https://www.garant.ru/products/ipo/prime/doc/74710556/ (accessed 25 October 2023).
[8] Cargo turnover of Russian seaports for 12 months of 2021. URL: https://www.morport.com/rus/news/gruzooborotmorskih-portov-rossii-za-12-mesyacev-2021-g (accessed 25 October 2023).
[9] Cargo turnover of Russian seaports for 12 months of 2022. URL: https://www.morport.com/rus/news/gruzooborotmorskih-portov-rossii-za-12-mesyacev-2022-g (accessed 25 October 2023).
[10] Cargo turnover of Russian seaports for January–June 2023. URL: https://www.morport.com/rus/news/gruzooborotmorskih-portov-rossii-za-yanvar-iyun-2023-g (accessed 25 October 2023).

4	Arkhangelsk	3.2	2.3	0.85

The infrastructural development of the AZRF in general and of the NSR in particular implies quite a large number of facilities; today, more than 70 transshipment bases and ports are located along this transport crossing.

The creation of oil and gas industry facilities, which are strategically important for the country, is of particular interest in the AZRF [18]. Within the framework of the Energy Strategy of the Russian Federation until 2035 [11], the Long-term Program for the development of liquefied natural gas production in the Russian Federation dated 16.03.2021 No. 640 [12], an increase in the production of liquefied natural gas to 140 million tons is projected. At the current stage, there is a noticeable increase in the share of LNG in the total volume of "blue fuel": at the beginning of 2020, the share was 27%, in 2010 — 47%, in 2021 — 50%, in 2022, natural gas became a kind of "safety cushion" in the face of European sanctions; about 17 million tons of LNG were supplied to the EU, which is almost 20% more than in 2021.

The projects of PJSC Rosneft, PJSC Gazprom Neft, PJSC Novatek, PJSC Gazprom, Rosatom State Corporation and other companies, the implementation of which will make it possible to realize the planned activities, are considered promising in the AZRF.

Following the events of February 2022, the EU adopted the fifth package of sanctions — critical equipment for the LNG industry was banned. According to the Union of Oil and Gas Producers of Russia, before these events, about 80% of the equipment used in the Russian Federation was exported by foreign suppliers. For example, the Prirazlomnaya offshore ice-resistant stationary platform operating on the Arctic shelf consists of 90% imported equipment.

The oil and gas sector and, in particular, PJSC Novatek have experienced an impressive number of restrictions from their recent "partners" [19]. The USA and EU have limited the supply of equipment and technologies for the Russian oil and gas sector, and Baker Hughes, Weatherford, SLB (Schlumberger) and Halliburton have announced the suspension of work. The French authorities and banks have refused to participate in the Arctic LNG 2 project. South Korean shipyard Daewoo Shipbuilding & Marine Engineering (DSME) has terminated a contract for the construction of three Arc7 LNG tankers, while Japanese and French companies are freezing investments for the project.

However, PJSC Novatek is implementing new projects using its own technology. Novatek's LNG technology portfolio includes: medium-tonnage "Arctic Cascade" [13]; "Polar Star" [14], which op-

[11] Energy Strategy of the Russian Federation for the period until 2035. URL: http://static.government.ru/media/files/w4sigFOiDjGVDYT4IgsApssm6mZRb7wx.pdf (accessed 25 October 2023).
[12] Long-term program for the development of liquefied natural gas production in the Russian Federation dated 16.03.2021 No. 640. URL: http://static.government.ru/media/files/l6DePkb3cDKTgzxbb6sdFc2npEPAd7SE.pdf (accessed 25 October 2023).
[13] A method for liquefying natural gas using a high-pressure cycle with pre-cooling with ethane and supercooling with nitrogen "Arctic Cascade" and the installation for its implementation. URL: https://patents.google.com/patent/RU2645185C1/ru (accessed 26 November 2023).
[14] The Polar Star natural gas liquefaction method and the installation for its implementation. URL: https://patents.google.com/patent/RU2740112C1/ru (accessed 26 November 2023).

timizes the “Arctic Cascade”; large-tonnage “Arctic Cascade Modified” [15]; large-tonnage “Arctic Mix” [16].

The “Arctic Cascade” and “Arctic Cascade Modified” natural gas liquefaction technologies can only be used in the Arctic at low average annual air temperatures. The new development of the company “Arctic Mix” with a capacity of about 6.5 million tons of LNG per year will be implemented at Murmansk LNG and is intended for operation not only in the Arctic zone, but also in the European part of Russia. Using the gas liquefaction technology “Arctic Cascade”, the fourth line of Novatek’s Yamal LNG is operating, and according to experts’ forecasts, it can produce 1 million tons of LNG instead of 950 thousand tons [17].

The technology “Arctic Cascade Modified” with a capacity of 3 million tons per year is planned for implementation at Obskoe LNG.

Novatek’s Arctic LNG 2 project is being actively implemented in the AZRF, where three lines will produce up to 19.8 million tons of LNG per year using both foreign and domestic equipment. In July 2023, LLC Novatek–Murmansk — the Center for the construction of large-tonnage offshore structures (CCLOS, Belokamenka settlement, Murmansk Oblast) sent the first liquefaction line of the Arctic LNG 2 plant on a gravity platform. V.V. Putin took part in the ceremony of the plant’s shipment by sea to the Utrennee field. In August, the LNG complex was delivered to the project’s resource base on the Gydan Peninsula, and specialists started connecting it to the coastal infrastructure. The second stage is planned for delivery in 2024, the third — in 2026.

The complexity of the project is in the fact that the most promising projects in oil and gas production in previous times were created according to Western standards in order to include their equipment in the production process [20; 21]. In the new geopolitical situation, many projects are at risk of failure due to the suspension of critical equipment supplies from the US and EU, in particular, the German Linde. One of the problems is the lack of technology for the production of medium and high-power gas turbines. Harbin Guanghan Gas Turbine Co of the People’s Republic of China helped resolve the issue, PJSC Novatek signed an agreement to purchase medium-power turbines to meet the needs of the Arctic LNG 2 under construction; an alternative option for solving the issue of power supply was also found, in particular, the Turkish Karpowership gas piston power plant was considered. The above-mentioned points indicate the existence of international co-operation with friendly countries [22].

During the implementation of Arctic LNG 2, many decisions had to be changed in process, which resulted in a 17% increase in the cost of the project: the initial cost of the project was 21 billion US dollars, at the current stage — 25 billion US dollars. According to Leonid Mikhelson, the

[15] The method of liquefying natural gas "modified Arctic cascade" and the installation for its implementation. URL: https://patenton.ru/patent/RU2792387C1 (accessed 26 November 2023).
[16] Natural gas liquefaction method "Arctic Mix". URL: https://patents.google.com/patent/RU2797608C1/ru (accessed 26 November 2023).
[17] Fuel and energy complex of Russia. URL: https://www.cdu.ru/tek_russia/issue /2023/1/1107/ (accessed 25 October 2023).

head of Novatek, the cost of the project will be more expensive at the first stage, but this always happens when introducing new technological solutions; once serial production of domestic equipment for liquefying natural gas begins, it will be cheaper than foreign analogues [18].

The topic of technological sovereignty in the oil and gas and industrial complexes of the country to create completely domestic units, machines, ship component equipment (SCE) and other products in 2022 has come to the forefront. The Russian Government has formed a list of projects that include critical areas of import substitution until 2030. According to forecasts, 5.2 trillion rubles are planned for the implementation of 162 projects: 2.3 trillion rubles in the form of preferential loans, and 2.9 trillion rubles as investor contributions. The list includes the following projects in the largest number: 54 in the chemical industry; 27 in the ferrous metallurgy industry; 18 in the forestry complex; 16 in railway engineering; 12 in the pharmaceutical industry; 8 in the automotive industry; 6 in agricultural engineering; 5 in non-ferrous metallurgy; 5 in construction and road engineering; 3 in the machine tool industry and 3 in heavy engineering; 2 in the aviation industry; 3 in other industries.

Assessing the real opportunities, it should be understood that it will not be possible to achieve rapid and complete import substitution, in particular, due to the fact that in some areas of activity it will be necessary to start from scratch. Consequently, it is possible to use one of the design processes — reverse engineering [19], when, based on a ready-made set of design documentation, it is necessary to master the production of analogues of imported units and components for emergency and/or planned replacement in the shortest possible time; it is possible to create centralized structures to solve these problems, especially with the state funding.

In order to establish production of domestic high-tech equipment for the oil and gas industry, the issues of creating a unified technology bank, national oilfield service co-operation, the possibility of creating a consortium of Russian enterprises, etc., are being addressed. Nevertheless, domestic manufacturers are already offering their developments.

Rosatom creates cryogenic heat exchangers for large-scale production (to replace German Linde and American Air Products). Rosatom's mechanical engineering division — JSC Atommash (AEM) is a leading manufacturer of cryogenic pumps for medium- and large-scale LNG production. The first in the history of the Russian petrochemical industry large-capacity pump for liquefied natural gas, developed and manufactured by OKBM Afrikantov, a part of AEM, was put into commercial operation in 2020. It is used to load LNG onto gas tankers. AEM is currently working on developing and manufacturing a pilot model of the first Russian liquid turboexpander with maximum use of domestic components, and is also developing the first LNG shipment stands. The delivery of the pilot sample of the stand for the Russian LNG project is scheduled for 2024. In the fu-

[18] Arctic LNG-2 is getting more expensive. URL: https://www.kommersant.ru/doc/6068141/ (accessed 26 November 2023).

[19] Reverse engineering (or reverse design) is the process of developing design documentation (DD) and/or a 3D model of a product based on a finished product sample, i.e. the DD and/or 3D model are not developed from scratch, but are restored based on a finished product.

ture, there will be an expansion of the assortment and localization of a wide range of equipment for large-capacity LNG production projects, LNG icebreakers and gas tankers carrying out LNG shipments [20].

JSC United Engine Corporation (UEC, part of Rostec State Corporation) [21] developed and manufactured a GTA-8 unit with a capacity of 8 MW at the Rybinsk enterprise UEC-Gas Turbines, which will be used in the PJSC Gazprom project on an ice-resistant platform in the Kara Sea to develop the Kamennomysskoe More field. Four GTA-8 units will be part of the GTES-32 power plant. The GTA-8 is driven by a GTD-8RM gas turbine engine manufactured by UEC-Saturn, the automated control system (ACS) was supplied by Elna (Moscow), and information equipment of the research and production company Sistema Service (St. Petersburg) is used.

In 2023, UEC-Saturn (part of Rostec State Corporation) manufactured the first serial gas turbine GTD-110M in the Russian Federation. This high-tech unit has surpassed its foreign counterparts in many parameters and brought Russia into the world league of manufacturers of such equipment.

The Leningrad Metal Plant (part of Power Machines Corporation) has created a 155-megawatt GTE-170 system (gas turbine + generator) for electrical installations. Power Machines Corporation is implementing the gas turbine production project with the support of the Russian Ministry of industry and trade. The total investment volume is over 15 billion rubles, of which 4.6 billion rubles are government subsidies. The planned production volume is 8 turbines per year by 2025 with subsequent increase in output.

JSC RUMO (Nizhny Novgorod Machine-Building Plant) is ready for serial production of 1 MW gas piston power plants running on natural gas. These engines from JSC RUMO are used for operation of compressors, as a ship unit, propeller shaft drive and other areas; the production volume is 40–50 engines per year, at the current stage an investment project is being launched to expand capacity to 100 units per year. Customers include the United Shipbuilding Corporation (USC), PJSC Gazprom, and others.

JSC Ural Steel [22] presented innovative steels with improved characteristics and capable of replacing foreign models. One of the areas of application is the creation of LNG storage tanks.

The C3D Labs Company [23] (a subsidiary of ASCON) has developed a domestic design program “Compass-3D” — a computer-aided design (CAD) system. The program is mainly used by engineers and designers in those industries that require schematic visualization of various objects — in instrument making, metallurgy, construction, mining, agriculture, etc. [23; 24]. The development required 17 years of painstaking work from Russian specialists, but the result is worth it. Thanks to it, there is no need to do a lot of work on adapting complex software complexes for new

[20] JSC Atommash. URL: https://www.aemtech.ru/ (accessed 25 October 2023).
[21] JSC United Engine Corporation. URL: https://www.uecrus.com/ (accessed 25 October 2023).
[22] JSC Ural Steel. URL: https://uralsteel.com/ (accessed 25 October 2023).
[23] C3D Labs. URL: https://c3dlabs.com/ru/company/about/ (accessed 25 October 2023).

operating systems — it is enough to go through the WINE@Etersoft, which ensures this compatibility.

According to the Union of Oil and Gas Producers of Russia, there are a number of domestic enterprises capable of producing high-tech products in the direction of creating technological sovereignty: SDO Obukhov Plant, Generatsiya Group, GMS Group, Uralmash-Izhora Group, ZAO NPF CKBA, NPO Vint, OJSC Barrikady, OJSC Katayskiy Pump Plant, OJSC Mashprom, OJSC NIITFA, OJSC NIKIMT-Atomstroy, OJSC Novaya Era, OJSC Proletarskiy Plant, OJSC Silovye Mashiny, OJSC Tekhnoros, OJSC Uralvagonzavod, OOO Uralmash NGO Holding, OOO Elektrotyazhmash-privod, FSUE SPO Analitpribor.

Conclusion

The Arctic is for the most part a Russian territory, an area of cooperation, ready for interaction with other countries. State support measures are being successfully implemented in the Arctic territories, new enterprises are being commissioned — 56 enterprises were commissioned in 2022, 47 have already been commissioned in the first half of 2023; more than 700 new investment projects are being implemented; infrastructure is being developed; living conditions for people are being created.

Speaking about the strategic development plans for the oil and gas industry, in particular, the Long-term program for the development of liquefied natural gas production in the Russian Federation, designed until 2035, we can confidently say that the foundation for subsequent development has been laid, and the solution of the tasks set is a matter of time.

Leading energy companies — Rosatom State Corporation, PJSC Novatek, PJSC Gazprom, PJSC Rosneft Oil Company, PJSC Gazprom Neft, etc. — as well as related enterprises are working on developing and localizing special equipment, creating domestic technologies for large-scale LNG production, programs for the exploration and production segment, carrying out research and development, and much more. In particular, PJSC Novatek has begun implementing the Murmansk LNG project, which provides for a significant increase in LNG production in the Arctic zone. Novatek's strategy includes the construction of the Volkhov–Murmansk gas pipeline with a capacity of 40 billion cubic meters, which will supply the Murmansk LNG. The measures for power supply of this project from the Kola NPP have been agreed upon and are being implemented, which is a distinctive feature in the use of electric drives of process compressors instead of gas turbines.

PJSC Novatek plans to use its own liquefaction technology "Arctic Mix", the capacity of one line will be about 7 million tons per year, the localization of the project is 70-75% of domestic equipment and components.

As a result, it should be noted that Russia is launching mega-projects that will further lead the country to technological sovereignty: today, 10 mega-projects have already started to create high-tech products, in particular, the production of medicines and medical devices, chemical, electronic and radio-electronic products, unmanned aircraft systems, machine tools, diesel engines,

the production of liquefied and natural gas, the production of ships and aircraft. The total investment in each project will be at least 10 billion rubles. As a result, long-term demand for domestic products in these areas will be formed, not only by industrial enterprises, but also by socially significant sectors of the economy: healthcare, fuel and energy and transport complexes. Nevertheless, technical isolation, an attempt to do everything by own forces is a way to nowhere. Russia is part of the global world, where development is impossible without international partnerships.

The technological sovereignty of the country created on the basis of the domestic scientific instrument park will form a stable “immunity” to geopolitical factors.

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North-Arctic Specificity of the Subject of Economic Research (Methodological Aspects)

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Abstract. The North-Arctic topic of economic research covers a wide range of issues. The author believes that if we look at this topic from the standpoint of the methodology of constructing the subject of research, we cannot help but notice the growing importance of the axiological and evaluative aspects of studying the North. This kind of priority is conditioned by the increasing influence of natural conditions on socio-economic activity and the need for scientific explanation of transitions from natural to social. The methodology of practical activity in the conditions of the North traditionally reflects the difficulties of choosing the ways of organizing production and social activity here. At present, this is supplemented by the ambiguity of the reaction of the northern regions to the emergence of new circumstances that significantly affect the national economy, such as the need to urgently ensure the technological sovereignty of our country and strengthen its military-industrial complex. Therefore, the method of mobilization management becomes very relevant for the North of Russia, and especially for its Arctic zone. The scientific and practical aspects of the methodology of North-Arctic activities have a common methodological attitude: the transition from the position "the more the better" to the position "good quality is more important than large quantity". Moreover, in the Arctic, the need for a transition "from the maximum necessary to the realistically possible" is increasingly realized.

Keywords: *methodology, economic topics, characteristics of the North, specifics, assessment, adaptation*

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[1] The article is based on the author's report at the scientific and methodological seminar "Research on social and economic systems". Institute of Socio-Economic and Bioresource Research, Federal Research Center for Socio-Economic Studies, Ural Branch of the Russian Academy of Sciences (Arkhangelsk), November 9, 2023. The report also takes into account the author's position regarding the methodology of scientific research work [1, Lazhentsev V.N., pp. 60–64].

Introduction

The author is aware of the depth of philosophical explanation of the methodology of cognition, and therefore speaks only about its individual aspects in order to outline the specific aspects of socio-economic development in extreme and difficult natural and climatic conditions. The idea of the article is to pose the question of what forms the basis of the North-Arctic theme of economic science and what new knowledge can be obtained. The answer is contained in the interpretation of the North as an object of research, the positioning of a researcher in relation to this object, the formation of a problem approach taking into account the characteristics of "northernness", the definition of the subject essence of research and national economic programs. Cognitive activity in this case is focused on the peculiarities and circumstances caused by various transformations of political and economic relations, Northern practices of adaptation to such changes deserve special attention, as they significantly influence economic thinking and emphasize the need to overcome economic determinism.

Two approaches to the formation of the Northern Arctic theme

1. Application of already known scientific results in solving specific scientific, technical and socio-economic problems of the North. In this case, the achievements of specific science (physics, biology, economics, etc.) are purposefully applied to the needs of the northern territories. Here, the methods of construction of available knowledge are used.

2. Focused study of what is inherent in the North itself. Here we are talking about obtaining new knowledge about the specific properties and qualities of northern natural and economic objects and processes, when they (properties and qualities) influence the formulation of completely new (search) topics that enrich the content of a particular branch of knowledge and science as a whole.

The specific characteristics of "northernness" include:

- *natural* — climatic discomfort, climate change (global warming), lack of ultraviolet radiation, polar days and nights, increased geomagnetic activity, permafrost, swampiness, abundance of snow, complex ice conditions, weak potential for restoration of tundra and taiga biocenoses;
- *economic and geographical* — transport remoteness, focal and linear forms of population settlement and production location, seasonality of economic rhythms, increased importance of ecological and economic functions of geosystems;
- *economic* — type of accelerated reproduction of fixed capital, high role of natural resource rent in the formation of investments and consumption funds, relatively high specific production and transport costs;
- *social* — poly-ethnicity and ethno-culture, specific lifestyle, special methods of public health protection, etc.

The listed characteristics of the North are stable; they serve as a basis for comparing northern objects with similar non-northern ones. According to the rules of cognitive methodology, they should be attributed to the subject of research.

The methodology of cognition includes one of the important elements of scientific work, namely, the positioning of a researcher in relation to the object of study. The author believes that the North can be considered as:

- ***springboard*** for obtaining scientific knowledge and experience in overcoming difficulties;
- ***testing ground,*** for example, for new technology;
- set of ***objects*** for the development of which new knowledge and technologies are generated;
- set of ***subjects*** organizing their activities with regard to complex conditions and circumstances [2, Lazhentsev V.N., pp. 26–31].

Methodological aspects

From a methodological point of view, let us consider four questions.

1. Under what conditions can economic research be regarded as North-Arctic research? There are two possible answers to this question:

- *certainly*, if we are talking about social and economic processes in the territories officially classified as the Far North and equated areas;
- *only on the condition of assessing the characteristics of "northernness"*, which are considered, on the one hand, (as already mentioned) as a subject of research, and on the other hand, as a factor that significantly influences the organization of social and economic activity. For example, the properties and qualities of permafrost are a special subject of cryology (the key word is "essence"); it (permafrost) can also be taken into account as a factor in the development of production and life support (the key word is "influence"). Economic science in this case studies influence.

2. How is the "problem field" of the North-Arctic topics formed? It is formed according to the principle of "counter movement" (Fig. 1) [2]. Other methodological techniques are also used to understand the essence of the North-Arctic problems, for example, methods of expert and interactive surveys of scientists and practitioners on a given topic [4, Lukin Yu.F., pp. 171–185]. Let us pay attention to the opinions of experts on the relationship between the Arctic and the Far North, which show the desire of many scientists and representatives of regional authorities to expand the Arctic Zone of the Russian Federation so that the "Arctic" itself, as a physical and geographical reality, is displaced from the Arctic issues. In this regard, we note that the designation of high-latitude territories with two words "Arctic" and "North" should not create a false understanding of

[2] The idea of "counter movement" belongs to T.E. Dmitrieva (ISE and EPS Komi Scientific Center of the Ural Branch of the Russian Academy of Sciences) [3, Dmitrieva T.E., pp. 71–83].

their separate existence. The North has a complex internal zonal and azonal structure, in which the Arctic zone is currently actualized. Let us remind that *arktikos* means “northern” in Greek.

“Counter movement”				
Characteristics of the North and their impact on life and economy		Objects of study and management	Economic evaluation of characteristics and regulation mechanism	
Characteristics	Impact		Evaluation	Mechanism
Climate discomfort	Threats to human health, additional costs	Household, settlement, enterprise, social community, economic complex, district, etc.	Geographical and economic expertise and diagnostics of norms and standards	Compensation of additional costs, special regime of capital reproduction
Economic remoteness	Slow and expensive. “Time and money!”		Calculation of working capital and transportation costs	Creation of insurance reserves, state participation in the creation of infrastructure
High natural resource potential	Strict subordination of life of the population and regional management with natural resource corporations		Socio-economic assessment of natural resource capital	Methods of capitalization of natural resources, mechanism of extraction and distribution of natural resource rent, state control over corporations
Ethnicity	Threat of destruction of traditional economy and livelihoods			Legal protection of the traditional economy and way of life of the indigenous population

Fig. 1. Formation of the “problem field” of the North-Arctic topics of socio-economic research.

3. What changes are taking place in the study of the problems of socio-economic development of the North? The topic of the natural-historical formation and development of northern societies with their ethnic and spiritual characteristics of economic activity certainly remains relevant. Traditionally, there is an economic analysis, the meaning of which can be designated by the question: “What do we have and what should be done for the harmonious and sustainable development of the northern territories?” The answers to this question are dominated by judgments about improving financial and economic relations, competition, norms and rules of economic behavior. At the same time, there are attempts to combine market priorities with public interests and scientific and technological progress, when the main question is “How should we do it?”, that is, with a focus on improving production and social technologies, mechanisms for regulating economic activity [5, Lazhentsev V.N., pp. 35–43] (Fig. 2).

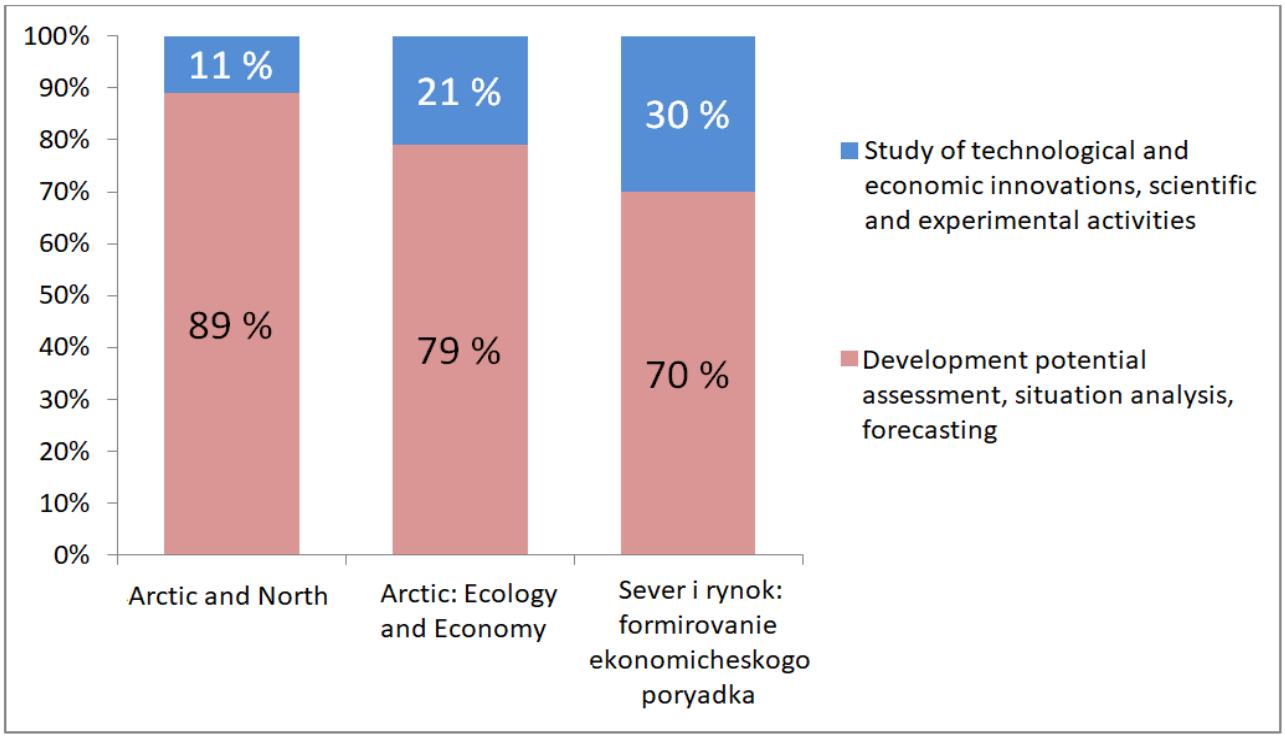

Fig. 2. Two blocks of publications in three scientific journals on the problems of the Arctic and the North.

Classical methods of structural-functional and problem-situational analysis of the economy have always been and still remain. However, in the study of northern regions, these methods should be complemented by a normative-evaluative approach to the organization of economic activity and life support systems, taking into account climatic and other conditions.

4. What theories are most important in the development of research programs on North-Arctic topics? Such theories include (the author whose works form the basis of this theory is indicated in brackets for orientation): philosophy of economy (Yu.M. Osipov); evolutionary theory and a set of concepts of economic sociodynamics, mixed economy, social clusterism and philosophy of cooperation (V.M. Polterovich); theory of economic mechanism (L.I. Abalkin); doctrine of geosystems (V.B. Sochava); theory of formation of industrial-territorial complexes (N.N. Kolosovskiy) and program-targeted TPCs (M.K. Bandman); geographical expertology (K.P. Kosmachev); theory of development of research programs (Imre Lakatos) (Table 1).

Table 1

Key methodological provisions most relevant for the North-Arctic economic research topics

Theory	Position most significant for the methodology of studying the Arctic and the North
Philosophy of economy	Knowledge about economic management is closely connected with general cultural and general natural knowledge
Evolutionary theory and the philosophy of cooperation	Increasing role of cooperative institutions is a natural result of technological, cultural and institutional evolution
Theory of economic mechanism	Economic mechanism is a system of economic relations and other driving forces of social development
Doctrine of geosystems	Not only nature and society are systemic “in themselves”, but in unity they form natural-social systems of various geographical dimensions
Theory of formation of industrial-	Individual elements of production in combination become

territorial complexes	local technical and economic complexes, and within the boundaries of relatively large territories (large economic regions) — complexes of productive forces of society
Theory of program-targeted TPC	Large investment projects for the formation of national economic complexes on a limited territory can be implemented more effectively on the basis of program-targeted planning
Geographical expertology	Checking general concepts, rules, norms and standards for reliability and compliance with local characteristics of economic activity allows reducing the extent of economic risks significantly
Theory of development of research programs	Program integrates internal structural elements of research (axioms, hypotheses, theories) on an interdisciplinary basis

Beyond the brackets of a number of economic theories indicated in the table are the concepts and theories relating directly to the North. The author did not intend to include them in this article. However, let us pay attention to the attempt to formulate such a theory as a new one. It is based on "four new research priorities in studying the process of developing the North and the Arctic: analysis of local institutional capital; special attention to conflicts and contradictions in the process of developing the territory's natural resources; attention to the evolution of the settlement system; uniqueness of interaction of large and small forms of developing this territory" [6, Zamyatina N.Yu., Pilyasov A.N., p. 5]. From the perspective of the methodology of the cognitive process, this claim for novelty should be tested. At first glance, it seems that it is impossible to disagree with the indicated priorities. At the same time, the priorities themselves are designated: either as an action of the researcher (analysis, attention) or as a property of the studied objects (peculiarity of interaction). The former refers to the methodology of activity, the latter — to the theory of the ideal image. The same authors presented the methodology (but not the theory) of studying the Russian North more convincingly in the form of conceptual baggage of domestic, European and North American regional science with the identification of the features of each of these sources [7, Pilyasov A.N., Zamyatina N.Yu., pp. 57–76]. The conceptual approach to the problems of the development of the North, indeed, explains a lot, including the diversity of opinions regarding its peculiarities [8, Lazhentsev V.N., pp. 4–14].

Practical aspects of the methodology

1. What follows from the assessment of historical experience? There are many things, but the main one is that the northern territories were not only developed, but also thoroughly inhabited (developed). Areas of sustainable economic activity were formed. Such areas should be considered as the main objects of economic science and regional policy.

Of methodological interest is the historical assessment of the ratio of state and private capital, which was given by V.A. Lamin, corresponding member of the Russian Academy of Sciences, in relation to the northern projects at the end of the 18th — beginning of the 19th centuries. He writes: "Domestic merchants and entrepreneurs, the first generation of whom Peter I nurtured at the expense of the state treasury, were still state fosterers a hundred years later. Due to the ine-

radicable thirst to live in luxury, in a royal way, spending an impermissibly large share of profits on themselves, which was destructive to the business, they did not have any significant working capital, sufficient for the implementation of large trade and entrepreneurial projects. Whenever there was a need for such funds, they turned to the state treasury with a shamelessly outstretched hand for privileges, benefits and direct financial support" [9, p. 38]. This narrative continues to this day, which is especially clearly manifested in the formation of investments in Arctic projects.

Some historical lessons have a clearly expressed methodological nature, for example, it is unprofitable to save money on the infrastructural development of territories *("a miser pays twice").*

2. What follows from the assessment of the historical experience of studying the problems of the North in the economic institutes of the USSR Academy of Sciences? The organization of academic research centers and institutes in the North of Russia was a consequence of the active participation of the USSR Academy of Sciences in the scientific substantiation of the rational distribution of productive forces and the creation of new industrial bases on the periphery of our country. It is useful for research economists working in northern academic institutes to know that their predecessors directly carried out technical and economic calculations on options for solving specific national economic problems. There is no doubt that pre-project economic analysis is socially useful and corresponds to modern technologies of strategic planning.

3. Is it relevant to analyze the norms and standards of economic and social activity in the conditions of the North in the market economy? There is no clear answer to this question. For example, the coefficients of increase in the cost of construction and installation works (CIW) in the zones of the North of Russia were established in 1984, and their scientific analysis was carried out in 1985, that is, 38 years ago [10, Dmitrieva T.E., pp. 14–28]. The methods of scientific expertise of the coefficients of CIW could still serve as a guideline in design and construction, as well as the coefficients to the norms of construction duration. However, it should be taken into account that the organization and technology of construction are improving, so the expertise of construction norms and rules is necessary [11, Varfolomeev Yu.A., Arbuzov Yu.A., pp. 29–42]. It is also relevant to the issue of accelerated depreciation of fixed assets; the climate determines the rate of wear of machines and mechanisms operated outdoors. It is desirable to conduct more frequent expertise of tariffs for heat and electricity and take into account not only the differences in economic and geographical location, but also the structure of energy sources.

The situation related to regional coefficients and seniority allowances to wages can be assessed differently. They have been discussed since the Soviet times, when labor incentives in the North could not be imagined otherwise than through allowances. In market conditions, the importance of regional coefficients and seniority allowances has been preserved only in the budgetary sphere; in the production sector, they are formal in nature and do not affect the formation of the wage fund. Another matter is the norm "activated days for outdoor workers". For example, in the Komi Republic, the accounted losses of working time in the winter period in fact amount to

3–13%, and according to hygienic requirements from 10 to 35%. Such a gap requires scientific expertise and administrative verification (either the climate has changed significantly, or the activation norm is not observed). The same can be said about "physiological requirements for energy and nutrients". Some standards, such as "insulated clothing sets", "seasonal stocks of goods", "financing and lending for northern deliveries", are mainly under the jurisdiction of the company's management. If the company considers it necessary to review the production and social standards of its activities, it can organize it at its own expense.

A special discussion about Arctic standards: should they be established to distinguish the Arctic from other territories of the Far North? Can, for example, the territories of the Arkhangelsk Oblast (the cities of Arkhangelsk and Novodvinsk; Onezhskiy and Primorskiy municipal districts), classified as part of the Arctic Zone of the Russian Federation, claim additional Arctic allowances, if they are not even included in the list of regions of the Far North?

Let us pay attention to another methodological aspect: standard indicators are a kind of indicators reflecting the economic essence of the "northernness" of certain processes. Thus, space can be measured by the indicators "goods in transit", "turnover rate", "transport costs" and displayed on the map by isochrones and isocosts.

4. What does mobilization economy mean in relation to the North? The problems of mobilization economy have become a reaction to the ongoing changes in the world order, the emergence of major threats to the national economy, local military conflicts. The situation is very complicated, but it does not serve as a reason for radical political and economic changes in our country. Its constructive resolution can be achieved through national economic programs that eliminate Russia's disadvantaged position in the high-tech market and strengthen the domestic Russian market space.

The author believes that it is reasonable to solve the following four problems in the regions of the North of Russia using mobilization economic methods:

- deficit in some types of non-ferrous and rare metals for the sake of the technological sovereignty of the Russian Federation;
- ensuring bio-resource and economic balance in reindeer herding;
- restoration of agriculture in the taiga zone;
- real and qualitative implementation of the program for resettling part of the population from the regions of the Far North.

The author's position in the methodological link "North — researcher of the North"

Each researcher strives to show his positive attitude to the North, to reliably determine the factors and conditions of its socio-economic development. It is the attitude that largely predetermines the methodology of the research process. If we position the author's works in the methodological link "North — researcher of the North" in the sequence noted at the beginning of the article (bridgehead, testing ground, object, subject), it turns out that the North for the author is, first

of all, a bridgehead for studying the problems of territorial development [3], when the problem is identified within the framework of the methodology of economic geography.

The economic and geographical foundations for the development of the North include:

- systemic reproduction of human and natural resource potential within the boundaries of territorial and economic systems;
- priority of development of already developed territories with historical and cultural centers of relatively sustainable life;
- active participation of northern economies in strengthening the market space of Russia by including natural resources in the technological complexes of the Russian manufacturing industry.

The economic and geographical methodology is reflected in the typology of territorial and economic systems of the North and the definition of the problems of development of each type of system. At the same time, it is concluded that natural-economic zones (the Arctic, the Far North, the Near North) are not economic systems. In our opinion, the systemic nature of the "North" is most clearly manifested in local economic entities and in their place and role in the composition of meridional structures — areas of regional (territorial, republican) rank and large economic districts. Such a judgment does not exclude systemic solutions and model approaches to the development and justification of management decisions common to northern zones [12, Chizhova L.A., Tutygin A.G., pp. 209–214].

→ Counter movement ←			
Subject of study	Object	Stages of knowledge	Researcher's actions
Local development	↓ Northern TES ↑	Observation	Surprise and doubt
Adapted (northern) arrangement		Scientific explanation	Formulation of an idea and formation of a "problem field"
Optimal functioning		Design	Preparation of programs and projects
Dialectics of long-term development		Use of scientific results	Development of methods of "implementation"
→		←	

Fig. 3. Methodological approach to the study of northern territorial-economic systems.

Among the cognition procedures presented in Fig. 3, the key position is occupied by "scientific explanation" as it is much more difficult to understand the existing economic reality than to develop a forecast or project for the future. Scientific explanation is based on understanding the meaning of what is happening and possibility of interpreting it taking into account cause-and-effect relations. Economic reality is surrounded by a wall of commercial and state secrecy, which

[3] The author attempted to substantiate the meaning of the scientific concepts: "territorial-economic system (TES)" — a set of administrative centers and their resources, united by common interests of location and joint activities to create favorable living conditions for the population; "territorial development" — a process of balanced and effective use and reproduction of natural, material, technical and social resources within the boundaries of local and regional economic systems; "territorial management" — the activities of local government bodies and regional government authorities regarding the formation and rational use of personal, communal, municipal and sub-federal property for the benefit of society as a whole.

significantly complicates the analysis of deviations of existing reproduction proportions from the optimal ones. The excessive preoccupation with statistical indicators is no less of an obstacle: they often predetermine the structure of scientific texts, i.e. they describe what is available from statistical reference books. At the same time, there is a danger of misdirecting statistical indicators without further validation; they show something, but not what is required for scientific explanation.

The economic and geographical approach to the study of the North to some extent made it possible to understand the essence of interdisciplinarity. It consists in the conjugation of the main concepts of each scientific discipline included in the corresponding research project, and the targeted use of various analytical methods. In studying the economy of the Northern regions, interdisciplinary synthesis concerns the methodology and results of physical and socio-economic geography, statistics, regional economics, sociology and history. If we take into account our emphasis on the characteristics of "northernness", then medical geography and economic climatology should be added to the above. As shown by I.I. Matvienko [13, pp. 153–166], the health protection of small-numbered peoples has once again become particularly relevant. Of course, it is necessary to take care of the health of all northerners, which is one of the subjects of research within the framework of economic climatology. This science is also becoming essential for assessing the conditions of functioning of material and technical complexes [14, Porfiryev B.N., Eliseev D.O., pp. 30–43].

Conclusion

The essence of the considered methodological aspects of the North-Arctic economic topics consists in: 1) methods for assessing the influence of the characteristics of "northernness" on the organization of economic activity; 2) organizing economic activity in accordance with scientific recommendations on how to do it, i.e. with a focus on improving production and social technologies, economic mechanisms for adaptation to the conditions of the North. The effectiveness of the methodology increases if the organization of research work and the organization of practical work complement each other. This is achieved by the unity of the subject matter of research programs and programs for solving national economic problems. Such unity is not formed automatically. Therefore, from time to time, it is necessary to conduct a comprehensive examination of scientific theories and hypotheses, norms and standards of practical activity for their compliance with existing reality. This is especially important, since the experience of studying the regions of the North shows the presence of prerequisites for a significant restructuring of economic thinking and socio-economic policy under the influence of local practices.

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Statistical Analysis of the Labor Force of the Arkhangelsk Oblast

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Abstract. Labor force is a key driver of economic growth and productivity. The more labor force, the more production, trade and services can be created. In addition, the quality and efficiency of the labor force directly affects the level of productivity and competitiveness of the region and countries. Although the workforce is a key resource, managing it can be challenging. One of the main challenges in workforce management is retaining highly qualified employees, as the labor market is constantly changing and opening up new opportunities. This article is devoted to the study of the labor force in the Arkhangelsk Oblast, which is of great importance for understanding the current situation of the region and determining directions for development. The object of the study is the labor force in the specified territory, and the subject is its essence, state, structure and movement. In the course of the study, the following goals were set: determining factors affecting the quality of the labor force, analyzing the dynamics and structure of the labor force, studying the level of employment and unemployment, identifying the impact of the labor force on the economic indicators of the region. The methodological basis of the study is general scientific statistical methods of data analysis: absolute and relative statistical indicators, series of dynamics, correlation and regression analysis. The main conclusion of the article is that the labor force of the Arkhangelsk Oblast is steadily declining, but the balance between the share of men and women in it is preserved. However, the problem of unemployment during the period under review becomes more relevant for women than for men. These changes reflect the need for key measures that will stimulate not only economic development, but also the creation of favorable working conditions.
Keywords: *labor force, employed, unemployed, economy, dynamics, analysis*

Introduction

The term “labor force” refers to people who are willing to provide their work in exchange for wages. This term has deep roots in both economic theory and resource management practice. Unlike more modern terms such as “economically active population” or “labor resource”, “labor force” has a more precise and narrow specification. It focuses specifically on people who can be directly involved in the production process or the provision of services, creating tangible and intangible value for the economy [1].

The novelty of this study is in the statistical analysis of the labor force of the Arkhangelsk Oblast. The author emphasizes the importance of the labor force and analyzes its impact on the level of productivity and competitiveness of the region. The study was designed to determine the

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factors influencing its quality, dynamics and structure, as well as to assess the impact of the labor force on the economic indicators of the region.

The subject of the study is the reduction of the labor force, which is considered to be the biggest economic problem in the Arkhangelsk Oblast. Its consequences can affect regional growth, productivity and competitiveness. Proper planning of education, infrastructure and investment not only contributes to the development of stability by creating good jobs, but also improves workers' skills and attracts investment. The purpose of the study is to analyze the current state of the labor market in the Arkhangelsk Oblast, to identify factors affecting the quality of the labor force, and to take steps to develop programs that strengthen the local economy by promoting growth and motivation of workers.

The author conducts a comprehensive statistical analysis using absolute and relative indicators of employment and unemployment, as well as a correlation and regression method to assess the impact on regional economic factors. Labor force issues have also attracted the attention of scientists from a wide variety of disciplines, including economics, sociology and demography — this is reflected in the diversity of their approaches and methodologies. Research is aimed at conducting a comprehensive analysis of the labor force, including its quality, structure, dynamics, as well as studying the relationship between indicators. For example, M.A. Kakushkina [1] focuses on the interpretation of the economic category "labor force", emphasizing its role in the production process and the creation of tangible and intangible values in the economy. E.Yu. Sapozhnikova [2] believes that education is a key component of labor quality and emphasizes the need to improve education and professional training. In their research, L.A. Davletshin [3] and his colleagues statistically assessed the impact of socio-economic factors on the workforce and identified key areas for improving its efficiency. Ultimately, comprehensive study and solution to these problems are important for maintaining and improving the competitiveness of the region.

Factors affecting the quality of labor force

The quality of the labor force is one of the most important factors in the development of any territory. In the modern world, where competition in the labor market is growing, the provision of quality workforce becomes a necessity for the sustainable development of the region.

One of the key factors affecting the quality of the workforce is the level of education and professional training of employees [2]. The Arkhangelsk Oblast has a developed education system, including higher education institutions, colleges and vocational schools. High-quality education and specialized training make it possible to provide highly qualified specialists in various sectors of the economy. The Northern Arctic Federal University named after M.V. Lomonosov offers educational programs adapted to the specifics of the region, for example, forestry, ecology and environmental protection in the Arctic zone, natural resource management in harsh climates, as well as programs for the study and preservation of the cultural heritage of indigenous peoples of the North.

Infrastructure and availability of resources also affect the quality of the workforce. The presence of modern production facilities, highways, communications and other infrastructure contributes to the development of business and the attraction of highly qualified specialists. Arkhangelsk has industrial technology parks that create favorable conditions for the development of innovations and the attraction of qualified specialists.

The demographic situation and availability of labor resources also have a huge impact on the quality of the workforce. For example, the presence of young and active population can increase mobility and willingness to master new skills. In the Arkhangelsk Oblast, the share of young people makes up a significant part of the population, which creates the potential for the formation of a highly skilled labor force.

An important aspect affecting the quality of the workforce is the level of wages and social guarantees [3]. Equitable and high wages, as well as the availability of social security and protection of workers' rights contribute to employee satisfaction and motivation, which, in turn, affects their motivation, professional activity and productivity. A high-quality labor force plays a key role in sustainable development, so it is very important to develop these aspects. The workforce is the foundation of economic growth. Skilled and motivated employees can improve the productivity and efficiency of processes in enterprises. High levels of professionalism and skill of workers help to improve technologies, as well as to develop and implement more innovative approaches to work.

To summarize, it is important to note that in the context of a discussion about labor force reduction in a particular industry, proposals to improve the level of education, qualifications, and wages of workers can be justified for several reasons.

Firstly, advancing the education and skills of workers can help them adapt to the changing demands of the labor market. This is especially important in a situation where some jobs may disappear due to automation. Having a higher level of education can help workers to retrain and find new job opportunities.

Secondly, wages can become an incentive to retain experienced and skilled workers in the industry [4]. This will help to prevent personnel brain drain and preserve accumulated knowledge and experience, which is important for maintaining stability and development of the industry.

Even though labor force reduction is discussed in the article, improving the education, skills and wages of workers can be seen as important steps to maintain and develop industry in the face of change.

Labor force participation rate

The labor force participation rate is an indicator of the size of the working-age population that is either employed or actively seeking work. The rate is calculated as the ratio of the labor

force to the total population of the corresponding age [1]. The higher the participation rate, the better the economy.

The aggregate unemployment and potential labor force rate is an important tool for assessing the labor market and the state of the country's economy. It provides a more complete picture of unemployment, taking into account both people who are actively looking for work and cannot find it, and people who could work but for various reasons are not looking for work. The aggregate unemployment and potential labor force rate is calculated as the sum of the potential labor force, employed and unemployed.

Analysis of the labor force of the Arkhangelsk Oblast

Let us analyze the dynamics of the composition and the size of the labor force aged 15–72 in the Arkhangelsk Oblast, including the Nenets Autonomous Okrug, for the period from 2000 to 2022 [2]. The dynamics of the labor force, employed and unemployed is shown in Fig. 1:

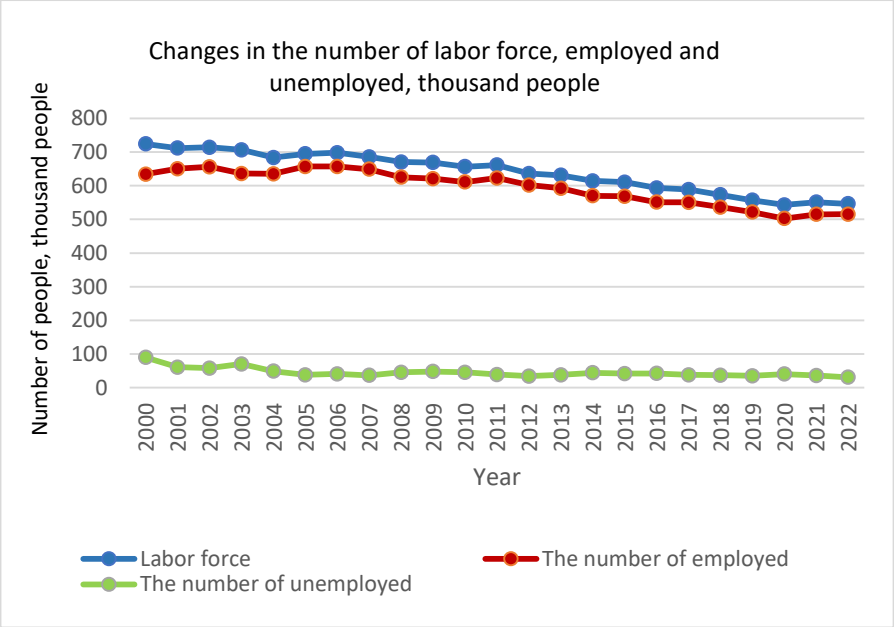

Fig. 1. Changes in the number of labor force.

Calculation examples:

- $\Delta Pc_{\text{(change in the labor force)}}$ = 546.3 – 724.2 = 177.9 thousand — it is important to note that during the period under review, the labor force in the Arkhangelsk Oblast decreased by 177.9 thousand people, which is 24.5% of the labor force in 2000. However, from 2020 to 2021, there was a slight increase in the labor force by 8.2 thousand people.
- $\Delta З_{\text{(dynamics of employed)}}$ = 515.6 – 634.4 = 118.8 thousand — the number of employed from 2000 to 2022 also decreased by 118.8 thousand people, which is about 18.7% of the number of employed in 2000. There has been some growth in employment in recent

[1] Labor force participation rate. Federal State Statistics Service. URL: https://rosstat.gov.ru/folder/210/document/13211 (accessed 15 December 2023).
[2] Labor force and persons not in the labor force, aged 15–72. Federal State Statistics Service. URL: https://29.rosstat.gov.ru/storage/mediabank/PC2000-2022_AO.xls (accessed 15 January 2024).

years, especially from 2020 to 2022, when the number of people in employment increased by 13 thousand people.

- $\Delta Б_{\text{(dynamics of unemployed)}}$ = 30.7 – 89.8 = 59.1 thousand — for the entire period under review, the number of unemployed decreased by 59.1 thousand people, or 65.8%.

Thus, it can be noted that in the Arkhangelsk Oblast, there is a decrease in the number of the labor force, including the employed, but there has been some growth in recent years. At the same time, the number of unemployed is decreasing, but in recent years this process has slowed down a little.

Since until 2017, the studies were conducted on people aged 15–72 years, and in January 2017, a new concept was introduced for people aged 15 years and older, as well as and the new "potential labor force concept", the further analysis includes people aged 15 years and older from 2017 to 2022.

The following conclusions can be drawn from the presented data on the size of the labor force (aged 15 years and older) [3] in the Arkhangelsk Oblast:

- the total labor force has been decreasing for six years, but after a drop in 2020 it increased slightly in 2021. The downward trend in the number of the labor force is not only a factor of recent years, it has been observed for the past 23 years (Fig. 1);
- a decrease in the number of employed people during the period under review indicates that the situation on the labor market in the Arkhangelsk Oblast was unstable. The number of unemployed people has shown a slight downward trend, with increase in 2020 and decrease in subsequent years;
- the number of people not in the labor force has been increasing for six years, which may indicate a lack of jobs and prospects for people who want to work. The number of potential labor force as a whole has also decreased, but only slightly, which may be due to people switching to other types of employment or finding work in other regions.

Next, let us analyze the participation rates of the population in the labor force and identify the employment, unemployment and the aggregate unemployment and potential labor force rates.

Table 1

Distribution of labor force participation rates, %

Indicator	Labour force participation rate	Employment rate	Unemployment rate	Aggregate unemployment and potential labor force rate
2017	61.0	57.1	6.4	9.1
2018	60.1	56.2	6.4	8.8
2019	58.9	55.2	6.3	9.6
2020	58.0	53.7	7.4	10.7
2021	59.0	55.1	6.6	9.6
2022	58.9	55.5	5.6	8.1

[3] Statistical yearbook of the Arkhangelsk Oblast. Federal State Statistics Service. URL: https://29.rosstat.gov.ru/publication_arh (accessed 15 January 2024).

Calculation examples:

- - $U_р = \frac{547.3}{547.3+382.6} * 100 = 58.9\%$ — the labor force participation rate for 2022 in the Arkhangelsk Oblast was 58.9%.
- - $U_з = \frac{515.7}{552.3+383.4} * 100 = 55.1\%$ — the employment rate for 2021 in the Arkhangelsk Oblast was 55.1%.
- - $U_б = \frac{40.3}{544.8} * 100 = 7.4\%$ — the unemployment rate for 2020 in the Arkhangelsk Oblast was 7.4%.
- - $U_{бп} = \frac{34.9 + 20.6}{558.2 + 20.6} * 100 = 9.6\%$ — the aggregate unemployment and potential labor force rate for 2019 in the Arkhangelsk Oblast was 9.6%.

According to the calculations, during the period under review, the lowest percentage of the labor force participation rate and the employment rate were in 2020, while the highest percentage of unemployment was observed in this year. This may be due to many factors, including the COVID-19 pandemic, which led to restrictions in various sectors of the economy and significantly affected the labor market. Movement restrictions and social distancing led to the closure of many businesses, which caused a sharp decline in employment. As a result, the employment and labor force participation rates decreased, while the unemployment rate increased.

Next, we determine the labor force participation rate, as well as the employment and unemployment rates separately by gender [4].

The following conclusions can be drawn from the data presented:

- over the entire period, the labor force participation rate of men is higher than that of women. Male labor force participation rate decreased by 2.1%, and female — by 2.3% from 2017;
- the unemployment rate among men has generally decreased over the period under review, but there are fluctuations depending on the year. The unemployment rate among men is higher than that of women, but the difference is gradually decreasing. The unemployment rate among women has increased by 0.6% over the period under review;
- the aggregate unemployment and potential labor force rate also shows some differences between the groups. The highest rate is observed among women in 2020, which may be related to the COVID-19 pandemic and its impact on the labor market.

To summarize, the labor market is subject to change, and additional efforts are needed to create conditions that ensure sustainable employment growth and a decrease in unemployment. Employment and unemployment rates are inversely related to each other, which is a natural phenomenon in the labor market.

[4] Labor force participation rate by gender, employment and unemployment rates. Federal State Statistics Service. URL: https://rosstat.gov.ru/folder/210/document/13211 (accessed 05 February 2024).

Table 2 shows the percentage of men and women in the labor force aged 15 and over. These data provide information on market economy trends over the current period and allow us to look at changes in the participation of men and women in the economy, as well as their unemployment rates.

Table 2

Ratio of men and women in the labor force, %

Indicator	Labor force		including			
	Men	Women	Employed		Unemployed	
			Men	Women	Men	Women
2017	51.6	48.4	51.2	48.8	57.4	42.6
2018	50.5	49.5	50.8	49.2	46.9	53.1
2019	51.8	48.2	51.4	48.6	57.6	42.4
2020	52.0	48.0	52.2	47.8	48.6	51.4
2021	50.9	49.1	50.6	49.4	54.5	45.5
2022	51.9	48.1	52.3	47.7	45.8	54.2

The following conclusions can be drawn from the data on the ratio of men to women in the labor force:

- in 2017–2022, the proportion of men and women in the labor force fluctuated, but overall remained relatively equal. Throughout the period, the proportion of men in the labor force was higher than the proportion of women. However, this difference was relatively small and amounted to approximately 1–3.9 percentage points. Over the period under review, the proportion of men in the labor force increased by 0.3 percentage points, while the proportion of women decreased by 0.3 percentage points;
- during the period under review, the proportion of men in the labor force always exceeded the proportion of women among both men and women. The difference between the genders in employment is also small. Over the entire period, the proportion of employed men increased, the proportion of women, on the contrary, decreased by 0.3 percentage points;
- comparing the data on unemployed men and women, it can be seen that in some years the share of unemployed women was higher than the share of unemployed men. During the period under review, the share of unemployed men decreased by 11.6 percentage points, while the share of women increased by 11.6 percentage points.

Thus, analyzing the presented data, it can be generalized that men and women in the labor force are characterized by relative stability during the period under study. However, there are some fluctuations in the gender ratio in the categories of employed and unemployed.

Next, let us analyze the rate of labor force dynamics by gender for the entire period under study, which is shown in Table 3. Analysis of these data will allow us to assess changes in the labor force, employment and unemployment among men and women.

Table 3

The rate of dynamics of the labor force by gender and employment, %

Indicator	Labor force		including			
	Men	Women	Employed		Unemployed	
			Men	Women	Men	Women
Rate of dynamics	93.33	92.13	95.54	91.47	64.68	103.09

The following conclusions can be drawn from the table:

- the number of men in the labor force in 2022 was 93.33% of the 2017 level, and the share of women was 92.13%. This means that the number of men in the labor force decreased by 6.67%, and women — by 7.87%.
- the number of employed men over the entire period decreased by 4.46%, and employed women — by 8.53%.
- the indicator of the dynamics of the number of unemployed men for the period under review was 64.68%, and of unemployed women — 103.09%. This demonstrates the dynamics of decreasing unemployment among men and positive dynamics of increasing unemployment among women. It is quite possible that during this period, women faced greater difficulties in finding work compared to men.

Table 4 shows the changes in the labor force, including employed and unemployed, for 2017–2022. This information is an important indicator of economic development and allows assessing the state of the labor market. The labor force is a key resource for any region and country, as it forms the basis for production and wealth creation.

Table 4

Distribution of the labor force, employed and unemployed

Indicator	2017	2018	2019	2020	2021	2022
Number of labor force, thousand people	590.1	575.2	558.2	544.8	552.3	547.3
Baseline (compared to 2017) indicators						
Absolute change (Dуб), thous.	-	-14.9	-31.9	-45.3	-37.8	-42.8
Dynamics coefficient (kб)	1.000	0.975	0.946	0.923	0.936	0.927
Rate of dynamics (Tб), %	100.0	97.5	94.6	92.3	93.6	92.7
Rate of change (DTб), %	0.0	-2.5	-5.4	-7.7	-6.4	-7.3
Chain (annual) indicators						
Absolute change (Dуб), thous.	X	-14.9	-17	-13.4	7.5	-5
Dynamics coefficient (kц)	X	0.975	0.970	0.976	1.014	0.991
Rate of dynamics (Tц), %	X	97.5	97.0	97.6	101.4	99.1
Rate of change (DTц), %	X	-2.52	-2.96	-2.40	1.38	-0.91

The following conclusions can be drawn from the table:

- according to the baseline indicators relative to 2017, the absolute change in the labor force varied from -14.9 to -45.3 thousand people. The rate of change also decreased, which indicates a slowdown in the rate of labor force reduction.
- chain indicators reflect changes in the labor force compared to the previous year. The absolute change varies from -14.9 to 7.5 thousand people. The dynamics coefficient

shows that the number decreased in most years, with the exception of 2021, when there was a small increase. The rate of change also varies, but generally a negative trend is maintained with some surges and slowdowns.

Let us calculate the average annual number, average annual absolute and relative changes in the labor force for the period under review.

If the intervals between observations are equal, we use the formula of a simple chronological average and calculate the average annual number of the labor force $\overline{S}$ [7].

$\overline{S} = \frac{\frac{590.1}{2}+575.2+558.2+544.8+552.3+\frac{547.3}{2}}{5}$ = 559.8 thousand — during the period under review, the average annual labor force was 559.8 thousand people, of which 523.2 thousand people were employed and 36.6 thousand were unemployed. The average annual potential labor force was 17.9 thousand people.

Δy (annual average absolute change) = (547.3-590.1)/5 = -8.6 thousand — on average, in the Arkhangelsk Oblast over the year, the labor force decreased by 8.6 thousand people, of which the employed decreased by 7.1 thousand people, and the unemployed — by 1.5 thousand people, the potential labor force decreased by 0.5 thousand people.

Iy (annual average relative change) = ((547.3/590.1)^(1/5))*100-100 = -1.5% — on average, over the year, the number of labor force aged 15 years and older decreased by 1.5%, the number of employed —by 1.3%, the number of unemployed — by 4.1%, and the potential labor force decreased by 3.3%.

In light of continuous development and change in demographic indicators, the analysis of the size of the region's labor force is becoming an important aspect for forecasting future trends in the economy [5]. Using certain methods and formulas, it is possible to estimate the expected size of the labor force in a certain period of time. Let us consider the expected size of the labor force and the potential one in 2024.

Number of employed: 516.5*((516.5/552.1)^(1/5))^2 = 502.9 thousand people.

Number of unemployed: 30.8*((30.8/38)^(1/5))^2 = 28.2 thousand people.

Number of potential labor force: 14.8*((14.8/17.5)^(1/5))^2 = 13.8 thousand people.

As a result of the calculations, provided that the current trend in the number of labor force and potential labor force continues, we can conclude that in 2024 the number of labor force is expected to decrease to 531.1 thousand people, and the potential labor force — to 13.8 thousand people.

Correlation and regression analysis

Investments in fixed capital play a key role in the development of the regional economy and ensuring sustainable growth. In the context of the Arkhangelsk Oblast, one of the factors that have a significant impact on attracting and retaining investments is the size and qualifications of the labor force. It is an important resource that ensures production processes and contributes to

economic growth. The size of the labor force affects the demand for investments in fixed capital, since more workers require more production capacity and equipment [8]. A large workforce can stimulate investments in new technologies and innovations. When there is a large labor force on the market, organizations seek to improve the efficiency of their production. They may invest in automation, robotization or new technologies to generally improve the speed and quality of the work process.

Let us consider the dependence of investments in fixed capital on the labor force in the Arkhangelsk Oblast. Table 5 shows the dynamics of the labor force and investments in fixed capital [5].

Table 5

Dynamics of labor force and investment in fixed capital

Indicator	Labor force, thousand people	Investments in fixed capital, mln rubles
2017	590.1	215 493.3
2018	575.2	198 357.4
2019	558.2	193 157.5
2020	544.8	197 761.4
2021	552.3	180 642.7
2022	547.3	162 906.9

To determine the dependence between these economic indicators, we use the experimental method; for this purpose we study the paired regression models: linear, degree, exponential, hyperbolic, selecting the best indicators for each coefficient characteristics: correlation, determination, Fisher criterion and average approximation error [6]. Table 6 presents all the indicators we need.

Table 6

Regression data

Indicator	Linear	Degree	Exponential	Hyperbolic
Correlation coefficient	0.739	0.741	0.720	0.736
Determination coefficient	0.546	0.549	0.519	0.541
Fisher criterion	16.867	17.009	15.111	16.533
Average approximation error	5.563	5.498	5.813	5.621

According to the provided data, the best paired regression model is the degree one. It has high values of the correlation coefficient of 0.741 and determination of 0.549, which indicates a strong positive relationship between investment and labor force. The Fisher criterion for the degree model is the highest, which indicates its statistical significance. The smallest average approximation error for the degree model is 5.498, which is an accurate forecast.

Comparative analysis of the labor force of the Arkhangelsk Oblast and the Russian Federation

Let us analyze the labor force size aged 15–72 years in the Russian Federation [6] for the period from 2000 to 2022. The dynamics of the labor force size are shown in Fig. 2:

[5] Investments in fixed assets. Federal State Statistics Service. URL: https://29.rosstat.gov.ru/storage/mediabank/inv%20AO.xls (accessed 11 February 2024).

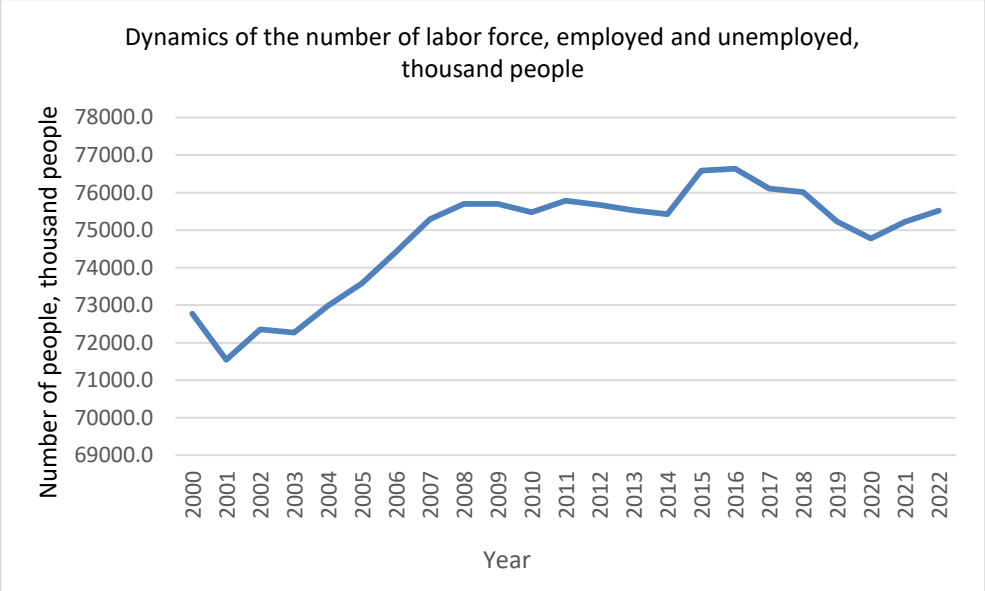

Fig. 2. Dynamics of the labor force size.

Figure 2 shows that from 2000 to 2022, the Russian Federation experienced general upward trends in the labor force size, although there were some fluctuations between the years. Since the beginning of the period under review, the labor force peaked in 2000, followed by a noticeable decline in 2001. However, a gradual increase began in 2001 and continued until about 2009. After this period, the general trend in the labor force was relatively stable, with minor fluctuations in some years. Some crises, such as the 2008–2009 crises, and the effects of the COVID-19 pandemic may have had a temporary negative impact on the labor force, which is reflected in the decline in official data. In recent years (2020–2022), there has been some growth in the labor force, which may be a sign of economic recovery from the pandemic and the measures taken to support employment. These changes reflect the complex economic, social and demographic processes affecting the country's labor market.

Comparing these indicators with the data for the Arkhangelsk Oblast, it can be noted that the general trend in the size of the labor force in the compared territories is similar: from 2000 to 2022, there were fluctuations in the size of the labor force both in Russia and in the Arkhangelsk Oblast. However, it is worth noting that while against the background of all-Russian data, there was an increase in the size of the labor force from 2000 to about 2009, in the Arkhangelsk Oblast this trend was less pronounced, and since 2008 a downward trend started.

It is also worth noting that in recent years (2020–2022), both in Russia and in the Arkhangelsk Oblast, there has been a general trend towards labor force growth, which may indicate economic recovery after the pandemic and measures taken to support employment. However, although there is growth in the region, it still remains at a relatively low level compared to the all-Russian indicator.

[6] The number and composition of the labor force aged 15–72. Federal State Statistics Service. URL: https://rosstat.gov.ru/labour_force# (accessed 22 March 2024).

Conclusion

The Arkhangelsk Oblast is one of the most developed regions in the country. However, as in many other regions, one of the main problems here is the lack of labor force. This creates problems for some companies and hinders local economic development. Over the past six years, the number of workers in the Arkhangelsk Oblast has decreased: in 2017 — 590.1 thousand people, and in 2022 — 547.3 thousand people. During this period, the labor force decreased by 7.3%, which may have a negative impact on the economy, leading to a decline in the production of goods and services and a drop in economic activity. Although the number of employed people decreased throughout the period, in 2021–2022 it increased slightly from 515.7 thousand people to 516.5 thousand people. There were also some fluctuations in the number of unemployed, decreasing from 38.0 thousand people in 2017 to 30.8 thousand people in 2022. The potential workforce has decreased by 270 thousand people over the past six years. This may indicate that the number of people willing to work in this region is decreasing.

As a result of the study, the main objectives have been achieved. It was found that the quality of the labor force depends on many factors, such as education, work training, demographics and wage levels. The region needs to improve education and create favorable conditions for life and work. It was found that the workforce is declining, the gender balance in it is still preserved, but targeted measures are needed to stimulate employment. The statistics provided insights into changes in the structure of the labor force, including changes in employment and unemployment, with an emphasis on the increased risk of unemployment for women.

The article also shows how both the quality and quantity of the labor force affect the economic development of the region. In order to improve the situation, the importance of investing in human capital and creating a favorable economic environment was emphasized. Based on this analysis, the hypothesis is confirmed that the workforce has a significant impact on the state of the region, and the human resource management is important to overcome existing problems and promote development.

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Human Capital and Social Capacity of the Regional Space of Arctic Karelia

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Abstract. The development of the Russian Arctic in the strategic perspective will require the attraction of significant labor resources. However, currently the population outflow trends prevail. The creation of territorial conditions for the expanded reproduction of human capital is of crucial importance in this context. The purpose of the study is to identify the territorial specificity of the conditions for the reproduction of human capital in Arctic Karelia in aspects reflecting the social capacity of the territory. The first task is to study the territorial conditions of human capital reproduction related to its social aspect: health care system, education system, culture, leisure and entertainment. The second task is to assess the possibility of applying the concept of social capacity of space to study the social component of the conditions of human capital reproduction. Complex economic and sociological tools are used. Information bases: Rosstat data, SPARK data, results of the population survey (autumn 2023). A comparative analysis of spatial aspects of the distribution of conditions for the reproduction of human capital and population estimates was carried out. According to the population's estimates, the most important problems in the health care sector are the shortage of specialists, lack of modern equipment, inaccessibility of complex types of medical care and a narrow range of laboratory tests. The key problems in the field of education are lack of specialists and institutions of higher professional education, decline in the level of education and poor condition of school buildings and kindergartens. The conclusion is made about the structure of indicators of the prospective concept of social capacity of territories and the necessary addition of information bases in accordance with its conceptual logic. The practical significance of the research lies in the formation of analytical bases for ensuring the expanded reproduction of human capital in the territories of the Russian Arctic.
Keywords: *Russian Arctic, Arctic Karelia, human capital, social capacity of space, healthcare*

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Introduction

Achieving a balance between the needs of economy and strategic objectives of its development on the one hand and a sufficient volume of labor resources on the other requires creating conditions for the sustainable reproduction of human capital [1, Govorova N.V., p. 53]. The key aspect of these conditions is their spatial relativity: better conditions attract labor from outside the territory and restrain the outflow of available labor resources as part of migration processes [2, Rybakovsky L.L., pp. 55–58; 3, Lee E.S., pp. 49–51], which is one of the factors of expanded reproduction of human capital. In addition, as studies show, intraregional conditions for the reproduction of human capital restrain the outflow of population for intergenerational reasons: the need to ensure the future of children occupies a significant place in migration attitudes [4, Volkov A.D., Tishkov S.V., pp. 26–27; 5, Volkov A.D., Simakova A.V., Tishkov S.V., p. 177]. Relatively worse conditions for the reproduction of human capital in spatial terms cause the outflow of labor resources. The key conditions of human capital reproduction include those spatial and temporal circumstances in which a person receives payment for the realization of ability to work, acquires everything necessary for its renewal for this payment (health care, education, leisure, purchase of food, clothing, other goods and services) and again implements his/her ability to work.

Consumption of health care and education services is considered by researchers as one of the key forms of investment in human capital in private [6, Pishnyak A.I., Goryainova A.R., Nazarbayeva E.A., Khalina N.V., pp. 71–73; 7, Guo Ju., Qu Xi.] and public levels [8, Paczos W., Sawulski J., Leśniewicz F., p. 1327; 9, Chen B-L., Liang F-C., p. 25]. However, the specifics of territorial conditions and local limitations of opportunities to receive or purchase services in these areas may lead to limited opportunities for investing in human capital [10]. Taking into account such peculiarities of the space of the Russian Arctic regions as sparseness and peripherality, ensuring the sufficiency of conditions for the reproduction of human capital in the spheres of health care and education is a pressing and problematic issue [11, Sinitsa A.L., pp. 23–24; 12, Toropushina E.E., pp. 118–119; 13, Toropushina E.E., pp. 102–103; 14, Konyshev V.N., Lagutina M.L., pp. 101–103].

The category of space capacity, which is divided into structural and functional components: social, economic, environmental, socio-cultural, etc., is a category that has, in our opinion, a promising value for analyzing the relationship between reproduction processes in the economy, and, first of all, the relationship between the reproduction of human capital and reproduction processes within spatial economic structures of different scales. This concept has not yet been fully developed in the scientific literature. The works by Tatarkin A.I. and Gershank G.A. consider a similar concept of territory capacity, divided into ecological, economic and social capacity. The authors associate the ecological capacity of the territory with the functionality of preserving the habitat as the basis of life activity of the population; economic capacity — with the functionality of implementing economic activity as the basis of expanded reproduction in the region; social capacity — with maintaining and increasing the standard and quality of life of the population [15, Gershanok G.A., pp. 167, 174–175; 16, Tatarkin A.I., Gershanok G.A., pp. 43–44]. The social capacity of the

territory is associated with the concept and indicators of the quality of life, within the framework of which two groups of criteria are used: statistical and sociological. The key areas and assessments of the quality of life of the population are the provision of the population with educational and medical institutions, housing, the average monthly salary, cash income and expenses of the population of the territory [15, Gershanok G.A., pp. 174–175].

In our opinion, in the context of the relationship between reproduction processes at the levels of "individual human capital" — "spatially localized socio-economic system", income and wages are more likely to be related to the economic component of the capacity of space and are directly related to the level of development of productive forces. While the provision of educational and medical conditions relates directly to the social subsystem of reproduction, to which it is reasonable to include the sphere of leisure, culture and entertainment, as well as the sphere of consumption.

A much more developed and established concept is the ecological capacity of the territory [17, Bezgubov V.A., Chasovnikov S.N.; 18, Zhang Y., Fan J., Wang S.; 19, Kopylov I.S., Krasilnikov P.A., Kletskina O.V.]. Its general conceptual content reflects "the limit, the excess of which in the process of economic activity, natural anthropogenic impact, will cause a crisis state of the region's ecosystem" [17, Bezgubov V.A., Chasovnikov S.N., p. 751]. Being an important aspect of sustainable development of the territory, the ecological capacity of space relates to the process of reproduction of human capital indirectly, affecting issues of health and recreation. In turn, the aspect of recreation is considered in terms of the recreational capacity of territories [20, Ermakova A.A.]. The concept of the demographic capacity of a territory is considered by a number of authors as similar in meaning to the ecological capacity [21, Rybkina I.D., p. 1437]. However, traditionally it has a broader and more multidimensional content [22, Fauzer V.V., Smirnov A.V.]

Thus, the consideration of social conditions for the reproduction of human capital is most closely related to the economic capacity of space (covering the totality of infrastructural, production and financial factors of reproduction of the socio-economic system) and the social capacity of space. In this division, the social capacity of space includes factors of provision with medical and educational conditions, conditions in the field of culture, leisure and entertainment, as well as consumption.

The object of this study is the Arctic territories of the Republic of Karelia, including the Loukhskiy, Kemskiy, Kalevalskiy municipal districts, Segezhskiy and Belomorskiy municipal okrugs, Kostomuksha urban okrug (Fig. 1).

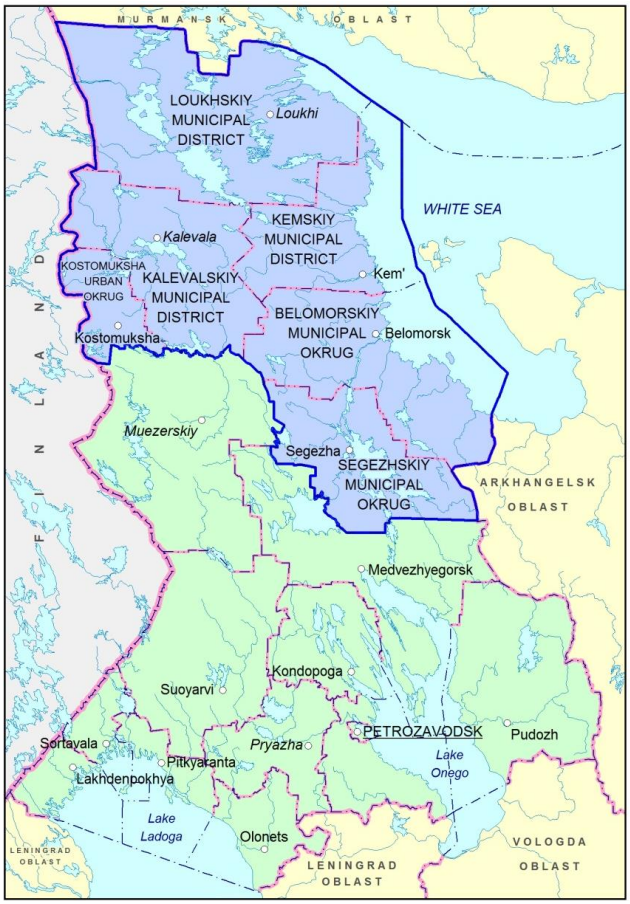

Fig. 1. Arctic Karelia — the region of the study.

The purpose of the study is to identify the territorial specifics of the conditions for the reproduction of human capital in aspects reflecting the social capacity of the territory.

The conceptual objective of the article is a prospective analysis of the territorial conditions for the reproduction of human capital in the context of further correlation with aspects of regional reproduction processes and consideration of the possibility of integrating sociological and statistical data in the framework of measuring the social capacity of the territory. The practical objective of the article is to analyze the conditions for the reproduction of human capital in the Arctic Karelia region, forming the analytical basis for regulating socio-economic processes at the regional and federal levels.

Methods and data

The information basis of the study was official and departmental statistics, SPARK system data and the results of a questionnaire survey of the population of the specified territories, conducted in August–September 2023. The sample was formed according to age and gender quotas reflecting the structure of the general population. Representatives of the permanently residing population aged 15–72 years took part in the survey. The average age of respondents was 43.9 years. The sample size was 1042 people. All respondents were informed about the purpose of the study and expressed their willingness (consent) to cooperate. A mixed method of data collection was used: personal interviews using a formalized questionnaire prevailed, for some respondents

the questionnaire was left for independent completion at their place of residence with a preliminary instruction and subsequent verification of completion (taking into account the continuing relevance of the epidemiological situation with COVID-19).

The survey instruments included a number of thematic blocks corresponding to such conditions of human capital reproduction as the healthcare system, the education system, the leisure, entertainment and culture spheres, as well as workplace conditions. The main emphasis in the study was placed on the analysis of the assessments of the state of these spheres by the population in various territories of Arctic Karelia.

Respondents were asked questions in three blocks:

- Block 1. Assessment of the state of the healthcare system by the population of Arctic Karelia;
- Block 2. Assessment of the state of the education system by the population of Arctic Karelia;
- Block 3. Assessment of the state of the leisure, entertainment and culture spheres by the population of Arctic Karelia.

Respondents' answers were summarized and analyzed both for the Arctic Karelia region as a whole and for municipal entities of the sub-region. The data of the population survey were compared separately with the information on the spatial specifics of the development of conditions for reproduction of human capital.

The characteristics of the sample and the correspondence between the sample parameters and the structure of the general population are presented in Table 1 and Table 2.

Table 1

Spatial distribution of the sample in the context of the study areas

	Female		Male		Both genders	
Karelia region	Number of respondents	Average age	Number of respondents	Average age	Number of respondents	Average age
Belomorskiy municipal okrug	74	48.6	68	43.4	142	46.1
Kalevalskiy municipal district	58	49.0	42	47.7	100	48.5
Kemskiy municipal district	67	46.0	57	43.2	124	44.7
Kostomuksha urban okrug	144	40.9	115	40.3	259	40.7
Louhskiy municipal district	80	46.2	65	44.3	145	45.3
Segezhskiy municipal okrug	160	42.5	112	43.5	272	42.9
Total	**583**	**44.4**	**459**	**43.2**	**1042**	**43.9**

Table 2

Correlation between the sampling and general population structures within the framework of the population survey in the territories of the Karelian Arctic

Age	Gender	Population, people	Population structure by age	Sample size, people	Sample structure	Deviation of sample structure from the general population
15–29 years	Male	7 645	8.4%	102	9.8%	1.4%
	Female	7 217	7.9%	123	11.8%	3.9%
30–44 years	Male	12 621	13.9%	146	14.0%	0.1%
	Female	9 502	10.4%	168	16.1%	5.7%
45–59 years	Male	11 950	13.1%	124	11.9%	1.2%
	Female	12 741	14.0%	162	15.5%	1.5%
60–72 years [1]	Male	10 182	11.2%	87	8.3%	2.8%
	Female	19 122	21.0%	130	12.5%	8.5%
Total		**90 890**	**100.0%**	**1042**	**100.0%**	**Average 3.2%**

The obtained data were analyzed using the SPSS software package. The data were interpreted in accordance with the objectives and purpose of the study.

At the second stage of the study, the data on the spatial localization of healthcare and educational institutions were compared with the data of the sociological survey. A coefficient of satisfaction with the state of the healthcare system / education and advanced training / culture, leisure and entertainment was introduced, calculated on the basis of sociological data using formula (1):

$$K_i = \frac{\sum_{j=1}^{5}(N_{ij} \times w_j)}{\sum_{j=1}^{5} N_{ij}} \quad (1)$$

For an objective display of the results of the answers to the question “How satisfied are you with the state of the healthcare system / education and advanced training / culture, leisure and entertainment in your place of residence?”, the values of the scale “absolutely dissatisfied — rather dissatisfied — neutral — rather satisfied — completely satisfied” were assigned corresponding values from “-1” to “+1”, and a formula calculating the weighted average values of the final assessments of the population's satisfaction with a particular sphere was introduced (1):

where N_{ij} — number of responses corresponding to a certain value of the j scale, respondents in the area of residence i;

w_j — score of the degree of satisfaction of a person with the state of a particular area under consideration (“not at all satisfied (-1 point) — not satisfied (-0.5 points) — do not attach importance (0 points) — satisfied (+ 0.5 points) — completely satisfied (+ 1 point)”);

K_i — criterion of satisfaction of the population with the state of a particular area under consideration in the area of residence i.

[1] The data are estimates, since official statistics are kept within the age range of 60–69 years.

As part of the study, a coefficient of the dynamics of the state of the health care system (D_i) was also introduced, calculated on the basis of responses to questions about improvements in this area in recent years [2] using the following formula (2):

$$D_i = \frac{N_{ij}}{N_i} \quad (2)$$

where N_i — total number of responses from respondents in the area of residence i.

The coefficients for the remaining components of the conditions for the reproduction of human capital are calculated using a similar formula.

Within the framework of the review of existing official and collected data, the authors made conclusions about the sufficiency of information bases for the prospective development and operationalization of the concept of social capacity of space in process, infrastructure and reproduction dimensions.

The final conclusions were based on a combination of methods of spatial economics, the theory of sustainable development and the dialectical approach.

Research results

We have analyzed the conditions for the reproduction of human capital in the blocks presented in the Methods and Data section.

Block 1. Population assessment of the state of the healthcare sector and spatial features of its development

One of the most important conditions for the reproduction of human capital is the state of the healthcare system. In order to identify the respondents' assessments of the state of this sphere, they were asked the following questions:

1. How satisfied are you with the state of the healthcare system in your place of residence?

2. What are the most serious and important problems in the healthcare system in your place of residence?

3. Have any important problems in the healthcare system been resolved in your place of residence in recent years? Are there any improvements?

4. If there have been improvements, describe them briefly.

Population satisfaction with the state of the healthcare system in the Arctic Karelia subregion is shown in Fig. 2.

[2] Question "Have any important problems in the healthcare system been resolved in your place of residence in recent years? Are there any improvements?"

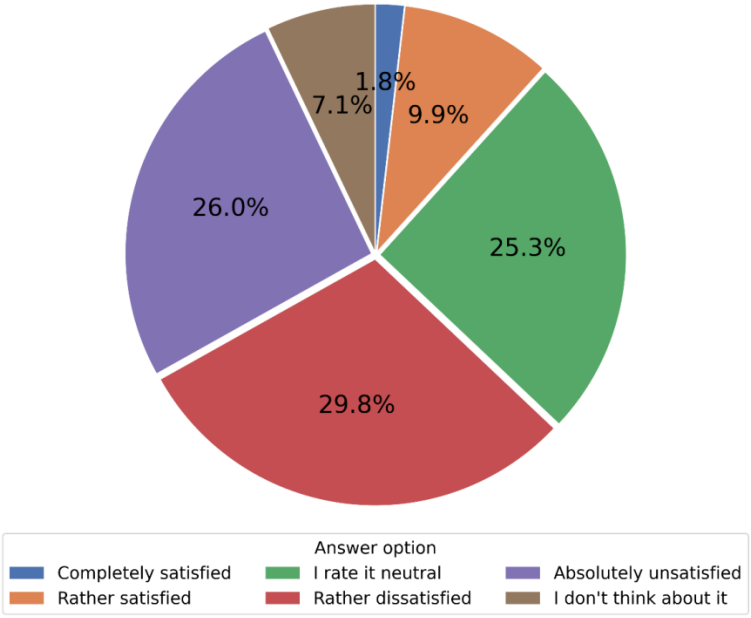

Fig. 2. Distribution of responses of the population of Arctic Karelia to the question *"How satisfied are you with the state of the healthcare system in your place of residence?"*

More than half of the respondents are not satisfied with the state of the healthcare system (55.8%). Of these, 26% are completely dissatisfied. In terms of territory, the least satisfied with the health care sector are residents of the Segezhskiy municipal okrug (64%, of which 31% are completely dissatisfied), Kemskiy (62%, of which 31% are completely dissatisfied) and Loukhskiy municipal districts (59%, of which 33% are completely dissatisfied). The largest share of the population satisfied with the state of the health care system is observed in the Kalevalskiy municipal district (16%) and the Kostomuksha urban okrug (15%).

The most serious and important problems in the health care sector, according to the population of Arctic Karelia, are the lack of specialized specialists (63.2%), the lack of modern diagnostic equipment (50.4%) and the inaccessibility of complex types of medical care (36.4%). Such problematic aspects as a narrow range of laboratory tests (28.4%), long waiting times to see a therapist (21.9%) and low qualifications of medical personnel (21.4%) are less pronounced. A positive aspect is the small proportion of respondents who noted the problem of low qualifications of ambulance crews (4.0%) — in general, this is the least pronounced problem in the healthcare sector of Arctic Karelia.

A number of problems are more obvious in terms of territories. For example, in the Kalevalskiy municipal district the problem of shortage of profile specialists is noted by 87% of respondents, while in the Belomorskiy municipal okrug — only by 52.8%. The issue of low qualifications of therapists is most relevant for the Segezhskiy municipal okrug (18.4%) and for the Kemskiy municipal district (16.9%), this problem affected the Kostomuksha urban okrug to the least extent (noted by only 1.9% of respondents). Long waits for an ambulance were reported by 26.1% of residents of the Belomorskiy municipal okrug and only by 1.9% of residents of the Kostomuksha urban

okrug. The problem of long waits for a therapist's appointment is most relevant for the Segezhskiy municipal okrug (33.5%), and least relevant for the Kemskiy municipal district (7.3%) (Fig. 3).

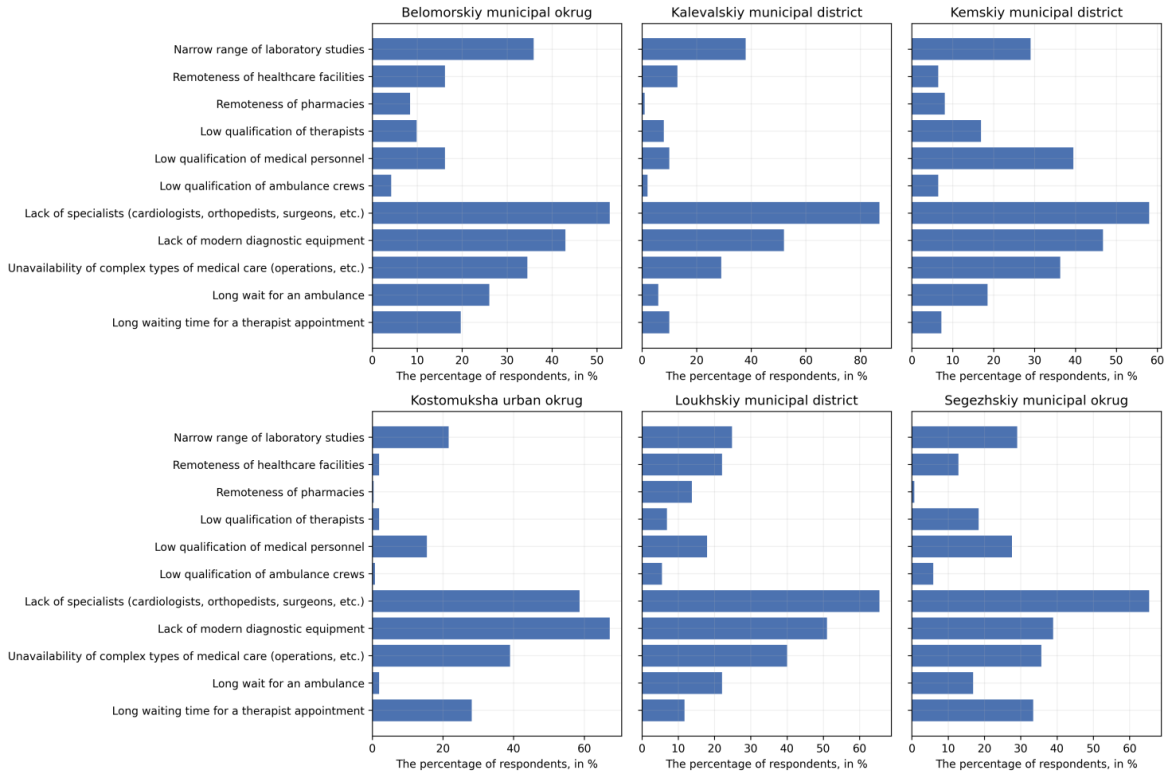

Fig. 3. Distribution of responses of the population of Arctic Karelia to the question *"What are the most serious and important problems in the healthcare system in your place of residence?"*

When answering the question *"Have any important problems in the healthcare system been resolved in recent years in your place of residence? Are there any improvements?"*, only 15% of the surveyed population of Arctic Karelia gave a positive answer. In spatial terms, this value changes relatively little — from 18% in the Kostomuksha urban okrug to 11% in the Segezhskiy municipal okrug. The most frequently noted improvements include: new equipment, renovation of hospital premises, new feldsher-midwife station, emergence of highly specialized doctors and a number of others. The spatial conditions for the development of the healthcare system in the Arctic territories of the Republic of Karelia are reflected in Fig. 4.

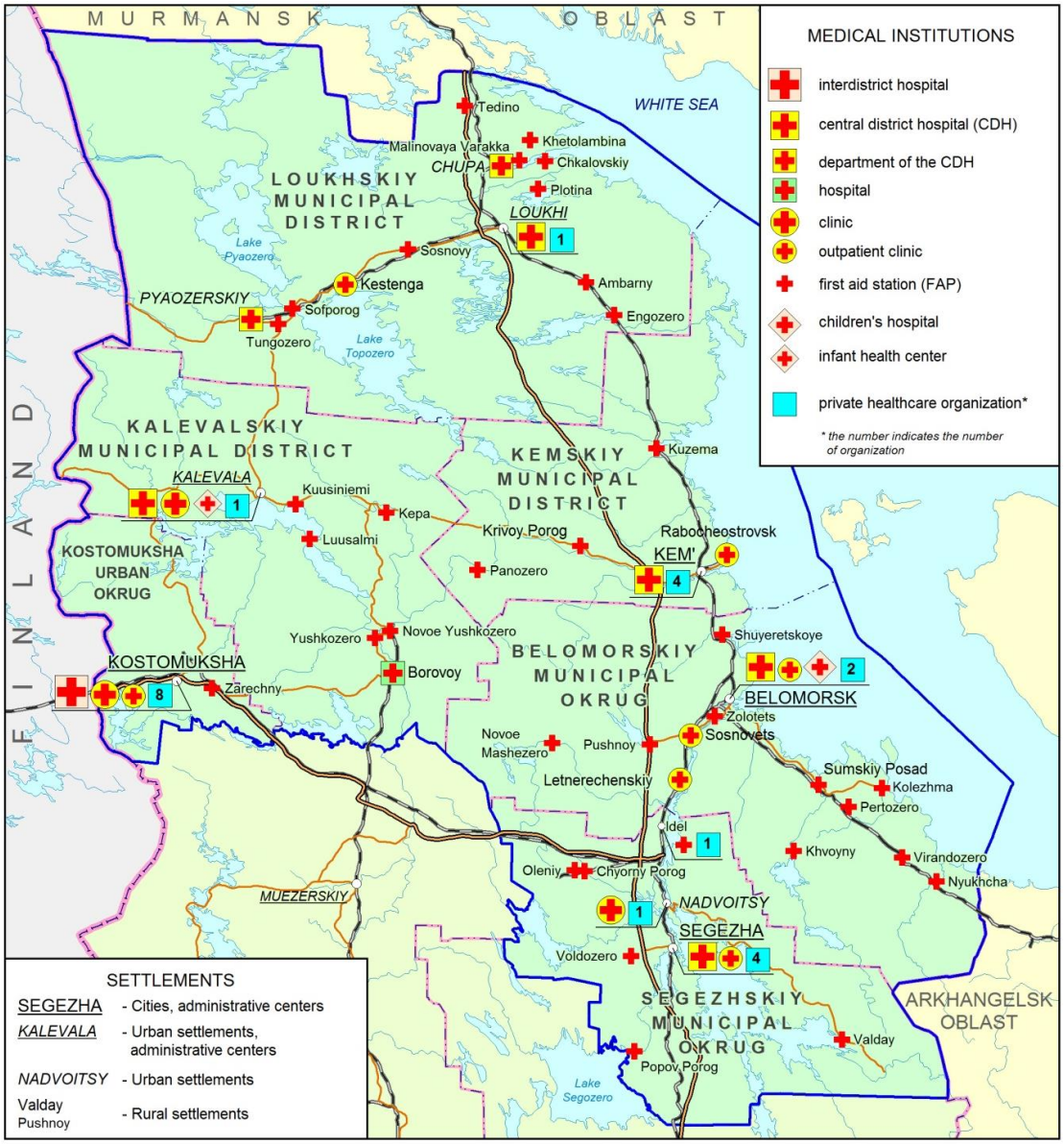

Fig. 4. Spatial features of the development of the healthcare system in Arctic Karelia.

In total, 8 hospitals and their departments, 39 feldsher-midwife stations (FMSs), of which 4 are private, 4 separate polyclinics, of which 1 is private (Russian Railways), are localized in the territory of Arctic Karelia. There are also polyclinics at district and inter-district hospitals. Private health care institutions are represented primarily by dental surgeries and institutions belonging to Russian Railways (polyclinic in Kemi and a number of FMSs). The spatial localization of healthcare institutions demonstrates the heterogeneity of the distribution of conditions for the reproduction of human capital associated with healthcare (Fig. 4). In addition, most FMSs in peripheral areas do not have permanent medical staff, and reception is carried out by a specialist coming from the district center, with a frequency of several times a week to several times a year, depending on the territory. FMSs in Nyukhcha and Virandozero (in neighboring Malenga the FMS is abandoned and reception is carried out in a private apartment) of the Belomorskiy municipal okrug, Cherny Porog and Olenye of the Segezhskiy municipal okrug, Tedino and Hetolambina of the Loukhskiy municipal district, Kuusiniemi of the Kalevalskiy municipal district and a number of other places operate in this mode.

The Kostomuksha urban okrug, the Belomorskiy and Segezhskiy municipal okrugs are the most endowed in terms of the breadth of medical services.

Summary economic and sociological information on the health care conditions in Arctic Karelia by municipalities is presented in Table 3.

Table 3

Summary information on the state of the healthcare system in the territories of the Arctic Karelia in 2022 [3]

Indicators	Municipal districts					
	(1)	(2)	(3)	(4)	(5)	(6)
Number of health care center	16	2	6	10	9	12
Number of medical hospital facilities	1	1	1	1	1	1
Number of private health centers	1	1	2	0	4	8
Number of hospital beds (per 10,000 people)	52	65	35	33	55	51
Provision of population with doctors (per 10,000 people)	27	27	32	20	31	39
Provision of the population with average medical personnel (per 10,000 people)	98	108	109	85	76	109
K_i for health care	-0.38	-0.28	-0.42	-0.47	-0.43	-0.25
D_i for health care	0.12	0.17	0.16	0.14	0.11	0.18

The highest rate of public satisfaction with the healthcare system is observed in the Kostomuksha urban okrug, as well as in the Kalevalskiy municipal district, the lowest rate is in the Loukhskiy and Kemskiy municipal districts, Segezhskiy municipal okrug. At the same time, the coefficient of the dynamics of the state of the education system has the highest values in the Kostomuksha urban okrug and Kalevalskiy municipal district, the lowest ones — in the Segezhskiy municipal okrug. There is no obvious correlation between the assessments of satisfaction with the state of the healthcare system and the provision of the population with hospital beds, doctors and paramedical personnel.

Block 2. Population assessment of the state of the education sector and spatial features of its development

The education system as a component of the spatial conditions for the reproduction of human capital is the second key aspect that requires consideration. Within the sociological part of the study, it was revealed through the following questions and assessments of the respondents:

1. How satisfied are you with the state of the education and advanced training system in your place of residence?

2. What are the most serious and important problems in the education system in your place of residence?

[3] Compiled by the authors on the basis of field research data and official statistical information
In the Table: (1) Belomorskiy municipal okrug; (2) Kalevalskiy municipal district; (3) Kemskiy municipal district; (4) Loukhskiy municipal district; (5) Segezhskiy municipal okrug; (6) Kostomuksha urban okrug.

3. Have any important problems in the education sector been resolved in your place of residence in recent years? Are there any improvements?

4. If there have been improvements, describe them briefly.

The assessment of satisfaction with the education and advanced training system by the population of Arctic Karelia is shown in Fig. 5. In general, the values indicate more positive assessments compared to those for the healthcare system. At the same time, a relatively large proportion of respondents noted that they do not think about the state of the education system (15.1%). The percentages of satisfied and dissatisfied respondents are equal, but the structure of assessments is somewhat more negative (6.4% of absolutely dissatisfied versus 3.6% of completely satisfied) (Fig. 5).

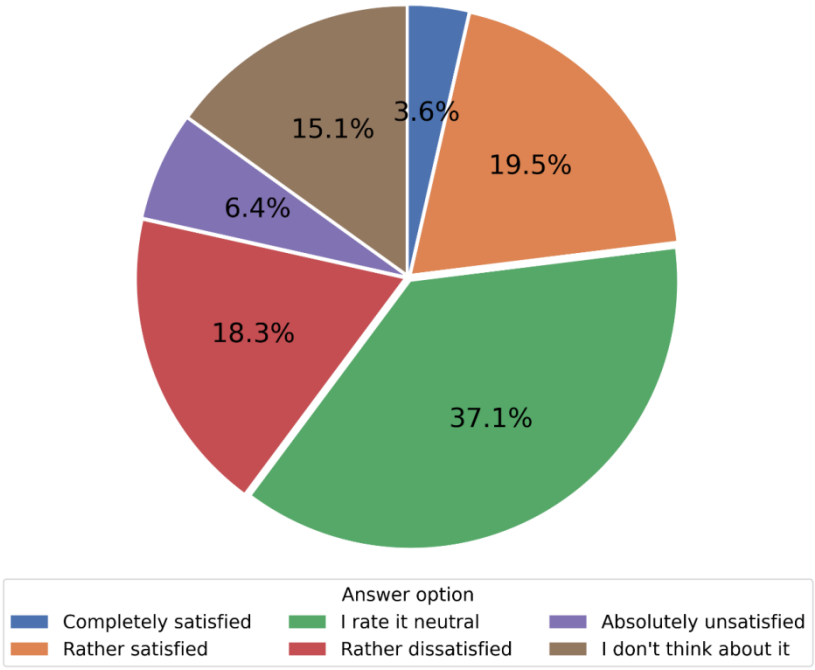

Fig. 5. Distribution of responses of the population of Arctic Karelia to the question "*How satisfied are you with the state of the education and advanced training system in your place of residence?"*

In terms of territories, the largest share of positive assessments is in the Kostomuksha urban okrug (35.5%, of which 3.9% are completely satisfied), the smallest one — in the Loukhskiy municipal district (15.2%, of which 2.1% are completely satisfied).

The most serious and important problems in the education system, according to the population of Arctic Karelia, are the lack of specialists (48.2%), the absence of higher professional education institutions (33.6%), the decline in the level of education (25.5%), the poor condition of school and kindergarten buildings (25%) and the absence or small number of sections and clubs (23.5%). As a positive phenomenon, it should be noted that the problems of shortage of places in kindergartens (2%) and schools (1.2%) are minimal.

Taking a closer look at the situation in individual districts, it should be noted that the issue of poor condition of school and kindergarten buildings is most acute in the Kalevalskiy municipal district (44%) and the Kemskiy municipal district (32.3%). The decline in the level of education is of

greatest concern to the population of the Segezhskiy municipal okrug (33.1%), and the lack of higher professional education institutions as a problem is primarily noted by residents of the Kostomuksha urban okrug (51.7%) and the Belomorskiy municipal okrug (48.6%). The problem of absence or small number of sections and clubs is most pronounced in the Loukhskiy municipal district (36.6%) and the Belomorskiy municipal okrug (35.9%), and to the least extent — in the Kostomuksha urban okrug (7.7%). The shortage of specialists in education is most acute for the population of the Loukhskiy (62.8%) municipal district and Segezhskiy (57.7%) municipal okrug (Fig. 6).

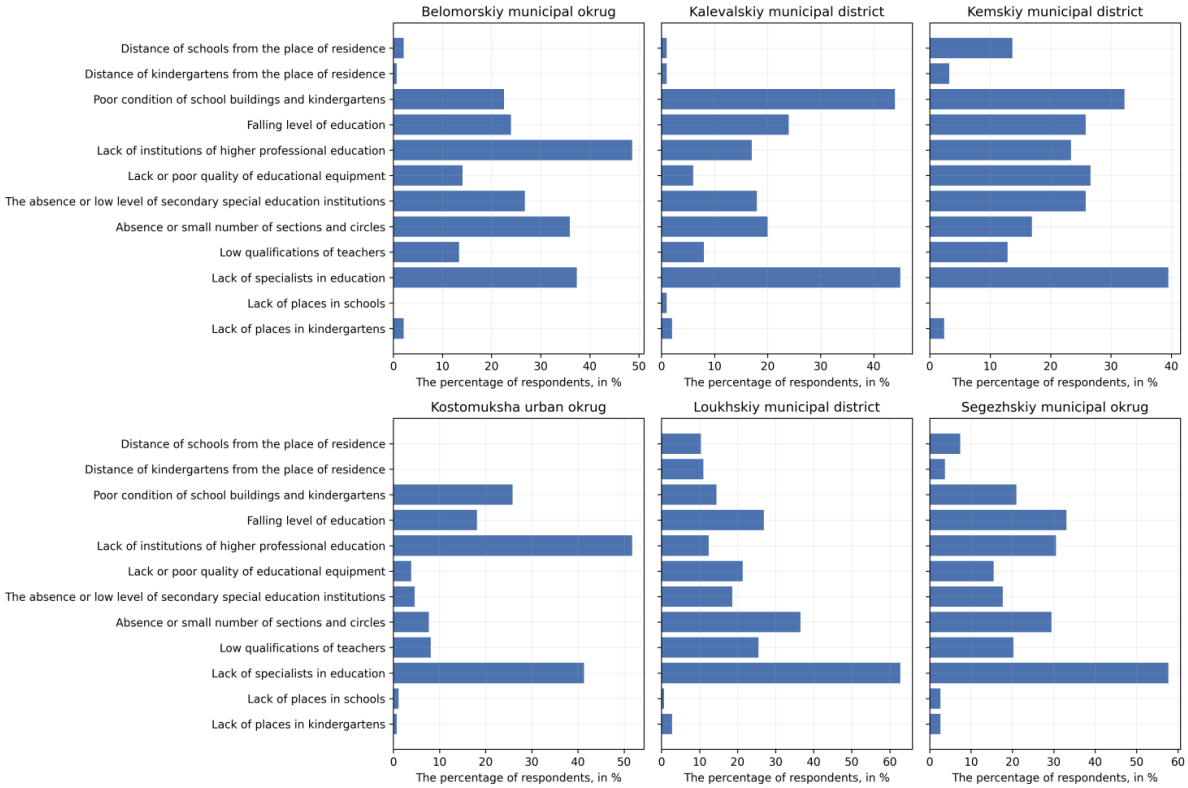

Fig. 6. Distribution of responses of the population of Arctic Karelia to the question *"What are the most serious and important problems in the education system in your place of residence?"*

Only 12% of respondents in Arctic Karelia gave a positive answer to the question about improvements in the field of education, which is lower than the level of assessments of positive changes in the field of healthcare. The highest share of those who noted positive changes is seen in the Kalevalskiy municipal district (22%), the smallest one — in the Belomorskiy municipal okrug (6%).

The list of improvements and positive changes that affected the education and advanced training system in the place of residence of the population of Arctic Karelia is extremely diverse and includes school renovation, opening of “growth points”, construction of new schools, sections/clubs, etc.

The spatial conditions for the development of the education system of the Arctic territories of the Republic of Karelia are reflected in Fig. 7.

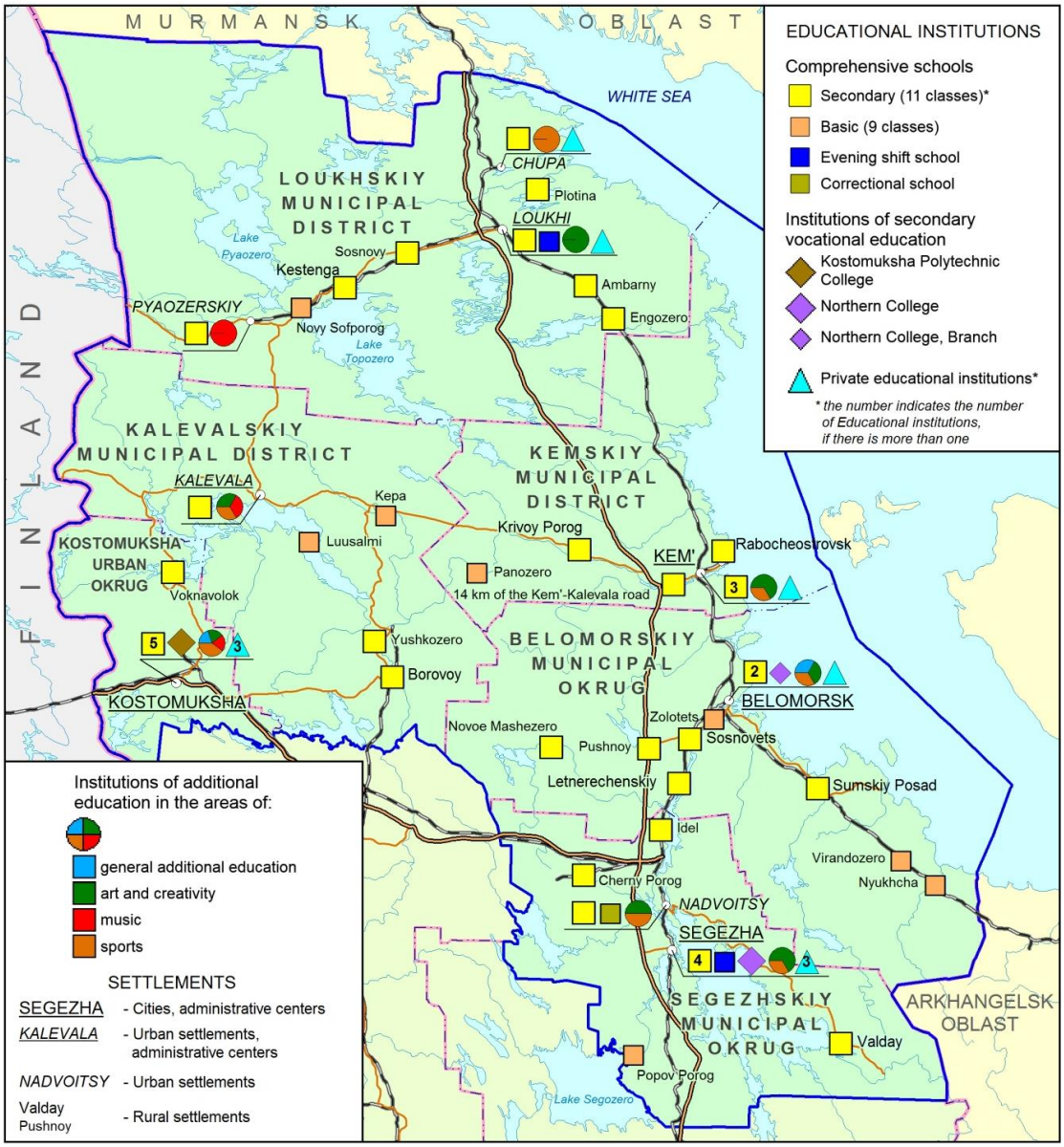

Fig. 7. Spatial features of the education system development in Arctic Karelia.

In total, 2 colleges and 1 branch of a college, 45 general education institutions, 22 institutions of additional education are localized on the territory of Arctic Karelia. A significant part of private institutions of additional education are represented by organizations operating driver training schools. Spatial localization demonstrates the heterogeneity of the distribution of the conditions for the reproduction of human capital associated with the education system (Fig. 7; Table 4).

Summary economic and sociological information on the spatial conditions of the education system is presented in Table 4.

Table 4

Summary information on the state of the education system on the territories of Arctic Karelia in 2022–2023 academic years [4]

Indicators	Municipal districts					
	(1)	(2)	(3)	(4)	(5)	(6)
Number of general education institutions	10	5	7	9	9	5
Number of additional education institutions	3	3	3	3	5	5
Number of vocation education institutions	1	-	-	-	1	1
Number of teachers per 10,000 population	171	151	118	115	76	87
Number of teachers per 100 students in general education institutions	11.6	10.9	7.6	10	6	5.9
Number of teachers per 100 students in vocation education institutions	26.1	-	-	-	7.7	6.6
K_i for education	-0.11	0.04	-0.07	-0.14	-0.07	0.12
Di for education	0.06	0.22	0.18	0.12	0.12	0.1

The highest coefficient of satisfaction with the education system is observed in the Kostomuksha urban okrug, as well as in the Kalevalskiy municipal district, the lowest one — in the Loukhskiy municipal district and the Belomorskiy municipal okrug. At the same time, the coefficient of dynamics of the state of the education system has the highest values in the Kalevalskiy and Kemskiy municipal districts. There is no obvious correlation between the assessments of satisfaction with the education system and the number of teachers per 10,000 population and 100 students.

Block 3. Population assessment of the state of the sphere of culture, leisure and entertainment and spatial features of its development

The most important component of the conditions for the reproduction of human capital is the state of the sphere of culture, leisure and entertainment. In the territories under consideration, this aspect was studied through the analysis of population assessments obtained in the framework of answers to the following questions:

1. How satisfied are you with leisure and entertainment in your place of residence?

2. What are the most serious and important problems in the sphere of leisure, entertainment and cultural institutions in your place of residence?

3. Have there been any improvements in the sphere of leisure, entertainment and culture in your place of residence in recent years?

4. If there have been improvements, describe them briefly.

In assessing the state of the sphere of culture and leisure, the most common attitude is neutral, however, negative assessments prevail over positive ones (32.5% and 21.6%, respective-

[4] Compiled by the authors on the basis of field research data and official statistical information.
In the Table: (1) Belomorskiy municipal okrug; (2) Kalevalskiy municipal district; (3) Kemskiy municipal district; (4) Loukhskiy municipal district; (5) Segezhskiy municipal okrug; (6) Kostomuksha urban okrug.

ly). At the same time, 13.9% of respondents are absolutely dissatisfied with the state of the leisure sphere, and 5.0% are completely satisfied (Fig. 8).

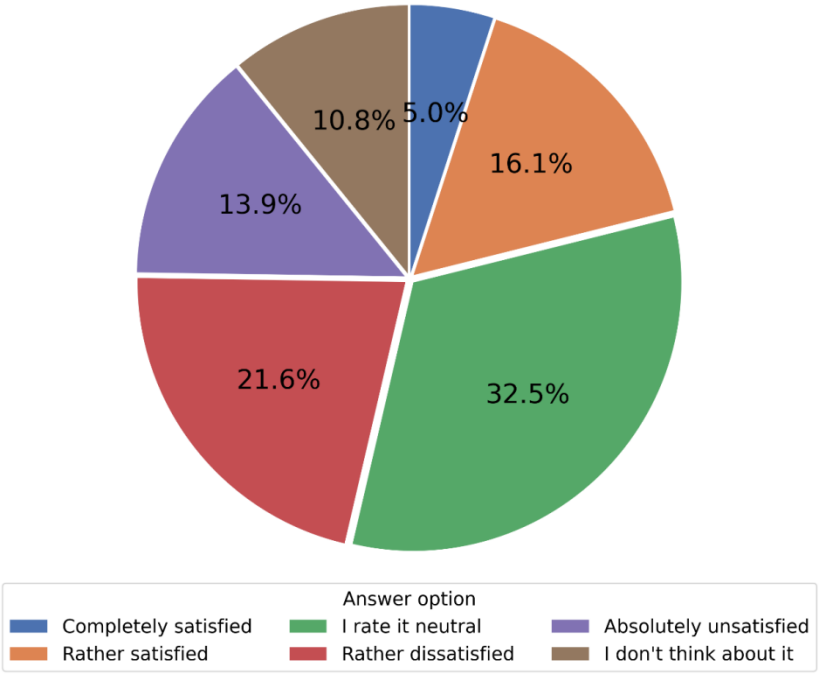

Fig. 8. Satisfaction of the population of Arctic Karelia with the state of the sphere of culture, leisure and entertainment.

In the territorial context, the lowest assessments of the state of this sphere are seen in the Kemskiy municipal district — 52.4% of respondents are not satisfied with its state (21.8% of them are absolutely dissatisfied). The highest assessments of the population characterize the state of the leisure sphere in the Kostomuksha urban okrug: 29.0% of respondents express satisfaction (5.0% are absolutely satisfied) and only 17.8% are dissatisfied (3.9% of them are absolutely dissatisfied). In the rest of the districts, negative assessments prevail over positive ones and their distribution occupies an intermediate position between the two indicated territories.

The key problems in the leisure sector, according to residents of Arctic Karelia, are the absence or small number of hobby groups (noted by 29.9% of respondents), the shortage or absence of movie theaters (20.9%), the absence or poor condition of libraries (20%), the low quality of available leisure services (19.5%), and the small number of interesting people with whom one would like to spend leisure time (17.3%).

The situation varies significantly across the territories (Fig. 9). If the predominant problem for the Kostomuksha urban okrug is the low quality of available leisure services (32.4%), then for the population of the Segezhskiy municipal okrug this problem (30.9%) is joined by the small number or absence of sports facilities (swimming pools, gyms, etc.) (31.3%). The peripheral areas are characterized by the severity of problems associated with the lack of leisure and cultural institutions: in the Belomorskiy municipal okrug — the absence or poor condition of libraries (52.8%) and the absence or small number of hobby groups (38%); in the Kalevalskiy municipal district — the absence or poor condition of libraries (28%) and the high cost of available leisure services (28%); in

the Kemskiy municipal district — the absence or small number of hobby groups (60.5%) and the lack or absence of cinemas (29%); in the Loukhskiy municipal district — the absence or small number of museums, exhibitions (49%), the absence or small number of hobby groups (37.9%).

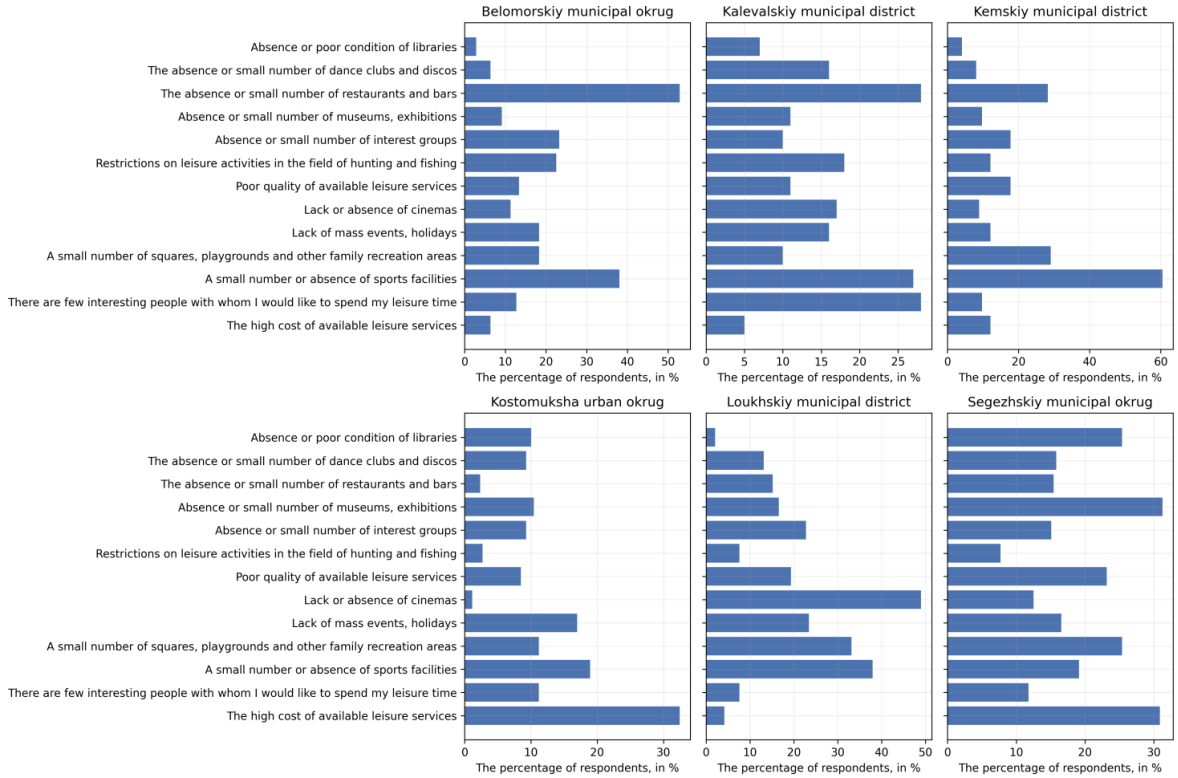

Fig. 9. Distribution of responses of the population of Arctic Karelia to the question *"What are the most serious and important problems in the sphere of leisure, entertainment and cultural institutions in your place of residence?"*

The improvements that have occurred in the sphere of leisure, entertainment and culture were noted by 19.8% of respondents. The largest share of positive assessments was in the Kemskiy municipal district (31.3%) and Kalevalskiy municipal district (28.0%), the smallest one — in the Loukhskiy municipal district (10.3%).

Improvements in the leisure sector noted by the population of Arctic Karelia include the appearance of a cinema, cultural events, the construction of a playground, the emergence of recreation areas, etc.

Considering the spatial localization of cultural, leisure and entertainment institutions, the greatest provision of conditions for recreation can be seen in the Kostomuksha urban okrug and Segezhskiy municipal okrug (Table 5).

Table 5

Summary information on the state of the culture, leisure and entertainment system on the territories of Arctic Karelia in 2022 [5]

Indicators	Municipal districts					
	(1)	(2)	(3)	(4)	(5)	(6)
Number of cultural institutions	4	5	7	9	5	3
Number of leisure and entertainment facilities	2	2	0	1	10	16
Number of cultural institutions per 10,000 population	3.39	9.43	6.25	10.34	1.72	1.21
Number of leisure and entertainment facilities per 10,000 population	1.69	3.77	0	1.15	3.44	6.45
K_i for culture, leisure and entertainment sector	-0.28	-0.07	-0.29	-0.20	-0.16	0.07
D_i for culture, leisure and entertainment sector	0.15	0.28	0.31	0.1	0.18	0.21

The highest rate of population satisfaction with the culture, leisure and entertainment sector is observed in the Loukhskiy and Kalevalskiy municipal districts, the lowest one — in the Kemskiy municipal district and Belomorskiy municipal okrug. Moreover, the coefficient of dynamics of the state of the education system has the highest values in the Kemskiy and Kalevalskiy municipal districts.

Conclusion

In conclusion, it should be noted that of the three considered components of the conditions for the reproduction of human capital, which we associate with the category of social capacity of space, the health care sector is characterized by the most critical assessments of the population. Despite the sufficient prevalence of institutions in spatial terms, one of the problems is the limited mode of their operation, associated with a shortage of specialists (often there is one paramedic or doctor for several FMSs) and lack of equipment. This aspect is reflected both in objective data on the number of medical and nursing personnel and the operating mode of institutions, and in the population's assessments of the most important problems in the health care sector in the place of residence. The key problems for the population of Arctic Karelia are the shortage of specialists (noted by 63.2% of respondents), shortage of modern equipment (50.4%), inaccessibility of complex types of medical care (36.4%) and a narrow range of laboratory tests (28.4%). This list allows talking about another aspect of the healthcare sector, which determines the completeness of its functionality in terms of the conditions for the reproduction of human capital — the ratio between the range of needs of the population and the range of healthcare services provided.

[5] Compiled by the authors on the basis of field research data and official statistical information.
In the Table: (1) Belomorskiy municipal okrug; (2) Kalevalskiy municipal district; (3) Kemskiy municipal district; (4) Loukhskiy municipal district; (5) Segezhskiy municipal okrug; (6) Kostomuksha urban okrug.

Negative assessments prevail with regard to the dynamics of solving problems in the health care sphere: only 15% of respondents note that improvements have occurred in recent years.

Considering the state of the education and advanced training system in Arctic Karelia, several key aspects should be noted that are important in terms of the reproduction of human capital: the absence of higher vocational education institutions or their branches in the sub-region, the limited number of secondary vocational education institutions, as well as the spatial unevenness of the placement of private educational institutions. For example, the absence of driving schools or their branches in the remote Kalevalskiy municipal district significantly limits the ability of local businesses to hire drivers and is an additional impetus for entrepreneurs to leave the territory. The key problems in the sphere of education and advanced training, according to the population, are lack of specialists in education (48.2%), absence of institutions of higher professional education (33.6%), decline in the level of education (25.5%) and poor condition of school and kindergarten buildings (25%). In general, satisfaction with the state of the education sector is assessed by respondents much higher than satisfaction with the health care system: neutral assessments prevail; in the Kostomuksha urban okrug, positive assessments even prevail over negative ones. However, the dynamics of the state of the education sphere is characterized by lower assessments: only 12% of respondents in Arctic Karelia note improvements.

In the sphere of culture, leisure and entertainment, there is a pronounced spatial unevenness in the placement of recreational conditions. High provision of the population with cultural facilities is typical for Kalevalskiy, Kemskiy and Loukhskiy municipal districts (more than 6 units per 10,000 people), while this value for Segezhskiy municipal okrug and Kostomuksha urban okrug is less than 2 units per 10,000 people. This position of Segezhskiy municipal okrug and Kostomuksha urban okrug is compensated by the relative development of the leisure and entertainment sphere. Against this background, Belomorskiy municipal okrug stands out — the population there is provided with both cultural and leisure institutions at a relatively low level. The key problems in the sphere of culture, leisure and entertainment, according to the population, are the absence or small number of hobby groups (noted by 29.9% of respondents), the absence of cinemas (20.9%), the absence or poor condition of libraries (20%) and the low quality of available leisure services (19.5%). However, the dynamics of the state of the sphere of culture, leisure and entertainment is characterized by the highest ratings of the considered components of the conditions for the reproduction of human capital: improvements are noted by 20% of respondents.

Summarizing the considered components of the conditions for the reproduction of human capital in the territory of Arctic Karelia in the context of the concept of social capacity of space, it should be noted that its substantive content should be divided into the following components, based on conceptual logic and available data:

1) infrastructural aspect: spatial distribution of objects;

2) functional aspect: completeness of the implementation of the functionality of objects;

3) reproduction aspect: the ratio between the range of services provided and the range of needs of the population.

For a more detailed analysis of the components of the social capacity of space, it is necessary to introduce into the system of indicators parameters reflecting the density of space and its connectivity in relation to the implementation of health care, education and culture, leisure and entertainment institutions of their social functions.

Thus, supplementing the information presented in this study with the values of the specified indicators will allow forming sufficient information bases for the prospective development and operationalization of the concept of social capacity of space in functional, infrastructural and reproduction dimensions.

The practical significance of the study lies in the formation of information and analytical bases for managing the territories of the Arctic regions of Russia in terms of creating conditions for the consolidation of the population and the transition to expanded reproduction of human capital.

The development of research in this subject area will focus on the development of economic and sociological tools for measuring the social capacity of space and expanding the geography of the research to other territories of the Arctic Zone of the Russian Federation.

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Roslyakova N.A. — methodology development; writing the original text; final conclusions;
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Media Image of the Arctic: Towards Qualified Human Resources

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Abstract. The article is devoted to the relevant topic — the Russian Arctic labor resources. The potential labor force of the Arctic today includes representatives of generation Z, graduates of Russian universities. The strategic issue of attracting labor resources to the Arctic has a target audience of young people. The governmental policy agent is mass media. The media provide public narratives of social constructs. The media are used to represent such an important social construct for the state as the Russian Arctic. The established media image of the Arctic includes characteristics related to the harsh weather conditions, the region's resource endowment, its military potential, and environmental problems. The traditional components of the media image of the Arctic have little significance in terms of highlighting the region's human resource potential. The existing media image of the Arctic is uninformative for potential Arctic labor force due to the features of public information consumption and processing by young people. The content of the media image has a specific pragmatic component that is directly related to the issue of labor vacancies, living conditions, work and lifestyle in the location of the vacancy. The aim of the study is to determine the media image of the Arctic corresponding to the Russian government's strategy for the development of the area. As a result, recommendations are made to adjust the media image of the Arctic to solve the problem of staffing the Arctic. The scientific novelty of the study is in the data obtained through surveys of Arctic university students. This data allows us to assess the degree of young people's awareness of the possibilities for applying professional competencies in the development of the Arctic. The study of the modern youth features, including the character of media consumption, also constitutes scientific novelty in the study of tools for the formation of Arctic workforce. Practical significance is represented by the possibilities that will provide a new media image of the Arctic for the creation of human resources potential of the AZRF.
Keywords: *Arctic labor resources, youth, media image of the Arctic, digital media, bloggers*

Introduction

Russia has a policy of managing the socio-economic development of the Arctic zone of the Russian Federation (AZRF) [1]. Innovative modernization in territorial management implies a balanced and thoughtful approach to the distribution of any resources aimed at the development of the country. The times of extensive social development are gone due to increasing environmental risks and the spread of intellectual forms of management and computer software

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[1] Order of the Government of the Russian Federation of April 15, 2021 No. 996-r "On approval of a unified action plan for the implementation of the Fundamentals of the State Policy of the Russian Federation in the Arctic for the period until 2035 and the Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period until 2035". URL: https://www.garant.ru/products/ipo/prime/doc/400560856/?ysclid=lr0ba7xbzf849734262 (accessed 05 February 2024).

technologies. Competent development of the AZRF includes synergetic consolidation of efforts on the part of the government, business, education, research institutions and public sphere [1, Zaikov K.S., Kondratov N.A., p. 126].

Development of the AZRF is impossible without human presence in harsh Arctic conditions, despite the widespread use of ICT and robotics in engineering and technological processes. The task of forming the human capital of the Russian Arctic, "receptive to innovations, ready for inclusion in scientific and production processes in the conditions of rapidly updating technologies" is proclaimed [2, Lipkin A.V., p. 13]. At the same time, experts note the imbalance of supply and demand in the labor market of the AZRF. Graduates are not employed in their professions. This situation has consequences both in the form of a decrease in the professional level of graduates and in the form of a reduction in the intellectual potential of the AZRF [3, Korchak E.A., p. 1626]. Against the background of increasingly frequent statements about the need to increase qualified labor force in the Arctic, researchers talk about the low rates of development of human capital in this zone [4, Karginova-Gubinova V.V., p. 8]. High rates of youth migration from the North are recorded.

The problems identified by experts indicate that the social policy of creating human resource potential in the Arctic needs to be improved. It is necessary to think about the mechanism of creating conditions for retaining and attracting young people to the AZRF. One of the means of social policy is traditionally the creation of a narrative approved by society [5, Boughton M.]. The narrative, or representation of a particular object, is created by the means of mass culture: cinema, literature, and fine art. The media make a huge contribution to the creation of a public narrative, generating a media image of a social construct. Due to the volume of information and the constant broadcast of a particular point of view, the media is able to form the attitude of the public to the issue under discussion [6, Terskikh M.V., p. 200].

The media image of the Soviet Arctic was associated with the life of polar explorers and included a significant share of romance, heroism, and courage, which was shown by a few eccentrics who dared to go to harsh lands. The image of the Arctic created by modern media has somewhat expanded the understanding of the northern territories, adding such pragmatic components as the potential and resourcefulness of the region. Despite the changes in the media image, studies show that today the Arctic is presented as a distant and difficult region to live in [7, Zhigunov A.Yu.]. It should be noted that the existing media image has not made the Arctic more understandable and attractive for living. When considering the media image of the Arctic as a part of public policy, there is an understanding of its inferiority within the framework of the state strategy for the development of the AZRF.

The fact that young people are the basis for the formation of the human resource potential that develops the Arctic raises questions:

- What information about the Arctic does a modern consumer of media content have?
- How does the knowledge about the Arctic obtained by a reader/viewer of the media

determine the public attitude to the issue of modern development of the AZRF?

- How productive is the media image of the Arctic for its development?
- What should the media image of the Arctic be to correspond to the state strategy of the Russian government for the development of the AZRF?

The answer to the last question became the goal of this study. The work provides recommendations for adjusting the media image of the Arctic in order to solve the problem of developing human capital in the Arctic and its staffing. Proposals for changing the media image of the Arctic are based on research devoted to studying the views of modern youth, including data on the characteristics of media consumption by the younger generation, which is a scientific novelty in studying the tools for attracting labor force to the Arctic. In addition, the novelty of the study is represented by the data from surveys of students of an Arctic university, which allow us to assess the degree of awareness among young people of the possibilities of using their own competencies in the development of the Arctic. The practical significance of the work lies in the perspectives that will provide a new media image of the Arctic for the creation of human resources for work in the AZRF.

Methodology

The basis for the study was the following fact: it was revealed that *students of the Arctic university, the purpose of which is, among other things, to train personnel for work in the Arctic, have a poor idea of how they can apply their efforts to the benefit of Arctic development*. Thus, in 2022–2023, we conducted a survey among 117 undergraduate and graduate students of the social and humanitarian cluster of the Northern (Arctic) Federal University. The following questions were asked:

- How can Arctic university students apply their professional competencies to the Arctic development?
- What do you know about the Arctic?
- Where did you get information about the Arctic?

The answers to the first question showed that:

- 67% of respondents believe that they *cannot* be useful for the Arctic development in any way,
- 28% responded that, *perhaps*, having received an education, they can be useful in one way or another,
- 3% declined to answer (Fig. 1).

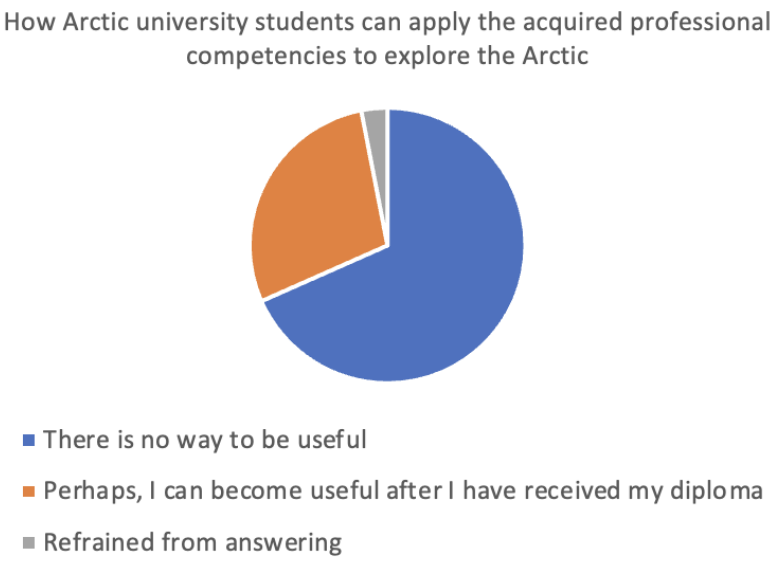

Fig. 1. How can Arctic university students apply their professional competencies to the Arctic development?

The answers to the question: “What do you know about the Arctic?” can be divided into three main groups:

- The Arctic has large natural resources (77%).
- The Arctic is a territory of critical temperatures (63%).
- I know nothing (11%).
- Other (26%) (Fig. 2).

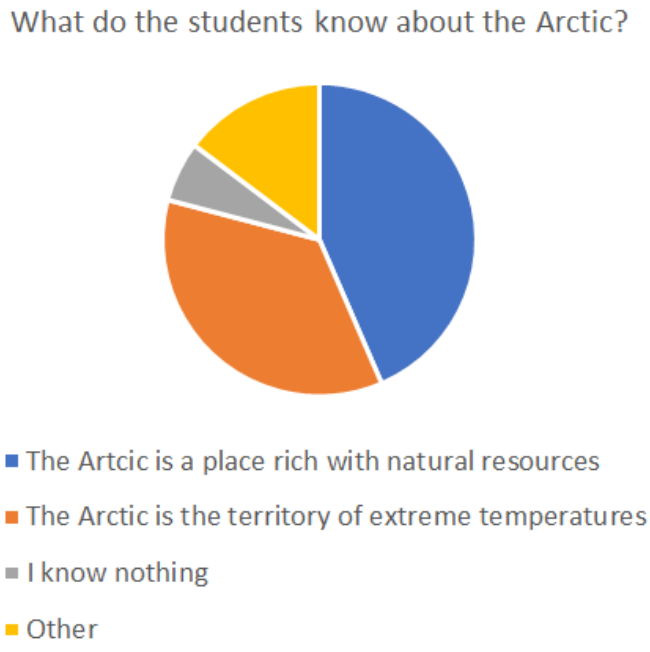

Fig. 2. What do students know about the Arctic?

The answers to the question “Where did you get information about the Arctic?” fall into the following groups:

- From the media (69%).
- From conversations with others (28%).
- Other (3%) (Fig. 3).

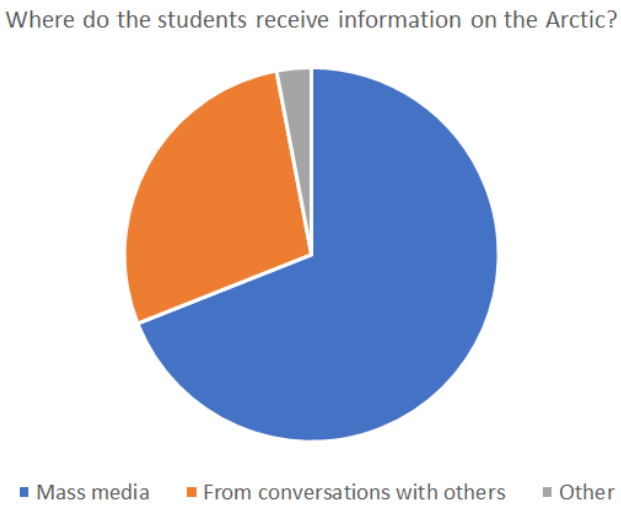

Fig. 3. Where do students get information about the Arctic?

The information received gives reason to believe that:

- young people who could potentially form the staff for developing the Arctic know little about the problems that arise in the process of developing the Arctic territories;
- the main means of obtaining information about the Arctic for the younger generation are the media and public opinion.

Given that public opinion is largely shaped by the mass media, we wondered why the media image of the Arctic does not provide insight into the problems that need to be addressed in the course of Arctic development. Another question that naturally arose in this context was: "What should the image of the Arctic be so that young people consider this region a place to work and live?" To answer these questions, we interviewed 50 undergraduate students and 20 graduate students in various fields of study at NArFU. We asked questions about their criteria for defining their place of work and life. The answers to these questions allow us to determine to what extent the existing public image of the Arctic can be considered by modern youth as a place to work and live. In addition, an analysis of existing scientific publications on these topics was conducted. The publications reviewed address the following questions:

- What are the characteristics of modern youth starting their careers?
- How do young people receive and process public information?
- What public information does the modern media image of the Arctic provide?

As a result of analyzing the interview data and the content of modern scientific publications, proposals were made to supplement the public image of the Arctic so that this territory becomes a place of choice for modern youth for employment.

Labor force for the Arctic

The Arctic needs labor force [2]. The areas of work in the Arctic are related to the extraction

[2] Development of the Russian Arctic will require about 180 thousand new specialists. URL: https://pravdasevera.ru/2022/11/10/636cdd6f3c903a2d8a4e4802.html?ysclid=lqzlmxi7j147122998 (accessed 05

of hydrocarbon raw materials, provision of logistics infrastructure, engineering and technological development of territories. Work in the North has features that can be considered negative: natural and climatic conditions of low temperatures, difficult transport accessibility, socio-psychological isolation of the working personnel, limited comfort, poor surrounding landscape. The listed features entail corresponding consequences for a person: health risks, including mental health, chronic diseases, high cost of living, frequent changes of working staff at enterprises. Most of the work is organized on a rotational basis. The predominant part of the labor force is male, which is explained by the fact that historically the Arctic workforces were primarily employees of the fuel and energy complex.

Great hopes in the issue of Arctic development are placed on modern youth, students of universities and institutions of secondary vocational education [8, Ivanova M.V., Zaitsev D.V., p. 47]. They are the ones who should make up the labor force for work in such a difficult macro-region for development as the Arctic. It is assumed that young people will choose the AZRF as a place to live, work, and start a family. However, according to researchers, modern youth want a comfortable life that will not require great effort and will provide an opportunity to earn good money and realize full potential [9, Dombrovskaya A. Yu., Pyrma R.V., pp. 173–174]. Does a career in the Arctic meet these requirements? Probably not, just like most other professional tracks. There is no job that would be both highly paid and low-cost, so the question of choosing a particular vacancy by young people is unlikely to be determined solely by the complexity of working conditions.

What factors influence young people's decisions in favor of a particular job position? We asked 70 students what they would like to know about a vacancy in order to form their decision about future work in extreme Arctic conditions. Both response options and the opportunity to answer in free form were given. Among the response options were those that are generally typical for an information page about any vacancy:

- salary,
- living conditions of work,
- career growth opportunities,
- health insurance,
- opportunity to take vacation at a time convenient for the employee,
- opportunity to improve skills at the expense of the enterprise,
- possibility of a preferential mortgage,
- transport accessibility of the workplace,
- recreational conditions (cultural institutions, cinema, gym, place for walks, catering).

The respondents selected the following options:

- salary — 70 people,

February 2024).

- living conditions — 70 people,
- career growth opportunities — 63 people,
- health insurance — 67 people,
- opportunity to take vacation at a time convenient for the employee — 59 people,
- opportunity to improve skills at the expense of the enterprise — 50 people,
- possibility of preferential mortgage — 69 people,
- transport accessibility of the workplace — 68 people,
- recreational conditions (cultural institutions, cinema, gym, place for walks, catering) — 70 people (Fig.4).

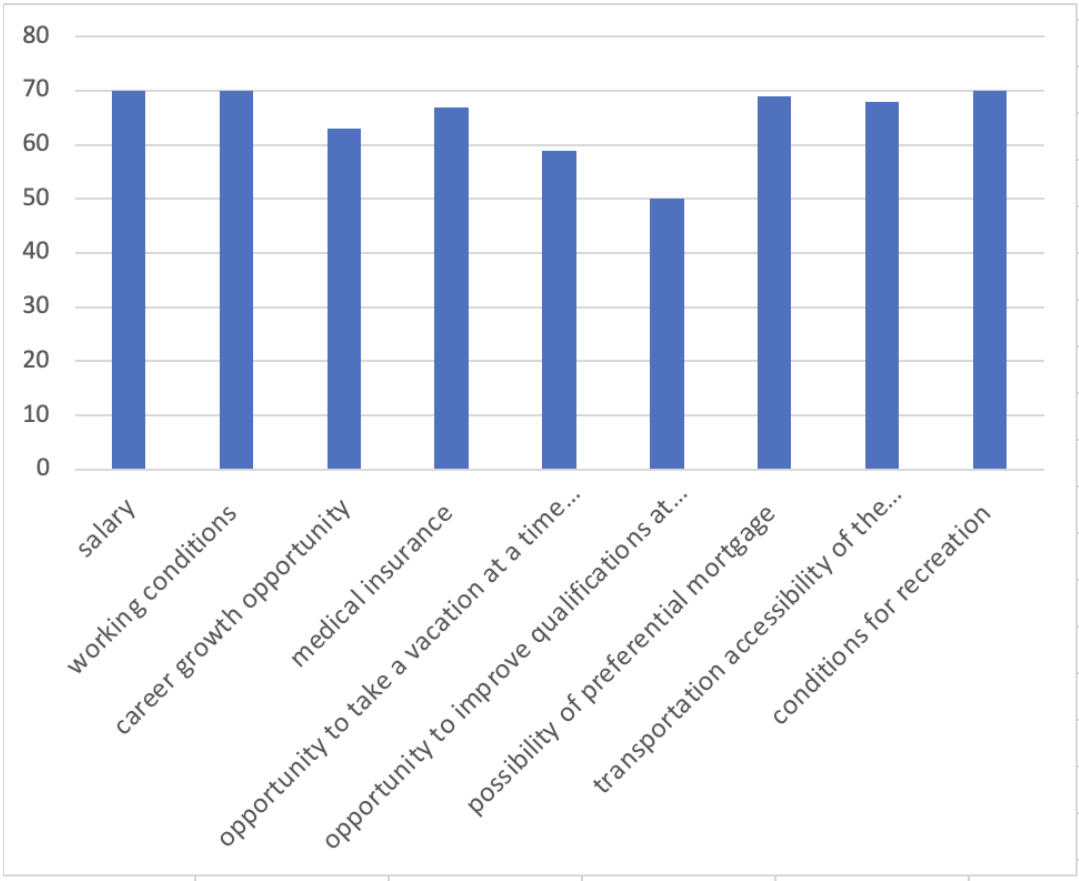

Fig. 4. Factors influencing the decision of young people when choosing a job vacancy.

It turns out that most of the information offered is necessary for young people to decide how suitable the vacancy is. The most interesting answers were those offered in free form. The following answers were given:

- *"The salary may be good, but the cost of travelling to the workplace may outweigh all the advantages";*
- *"Even if a mortgage is given, are there many options for choosing housing in the Arctic?";*
- *"Living conditions — indoors or outdoors? And if indoors, is it in the field?";*
- *"I would like to know whom I will be working with. I don't know anyone working in extreme Arctic conditions";*

- *"Remote work is needed. Everyone works on computers now";*
- *"I don't know if I can work in low temperatures. Most likely, I will need to try first. Is there a trial work option?";*
- *"I would like to know who my supervisor will be";*
- *"They should provide a link to photos of the place of work, the company";*
- *"What kind of work is there in extreme Arctic conditions?";*
- *"I can't imagine how the living conditions in the Arctic can be described. No matter what is written, you need to visit the place of work."*

As can be seen, many answers are given in the form of questions. Of the affirmative sentences, the last answer seems to be the most indicative. Indeed, when people hear about work in the Arctic, they have questions, not answers. The reaction is natural: a person cannot make a choice in favor of something he or she does not know about. General statements like salary, mortgage, and health insurance are probably sufficient when it comes to the average job. A job in the Arctic is going beyond everyday experience. Is there much information in the public domain about real cases of work in the Arctic? Are there people we know who can share their own stories of working in the Arctic? If there are such people, how well does their story fit into the framework of a comfortable life? Where do we get enough information to make a decision about working in the Arctic?

Characteristics of youth as a labor resource

Although the category of youth includes the population from 12 to 30 years old, in this study we will focus on the characteristics of the segment of young people who are university students. This choice is justified because a number of universities today are building their educational strategy taking into account the Arctic labor market: universities of the Far East, Siberia, Yakutia, Murmansk, Arkhangelsk oblasts. University representatives are looking for tools to retain talented people and attract professional staff to the Arctic. Society and universities expect that after graduating, students will work for the economy of the Arctic region, will be employed at regional enterprises, and will work in remote areas of the Arctic Zone of the Russian Federation. Personnel trainings are carried out at the request of mining, shipbuilding companies, manufacturing, fuel and energy enterprises. Since the northern regions are characterized by high migration rates, we are talking about measures to retain young people in the northern regions and attract graduates from universities in neighboring regions to the North [10, Oglezneva T.N., p. 15]. It cannot be said that the stated measures are effective, since the outflow of young people from the northern territories is high and difficult to contain.

The reasons for youth migration are complex. However, an important factor is the characteristics of the age group. The socio-psychological characteristics of young people allow us to classify this group of the population as the most vulnerable and unprepared for the existing labor market. Representatives of Generation Z are described as trainable, creative and sociable [11,

Nikulina Yu.N., p. 756]. At the same time, a high level of ambition, a low level of patience, inflated expectations regarding wages and job status, and a lack of long-term plans in professional life are noted. In addition, young people strive for independence in decision-making, a life separate from their parents, and economic independence [12, Zakharova V.A., pp. 49–50]. At the same time, it is noted that young people desire to get what they want quickly and without difficulties, rapidly change goals and preferences, do not recognize authority, and highly value honesty, realism, and openness. It is important for young people to be in touch with friends and relatives; they often choose remote work, being digital natives [13, Badham M., Luoma-aho V., p. 420].

If we apply the listed characteristics to the situation of work in the Arctic zone, we can determine both pros and cons regarding the correspondence between the characteristics of potential labor force and working conditions. Thus, developed soft skills — communication, creativity — will make it easier to enter into negotiations with potential employers, as well as to become part of the work team. The desire for independence will enable you to make a decision about a workplace even if your relatives express a negative attitude towards the original choice. Independence will allow making decisions in difficult work situations that are quite real for extreme Arctic conditions. The ability to work with digital technologies will ensure the ability to easily handle high-tech equipment. Overall, the high level of trainability attributed to the young audience makes them valuable employees in any innovative production facility.

Despite the listed advantages of Generation Z, there are critical characteristics that make it less likely for young people to work in the Arctic. Ambition and low patience are bad assistants in any responsible position. Expectations of a high salary are also not always justified. The lack of prospects and long-term professional plans become a serious obstacle in the case of a region that can be classified as a developing territory. The desire for quick success and the lack of authority in the profession are undesirable where there are no obvious and established solutions. The ability to listen to the advice of experienced staff and the experience of the indigenous population is often cited as a condition for success in the critical conditions of the Arctic. The least realistic seems to be the possibility of constant communication with friends and relatives in hard-to-reach areas of the North. The need for openness, noted as a requirement of the younger generation, can also be an obstacle due to the low level of information coverage of events in hard-to-reach areas.

Perception of information in public communication

In modern society, public opinion about many social constructs is formed through the media. The media is a channel of communication between government and society. The public image of the Arctic is created via information contained in newspaper and magazine articles, TV and radio broadcasts, and popular science blogs [14, Bolsunovskaya L.M., pp. 148–149].

The youth audience has specific features in terms of receiving and processing information. Young people prefer digital media as their main source of information. The younger the contingent, the more often they view blogs and YouTube [15, Poluekhtova I.A., p. 100]. Traditional television

and print media remain practically out of young people's sight [16, Vartanov S.A., pp. 170–172]. As for the channels for receiving information, mobility is important. The number one means of receiving information is a smartphone connected to the Internet. Only a few people are familiar with the works of classical and Soviet literature. It was in Soviet culture that the first narratives of Arctic exploration appeared. However, neither fiction nor early style cinema are objects of choice for Generation Z as a whole.

Information processing also differs significantly from the ways typical for an adult audience. Standard means of attracting attention — banners, contextual advertising — are no longer perceived. Preference is given to visual means: memes, pictures, photographs. Young people practice "diagonal" reading, often concentrating solely on headlines, reading predominantly short texts and calling longer texts — either dismissively or with a sneer — longreads. Any news remains such for a short time, quickly leaving the field of vision of young people. Generation Z remembers not information, but the place where it can be found. The political agenda, traditional ideas about patriotism are not interesting. The formation of a new type of civic activity is noted [17, Dunas D.V., p. 120].

There is a problem of young people's trust in information in the public sphere. According to research, half of young users of Russian media trust the information offered, half do not trust it [18, Lapshinova K.V., p. 139]. Bloggers stand out among the most authoritative sources of information. They play the role of opinion leaders among young people. Researchers note that bloggers' leadership is associated with their ability to achieve fame, publication activity, the quality of published posts and a stable civic position [19, Osmanova A.I.]. Trust in bloggers extends from the issue of choosing a clothing brand to political choice. Often, bloggers are so authoritative that representatives of the younger generation literally begin to speak in sentences from bloggers' speech. Business is already widely taking advantage of such preferences of young people. There are few brands that do not resort to the help of famous trend-setters to build communication with a young audience. These trends should be taken into account when building communications with a young audience on issues of choosing a career path and employment. The associative word cloud represents modern communication trends in the youth environment (Fig. 6).

Fig. 5. Associative word cloud of modern communication trends in the youth environment.

Modern media image of the Arctic

The public image of the Arctic formed by the media — the media image of the Arctic — attracts the attention of researchers. Studies by N.S. Avdonina and S.O. Dolgoborodova describe the media's wide attention to Arctic issues since 2001. From the beginning of its formation, the media discourse of the Arctic was characterized by competitiveness, dictated by the struggle of different countries for the Arctic shelf [20, p. 739]. Geopolitical, economic issues, and the region's resource potential were the most typical topics covered in the media in the period 2001–2007. Then, the media discourse of the Arctic became even more competitive and militaristic. The emerging public image of the Arctic also includes issues of ecology, climate change, and history.

Tracing the history of the development of the media image of the Arctic, the authors note that later the media began to be more interested in issues of oil drilling and global warming. By 2009, the competitiveness of the Arctic media discourse becomes less obvious. International cooperation events begin to be covered more widely. In general, the media image of the Arctic remains stable, and its content hardly changes. Confirmation of this fact can be found in the 2020 study by A.Yu. Zhigunov, where the author identifies three main topics of materials about the Arctic in the media: militarization and geopolitical situation in the region, economic activities of large companies, and environmental problems. Among the new components in the media image, tourism and scientific expeditionary activities stand out. In addition, the topic of regional industry and infrastructure is added. This issue is related to the need to develop the service industry. Besides, the media pay attention to the issue of investment in industrial facilities, in the development of transport infrastructure, and the problem of mining and processing minerals. It should be noted that materials related to the topic of social development of the Arctic appear in the status of "other" and [7, p. 105].

The most recent analysis of the media image of the Arctic is presented in the study by A.V.

Simakova and I.S. Stepus [21]. This material to some extent addresses the practical side of the issue of the media image of the Arctic, as it raises the question of what is the weight of the romantic and the pragmatic in the media Arctic discourse. In fact, the romanticism inherent in the Arctic theme is traditionally widely described in cinema, music and art works, painting. The authors write that, despite the obvious romanticization of the Arctic image, the modern Arctic is not only a territory of romantics, but also a strategically important object. It is noted that the official media of 2019–2021 present the Arctic in a positive light as a national priority and an area of investment attraction. The social component in the media image of the Arctic is more confident. The topic of creating infrastructure, comfortable living conditions, attracting human resources is initiated.

A.V. Simakova and I.S. Stepus study the image of the Arctic formed in the minds of people and record all the above-mentioned thematic components. However, it is important to note that the public's perceptions of the Arctic are rather romantic and connected with the beauty of nature and the theme of homeland. Although public opinion is divided, the majority of people are far from a practical understanding of the importance of the Arctic territories. There is simply no talk of the population connecting the Arctic, which is rich in resources and is a promising region for development. The issue of human resource development is being discussed more and more frequently in recent publications. At the same time, the topic concerns the difficulties associated with the problem of attracting labor force and finding a solution to this problem [22, Saburov A.A., Nikiforov A.S.]. In general, such publications can be attributed to political issues of Arctic development. For an ordinary person, such materials are of little importance due to their detachment from the life problems: life support, income, living conditions, family maintenance, raising children, health care, recreation.

Life experience of Arctic labor force as part of the media image

How does the created media image of the Arctic correlate with the task of developing human resources potential and attracting labor resources to the North? Is the information contained in the media image important for making a decision about a place of work in the Arctic? Modern youth is quite pragmatic and has no illusions about building their lives. For a reasonable young man, the romantic image of the Arctic can be attractive as part of aesthetics, art and culture, but not as a basis for determining his professional future. The knowledge that the Arctic is a territory of dialogue, polar bears, and extreme temperatures cannot have a positive impact when choosing the AZRF as a place to live and work. The informational, media image of the Arctic, aimed at attracting personnel, should provide not only grounds for objective pride, but also an understanding of the real future experience, important for planning one's own life and building a family.

The authors of recent publications on the issue of labor force in the Arctic are unanimous in their opinion: the personnel of the future must have a number of competencies that are not

only disciplinary, but also supra-professional. In the Arctic, professional skills are important, including not only expert knowledge, but also so-called "soft" competencies. Thus, during a discussion at the St. Petersburg International Economic Forum 2023, rectors of leading Russian universities that train personnel for the Arctic, drew a portrait of a potential specialist working in the Arctic. Such a specialist should "love nature, country" and be "kind" and "hospitable" [3]. The ability to work in a team, intercultural communication skills, the ability to quickly adapt to new conditions and respond to emergency situations are important. In addition, high discipline and a desire to develop professionally are necessary [22, Saburov A.A., Nikiforov A.S.]. The prospect of developing emotional intelligence, interpersonal skills, and self-management should be clear to students planning their future activities in the Arctic.

Researchers also note the need for special training of employees for shift work [23, Korneeva Ya.A., p. 384]. Despite the problem of sparse population in the Arctic territories, which is of concern to specialists, shift work in the Arctic will remain one of the main methods. The approach to seasonal and rotational employment, which is widespread in society, does not take into account the physical and psycho-emotional overloads characteristic of this type of work. Employees work in a confined space, are isolated from the outside world, and have to leave their families for long periods of time. At the same time, shift work has its advantages: high wages and a favorable calculation of seniority. As a rule, employers provide shift workers with free medical care, clothing, and food. Publicity of scientific data on the specifics of shift work in the Arctic will increase the number of success stories among young professionals starting their career.

On the other hand, the connection between the infrastructure of the Arctic region and the availability of professional personnel for further development of the area is important for understanding society; the media space should contain information on the importance of creating a comfortable environment in the Arctic for workers. Infrastructure is needed to make an area comfortable for living. In the Arctic, the creation of infrastructure is complicated by its high cost and extreme climatic conditions. Innovative solutions are important to cope with the task of creating housing infrastructure. The state of the housing sector, the level of utilities, the availability of public transport, healthcare and education have a serious impact on the standard of living of a person and, accordingly, on the choice of the AZRF as a place of residence. For young personnel, information about the Arctic regions with the most developed infrastructure is important. In addition, it is necessary to cover projects and plans for infrastructure development. Even if a particular location currently lacks the best infrastructure, the anticipation of planned changes may be important in choosing a future job.

Understanding the benefits of the region not only to the state, but also to ordinary people is important because meeting personal and local needs is one of the basic human needs. Students expect to find a job that will feed them and their future families. Living in the Arctic region should

[3] Education and work in the Arctic: what competencies and skills are needed were discussed at the SPIEF. URL: https://rsv.ru/news/2/5500/ (accessed 05 February 2024).

not only be feasible, but also advantageous. Difficult living conditions should be compensated by the advantages that the Arctic nature provides and at the same time comply with the principles of sustainable development. Within the framework of the programs for the sustainable development of the territories of the Arctic Zone of the Russian Federation, projects are being implemented to restore Arctic stations, build ports, icebreakers, container ships for year-round navigation along the Northern Sea Route, create reserves and national parks offering tourist programs. The economically favorable characteristics of working in the Arctic should become part of the media image of the Arctic territories.

Natural, climatic and environmental issues remain determining factors in the decision to work in the AZRF. The fact of extreme air temperatures and low comfort of weather conditions is well known. However, it is important to have a clear understanding of what a future employee can expect when he or she arrives at the place of employment with regard to the climatic situation. Even more important is knowledge of how a person can cope with the difficult natural conditions of the Arctic territories. For example, in the Arctic Circle, the low water vapor content makes oxygen absorption from the atmosphere worse than in neighboring latitudes. Lack of solar radiation and specific light regime are also unfavorable factors for human health [24, Chashchin V. P., Gudkov A. B., p. 90]. A person is able to cope with these difficulties. However, this is only possible if a person has information about ways to solve the problem. Understanding of the real situation and availability of working solutions to overcome difficulties will allow potential employees to make their choice. In addition, it is important for future workers in the Arctic to know how environmental problems are being addressed and what risks exist in this regard.

The potential of modern artificial intelligence is a breakthrough for the development of Arctic territories due to a number of factors specific to this area: harsh natural conditions, environmental problems, shortage of skilled labor, remoteness from highly developed infrastructure. Where humans face difficulties in applying their physical resources, AI with its “big data” and “smart transport” turns out to be a significant force for development. Modern innovative schemes for the development of Arctic resources look like separate autonomous production platforms, where the processes of extraction and processing of natural resources are carried out using unmanned technologies and remote control of all production processes. Such development of Arctic deposits in the format of economic platforms with the effect of extreme localization requires the use of artificial intelligence [25, Pilyasov A.N., Putilova E.S., p. 28].

Employers also recognize the high importance of digital technologies in the development of Arctic territories. Automation of the labor process in the Arctic is associated with the use of geographic information systems, unmanned aerial vehicles, and data collection and processing systems. Possession of digital competencies is becoming typical for modern Arctic personnel. It is noteworthy that some of the AZRF subjects have a high level of digitalization potential even in comparison with other regions of the Russian Federation [26, Babkin A.V., Egorov N.E., p. 51]. Since AI offers promising prospects for solving a number of issues, publications on this subject will

provide understanding of the options for developing Arctic territories using digital technologies. Modern youth are eager to use digital technologies and AI. Information about the application of trendy digital competencies in Arctic development will focus young people on the need to purposefully develop digital skills for future use in labor activities in the Arctic territories.

We can briefly list the main areas in which the awareness of the potential Arctic labor force needs to be raised:

- ability to psycho-adaptation;
- absence of health problems;
- developed digital competencies;
- information on the development of the AZRF infrastructure;
- information on the benefits of working and living in the AZRF.

However, it is important that the listed areas cannot simply be mentioned as workforce requirements or as job characteristics. Detailed information with illustrative examples and analysis of work situations that will demonstrate the essence of the above problems is needed. Real cases of workers, feedback from employers, examples from the life of work collectives, stories about solving difficulties — all these are important for creating a general overview of the life experience of a person working in the North. Reflecting on other people's experience, a person is able to make a decision about the extent to which such an experience is possible for him/her. The lack of understanding of what a person experiences when living in the Arctic makes the possibility of such an experience dangerous and undesirable.

It is necessary to adjust the media image of the Arctic by including an element of the life experience of a person living in the Arctic territory. The image of a strategically important region, a place rich in natural resources, a beautiful land and a new transport hub does not provide the information necessary for making a decision about life and work in the Arctic. People can make such a decision when they realize that living conditions in the North are acceptable to them. Measures of adaptation to climatic difficulties, the ability to use professional and personal competencies, an idea of the peculiarities of life in an Arctic city or village in a full calendar cycle — such knowledge is necessary for the future Arctic labor force.

Conclusion

The motivation for conducting this study was the information that Arctic university students, for the most part, have no idea how they can use their professional competencies to work on the development of the Arctic territories. Despite the fact that the state has high expectations of university graduates as a labor force for the Arctic, young people do not associate the knowledge they received at the university with the prospect of applying this knowledge to work in the Arctic. Moreover, the youth audience perceives the Arctic not as a place for work and life, but as a remote territory of critical temperatures and natural resources. This image of the Arctic was formed under the influence of public opinion and media.

The survey of students showed that when looking for a job, they are interested in salary, living conditions, career opportunities, health insurance, preferential mortgages, etc. However, this information provided in relation to work in the Arctic is insufficient. The public attitude towards the Arctic suggests that simple facts about the peculiarities of working in the Arctic are not enough to make a decision to work there. The difficulty lies in the fact that the conditions of the Arctic climate and the remoteness of the territory hinder personal experience in the Polar Regions. At the same time, there is an understanding that the real living conditions in the Arctic are more than just the facts from a job advertisement. Young people lack personal experience of life in the Arctic.

Young people get their idea of the Arctic from the media. The media are the creators of the public experience of the Arctic, accessible to the average Russian citizen. The media image of the Arctic territories available to the Russian citizen has been created under the influence of events that have taken place since the early 2000s. It gives an understanding of the Arctic as a geopolitically unstable, militarized, but resource-rich region. The strategic importance of this region is associated primarily with oil drilling. The region is also known for climatic and environmental problems. In the recent media image of the Arctic, information about the tourism potential and expeditionary activities related to the scientific exploration of the Arctic is added. The image is supplemented with information about the problems of infrastructure development and the difficulties associated with attracting personnel to work in the Arctic. We conclude that the existing media image of the Arctic is not stimulating for young people. Information about events in the Arctic does not cause a desire to choose this region for work and life.

As a result of the study, recommendations are given for supplementing the media image of the Arctic in order to make it consistent with the state strategy for attracting labor force to the Arctic. First of all, the changes are related to the inclusion of the real-life experience of a person working in the Arctic in the media image. Despite the fact that work in the Arctic is associated with a number of difficulties due to critical weather conditions and inaccessibility of the region, this is not the main stumbling block in the understanding of young people. University graduates lack information about how people cope with the difficulties of work and life in the Arctic. The media image of the Arctic should include cases from the lives of workers in the Arctic territories, success stories of people who chose this region for their professional development. Student work practice would be a very expensive way for young people to get to know the northern territories. However, even if most young people do not have the opportunity to gain trial work experience in the Arctic before deciding on their employment there, virtual tours and narratives telling about real people working in the Arctic weather conditions would become the necessary link to enable self-determination.

The prospects for research involve tracking changing socio-economic conditions and their impact on living and working in the AZRF. The media image of the Arctic should be adjusted depending on the needs of the state and the development plans of society. It is important to

remember that the media user applies incoming information to own life. The population does not need abstract rhetoric, but rather the presentation of life experience situations. It is important to further study the life experiences of the Arctic labor force and share the results of this activity with the population. Pride in the Arctic is based on real human achievements.

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Directions and Priorities for Tourism Development in the Arctic: Content Analysis of Strategic Documents

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Abstract. The number of strategic documents has been adopted at the federal level in recent years, establishing the regulatory regime for the development of tourism in the Arctic. At the beginning of the study the key directions and priorities of the tourist development of the Arctic on the federal agenda were identified, and then the strategies of the nine Arctic regions of Russia were considered. The purpose of the work is to determine the key directions and priorities for tourism development in federal and regional policies, as well as to identify the correspondence of regional strategic directions for tourism development with the key directions of tourism development in the Arctic declared by the federal agenda. The study is based on the method of content analysis of regional documents by assessing the qualitative and quantitative presence of keywords chosen by the authors, which made it possible to identify trends that are reflected to varying degrees in regional strategies, concepts, and programs. It was possible to demonstrate common and different features in strategic development of Arctic tourism. The analysis of regional strategic documents on tourism development reveals the existing heterogeneity in content and structure due to the diversity of formats of the documents. The analysis also revealed a lack of assessment of the possibilities and prospects for the development of interregional and intermunicipal cooperation.
Keywords: *Arctic regions, directions of tourism development, Arctic, strategy, concept, content analysis*

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Introduction

Tourist and recreational development of the Arctic regions of Russia is positioned as one of the priority and/or promising areas of economic activity, which is reflected in the main strategic documents of socio-economic development [1, Kondrateva S.V.; 2, Noeva E.E.; 3, Kropinova E.G., Smirnova E.]. In addition, the Arctic zone is home to 19 small-numbered peoples, objects of their historical and cultural heritage, which have historical and cultural value of global significance [1]. Taking into account the importance of tourism in regional development, the issue of compliance

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[1] Decree of the President of the Russian Federation of 26.10.2020 No. 645 (as amended on 12.11.2021) "Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035". URL: http://www.kremlin.ru/acts/bank/45972#sel=40:3:wZ,40:4:Zw (accessed 01 March 2024).

of regional strategic directions of its development with the key directions declared by the federal agenda for tourism development of the Arctic seems important. This article is devoted to the study of the specifics of strategizing the tourism sphere in the regions of the Arctic zone of the Russian Federation.

In this study, for the first time, documents for planning tourism development (strategies, concepts, programs) of all Arctic regions of Russia are considered on the basis of content analysis, which makes it possible to correlate the federal Arctic agenda with regional ideas for the development of Arctic territories. The practical significance lies in the possibility of harmonizing strategies at the federal and regional levels, jointly developing directions for the development of Arctic tourism. The purpose of the work is to determine the key directions and priorities for tourism development in federal and regional policy, as well as to identify the compliance of regional strategic directions for tourism development with the key directions for tourist development of the Arctic declared by the federal agenda.

Theoretical approaches to research

The issues of strategic management of tourism development both at the federal and regional levels seem to be one of the topical areas of scientific research in recent decades. Thus, in the collective work of I.I. Kruzhalin (Professor, Vice-president of the National Academy of Tourism, full state advisor of the 3rd class, Head of the department of recreational geography and tourism of the geography faculty of Moscow State University named after M.V. Lomonosov), T.N. Menshikova (Acting Head of the Department of state tourism projects and tourism security of the Federal Agency for Tourism) and K.V. Kruzhalin (Associate Professor of the department of recreational geography and tourism of the geography faculty of Moscow State University named after M.V. Lomonosov), the "set of regional documents of strategic planning, organizational and managerial relations ensuring sustainable development of tourism in the management of tourist territories" is analyzed [4, p. 139]. The authors emphasize that "strategic planning of tourism based on the principles of sustainability is the basis for the effective development of the tourism industry and should be implemented at the federal and regional levels" [4, p. 146]. According to Academician V.L. Quint (foreign member of the Russian Academy of Sciences, creator of the theory of the global emerging market, developer of the general theory of strategy), strategic management is understood as "the process of formation and functioning of the strategic management system that ensures the development and long-term implementation of the strategy, its doctrine, in accordance with the competitive advantages, priorities, goals and objectives contained in them, contributing to the embodiment of the fundamental values and interests of the object of strategizing" [5, pp. 8–9]. Issues of strategic management of tourism development occupy a central place in the works of I.Z. Chkhotua, A.A. Muradov (researchers at Moscow State University named after M.V. Lomonosov, Moscow), the methodological basis of which are the works of Academician of the Russian Academy of Sciences V.L. Quint on the theory, methodology and practice of strategizing [6; 7]. Ac-

cording to V.L. Quint, “strategy is a system of searching, formulating and developing a doctrine that will ensure long-term success with its consistent and complete implementation” [8, p. 10]. However, M.K. Alimuradov and L.I. Vlasyuk (researchers at the Moscow School of Economics, Moscow State University named after M.V. Lomonosov, Moscow) identify the existing contradiction in the formation of strategic documents: “there are practically no economic entities left in the country that have not submitted strategic documents in one form or another” with “the absence of a unified understanding of the essence of strategizing processes” [9, pp. 155–156]. Revealing the identified problems, the authors conclude that “a large number of strategic documents, especially those concerning regional and sectoral strategies” demonstrate “an urgent need to form long-term concepts, optimize the use of available resources, create conditions for economic and social development, and increase the level of competitiveness of regions and sectors”, however, “adopted strategies undergo fundamental changes within a few years, leading to the impossibility of their consistent implementation, and the resources allocated to achieve the goals stated in previous versions are irretrievably lost” [9, Alimuradov M.K., Vlasyuk L.I., p. 156]. Among other reasons, Alimuradov M.K. and Vlasyuk L.I. emphasize the following: “the absence of a single, generally accepted methodology for developing regional, sectoral and corporate strategies”, “artificial substitution of strategizing processes with long-term planning and forecasting processes”, as well as “underdevelopment of the regulatory framework governing strategizing processes” [9, Alimuradov M.K., Vlasyuk L.I., p. 156]. At the same time, as I.V. Katrin, a researcher at the Northern (Arctic) Federal University named after M.V. Lomonosov (Arkhangelsk), rightly notes in his work, the issue of “the influence of federal center policy on the situation in the regions” is relevant and, in addition to theoretical significance, has practical value: “in modern Russia, the vector and pace of regional development largely depend on the degree of consistency of regional policy with the federal agenda, on the ability of the regions to “fit into” federal trends” [10, p. 29].

The issues of exploration and development of the Arctic territory of the Russian Federation are becoming increasingly relevant, materializing in an increasing number of scientific papers focusing on the Arctic [11, Lukin Yu.F.; 12, Lukin Yu.F.; 13, Sevastyanov V.D.]. A detailed analysis of the results of the implementation of the Strategy for the development of the Arctic zone of the Russian Federation and ensuring national security for the period up to 2020 is the subject of the collective work of A.V. Krutikov (Deputy Minister of the Russian Federation for the development of the Far East and the Arctic), O.O. Smirnova (Doctor of Economic Sciences) and L.K. Bocharova (Department of the World Ocean and the Arctic, Council for the Study of Productive Forces of the All-Russian Academy of Foreign Trade of the Ministry of Economic Development of Russia) [14]. The textbook by Z.Yu. Zhelnina (Associate Professor of the Department of Service and Tourism of the Murmansk Arctic State University, Murmansk), presenting the resources of a number of Arctic regions of the Russian Federation, the system of public administration and the tasks of tourism development taking into account strategies for improving the quality of life, economic, social and environmental sustainability of the territories under consideration, deserves special attention

[15]. In another work, the author analyzed changes in approaches to tourism management using the example of the Murmansk Oblast. The author concludes that "the integral task of public administration of regional tourism can be defined as achieving synchronization of the interests of subjects of entrepreneurial and public initiative in the interests of territorial development" [16, Zhelnina Z.Yu., p. 92]. It is also necessary to identify works focusing on the cluster approach to sustainable tourism development in the Arctic regions. Thus, the joint work of Professor N.N. Shchebarova and M.A. Kovaleva (Murmansk Arctic State University, Murmansk) presents an assessment of the conditions for clustering the economy of the Murmansk Oblast in the field of tourism, as well as an analysis of the tourism cluster from the standpoint of its impact on the economic potential of the region [17].

In our country, significant attention is paid to the development of tourism clusters, which is reflected in the concepts of long-term socio-economic development and in the development strategies of individual regions. As theoretical and empirical foreign studies demonstrate, the policy of shifting values from helping individual companies to supporting effective large agglomerations between participants in the recreation and tourism sectors is justified. Interaction in a tourism cluster leads to the formation of positive effects due to the presence of spatial concentration of production, as well as active mutually beneficial cooperation between participants in the chain of formation of a tourism product. But the development and implementation of municipal measures to stimulate the creation and development of tourism clusters and the assessment of their effectiveness depend on the type of existing relationships between its participants. This article discusses a cluster approach to sustainable regional development and management using the example of the Murmansk Oblast.

A separate block is represented by the works focusing on the strategizing of local territories. Thus, analyzing the Development Strategy of the Solovetsky Archipelago, Arkhangelsk Oblast (approved by the Order of the Government of the Arkhangelsk Oblast dated July 16, 2013 No. 310-rp), A. Yu. Tsvetkov, Associate Professor of the Higher School of Economics, Management and Law of the Northern (Arctic) Federal University named after M.V. Lomonosov (Arkhangelsk), points out the need for special attention to the "economic aspect of planning, increasing the efficiency of development of financing, developing infrastructure projects aimed at developing transport accessibility, improving the quality of life of the local population and the tourist attractiveness of the Solovetsky Archipelago" [18, p. 56]. In another work, the researcher, based on an assessment of the benefits of the transport and geographical position of the main destinations of the Arkhangelsk Oblast relative to the places of formation of tourist flows, using various transport schemes, describes a probable strategy for the development of tourism in the Arkhangelsk Oblast. A. Yu. Tsvetkov summarizes the study by the need to include in the strategy for the recreational development of the Arkhangelsk Oblast measures aimed at improving the transport and geographical position of the main destinations through "improving the transport infrastructure, choosing priority logistics schemes for delivering tourists" [19, pp. 49–52].

Of interest is the study of the policy documents of the Arctic states, permanent participants of the Arctic Council, observer states of the Arctic Council, the AC chairmanship program and the ministerial declaration for the period 1996–2019, conducted by Professor L. Heininen, Doctor of Social Sciences (University of Helsinki, Helsinki, Finland; Northern (Arctic) Federal University named after M.V. Lomonosov, Arkhangelsk, Russian Federation). Thus, based on the analysis of national policies/strategies, chairmanship programs and the declaration (tourism is included in the 14 selected indicators), the researcher "identified, formalized and briefly analyzed new/emerging trends in the context of the studied narratives, ideas and discourses" [20, pp. 198–202]. In the work devoted to the theoretical and methodological substantiation of tourism development in the Arctic, N.K. Kharlampyeva uses the "water-basin and water-land approaches, as well as the water-ecological principle within the framework of the integrated concept of a single aqua-territorial natural complex of the Arctic" as the basis for studying Arctic tourism, the choice of which is determined by environmental requirements for economic activity in the Arctic. The author proposes a research matrix for studying the foundations of tourism development in the Arctic, coordinating the levels of applied analysis and organization, the competence of which includes the development of Arctic tourism [21, pp. 127–128].

Despite the diversity of focuses and approaches to studying the management of tourism development in the Arctic territories, there is a lack of a comprehensive study of strategic management of tourism development in the Arctic zone of the Russian Federation, where documents of the federal and regional levels of all the regions under consideration would be interconnected. The present study is aimed at filling this gap.

Methods and data

The proposed approach based on the content analysis of strategic documents of the federal and regional levels on tourism development in the Arctic territories allows:

- to determine the key areas and priorities for tourism development in federal and regional policies;
- to identify the compliance of regional strategic directions of tourism development with the key areas of Arctic tourism development declared by the federal agenda;
- to identify general trends and regional specifics of tourism development in the Arctic.

The content analysis method applied in the work is widely used in the study of regulatory and doctrinal documents [22, Degterev D.A., Vasilyuk I.P., Baum V.V.; 23, Bokeria S.A., Kerner E.A., Kuznetsova D.A.]. The need to assess the qualitative and quantitative presence of the semantic cores established by the authors required that this particular research method be given central attention. The content analysis was conducted without the use of technological means.

The study included two main stages:

- at the first stage, the federal-level strategic documents on tourism development were analyzed in detail: the Strategy for tourism development in the Russian Federation until

2035, the Strategy for the development of the Arctic Zone of the Russian Federation and ensuring national security until 2035, the National Standard of the Russian Federation. Arctic Tourism, the Federal Law "On state support for entrepreneurial activity in the Arctic Zone of the Russian Federation", the Federal Target Program "Development of domestic and inbound tourism in the Russian Federation (2019-2025)" in order to identify keywords (semantic cores);

- at the second stage, a detailed analysis of strategic documents on tourism development in nine Arctic regions of the Russian Federation was carried out.

Thus, the study of doctrinal documents of nine Arctic regions of Russia made it possible to identify the place of Arctic topics in the development of regional tourism and the main priorities. In addition, it was possible to demonstrate the common and different in the strategic development of Arctic tourism in a meaningful and clear way, and the identification of the frequency of some semantic cores in the texts of federal documents identified trends that are reflected in varying degrees in regional strategies, concepts and programs.

The object of the study is a set of strategic documents on the development of tourism at the federal and regional levels; the subject is the compliance of regional strategic directions of tourism development with the key directions declared by the federal agenda for the tourist development of the Arctic.

The median indicators are calculated in the work.

Research results

Tourism development strategizing in the Arctic: federal level

The importance of the tourism vector of the Arctic development is emphasized by the adoption of a number of strategic documents at the federal level over the last four years, which establish the regulatory and legal regime for tourism development in the Arctic.

The Strategy for the development of tourism in the Russian Federation for the period up to 2035 is the main framework document defining the policy of the authorities in relation to the tourism industry. The Arctic is mentioned twice in this Strategy. Firstly, in the section on improving the regulatory framework for tourism activities and systemic support measures: "the implementation of the Strategy will require the development of strategic and program documents, as well as other documents for the development of individual areas of tourism, such as the Strategy for the development of Arctic tourism in the Russian Federation for the territories of the Arctic zone of the Russian Federation and the regions of the Northern Sea Route, etc." [2] Secondly, in the section on the development of cruise tourism: "the most promising areas for the development of cruise

[2] Decree of the President of the Russian Federation of 26.10.2020 N 645 (as amended on 12.11.2021) "Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035". URL: http://www.kremlin.ru/acts/bank/45972#sel=40:3:wZ,40:4:Zw (accessed 01 March 2024).

tourism in Russia will be combined river and sea cruises in the Azov-Black Sea, Caspian and Baltic basins, the development of expedition tourism, primarily in the Arctic zone" [3].

The National Standard of the Russian Federation on Arctic tourism, adopted in 2022, for the first time defines Arctic tourism as "tourism in the Arctic zone of the Russian Federation, aimed at popularizing its historical, cultural and natural potential" [4]. The Standard takes into account the complex climatic and natural features of the Arctic.

The Federal target program "Development of domestic and inbound tourism in the Russian Federation (2019–2025)" includes the project "Russian Arctic" in the Perspective tourist destinations, and the participating regions specializing in "Arctic cruises and expedition routes" include the Arkhangelsk and Murmansk oblasts, the Yamalo-Nenets Autonomous Okrug, the Krasnoyarsk Krai, and the Republic of Sakha (Yakutia). The program notes that "the process of tourist redevelopment of the Russian Arctic should also become a fundamentally new subject of state regulation, implying a systemic interconnection of many local strategies, programs, and projects at the federal, regional, and municipal levels with the interests of economic entities and investors". Chapter 23 "Proposals for the advanced development of the Arctic Zone of the Russian Federation" discusses only the development of tourism on Franz Josef Land Island and the Russian Arctic Park. However, it is indicated that "the entire Arctic region in all the diversity of its components and problems should become the object of redevelopment of the Russian Arctic for the first time, and all necessary actions should be considered as part of a single (integrated and systemically linked) regional cluster" [5]. Other regions of the Arctic zone of the Russian Federation are not considered.

The elaboration of individual measures for the "development of the tourism industry in places of traditional economic activity of indigenous peoples of the Russian Federation" is provided for in Federal Law No. 193-FZ of July 13, 2020 "On state support for entrepreneurship in the Arctic zone of the Russian Federation" [6].

Content analysis of federal documents on tourism development revealed four semantic cores that can be considered as key directions and priorities for tourism development in the Arctic: "Arctic" ("arctic"), "eco" ("ecological"), "natural" and "cruise". Summarizing the federal level of tourism strategizing in the Arctic, it can be said that the federal agenda pays special attention to the Arctic territories, for which the development of cruise and expedition tourism is defined, taking into account the difficult climatic and natural conditions and e conomic activities of the local population.

[3] Ibid.
[4] National standard of the Russian Federation. Arctic tourism. Date of introduction 2022-06-30. Developed by the Federal Agency for Tourism (Rostourism). URL: https://docs.cntd.ru/document/1200182007 (accessed 01 March 2024).
[5] Order of the Government of the Russian Federation on approval of the Concept of the federal target program "Development of domestic and inbound tourism in the Russian Federation (2019-2025)" dated May 5, 2018 No. 872-r (as amended on July 11, 2019). URL: https://docs.cntd.ru/document/557414759 (accessed 01 March 2024).
[6] Federal Law of July 13, 2020 No. 193-FZ "On state support for entrepreneurial activity in the Arctic zone of the Russian Federation". URL: https://www.consultant.ru/document/cons_doc_LAW_357078/ (accessed 01 March 2024).

Tourism development strategizing in the Arctic regions

Analysis of strategic documents of the Arctic regions reveals some specifics of the positioning of tourism development in the Arctic in documents of two levels: in the Strategies for the socio-economic development of regions and in the Concepts/Strategies/State programs for tourism development (Table 1.):

Table 1

Strategic documents of the regions of the Arctic zone of Russia

No.	Strategies for the socio-economic development	Strategies/Concepts/State programs for tourism development
1	*Murmansk Oblast*	
	Strategy for the socio-economic development of the Murmansk Oblast until 2020 and for the period until 2025	Strategy for the development of the tourism and recreation cluster of the Murmansk Oblast for 2021–2025. Order of the Government of the Murmansk Oblast dated 21.04.2021 No. 72-RP
2	*Republic of Karelia*	
	Strategy for the socio-economic development of the Republic of Karelia for the period until 2030	State Program of the Republic of Karelia "Tourism Development" (2016–2030). Resolution of the Government of the Republic of Karelia dated 28.01.2016 No. 11-P as amended on 07.12.2023.
3	*Arkhangelsk Oblast*	
	Strategies for the socio-economic development of the Arkhangelsk Oblast until 2030	Concept of tourism development in the Arkhangelsk Oblast. Resolution of the Government of the Arkhangelsk Oblast dated January 19, 2021 No. 1-pp
4	*Nenets Autonomous Okrug*	
	Strategy for the socio-economic development of the Nenets Autonomous Okrug until 2030	Strategy for the development of the tourism and recreational cluster of the Nenets Autonomous Okrug for the period up to 2022. Resolution of the Governor of the Nenets Autonomous Okrug dated December 15, 2017 N 105-pg
5	*Komi Republic*	
	Strategy for the socio-economic development of the Komi Republic for the period until 2035	Concept of tourism development in the Komi Republic for the period 2023–2028. Order of the Government of the Komi Republic dated December 19, 2023 No. 666r
6	*Yamalo-Nenets Autonomous Okrug*	
	Strategy for the socio-economic development of the Yamalo-Nenets Autonomous Okrug for the period until 2035	State program of the Yamalo-Nenets Autonomous Okrug "Development of tourism and hospitality industry" (2022–2035). Resolution of the Government of the Yamalo-Nenets Autonomous Okrug of December 22, 2021 N 1163-P
7	*Krasnoyarsk Krai*	
	Strategy for the socio-economic development of Krasnoyarsk Krai until 2030	State program of Krasnoyarsk Krai "Development of tourism" (2024–2030). Resolution of the Government of Krasnoyarsk Krai dated 27.02.2024 No. 124-p
8	*Republic of Sakha (Yakutia)*	
	Strategy for the socio-economic development of the Republic of Sakha (Yakutia) for the period until 2030 with a target vision until 2050	Strategy for the development of tourism in the Republic of Sakha (Yakutia) for the period until 2025. Order of the Government of the Republic of Sakha (Yakutia) dated

		November 20, 2020 N 1070-r
9	*Chukotka Autonomous Okrug*	
	Strategy for the socio-economic development of the Chukotka Autonomous Okrug until 2030	Strategy for the development of tourism in the Chukotka Autonomous Okrug for the period up to 2025. Order of the Government of the Chukotka Autonomous Okrug dated December 9, 2019 No. 487-rp

** Note: regions partially included in the Arctic zone of the Russian Federation are highlighted in italics.*

First of all, it should be noted that in the period 2016–2018, the Strategies for the socio-economic development of Russian regions with a planning horizon of up to 2025, 2030 and 2035 were updated, the Arctic theme was reflected in them. For example, the "Strategy for the socio-economic development of the Republic of Karelia for the period up to 2030" refers to the formation of the Karelian support zone within the framework of the implementation of the state program of the Russian Federation "Socio-economic development of the Arctic zone of the Russian Federation", which, in particular, will specialize in technologies in the field of tourism. In the section dedicated to the strategic direction "Development of tourism and the hospitality industry", it is proposed to elaborate programs for the development of inter-municipal tourist clusters "Belomorskie petroglyphs" and "Arctic Karelia" [7].

It should be noted that most regional documents on tourism development were adopted before the development of the regulatory regime for tourism development in the Arctic. It is worth paying attention to the different levels of regional tourism policy documents:

- Concepts of tourism development (Komi Republic and Arkhangelsk Oblast),
- State programs (Republic of Karelia, Yamalo-Nenets Autonomous Okrug, Krasnoyarsk Krai),
- Tourism development strategies (Chukotka Autonomous Okrug and Sakha Republic (Yakutia)) and tourism and recreational cluster (Murmansk Oblast and Nenets Autonomous Okrug).

The strategies provide the most complete analysis of the territories in terms of strengths, weaknesses, opportunities and threats (SWOT-analysis), assess accommodation facilities, transport infrastructure, list the key attractions of the region, and highlight tourism development objectives. The concepts define the general goals and guidelines for the development of the tourism industry in the region, and also contain a detailed description of the potential and resources of the territory. State programs offer a specific plan of tourism development activities with the indication of implementation dates, financing and executors. Since only the districts of four regions (Murmansk Oblast, Nenets, Chukotka and Yamalo-Nenets Autonomous okrugs) are fully included

[7] Strategy for the socio-economic development of the Republic of Karelia for the period until 2030. Order of the Government of the Republic of Karelia dated 29.12.2018 No. 899r-P (as amended on 13.04.2021). URL: https://www.consultant.ru/regbase/cgi/online.cgi?req=doc;base=RLAW904;n=599130#7RG5n6UEnE7v1YcT1 (accessed 12 March 2024).

in the Arctic zone of Russia, the analysis of documents of other regions was carried out in the part concerning the Arctic territories.

Summarizing the above, it should be noted that there is heterogeneity of regional strategic documents on tourism development, their different structuring and content due to the diversity of formats of the documents themselves. In addition, some documents of tourism development practically lack the Arctic vector, at the same time, regional strategies of socio-economic development have a separate section on tourism development with an Arctic focus (for example, in the Republic of Karelia).

Directions and priorities of tourism development in the Arctic: content analysis of regional strategic documents

The study of correlation of regional tourism development strategy with the federal agenda was conducted on the basis of content analysis of regional documents by identifying the frequency of occurrence of the selected semantic cores:

- *"Arctic" ("arctic")*: in the documents, this semantic core is used in various contexts. It refers to the Arctic zone, Arctic territories, Arctic tourism and such state programs as "Arctic hectare" or "Arctic preferences package". "Arctic" is also used to emphasize the specificity of tourism products.
- *"eco" ("ecological")*: this semantic core is used in the context of the environmental load on the tourist territory, ecosystem, the development of ecological paths and routes, as well as regional brands. It should be emphasized that the conservation of Arctic resources is one of the vectors that contribute to the responsible management of the Arctic territories.
- *"natural":* all Arctic territories are distinguished by unique natural resources, the presence of geological natural complexes and a favorable ecological situation. The semantic core "natural" is mentioned when referring to natural and infrastructural conditions, sudden natural phenomena, natural attractions, specially protected natural areas, natural ecological systems.
- *"cruise"*: it is used in the context of river and sea cruises, the development of cruise shipping, which emphasizes the special place of Arctic cruise tourism.

Visualization of the results of the content analysis of regional documents on tourism development for compliance with the trends in tourist development of the Arctic set by the federal agenda allows us to identify some general trends and specifics of the regions (Fig. 2). The frequency of mentioning the identified semantic cores on the graph is indicated as follows:

- X axis — "eco" ("ecological");
- Y axis — "natural";
- marker size — "Arctic"*;*
- color saturation — "cruise".

The Yamalo-Nenets Autonomous Okrug stands out from the general picture of following the trends of Arctic tourism development set by the federal agenda; it is not represented on the graph due to the zero values of all semantic cores. Considering that the region is fully included in the Arctic zone of the Russian Federation, this circumstance may be to some extent due to the format of the strategic document (state program), which does not allow for a detailed and meaningful consideration of the specifics of tourism development.

Among the identified semantic cores, “Arctic” (“arctic”) is the most frequent in regional strategic documents for tourism development (169 times in total). Visualization of the content analysis results clearly demonstrates that the words “Arctic” and “arctic” are most often found in the Tourism Development Strategies of the Murmansk Oblast, Chukotka Autonomous Okrug, and the Republic of Sakha (Yakutia), which makes this semantic core the most common in the texts compared to other keywords. It is noteworthy that this semantic core is mentioned in the description of specific tourism products: for example, an Arctic rally raid (Sakha Republic (Yakutia)) or “Arctic ethno village” (Chukotka Autonomous Okrug). It is noteworthy that these two regions have chosen specific types of tourism for development: mystical, yoga tours, and paleontological.

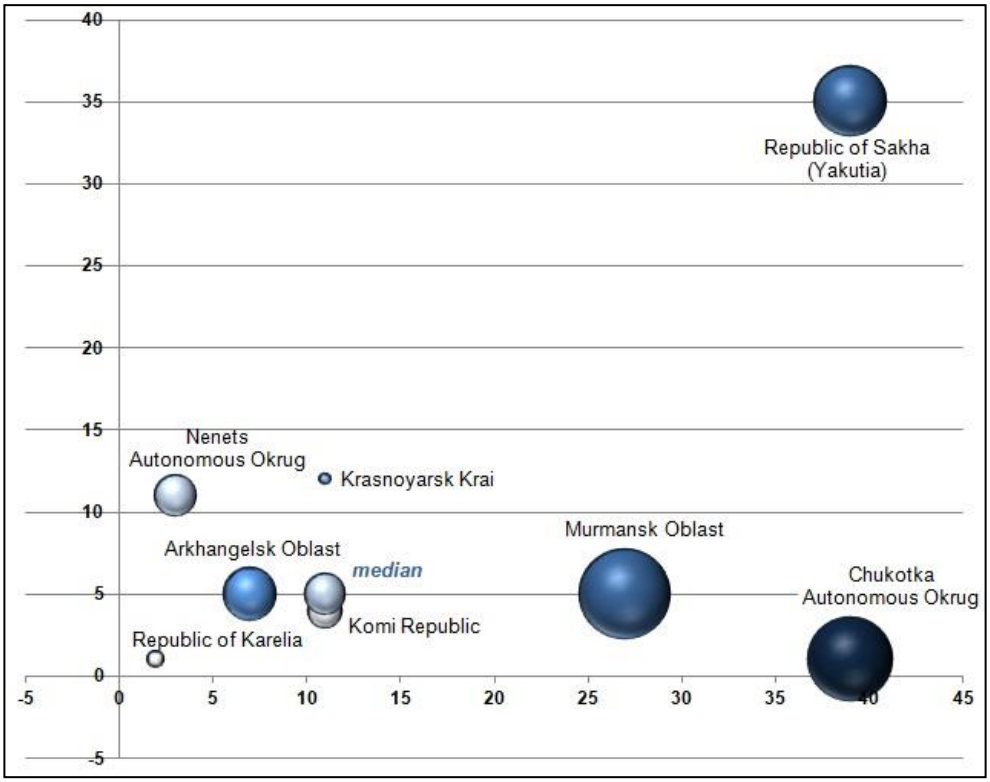

Fig. 2. Distribution of Arctic regions by frequency of semantic core mentions in regional strategic documents for tourism development [8].

The second most frequently used semantic core is “eco” or “ecological” (a total of 139 times in documents) and is most often found in regional strategic documents of the Chukotka Autonomous Okrug and the Republic of Sakha (Yakutia) — 39 times and in the Murmansk Oblast — 27 times. In addition, in the Concept for the development of tourism in the Komi Republic for the

[8] Source: calculated and compiled by the authors.

period 2023–2028, this semantic core is used to form the regional brand: "Eco Komi Republic". The high frequency demonstrates the importance of this area for these Arctic regions.

Despite the third place in terms of frequency of mention of the semantic core "cruise" in regional strategic documents (a total of 107 times), it is noteworthy that the development of cruises stands apart from the highlighted semantic cores. Thus, its indication is completely absent in three strategic documents of three Arctic regions: the Yamalo-Nenets Autonomous Okrug, the Republic of Karelia and Komi (due to this circumstance, the last two are marked with a white marker). It should be emphasized that among the Arctic regions, the Komi Republic is the only region not washed by the waters of the Arctic Ocean. In the Strategy for the development of the tourism and recreation cluster of the Nenets Autonomous Okrug until 2022, this semantic core is found only once. The highest frequency is demonstrated by the strategic documents of the Chukotka Autonomous Okrug (61 times), as well as the Republic of Sakha (Yakutia) and the Murmansk Oblast (20 and 18 times, respectively). Such a high frequency of the semantic core "cruise" in the Strategy for the development of tourism of the Chukotka Autonomous Okrug until 2025 is the peak among all semantic cores and is largely determined by the priority of the region. Thus, the implementation of projects for the development of Arctic cruise tourism is positioned as a priority task, since "sea cruises are both one of the popular forms of tourism among guests of Chukotka, and one of the two ways tourists get to the region" [9]. It is noteworthy that the Strategies of the Chukotka Autonomous Okrug and the Republic of Sakha (Yakutia) assess the world experience of developing Arctic tourism, and only the Murmansk Oblast considers the potential of neighboring Russian regions, but as competitors: "The Murmansk Oblast borders the Arkhangelsk Oblast and the Republic of Karelia. The proximity of these regions ensures the similarity of tourism and recreational resources and increases the competition for tourists with the difference in the development of tourism infrastructure and the formation of the region's brand" [10].

The fourth semantic core "natural" is least mentioned in the documents of the regions on tourism development (a total of 74 times). The greatest emphasis on the "natural" component is presented in the Strategy for tourism development in the Republic of Sakha (Yakutia) for the period up to 2025 (mentioned 35 times).

The correspondence of regional strategic directions of tourism development with the key directions of tourist development of the Arctic declared by the federal agenda is observed to a greater or lesser extent in most Arctic regions (8), the exception is the Yamalo-Nenets Autonomous Okrug. There are three regions where the correlation with the federal agenda is the most complete in terms of frequency of semantic of semantic cores in regional strategic documents for

[9] Strategy for the development of tourism in the Chukotka Autonomous Okrug for the period up to 2025. Order of the Government of the Chukotka Autonomous Okrug dated December 9, 2019 No. 487-rp. URL: https://chukotka.travel/upload/files/Chukotka_strategy_text.pdf (accessed 03 March 2024).

[10] Strategy for the development of the tourism and recreation cluster of the Murmansk Oblast for 2021–2025. Order of the Government of the Murmansk Oblast dated 21.04.2021 No. 72-RP URL: https://minec.gov-murman.ru/ppmo-ot-25.12.13-_-768_pp_20-_v-red.-ot-10.07.17_.pdf (accessed 03 March 2024).

tourism development: the Chukotka Autonomous Okrug (146 mentions of the identified semantic cores), the Republic of Sakha (Yakutia, 126 times) and the Murmansk Oblast (102 times).

At the same time, a lack of analysis of the prospects and possibilities of interregional and inter-municipal cooperation was revealed. Solving similar socio-economic problems, forming similar development directions, for example, tourist clusters, Arctic regions will inevitably face increased competition for investment, labor resources and tourists without interaction with each other. In order to strengthen competitive advantages, there is a need to search for organizational and managerial solutions for regional development. In addition, the process of filling Arctic destinations with thematic and strategic directions, which is currently taking place, should be taken into account. In this regard, as Yu.O. Vladykina, Associate Professor of the Novosibirsk State Technical University, correctly emphasizes in her work, further prospects for the concentration and unification of regional tourist zones into full-fledged tourist clusters will depend on the speed of making management decisions in regional policy and the centralization of efforts to attract tourist flows to each territory [24]. Many strategies consider the possibilities of developing international Arctic tourism together with Finland, Norway and other foreign countries, but due to the closure of borders with European countries and the deterioration of relations, joint cross-border routes are not being further developed. At the same time, there is an opportunity to strengthen interregional cooperation within the framework of developing interregional tourist routes, for example, ecological ones, since nature tourism is one of the priority types of tourism for all Arctic territories.

Conclusion

The proposed approach made it possible to identify the key directions and priorities of tourism development in federal and regional policies, the compliance of regional strategic directions of tourism development with the key areas of Arctic tourism development declared by the federal agenda, as well as general trends and regional specifics of Arctic tourism development.

The analysis of federal documents reveals special attention to the development of Arctic territories, including their tourism and recreational development. Thus, content analysis allowed us to identify four semantic cores that can be considered as key areas and priorities for tourism development in the Arctic: “Arctic” (“arctic”), “eco” (“ecological”), “natural” and “cruise”. The federal agenda pays special attention to the Arctic territories, for which the development of cruise and expedition tourism is defined, taking into account the difficult climatic and natural conditions, as well as the economic activities of the local population. The analysis of regional strategic documents on tourism development reveals the existing content heterogeneity and their different structuring due to the diversity of the formats of the documents themselves.

Among the four semantic cores identified from federal documents, the most common is “Arctic” (“arctic”), occurring a total of 169 times. The following semantic cores are presented in descending order: “eco” or “ecological” (similarly, 139 times), “cruise” (107 times) and “natural” (74 times).

The correspondence of regional strategic directions of tourism development to the key directions of Arctic tourism development declared by the federal agenda is observed to a greater or lesser extent in eight out of nine Arctic regions. Among the Arctic territories, three regions can be identified where, from the standpoint of the frequency of semantic cores in regional strategic documents on tourism development, the most complete correlation with the federal agenda is observed: the Chukotka Autonomous Okrug (the selected semantic cores are mentioned 146 times), the Republic of Sakha (Yakutia, 126 times) and the Murmansk Oblast (102 times). The Yamalo-Nenets Autonomous Okrug stands out from the general picture of following the trends set by the federal agenda, where none of the selected semantic cores is found. Considering that the region is entirely part of the Arctic zone of the Russian Federation, this circumstance may be to some extent due to the format of the strategic document (state program), which does not allow for a detailed and meaningful consideration of the specifics of tourism development.

According to regional strategic documents, Arctic tourism is considered as a complex that includes various tourism areas, such as cultural and educational, natural and ecological, event, children's and youth, ethnographic, active, as well as rare types of tourism (mystical, yoga tours, paleontological). Meanwhile, natural and ecological tourism are distinguished both as key areas of tourist development of the Arctic territories and as contributing to responsible management of the Arctic.

At the same time, the analysis revealed the lack of assessment of the opportunities and prospects for the development of interregional and inter-municipal cooperation. Further research will be aimed at studying the prospects and potential areas of interregional cooperation of the Arctic regions in the field of tourism in order to develop recommendations for regional, municipal authorities, tourism business to stimulate the development of domestic and international inbound tourism.

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Modern Tourist Practices of the Northern and Arctic Territories

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Abstract. The ideas of northern and Arctic tourism are relevant in the modern world. Currently, northern tourism is becoming more and more popular among people with medium and high incomes in different countries, including Russia, and the trend of its development is positive. The purpose of this study is to show the relevance of tourism development in the northern and Arctic territories, to identify current trends and the need of people for the development of such tourism. The Arctic is becoming an increasingly popular tourist destination. The increased interest in tourism in the Arctic has led to the creation of appropriate infrastructure and has had an impact on the region and the people who inhabit it. It has also impacted the cultural identity and traditional livelihoods of the region. In particular, the recent rapid growth of tourism and related activities will have a permanent impact on the environment and cultures of the Arctic. The article presents an analysis of modern research on this topic. The author's research of ethnocultural tourism in the northern territories of the Karelian borderland is shown. Conclusions about the necessity of tourism development on the northern border territories and in the Arctic zones are made.
Keywords: *tourism, Arctic, ethno-futurism, regional economy, northern regions*

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Theoretical approaches: Russian and foreign experience

Since the 1980s, due to the rapid development of the global economy, people's demands for quality of life and spiritual needs have been constantly increasing; this has led to the development of ecotourism and cultural tourism in the northern territories. Arctic regions attract the attention of tourists from all over the world with their spectacular ice and snow landscapes, as well as the cultural characteristics of various indigenous peoples. In addition to indigenous cultures, the history of the exploration of these territories by other peoples is attractive.

Some authors have noted the comparative lack of research on the opinions of representatives of Arctic communities that are directly affected in this context, especially with regard to sustainable development issues [1, Boluk K.A., Cavaliere C.T., Higgins-Desbiolles F.]. In this regard, the authors A.A. Grenier and D.K. Müller argue that states with Arctic territories seek to support and legitimize claims to sovereignty in the region through tourism, arguing that "a functioning tourism

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industry satisfies certain legal requirements for international recognition", namely, it proves that "human habitation" is possible in the relevant place, demonstrates "state functions/responsibilities" [2].

For example, Canada has used Arctic tourism as a means of strengthening its claims to sovereignty, referring to the presence of indigenous peoples: "Indigenous peoples of the North play a decisive role in the development of tourism in the Arctic territories, [...] emphasizing local tourism" [3, Mahoney I., Collins V.E.].

Russian authors, for example T.N. Menshikova, believe that "northern" tourism can be developed through the creation of tourist clusters [4]. D.Z. Mesablishvili considers a promising and more convenient route for Arctic tourism through the development of air links: the movement of tourists via Helsinki (Finland), then Oslo (Norway), and then to the Spitsbergen Islands, Iceland or Greenland (3 Arctic islands) [5]. S.A. Agarkov considered the route for tourists that would attract the attention of foreigners: the main attractions are the walrus rookery on Apollon Island, the wooden house of Eira, built in 1881 on Bell Island, Tikhaya Bay, the capital of the archipelago in Soviet times, the bird paradise on Rubini Rock and the garden of stone spheres on Champion Island [6]. Volcanoes and interesting landscapes can also be seen on the territory of Chukotka.

Current tourism-based narratives of state influence in the Arctic include non-Arctic or "near-Arctic" entities. Perhaps the most striking example of this is the debate around Chinese investment in Arctic tourism. L. James, L. Smed Olsen and A. Karlsdóttir [7] examined the potential of countries located within or near the Arctic Circle, including Norway, Sweden, Finland, Iceland and Canada. According to the authors, they have become "prime" destinations for observing the mystical aurora borealis and benefiting from the growth of the industry due to this phenomenon. In 2020, the global polar travel market was valued at $ 830.5 million USD and is projected to grow at a compound annual growth rate of 10.28% between 2023 and 2031, reaching $ 2,003.6 million USD [7, James L., Olsen L.S., Karlsdóttir A.].

The unique tourist and recreational potential of the territories, along with preserved original traditions, local culture and hospitality of the local population, attracts increasing flows of Russian and foreign tourists (except for the period of restrictions of the COVID-19 pandemic) [8, Kondratyeva S.V.].

Modern tourist practices in the Arctic

Today, expedition cruises in the Arctic are becoming increasingly popular in the regions, for example, in Russia, Canada and Scandinavia. They offer a unique experience, combining natural beauty, cultural heritage and excursions to historical sites [9, Kruzhalin V.I., Shabalina N.V. et al.]. If we consider tourism from a cultural point of view, then tourists have the opportunity to immerse in the amazing world of indigenous peoples, culture and traditions. Travelers can visit ancient settlements, get acquainted with local customs, try national cuisine, participate in traditional events and get acquainted with the history and myths of these unique cultures.

Cruises and polar “safaris” allow tourists to see the beauty of the northern territory, see the polar lights and look at the animals that inhabit the northern territories from a safe distance. As for expeditions, the emphasis is on more remote northern territories. Such trips include hiking, kayaking, cycling, etc. One of the promising areas is ice trekking. This includes walks on glaciers and snow covers of the polar regions with the opportunity to visit deep ice caves and other unique places. Winter recreation is popular everywhere today and include skiing, snowboarding, snowmobiles, dog sledding, ski jumps, etc.

Among many types of cultural tourism, one of the most democratic and interesting is gastronomic tourism. It involves not only tasting national dishes, but also full acquaintance with the technology of cooking. Some professional participants of the gastronomic market consider the purchase of a gastronomic tour as an opportunity to improve their skills and undergo professional training. Within the framework of such tours, various kinds of master classes, excursion practice, and so on are gaining great relevance. A gastronomic tour should be considered as an option for a unique vacation, where the emphasis is on tasting drinks and dishes, learning how to cook them. At the same time, it allows getting closer and understanding the culture and mentality of local people. Complex programs and gastronomic tours solve several tasks at once. Firstly, tasting of drinks and dishes is organized to understand the cultural characteristics of the region through food. Secondly, special knowledge on technologies of preparation of specific dishes of national and regional cuisine is obtained, which allows adopting experience and foreign cultural values.

Gastronomic tourism can be part of a complex tour or have some features of other types of tourism, by which it is possible to classify:

- rural (“green”) gastronomic tourism;
- business (urban) gastronomic tourism;
- event (festival) gastronomic tourism;
- cultural-educational and gastronomic tourism [10, Nekhaeva N.E., Terekhova Yu.S.].

Visiting the Arctic and adjacent regions is possible mainly in the summer period. In the rest of the year, these destinations are less attractive, since this is a risky project from an investment point of view. The development of gastronomic tourism in Russia is hampered by the lack of close ties between the travel companies themselves and the producers of the products. The creation of the necessary infrastructure for the development of gastronomic tourism requires large investments from the companies themselves. The enterprises in the field of food and beverage production are still closed to prying eyes. The influence of gastronomic tourism can diversify the economy of the regions with complex agricultural elements, thereby preventing stagnation.

In some regions, one of the reasons for the development of gastronomic tourism is the situation with the lack of a single theme for organizing tours. At the moment, there are many different festivals with an ethnic focus in Russia. Within the framework of these festivals, there is a practice of organizing fairs of small or large farms. However, in order for tourists to be interested

in getting to know the region, and therefore the country as a whole, the organizers of such festivals need to develop the topic of gastronomic tourism as a separate block.

It is important that guest house owners, tour operators, event managers, businessmen and other persons involved in tourism activities in the Arctic should base their innovations on real historical and cultural elements of the region, not on fictitious products, despite the fact that tourists are also interested in the new: from the point of view of protecting the unique cultures of the Russian North, this is a careless act [11, Morozov A.A.].

According to a recent report from the United Nations Environment Programme, Arctic marine tourism has increased by almost 500% in the last 15 years, while land-based tourism activity has grown by almost 800% over the past decade [1]. According to a recent study, the Arctic expedition cruise industry makes a significant contribution to the local economy, accounting for two-thirds of the total investment, while traditional cruises contribute only one-third. Despite safety and environmental concerns, there is significant potential for future economic and social changes that favor the development of a polar cruise industry in the Arctic [2].

Tourism in Svalbard could be part of the diversification of Russia's presence in the Arctic. In addition to Russia, Norway is also concerned about this: by 2027, it is planned to close a Norwegian coal mine and switch to renewable energy sources [3]. At present, the domestic polar tourism market accounts for an increasing share of the world market every year, and foreign monopolies should be gradually reduced. Once China's polar tourism enterprises can carry out polar tourism projects relatively independently, they will be able to formulate rules and use resources. In terms of greater autonomy, it can better protect the rights and interests of domestic tourists; by reducing agent costs, lowering operating costs and reflecting higher price competitiveness, the consumer market will expand.

Current challenges to the tourism business and local community

However, despite the natural and cultural diversity of the Arctic, typical activities in northern Finland, for example, are also common to other Arctic destinations such as Longyearbyen (Norway), Sisimiut (Greenland), Tromsø (Norway), Whitehorse (Canada) or Fairbanks (USA) [3, Mahoney, Collins]. Furthermore, the tourist regions of northern Europe are experiencing an increase in tourism due to the increasing relativization [4] of tourism and increasing simplification of space, which we suggest can be understood as a process associated with "arctification" [12, Varnajot A., Saarinen J.]. Like regional brands, tourist seasons are increasingly shaped by marketing

[1] United Nations Environment Programme. URL: http://www.unep.org/ (accessed 15 February 2024).
[2] Ren C., Chimirri D. Arctic Tourism — More than an Industry? The Arctic Institute. April, 2018. URL: https://www.thearcticinstitute.org/arctic-tourism-industry (accessed 15 February 2024).
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[4] Refusal to give something absolute meaning; correlating something with some point of reference, with some standard, reference point, measure, etc.

and global ideals of leisure. Russian Arctic tourism, for example, is associated with “new” seasons and products, including summer and autumn tourism with excursions, mountain biking, gastro-tourism, ethno-cultural tourism and viewing the northern lights.

The process of “arctification” can also have negative consequences for local tourism industries and communities. Firstly, stereotypical images of the North and the Arctic can lead to an emphasis on the winter season in tourism and, consequently, ignoring the seasonal dynamics of the North and the associated environmental changes.

At worst, the result of formulaic promotion is a loss of the uniqueness of the destination and region due to the replication of successful place branding strategies from other sources. Secondly, “arctification” may change the labor force structure in tourism and therefore challenge the extent to which the tourism experience reflects the values and contributions of local residents, attracting increasing numbers of seasonal workers from other areas, regions, countries [13]. Consequently, the tourism sector remains vulnerable to cycles of “ups and downs” and economic instability, resulting in sudden declines in demand and revenues.

Finally, the “arctification” process raises concerns about climate change, particularly its impact on the cryosphere. [13] As a result, some authors argue that tour operators have become overly dependent on climate elements desired by visitors that they cannot control. This situation becomes critical when the Arctic weather does not match the tourists’ expectations.

Regional practices of tourism development in the Arctic

Speaking about regional features of Arctic tourism, it is necessary to consider them in each region separately, since each of them can have both common features inherent to Arctic tourism in general, and individual ones. Among the individual features that distinguish northern and Arctic tourism from others is the presence of various indigenous cultures of the peoples of Russia and the natural and geographical features of the territories.

Next, let us consider some features of the Arctic regions of Russia, what information they offer in the public domain.

For example, tourism in the Murmansk Oblast is based on sports tourism, gastronomic and ethno-cultural tourism. There are many tourist routes in the region: from visiting the urban environment to staying and learning about indigenous culture and reindeer herding. The presence of mountains and hills allows for the development of sports tourism: skiing, skateboarding, hiking.

The Arkhangelsk Oblast offers various types of sports tourism, for example, snowmobile and ski tours, various rafting trips; cultural and educational tourism — visiting museums, fortresses, various festivals.

The Komi Republic offers to touch the past and study the history of the Old Believers of this territory.

The Nenets Autonomous Okrug (NAO) is one of the youngest Russian regions, while administratively it is part of the Arkhangelsk Oblast. This is the most sparsely populated subject of the

Russian Federation, but it is also important in the general system of development of the Arctic territories. The peculiarity of this region is the presence of indigenous peoples, whose culture can be learnt by visiting this territory. The region has various museums, including a museum-reserve and an ethnographic museum, as well as various nature reserves. Important elements are archaeological monuments, as well as different waterways — rivers and lakes. Tours for fishermen and hunters are carried out on the territory. Various festivals are held in the region — reindeer sled races, snowmobiles, smelt festival and others.

The Yamalo-Nenets Autonomous Okrug offers such types of tourism as skiing, ethno-cultural, photographic, water, event, ecological, mountain (hiking). On the territory of the YaNAO, there is a natural and ethnographic open-air park-museum "Zhivun", where various events are held. There are tours for fishermen and hunters.

In the districts of Krasnoyarsk Krai there are many tours related to the typical Arctic tourism themes.

The features of Arctic tourism in the Chukotka Autonomous Okrug (ChAO) are determined by its natural features and the presence of indigenous cultures. There are many recreational opportunities in the Chukotka AO: fishing, hunting, conditions for ecological, ethnographic, scientific and adventure tours. In addition, an important element is the availability of scientific tourism.

Since 2020, the development of domestic tourism has increased significantly, especially in the European part of the Russian Federation, and one of the most popular types of tourism in the Arctic and the Northern territories is ethno-cultural and educational tourism [14, Belaya R.V., Morozova T.V., Kozyreva G.B. et al.]. Next, we will consider the potential of such tourism using the example of a sociological survey of tourists in the territories of the Republic of Karelia and in Northern Karelia in Finland. The research was conducted in 2019, and as a result of it the database "Ethno-cultural potential in the tourism industry of border territories — a survey of tourists in the Republic of Karelia (Russia) and Northern Karelia (Finland) in 2019" was registered, Certificate of Database Registration No. 2021620812, 22.04.2021 [5].

The respondents were citizens arriving in the above-mentioned territories and positioning themselves as consumers of tourist services, staying for rest and accommodation in organized places of stay (hotels, inns, cottages, recreation centers, etc.). The study analyzed the popularity of tourism products with elements of traditional and modern culture among tourists. The information base of the study was data obtained in the framework of a sociological survey of tourists in the territory of the studied destination, including border regions: the Republic of Karelia (Russia) and Northern Karelia (Finland). The sample consisted of 805 respondents. Of these, 424 respondents travelled in the Republic of Karelia (Russia) and 381 respondents — in Northern Karelia (Finland).

[5] "Ethno-cultural potential in the tourism industry of border territories — a survey of tourists in the Republic of Karelia (Russia) and Northern Karelia (Finland) in 2019". Morozova T.V., Belaya R.V., Kozyreva G.B., Morozov A.A. Database Registration Certificate No. 2021620812, 22 April 2021. Application No. 2021620705 dated 15 April 2021.

The analysis of tourists' responses on the ratio of traditional and modern cultural elements in a tourist product showed the following (Table 1): 95.1% of respondents from the sample answered the question "Which types of ethno-cultural tourist products from those offered below are of the greatest interest to you?". The demand for traditional cultural tourist products without strong interference of modern cultural elements dominates on the tourist market in Karelia (more than 50%). More than one third of tourists prefer to use elements of traditional culture in combination with elements of modern culture in music, design, clothing, etc. About 10% of tourists prefer only tourist products of modern culture.

Table 1

Respondents' attitudes to types of ethno-cultural tourist products, % [6]

Indicators	Region of tourist residence				Total of sample
	Moscow	Saint Petersburg	Karelia	Other regions of Russia	
Tour products of traditional culture, without strong interference of modern elements	63.6	48.4	48.1	61.6	55.5
Tour products of modern culture with inclusion of elements of traditional culture	27.3	43.8	38.5	32.0	35.3
Tour products of modern culture with little or no connection to local cultural heritage	9.1	7.8	13.5	6.4	9.2
Number of respondents answering, %	90.2	94.1	97.2	96.2	95.1

In the regional context, tourists from Moscow and other regions of Russia prefer tourist products with traditional cultural elements only (more than 60%). Tourists from St. Petersburg and Karelia support such tourist products to a lesser extent (about 50%) and also prefer a combination of traditional and modern cultural elements. Increased demand for tourist products without the intervention of cultural heritage elements is observed among tourists — residents of Karelia (more than 10%).

The potential demand of tourists for the purchase tourist products with ethno-cultural content is revealed not only through indicators related to tourists' interest in cultural heritage elements, but also, perhaps to a greater extent, through indicators of tourists' readiness to purchase tourist products with ethno-cultural content. According to the survey, 97% of tourists from Karelia are ready to engage in the purchase of tourist products with ethno-cultural content. In terms of tourist product elements, traditional craft skills are the most popular (about half of the tourists would like to purchase such a tourist product). The following are highly popular (40%) with a slight difference: historical and cultural heritage of the region; traditional cuisine; new information about the cultural traditions of the territory: holidays, songs, dances, folk crafts, etc.

[6] Source: compiled by the author.

In the regional context, there are differences and peculiarities in the preferences of tourists (Table 2). Tourists from Moscow are less inclined to choose the historical and literary heritage of the region, cultural traditions (songs, festivals, etc.) and traditional cuisine (less than 30%) when forming a tourist product. Tourists from St. Petersburg, in comparison with other regions, are distinguished by a high interest in the historical and literary heritage of the region and traditional craft skills (more than 50%), traditional cuisine (about 60%) and discovering the traditional culture of the region through modern ethno-futuristic forms (about 50%). A distinctive feature of tourists from Karelia is their high interest in new information about the cultural traditions of the territory: holidays, songs, dances, folk crafts, etc. (more than 45%). Tourists from other regions, like tourists from St. Petersburg, are characterized by a high readiness to get acquainted with the historical and literary heritage of the region: folklore, legends, chronicles, tales, stories, etc. (more than 50%) and, to a lesser extent, compared to others, prefer traditional craft skills and acquaintance with traditional culture through modern ethno-futuristic forms.

Table 2

Respondents' answers to questions about the attractiveness of various elements of cultural heritage [7]

Indicators	Region of tourist residence (share of tourists from the region, %)				Total of sample
	Moscow	Saint Petersburg	Karelia	Other regions of Russia	
Historical and literary heritage of the region: folklore, legends, chronicles, tales, etc.	24.6	52.9	34.6	52.3	42.6
New information on cultural traditions of the territory: holidays, songs, dances, folk crafts, etc.	24.6	44.1	46.7	39.2	39.9
Traditional craft skills: weaving, embroidery, wooden architecture, working with metal, clay, wood, sewing, etc.	42.6	55.9	47.7	39.2	45.4
Learning about traditional culture through modern ethno-futuristic forms: in music (e.g. folk style), design of modern housing, clothes, everyday life with elements of traditional culture, etc.	32.8	48.5	37.4	26.9	35.0
Discovering traditional cuisine	29.5	58.8	39.3	37.7	40.7
Other	1.6	1.5	1.9	0.8	1.4
Number of respondents, %	91.8	97.1	100.0	96.9	97.0

[7] Source: compiled by the author.

The research data revealed the interest of tourists in tourist products of traditional culture (90.8%) of the territory of the Republic of Karelia destination and the readiness of tourists to purchase tourist products of ethno-cultural content (97%). The coincidence of interest and readiness indicates the presence of potential demand for ethno-cultural tourism in the tourism market in the Republic of Karelia, including in the Arctic regions of the Republic.

In 2023, the author conducted a pilot study with a similar topic. Based on the results of the study, the database "Measuring the dynamics of factors of tourist attractiveness of a region based on survey methods" was registered [8]. It can be concluded that tourists started travelling more often both to Karelia and its Arctic areas and to the regions of North-West Russia as a whole. People have become more attracted to this national and cultural diversity. In gastronomic establishments, people more often want to see local dishes, menus are often bilingual or in the local language. People have become slightly more interested in various modern types of cultural expressions with ethnic elements. All this is already, in reality, having a positive effect on the economic situation in the region. Compared to the results of the 2019 study, in 2023 people became more interested in the traditional component of northern cultures than in the ethno-futuristic one. But despite this, tourists' interest in all cultural elements offered by actors is growing. Of course, 2020 and 2021 made their own adjustments to the sphere of domestic tourism. However, in the Republic of Karelia and the Murmansk Oblast, even in 2020, the growth in tourist flow was positive, and after the removal of COVID restrictions, it increased and continues to grow [15, Morozov A.A.].

Conclusion

Tourism in the northern and Arctic regions of Russia is currently experiencing some difficulties due to the uncertain political situation and sanctions pressure. In this regard, in March 2022, Western countries announced the suspension of participation in any events in protest against the events in Eastern Europe. However, despite this, the tourism industry in the Russian Arctic is on the rise and is becoming an integral part of its culture and economy. Nowadays, special attention should be paid to the impact of tourism on remote Arctic communities, the natural environment and its resources. The development of new technologies means that larger ships will be able to navigate the northern hemisphere, bringing natural economic benefits to local industry and tourism.

Over the decades of development, the international Arctic tourism industry has become more mature and streamlined, appropriate management organizations and legal systems have been created. The polar tourism industry in our country was formed late, but in recent years it has developed rapidly.

The growth of tourism in the northern and Arctic territories has been increasing over the last five years, therefore, government authorities, businesses and local communities of these terri-

[8] Morozov A.A. Measuring the dynamics of factors of tourist attractiveness of a region based on survey methods. Database registration certificate No. 2023621429, 10 May 2023.

tories should pay special attention to project activities and initiatives of the local population, as not only nature but also people make this territory unique. Attention should be paid to the development of indigenous languages and cultures in the northern and Arctic territories. It makes special sense to support initiatives to develop the ancestry of local people. This will only increase patriotism in local societies, which can significantly influence the attention of residents to their own territories. Support for socially oriented projects remains an important criterion.

Russia should resolve external uncertainties as soon as possible, improve existing laws and regulations and accelerate integration with the international polar tourism industry; take advantage of the country's opportunity to actively develop tourism, create its own polar tourism brand and open the domestic market to improve the professional level of practitioners; conduct preliminary data collection and field visits to fully understand the type, distribution and characteristics of polar tourism resources, and create an appropriate assessment system. In addition, attention should also be paid to indigenous cultures. The number of indigenous and small peoples in the Arctic territories is rapidly declining.

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Level and Rate of Population Ageing in the Northern Regions of Russia According to the New Retirement Age

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Abstract. The article is devoted to the peculiarities of demographic ageing in the northern regions of Russia in accordance with the new economic threshold of old age. The relevance of the research is conditioned by the gradual increase of the retirement age in Russia and preservation of the favorable retirement age in the North. The information base is the results of the population censuses and the official data of Rosstat. The dynamic and comparative statistical analysis and demographic research methods are used. Regularities of ageing of the Russian population by new retirement age in different inter-census periods are revealed. The period of 1959–1970 is characterized by "ageing from below" due to the transition to limited fertility, and "ageing from above" under conditions of increasing life expectancy of the population. The periods of 1970–1979 and 1989–2002 are characterized by "ageing from below". Within the periods of 1979–1989 and 2002–2010, there was a decrease in the level of ageing of the population in Russia. The last intercensal period of 2010–2021 is the only one for which the definition of "ageing from above" is suitable. By 1989, the North zone had a noticeably younger age structure of the population than in the country as a whole. The migration outflow that began in the late 1980s caused the increased rates of demographic ageing of the Northern regions, which also continued in 2002–2010. As a result, in Karelia and the Arkhangelsk Oblast, the share of the population above the new retirement age in 2021 already noticeably exceeds the average Russian level, while in the Sakhalin Oblast, the Komi Republic and the Murmansk Oblast, it is close to the national level.

Keywords: *age structure of the population, demographic ageing, retirement age, economic threshold of old age, northern regions of Russia*

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Introduction

Demographic ageing is an increase in the proportion of elderly and old people in the total population, caused by long-term changes in the nature of its reproduction [1, Pirozhkov S.I., p. 117]. Along with the general population growth, increased international migration and urbaniza-

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tion, the UN considers population ageing to be one of the global demographic "megatrends" [1] [2] that has a long-term impact on global development.

A number of scales based on different values of the old age threshold are used to measure the degree of demographic ageing. In Russia and the countries where a significant portion of the population retires at 60, the J. Beauje-Garnier – E. Rosset scale with the old age threshold of 60 years is the most widely used [2, Dobrokhleb V.G., p. 185]. In economically developed countries, another boundary of old age — 65 years — is traditionally used as a criterion for identifying the elderly population for statistical purposes. In recent years, the UN has increasingly applied this threshold not only to developed countries, but also to the population of the entire world [2].

Both old-age thresholds are tied to the upper limit of working age. This is logical, since it is the number of people of retirement age and their share in the population that determine the economic aspects of population ageing, and it is the transition to the working-age boundary that determines the formation of a new social status of a person with the whole complex of socio-psychological consequences of ageing. Therefore, in our previous studies on demographic ageing [3, Popova L.A.; 4, Popova L.A., Zorina E.N.; 5, Popova L.A., Zorina E.N.], we adhered to the economic threshold of old age, i.e. the age of retirement, rather than the age of 60 for both genders traditionally used in Russian studies on ageing [6, Dobrokhleb V.G., Barsukov V.N.; 7, Safarova G.L.; 8, Shabunova A.A.], or 65 as in foreign ones [9; 10; 11, d'Albis H., Collard F.; 14, Belgrave L.L., Sayed B.A.; 13, Brunow S., Hirte G.; 14, Casamatta G., Batte L.] [3]. Since 1932, when the retirement age was legislatively established in the USSR (60 years for men and 55 years for women), the retirement age in the country has not changed [15, Roik V.D.], population censuses made it possible to correctly analyze the level and rate of ageing of the population of Russia and individual regions based on the dynamics of the number and proportion of the population over working age.

On January 1, 2019, the law on a gradual increase in the retirement age came into force in Russia [4], according to which the upper limit of working age for men will increase to 65 years, and for women — to 60 years by 2028. The All-Russian population census conducted as of October 1, 2021, classified men aged 61.5 years and older and women aged 56.5 years and older as the population of older working age [5]. Previous censuses included men aged 60 years and older and women aged 55 years and older in this category. The upcoming and subsequent censuses will include men aged 65 years and older and women aged 60 years and older in the population of older working

[1] Report of the Secretary-General on the review and appraisal of the Programme of Action of the International Conference on Population and Development and its contribution to the follow-up and review of the 2030 Agenda for Sustainable Development (E/CN.9/2019/2). URL: http://www.un.org/ (accessed 21 December 2023).
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[5] Official website of Rosstat. URL: https://rosstat.gov.ru/ (accessed 21 December 2023).

age, in accordance with the new retirement age. Thus, the continuity of research on the regularities of ageing of the population of Russia and its regions by the economic threshold of old age in different periods of time is disrupted — it is necessary to bring them to a single criterion. The purpose of this article is to identify the characteristics of demographic ageing in the northern regions of Russia in accordance with the new retirement age.

Research methods

The methodological basis of the study is the general scientific methods of analysis, synthesis, comparison and generalization. The work uses a systems approach, dynamic and comparative analysis, statistical and demographic research methods, and a tabular data visualization technique. The theoretical basis of the study is the scientific works of leading demographers, sociologists and economists devoted to the study of demographic ageing. The information base was the results of population censuses and official data from Rosstat.

Research results

Demographic ageing is traditionally distinguished by "ageing from below", which occurs due to a gradual reduction in the number of children due to a decline in the birth rate, and "ageing from above", caused by an increase in the number of old people as a result of a reduction in mortality in old age with a relatively slow increase in the number of children [1, Pirozhkov S.I., p. 117]. The direction and intensity of migration processes have a significant impact on changes in the age structure of the population: since people of active working age are characterized by the greatest territorial mobility, the migration inflow of the population contributes to the rejuvenation of the age structure, and the outflow — to the ageing of the population. The rate of ageing may also depend on the characteristics of the demographic history of the country, increasing during periods when generations born in years of high birth rates reach the threshold of old age [4, Popova L.A., Zorina E.N., p. 8].

In Russia as a whole, the proportion of the population above the new retirement age (men aged 65 and older and women aged 60 and older) has increased more than 2.5 times over the past 60 years: from 8.0% in 1959 to 20.3% in 2021 [6] (Table 1). The share of the population of these ages in the adult population (16 years and older) has increased more than 2 times during this time: from 11.4% to 24.4%.

Table 1

Age structure of the Russian population based on census data according to the new retirement age, % [7]

Year	Population aged 0–15 years	Men aged 16–64 years and women aged 16–59 years	Men aged 65 years and older and women aged 60 and older	Proportion of men 65 years and older and women 60 years and older in the population 16 years and older
1959*	29.9	62.1	8.0	11.4

[6] Official website of Rosstat. URL: https://rosstat.gov.ru/ (accessed 21 December 2023).
[7] Source: calculated by the authors on the basis of Rosstat data. URL: https://rosstat.gov.ru/

1970*	28.6	60.9	10.5	14.7
1979*	23.3	64.3	12.4	16.2
1989*	24.5	64.2	11.3	15.0
2002	18.1	65.6	16.2	19.8
2010	16.2	67.9	16.0	19.0
2021	16.8	62.9	20.3	24.4

* RSFSR

Our statistical and demographic analysis of the level and rate of ageing of the Russian population according to the new retirement age revealed that different inter-census periods are characterized by different patterns of ageing according to the new economic threshold of old age.

- In 1959–1970, there were both “ageing from below”, in the context of the population’s transition to having few children, and “ageing from above”, due to the increase in the life expectancy as part of the completion of the first stage of the epidemiological revolution.
- The inter-census period of 1970–1979, against the backdrop of a continuing decline in the birth rate, is characterized by “ageing from below”, restrained by the achievement of working age by numerous generations of the post-war compensatory rise in the birth rate and the beginning of migration growth.
- The period of 1979–1989 is characterized by a decrease in the proportion and size of the population over the new retirement age, caused by an increase in the birth rate under the influence of the pro-family demographic policy of the 1980s, a decrease in mortality among the working-age population as a result of the anti-alcohol campaign of 1985, as well as the attainment of older ages by the generations born in the 1920s, who suffered significant losses during the Great Patriotic War.
- The inter-census period of 1989–2002 is characterized by the highest rates of ageing. This is based on a decrease in the birth rate throughout almost the entire period and an extremely high mortality rate in the working-age population — two mutually reinforcing “ageing from below” are observed. The demographic history also contributed to the ageing of the population during these years, since among the population reaching old ages, the generations that had suffered enormous losses during the war were gradually replaced by generations that did not take part in it. At the same time, external migration slightly restrained the rate of ageing.
- Within the period of 2002–2010, there was a slight decrease in the number and proportion of the population over the new retirement age in Russia, which, in our opinion, was due to the legacy of the mortality crisis of the 1990s and the increased registration of Russian citizenship by migrants from neighboring countries in the context of the improvement of Russian migration legislation.
- The last inter-census period 2010–2021 is, in fact, the only one in Russia for which the definition of “ageing from above” is appropriate. With the recovery of the positive trend in life expectancy (after a two-year decline in the context of the COVID-19 pandemic, the

indicator increased to 72.7 years in 2022 [8]) and the forthcoming structural increase in the birth rate in the nearest future, "ageing from above" has a chance to become sustainable in Russia.

Differences in demographic processes in Russia's regions cause significant regional disparity in the level and rates of population ageing. Due to the high birth rate, the Republic of Ingushetia is characterized by the youngest age structure, despite the highest life expectancy rate in the country. According to the 2021 census [9], only 6.6% of the region's population was older than the new retirement age, compared to 20.3% in the country as a whole. Low birth rates and good life expectancy indicators in Moscow and St. Petersburg determine a significant level of demographic ageing of the capitals, even in the context of a stable migration inflow of the working-age population: 21.0% of the population in Moscow and 21.5% in St. Petersburg is older than the new economic threshold of old age. The large-scale migration outflow of young people determines the most significant national level of population ageing in the Kirov Oblast (24.8% in 2021).

In the North zone (the article considers 13 subjects of the Federation, the territories of which are entirely related to the Far North and equated areas, for which information for dynamic analysis is available) migration is also a determining factor in the level and rate of population ageing. Due to the long history of migration character of population formation, the North had a noticeably younger age structure by 1989 than Russia as a whole. The shares of children and working-age people in almost all northern subjects exceeded the Russian average. Only in the Republic of Tyva, the specific weight of the working-age population against the background of a very significant share of children was slightly lower than the average for the RSFSR [4, Popova L.A., Zorina E.N., p. 12].

Accordingly, the percentage of retirement ages in the northern regions was significantly lower than the Russian average. Only in Karelia and the Arkhangelsk Oblast, the specific weight of the population above the new retirement age in 1989 was comparable with the all-Russian level: 10.7% each compared to 11.3% for the RSFSR as a whole [10] (Table 2). In the Chukotka and Yamalo-Nenets Autonomous okrugs, the proportion of older people was 10 times less than the Russian average, in the Khanty-Mansi Autonomous Okrug and the Magadan Oblast — 5.5 times lower, in the Kamchatka Krai, the Sakha (Yakutia) and Tyva republics, the Nenets Autonomous Okrug, the Murmansk and Sakhalin oblasts and the Komi Republic it was 3.4 to 1.7 times lower.

Table 2

Share of population above the new retirement age (men aged 65 and older and women aged 60 and older) in the northern regions of Russia according to census data, % [11]

	1989 *	2002	2010	2021
Russian Federation	**11.3**	**16.2**	**16.0**	**20.3**
Republic of Karelia	10.7	15.2	15.9	23.3

[8] Official website of Rosstat. URL: https://rosstat.gov.ru/ (accessed 21 December 2023).
[9] Ibid.
[10] Ibid.
[11] Source: calculated by the authors based on Rosstat data. URL: https://rosstat.gov.ru/

Komi Republic	6.5	10.6	11.6	19.0
Arkhangelsk Oblast	10.7	14.5	15.1	22.0
Nenets Autonomous Okrug	5.1	8.5	8.9	14.6
Murmansk Oblast	5.4	9.8	12.0	18.0
Khanty-Mansi Autonomous Okrug	2.1	4.4	5.7	12.3
Yamalo-Nenets Autonomous Okrug	1.2	2.5	3.6	9.0
Republic of Tyva	4.9	6.2	6.5	7.7
Republic of Sakha (Yakutia)	4.0	7.0	7.8	12.5
Kamchatka Krai	3.3	7.9	11.0	15.9
Magadan Oblast	2.1	7.0	9.6	15.6
Sakhalin Oblast	6.4	10.7	12.2	19.6
Chukotka Autonomous Okrug	1.0	3.4	4.9	9.8

* RSFSR

The migration outflow of population from the northern territories that began three and a half decades ago caused the increased rates of demographic ageing of the North zone (Table 3). In the period between the censuses of 1989 and 2021, the share of the population above the new retirement age in the total population of Russia increased by 80%. At the same time, in the Chukotka Autonomous Okrug, there was an almost tenfold increase in the percentage of older ages (from 1.0% to 9.8%), in the Yamalo-Nenets Autonomous Okrug and the Magadan Oblast, their share increased by 7.5 times, in the Khanty-Mansi Okrug — almost 6 times, in the Kamchatka Krai — almost 5 times, in the Murmansk Oblast, the Sakha Republic (Yakutia) and the Sakhalin Oblast — more than 3 times, in the Komi Republic and the Nenets Autonomous Okrug — almost 3 times, in Karelia and the Arkhangelsk Oblast — more than 2 times [12]. Only in Tyva, which has a high birth rate and very low life expectancy, in 1989–2021 there was a less significant increase in the proportion of older ages (by 57%) than in the country as a whole.

Table 3

Growth rates of the share of the population over the new retirement age (men aged 65 and older and women aged 60 and older) in the northern regions of Russia in the inter-census periods, % [13]

	1989–2002	2002–2010	2010–2021	**In total for 1989–2021**
Russian Federation	**43.4**	**-1.2**	**26.9**	**79.6**
Republic of Karelia	42.1	4.6	46.5	**117.8**
Komi Republic	63.1	9.4	63.8	**192.3**
Arkhangelsk Oblast	35.5	4.1	45.7	**105.6**
Nenets AO	66.7	4.7	64.0	**186.3**
Murmansk Oblast	81.5	22.4	50.0	**233.3**
Khanty-Mansi AO	109.5	29.5	115.8	**485.7**
Yamalo-Nenets AO	108.3	44.0	150.0	**650.0**
Republic of Tyva	26.5	4.8	18.5	**57.1**
Republic of Sakha (Yakutia)	75.0	11.4	60.3	**212.5**
Kamchatka Krai	139.4	39.2	44.5	**381.8**
Magadan Oblast	233.3	37.1	62.5	**642.9**
Sakhalin Oblast	67.2	14.0	60.7	**206.3**
Chukotka AO	240.0	44.1	100.0	**880.0**

The scale of the migration outflow from the northern territories, the majority of which falls on the working age, increased until the second half of the 1990s: some researchers call 1999 the

[12] Official website of Rosstat. URL: https://rosstat.gov.ru/ (accessed 21 December 2023).
[13] Source: calculated by the authors based on Rosstat data. URL: https://rosstat.gov.ru/

year of the second change in the population dynamics of the North, since after the default of 1998, due to the sharp fall in the exchange rate of the ruble, the opportunities of exporting industries significantly expanded, and the attractiveness of the northern regions began to increase again [16, Pchelintsev O.S., Shcherbakova E.M., Nozdrina N.N., Minchenko M.M., p. 121]. For Russia as a whole, in the 1990s, on the contrary, the maximum volumes of migration inflow of population from neighboring countries were characteristic [4, Popova L.A., Zorina E.N., p. 17]. Therefore, in the inter-census period of 1989–2002, there was a very significant excess of the average Russian growth rate of the proportion of the population over the new retirement age in the northern regions. The exceptions were the Republic of Tyva with a high birth rate and a very low life expectancy rate, as well as the Arkhangelsk Oblast and Karelia, where, as in Tuya, migration played a less significant role. Moreover, such an excess was observed in the context of a significant lag behind the all-Russian level of the life expectancy of the population in almost all northern territories (except for the Khanty-Mansi Autonomous Okrug), as well as a traditionally high birth rate in a number of regions of the Asian North (in the republics of Tyva and Sakha (Yakutia), the Yamalo-Nenets and Chukotka Autonomous okrugs) and the Nenets Autonomous Okrug [14], which contributed to a reduction in the scale of “ageing from below”.

In the inter-census period of 2002-2010, there was a slight decrease in the proportion of the population over the new retirement age in Russia as a whole (by 1.2%). One of the reasons for this, in our opinion, is the increased acquisition of Russian citizenship by migrants from the former Soviet republics, as indicated by a fairly noticeable increase in the proportion of the working-age population in the country during this period (from 65.6% to 67.9%). For all northern regions without exception, in 2002–2010, an increase in the percentage of the population over the new economic threshold of old age is characteristic. At the same time, in Yakutia, the Nenets and Yamalo-Nenets Autonomous okrugs, the rate of decline in the proportion of children during this period turned out to be more significant than the national average, which indicates an intensification of the demographic transition among the indigenous peoples of the North. In almost the entire European North and in a number of regions of the Asian North, “ageing from below”, i.e. due to the birth rate, was more intense in 1989–2010 than the Russian average [15].

In 2010–2021, the ageing of Russia's population is observed in the context of an increase in the share of the population below working age, which, as noted, corresponds to the model of “ageing from above”. Accelerated growth of the birth rate in the first years of implementation of the regional maternity capital and its increased levels already in the period of its initial decline led to the fact that the proportion of children in Russia as a whole increased by 3.7%: from 16.2% to 16.8% (Table 4).

[14] Official website of Rosstat. URL: https://rosstat.gov.ru/ (accessed 21 December 2023).
[15] Ibid.

Table 4

Change in the share of children in the northern regions in the inter-census period 2010–2021 [16]

	Share of population aged 0–15 years, %		Growth (loss) rate for 2010–2021, %
	2010	2021	
Russian Federation	**16.2**	**16.8**	**3.7**
Republic of Karelia	16.0	17.1	6.9
Komi Republic	17.7	18.8	6.2
Arkhangelsk Oblast	16.7	17.9	7.2
Nenets AO	22.7	22.5	-0.9
Murmansk Oblast	16.2	18.2	12.3
Khanty-Mansi AO	20.4	21.6	5.9
Yamalo-Nenets AO	22.0	22.8	3.6
Republic of Tyva	30.5	32.7	7.2
Republic of Sakha (Yakutia)	23.3	24.0	3.0
Kamchatka Krai	17.1	19.4	13.5
Magadan Oblast	16.8	17.0	1.2
Sakhalin Oblast	16.7	16.2	-3.0
Chukotka AO	22.4	22.4	0.0

In 7 out of 13 northern territories, there is a more significant increase in the share of the population below working age, which restrains the growth of the ageing rate. At the same time, in a number of northern regions, most of which are regions with traditionally high birth rates, there is a less significant increase in the percentage of children (Magadan Oblast, Republic of Sakha (Yakutia), Yamalo-Nenets Autonomous Okrug), zero growth (Chukotka Autonomous Okrug) or even a decrease (Nenets Autonomous Okrug, Sakhalin Oblast), indicating the continued activation of the demographic transition among the indigenous peoples of the North, contributing to the acceleration of population ageing in these regions.

As a result of all these changes, according to the 2021 census, in two northern regions, Karelia and the Arkhangelsk Oblast, the share of the population over the new retirement age is already noticeably higher than the average Russian level (Fig. 1).

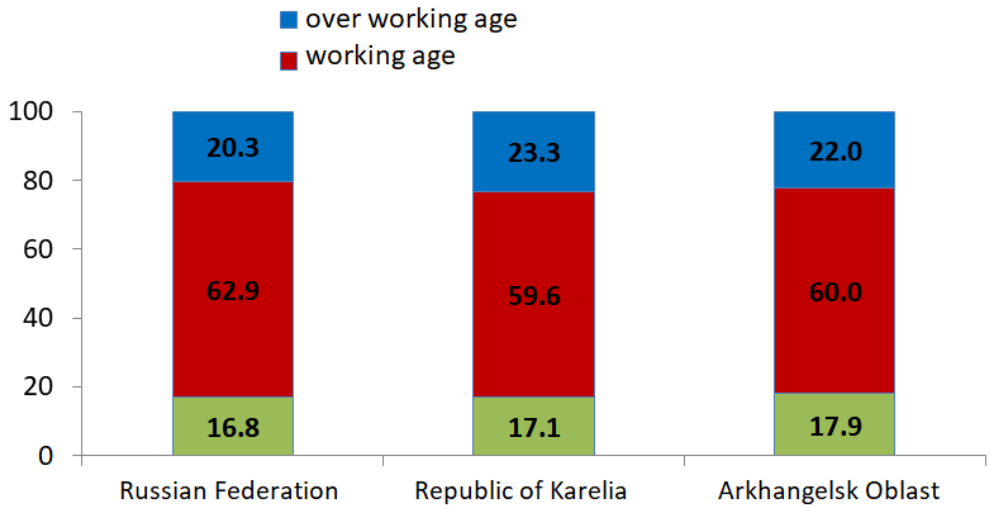

Fig. 1. Age structure of the population of the Russian Federation, the Republic of Karelia and the Arkhangelsk Oblast in 2021 according to the new retirement age, %.

[16] Source: calculated by the authors based on Rosstat data. URL: https://rosstat.gov.ru/

In the Sakhalin Oblast, the Komi Republic and the Murmansk Oblast, it is close to the national level. At the same time, the sectoral system of economic activity and discomfort of living conditions in the North impose special requirements to the health characteristics of the population, and, accordingly, to its age structure.

In addition, it should be taken into account that since 1993, a preferential retirement age has been applied throughout the North, including areas equivalent to the Far North. For citizens with 15 years of work in the Far North or 20 years of work in areas equivalent to the Far North, with an insurance record of 20 years for women and 25 years for men, it provides the opportunity to apply for a pension 5 years earlier than in the country as a whole [17]. When the retirement age was raised, the northern privilege was retained.

Accordingly, in the Republic of Karelia and the Arkhangelsk Oblast, even with the final transition to a higher retirement age in Russia, more than one third of the adult population (16 years and older) will have the right to stop economic activity in connection with retirement if they have the necessary length of work experience (Table 5). In the Komi Republic, the Sakhalin and Murmansk oblasts, about 30% of the adult population will be eligible for old-age pensions in accordance with the new northern economic old-age threshold, while in the Kamchatka Krai, the Nenets Autonomous Okrug and the Magadan Oblast — up to 27% [18].

Table 5

Age structure of the population of the northern regions of Russia in accordance with the new northern economic old-age threshold (men aged 60 and older and women aged 55 and older) based on the data of the 2021 census, % [19]

	Population aged 0–15 years	Men aged 16–64 years and women aged 16–59 years	Men aged 65 years and older and women aged 60 and older	Proportion of men 65 years and older and women 60 years and older in the population 16 years and older
Republic of Karelia	17.1	52.3	30.6	36.9
Komi Republic	18.8	55.2	26.0	32.0
Arkhangelsk Oblast	17.9	53.1	29.0	35.3
Nenets AO	22.5	56.7	20.8	26.8
Murmansk Oblast	18.2	57.5	24.3	29.7
Khanty-Mansi AO	21.6	59.9	18.6	23.7
Yamalo-Nenets AO	22.8	62.5	14.7	19.0
Republic of Tyva	32.7	55.2	12.1	18.0
Republic of Sakha (Yakutia)	24.0	57.8	18.2	23.9
Kamchatka Krai	19.4	58.6	22.0	27.3
Magadan Oblast	17.0	60.9	22.1	26.6
Sakhalin Oblast	16.2	57.8	26.0	31.0
Chukotka AO	22.4	61.7	15.9	20.5

[17] Law of the Russian Federation of February 19, 1993 No. 4520-1 "On state guarantees and compensation for persons working and living in the regions of the Far North and equated localities, when assigning and recalculating pensions". URL: https://www.consultant.ru/document/cons_doc_LAW_1786/ (accessed 21 December 2023).
[18] Official website of Rosstat. URL: https://rosstat.gov.ru/ (accessed 21 December 2023).
[19] Source: calculated by the authors based on Rosstat data. URL: https://rosstat.gov.ru/

Only in five regions of the Northern zone the share of adults who receive the right to pension provision in accordance with the new northern retirement age is lower than the share of old-age pensioners in the adult population in Russia as a whole (24.4%, see Table 1). In the Republic of Sakha (Yakutia) and Khanty-Mansi Autonomous Okrug it is less than 23%, in the Chukotka and Yamalo-Nenets okrugs and Tyva — up to 18–20% of the population over 16 years old.

Conclusion

Due to the long history of migration character of population formation, by 1989, the northern regions had a noticeably younger age structure than in Russia as a whole. The migration outflow, which began in the late 1980s, led to an increased rate of demographic ageing in the North, despite the low life expectancy of the population in most northern territories and a high birth rate in a number of them, even in the conditions of intensified demographic transition among the indigenous peoples of the North. As a result, in Karelia and the Arkhangelsk Oblast, the share of the population above the new retirement age in 2021 is already noticeably higher than the national average, while in the Sakhalin Oblast, the Komi Republic and the Murmansk Oblast it is approaching the national level.

At the same time, the economic threshold for old age in the North is 5 years lower than in the country as a whole. In accordance with the preferential retirement age in Karelia and the Arkhangelsk Oblast, over a third of the adult population, with the necessary work experience, will have the right to cease economic activity, in the Komi Republic, the Sakhalin and Murmansk oblasts — about 30% of the adult population, in the Kamchatka Krai, the Nenets Autonomous Okrug and the Magadan Oblast — up to 27%. Only in Yakutia, the Khanty-Mansi, Chukotka, Yamalo-Nenets Autonomous okrugs and the Republic of Tyva, the share of adults who receive the right to pension provision at the new northern retirement age is lower than the share of old-age pensioners in Russia as a whole.

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Informal Employment: Features in the North and South of Russia

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Abstract. The spread of informal employment is relevant for the labor market of the Russian Federation as a whole, and for its regions. The relevance of the research problem is associated with the lack of comparative data on the informal sector of the economy of the territories of the north and south of the Russian Federation. The reason for the growth of employment in the informal sector is associated with the development of the service sector and digitalization of the economy, increased competition in regional markets, which leads to the growth of flexible forms of employment. The purpose of the study is to assess the scale of employment in the informal sector in the northern and southern regions of Russia using a production approach. The work attempts to identify and assess the economic conditions affecting informal employment in the regions under consideration. The author examined three groups of conditions and selected indicators characterizing these conditions, which formed the basis for the analysis of employment dynamics in the informal sector. Panel data were collected on the basis of Rosstat information for recent years, maintaining comparability of data collection and processing methods. The study provides an assessment of employment in the informal sector for the regions of the south and north of the Russian Federation draws conclusions on the impact of the above groups of economic factors on employment in the informal sector in these regions. The relationship between per capita gross regional product and informal employment is revealed. The practical significance of the study lies in the fact that the results obtained may be in demand when assessing the processes of employment change during the development of strategies and programs for regional development. The prospects for further research are determined by a more in-depth analysis of the degree of influence of the current socio-economic situation on the level of employment in the regions.

Keywords: *informal sector, employment, north, south, production approach*

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Introduction

Research on the informal sector helps to understand its impact and significance both for economic development and for social protection and sustainability of society.

The study of the informal sector is related to the fact that it can represent a significant part of the economy of some countries: for example, the share of the informal sector in the countries

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of Eastern Europe and Central Asia in the structure of gross value added reaches 14.0% [1]. However, the level of employment in the informal sector of the economy is also significant. People employed in the informal economy most often deal with unstable low incomes, limited social protection and face difficult working conditions. Therefore, a study of employment in the informal sector of the economy will help to assess not only its scale, but also to identify and understand the characteristics and problems of those working in the informal economy. The study of employment in the informal sector is a necessary tool for analyzing the economy and social reality in the regions. Thus, the relevance of this study is due to the lack of comparative data on employment in the informal sector in the territories of the north and south of the Russian Federation.

Theoretical aspects of informality in the labor market

The informal sector of the economy is understood as "a set of types of economic activity that are not fully or partially subject to state regulation, not supported by formal contracts and not recorded by statistical and tax accounting" [2]. The objective condition for the emergence of the informal sector was its study in developing countries as a segment separate from the corporate structure, where regulation occurs according to other rules for the fulfillment of obligations. K. Hart laid the foundations for understanding the significance of the informal sector of the economy, which played a huge role in ensuring political stability and economic growth in developing countries. At the present stage, researchers of the informal sector study it as a phenomenon that differs in regions both in scale and in form, causality, and social composition [3]. The informal sector of the economy has come to be seen as a characteristic of both developing and developed countries. It includes the economy, starting from households and ending with informal (criminal) practices [1, p. 27]. The concept of the "informal sector" is expanding and is becoming not an isolated segment of economic activity, but a basic component of the economic system.

There are three main approaches [4] to studying informality in the labor market. Firstly, it is the production approach, in which employment in the informal sector is studied based on the characteristics of the enterprise. Secondly, the legalist approach, which appeals to the characteristics of jobs when studying informal employment. And thirdly, there is the "hybrid approach", which combines the logic of the two previously mentioned approaches.

Informal employment is opposed to formal employment [2]. Since the 1980s, it has been associated with high costs of legality [3]. Further, many studies are devoted to assessing informality by various indicators [4]. Thus, according to the resolution adopted by the International Labor

[1] Official website of the International Labour Organization. URL: https://www.ilo.org/moscow/projects/WCMS_826840/lang--ru/index.htm (accessed 21 December 2023).
[2] Barsukova S.Yu. Informal Economy. Lecture Course. Moscow, Publishing House of the State University — Higher School of Economics, 2009, 354 p. (In Russ.)
[3] Ibid.
[4] Ibid.

Organization [5], the scale of the informal sector can be assessed by the number of employees and registration in one or another legal form. In many countries, information on the number of employed in the economy is the most accessible, while statistical information on business registration has its own peculiarities, primarily related to its limitations and reliability. The main criterion for classifying an enterprise as informal is the number of hired personnel (not more than 5–7 people).

The economy of developing countries (such as Russia) is heterogeneous; researchers distinguish the "normal" economy (associated with the economic activity of state enterprises and transnational companies) and the "different" economy, dealing with peasant farms and small entrepreneurs. The population working in the informal sector in our country includes all those who work in unregistered enterprises. These include individual entrepreneurs without forming a legal entity (IE), employed by individuals and IEs, employed on an individual basis (without registering as IEs, self-employed and illegal), farms employed by individuals and IEs, as well as production in households for sale. Employment in the informal sector of the Russian Federation is approximately 20.0% [4]. Moreover, back in the 1970s, researchers of the informal sector noted its growth from east to west and from north to south of the country [5]. The state policy regarding informality in the labor market has been different in the post-Soviet history of the Russian Federation in different decades. Thus, in the 1990s, the state ignored the problem of informality. Later, in the 2000s, the position changed, and the emphasis was placed on economic growth, which should contribute to solving the problems of informality. Already in the 2010s, it became clear that automatic legalization did not occur, so the direction towards increasing the attention of the state to informality in the labor market was determined. The question of what constitutes a compromise in state policy towards the informal sector, which has such an advantage as the ability to self-organize away from the state, while simultaneously being the basis for the stability of social development, remains debatable. Researchers studying the informal and formal sectors of the economy propose the idea of the inseparability of the formal and informal order on the basis of institutional analysis [1, p. 22].

Institutionalists identify a socio-cultural factor that determines the economic development of territories [6]. As one of the main factors influencing the diversity of regional development, they highlight climate with its peculiarities of agricultural practices used in different climatic zones. For example, studies indicate an N-shaped relationship between temperature and "masculinity"/"femininity", a tendency towards mass standard production or service activities and creativity. In a climate with average sharply high and low temperatures, there are "feminine" populations that recognize the need for consensus, care for others, service orientation, intuitive thinking, modesty and belonging to a certain community or group. "Masculine" populations live in a more favorable climate, since a huge number of ethnic groups flock there, resulting in high competition [7].

[5] Resolution on employment statistics in the informal sector adopted by the 15th International Conference of Labor Statisticians (Geneva, 1993). URL: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_234473.pdf (accessed 21 December 2023).

Thus, climatic conditions act as a powerful factor of differentiation in economic development [6], [7]. Research on Russian regions indicates significant differences in their socio-economic [8] and socio-cultural [9] development, which in turn affects the level of informality in the labor market.

Methodology and materials

The study mainly covers the period from 2010 to 2021. The work was carried out on the basis of systemic, institutional and production approaches. The empirical analysis was conducted in the northern and southern regions, which have specific features that are reflected in the assessments of socio-economic development. Russian regions are characterized by significant asymmetry of this development, dividing into rich and poor regions. This difference is especially noticeable when comparing the southern and northern territories. The northern regions include [6] the republics of Karelia, Komi, Tyva and Sakha (Yakutia), Arkhangelsk, Murmansk, Magadan and Sakhalin oblasts, Nenets, Khanty-Mansi, Yamalo-Nenets and Chukotka autonomous okrugs, as well as Kamchatka Krai (hereinafter referred to as the north of Russia). The southern regions include [7] the republics of Adygea, Kalmykia, Dagestan, Ingushetia, Kabardino-Balkaria, Karachay-Cherkessia, North Ossetia-Alania, Chechnya, Krasnodar Krai, Astrakhan, Volgograd and Rostov oblasts, as well as Stavropol Krai (hereinafter referred to as the south of Russia) [10]. The aim of the study was to analyze the characteristics of informal employment in the northern and southern regions of Russia. As a methodological basis of the study, we used general scientific methods of cognition: cause-and-effect and logical-structural analysis, economic and statistical methods (systematization of statistical information, compilation of an information and analytical database, etc.). Data processing was carried out using MS Excel.

Research results

When comparing the gross regional product (hereinafter GRP) of the south and north of the country, we notice that the southern regions are losing the competition to the northern regions by this indicator (Table 1).

Table 1

Gross regional product of the south and north of Russia [8]

Area	Value by year, billion rubles							2010/ 2020
	2010	2012	2015	2016	2017	2018	2020	
Russian Federation	37 687.8	49 926.0	65 750.6	69 237.7	74 798.9	84 976.7	93 810.3	2.5
South	3 229.8	4 394.5	6 030.7	6 385.1	6 862.2	7 422.2	8 456.8	2.6
Share of the south in the RF	8.6	8.5	8.8	9.2	9.3	9.2	9.2	-

[6] The northern regions include subjects the entire territory of which belongs to the regions of the Far North and equated localities.
[7] The southern regions include subjects that are territorially part of the Southern and North Caucasian Federal Districts.
[8] Source: calculated based on Rosstat data.

North	5 087.6	6 367.1	8 710.9	9 062.8	10 114.6	12 596.9	11 558.2	2.3
Share of the north in the RF	13.5	13.3	13.5	13.2	13.3	13.2	13.1	-

According to official data from Rosstat, the contribution of the informal economy to the Russian Federation's GDP in 2022 is estimated at 14.0–15.0%, but this figure varies across the regions, and in some southern regions it reaches 40.0–60.0% [9]. Thus, the informal economy has great potential for legalization in most southern regions, but the mechanism used to equalize the budgetary provision of regions contributes to the preservation of dependent sentiments of poor regions [11]. Rosstat determines the contribution of the informal sector of the economy (the main criterion for determining informal sector units is the absence of state registration as a legal entity) to GDP on the basis of economic transactions that are not observed by direct statistical methods. But this is not a "shadow" or criminal economy. Shadow operations in the legal economy include situations when part of production is deliberately hidden from the attention of the state, for example, for tax evasion. The share of such shadow economy is about 4.0% of GDP [10]. For example, Rosstat classifies production of subsidiary farms that grow goods on their plots for sale on the market as production in the informal sector. In addition, when calculating GDP, Rosstat also takes into account what we all produce for our own consumption (from vegetables, berries and mushrooms to self-repair of a car, etc.). Criminal production of goods and services is not included in the country's GDP.

Unfavorable climatic conditions for living have caused an outflow of population from the north of the country. While before the 1990s the population of the north was growing, after the collapse of the USSR the migration outflow worsened, and in 1991–2020 the northern regions lost about 6.0% of their population [11].

The Central, Volga Federal Districts and, of course, the southern regions of the country, that is, territories with a more favorable climate, have become active "receiving" zones for northern migrants. Regional capitals and their suburbs are becoming "almost the only points of positive population dynamics in the overwhelming majority of Russian regions" [12]. In turn, the development potential of regional centers is determined by the availability of resources on the periphery — in cities and districts that serve as sources of migration growth for them [8; 13].

Institutionalists have identified that in territories comfortable for living, there are institutions oriented not on rent, but on other productive activities, when life is arranged for oneself [14]. Here, in the "receiving" regions of the south, the Krasnodar, Stavropol, Rostov and Volgograd agglomerations are emerging (despite the fact that in general the population in these regions was falling, with the exception of Krasnodar Krai, where the population grew by 10.0% (Table 2), while

[9] Head of Rosstat: Authorities are increasingly interested in statistics. Rosstat speeches, interviews and comments. URL: https://rosstat.gov.ru/media_official_comments/document/125108 (accessed 08 February 2024).
[10] Ibid.
[11] Mkrtchyan N. From Russia to Russia: where from and where do internal migrants go. Demoscope, 2002, no. 79-80. URL: http://www.demoscope.ru/weekly/2002/079/tema06.php (accessed 01 December 2022).

the urban population was growing (Table 3)), and as a consequence, competition in such regions becomes more intense [14; 11].

Table 2

Population dynamics, thousand people [12]

Area	2010	2015	2020
South	23 290	23 763	24 038
Krasnodar Krai	5 230	5 514	5 684
Rostov Oblast	4 275	4 236	4 181
Volgograd Oblast	2 607	2 546	2 475
Stavropol Krai	2 786	2 802	2 793
North	7 915	7 859	7 815

Table 3

Urban population dynamics, thousand people [13]

Area	2010	2015	2020
South	12 343	12 832	13 321
Krasnodar Krai	2 767	2 994	3 160
Rostov Oblast	2 877	2 872	2 851
Volgograd Oblast	1 981	1 953	1 916
Stavropol Krai	1 594	1 634	1 478
North	6 095	6 130	6 174

The population of the southern regions of Russia in 2021 was 16.5% of the country's population, while the population of the northern regions was 5.3%, which is three times less.

Researchers identify three conditions [8]: economic independence (the indicator of the share of employed in small business), economic resources (the share of the population above working age) and the level of education, which largely determine the behavior of the population in terms of both social independence and institutional structure. Below, we have analyzed these three conditions.

1) The share of people working in small businesses

This indicator characterizes the level of independence of the population. Why is it so important? Because people working in small businesses are those who make economic decisions independently every day. How many of them are there in the total population? For example, in Moscow, every third resident works in small businesses (26–29%), in the south and north this figure is twice lower and is about 10–11% (Table 4).

Table 4

Dynamics of the number of employed in small enterprises in the southern and northern regions of Russia, 2010–2021 [14]

Year	Southern regions		Northern region	
	thousand people	share of total number of employed, %	thousand people	share of total number of employed, %
2010	1 109.7	11.7	506.5	11.9
2012	1 130.2	11.8	482.3	11.3
2013	1 129.6	11.6	475.4	11.2
2014	1 135.5	11.9	454.6	10.8

[12] Source: calculated based on Rosstat data.
[13] Source: calculated based on Rosstat data.
[14] Source: calculated based on Rosstat data.

2016	1 029.9	10.1	421.8	10.0
2017	1 112.6	10.8	438.4	10.8
2018	1 079.0	10.5	436.2	10.3
2019	1 136.7	11.1	445.7	11.3
2021	993.3	9.6	443.4	10.6

Both in the south and in the north, the number of people employed in small businesses is characterized by a downward trend. While in the south of the country, employment in small businesses was growing before 2014, then after 2014, the number of employed in small enterprises here fell, and the decline continues to the present day; in general, over the past ten years, it has decreased by 10.5%. In the northern regions, the number fell from year to year, and over ten years, the decline was 12.5%. Thus, the level of independence of the majority of residents of the south and north can hardly be called high, and studies show that during crisis years, employment in the informal economy grows [4], since entrepreneurs reduce their costs by going into the "shadow" [8].

2) The proportion of the population over working age.

This indicator is important in terms of the risks of informal employment, as this age group has a rather high risk due to the specifics of human capital, health, etc. In the north, the population over the working age averaged 17.6% for 2005–2020, while in the southern regions this figure is higher — 20.1%. That is, in the south, every fifth resident is a pensioner. In the north, the retirement age is five years lower, that is, all other things being equal, there should be more pensioners in the north, but the migration factor plays a significant role: after retiring, people often move to more favorable regions for life, as a result, the share of the working age in the north is higher than in the south (Table 5).

Table 5

Dynamics of the proportion of the working-age population in the south and north of Russia, % [15]

Area	Share of the working-age population in the total population			Employed working population in the total population		
	2010	2015	2020	2010	2015	2020
Russia	61.5	57.4	56.0	47.3	48	49.7
North of Russia	65.6	61.2	58.6	53.7	54.1	58.6
South of Russia	60.7	57.1	55.7	37.6	36.1	31.2

The northern regions, despite a 7 percentage points decrease in the share of the working-age population over the last 10 years under review, have an increase in employment, the value of which remains above the national average, while the southern regions had a decrease in the share of the working-age population by 5 percentage points, but, unlike the northern regions, lower employment rates are observed here.

3) Educational level of the population.

[15] Source: calculated based on Rosstat data.

The educational level of the population is primarily associated with the choice of each individual of informal or formal employment, as well as with the quality of human capital, which has a significant impact on the competitiveness of the region [16]. The 2020 population census showed that the level of education is growing in the Russian Federation as a whole (Table 6).

Table 6

Education level of the population over 15 years old in the northern and southern regions of Russia (per 1,000 population), according to the 2010 and 2020 censuses [16]

Area	2010				2020			
	higher	incomplete	secondary	primary	higher	incomplete	secondary	primary
Russia	234	46	312	56	267	24	258	137
South	208	49	266	49	236	21	224	100
North	214	40	335	64	279	20	259	147

In the south, the number of people aged 15 and over with higher education increased in 2020 and was 236 per 1,000 people, compared to 208 in 2010. At the same time, the number of people with secondary vocational education decreased from 266 to 224 per 1,000 people in ten years. Over the same ten years, the number of people with primary vocational education increased from 49 to 100 per 1,000 people.

In the north of the country, educational trends were similar. Thus, the number of people aged 15 and over with higher education increased, but the number of people with secondary and primary vocational education decreased. The population in the north was more active in improving their level of education, but the dominant extractive industry in the economy maintains the demand for a “low” level of education of the population, so the northern regions have a significant share of people with primary vocational education (Fig. 1).

[16] Compiled based on data from the 2010 and 2020 censuses.

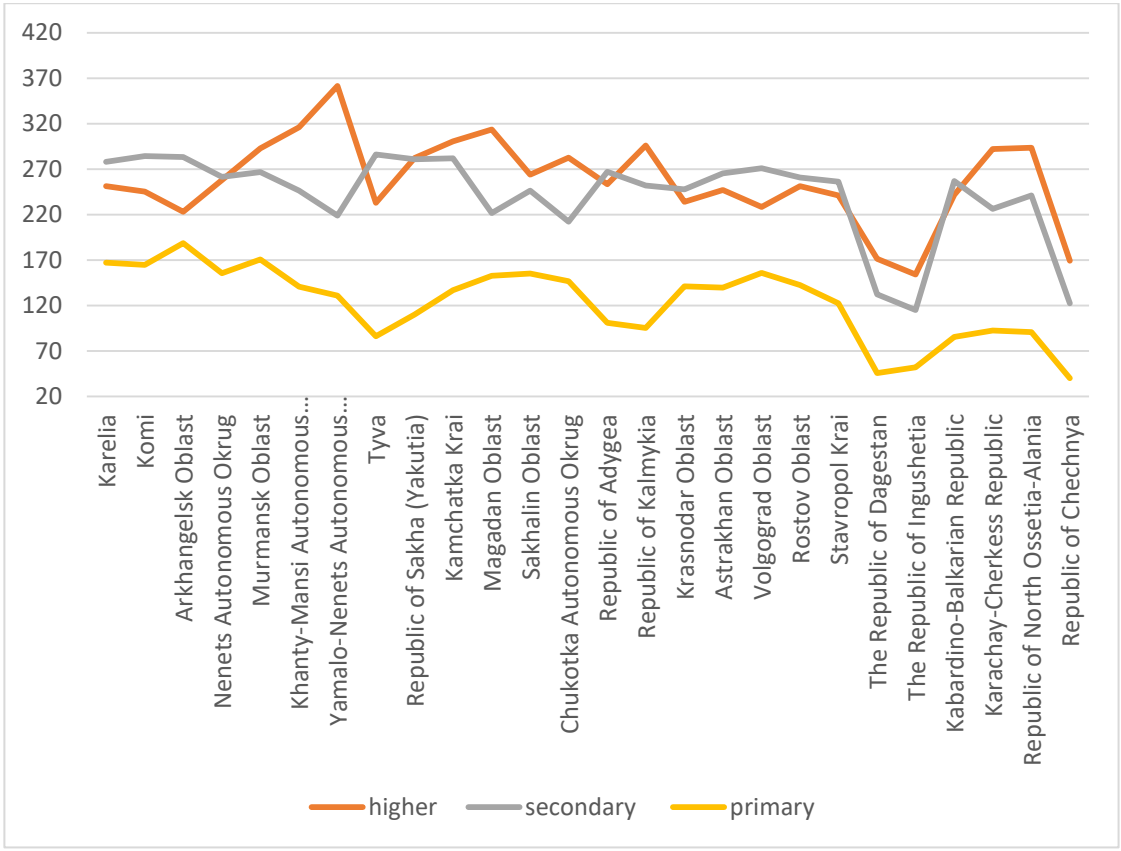


Fig. 1. Structure of the population over 15 years old by level of education in the regions of Russia (per 1,000 population) [17].

Institutional changes in the labor market in the regions affected the behavioral attitudes of the population, which was manifested in adaptation to new realities through education, so in general, the Russian Federation is characterized by an increase in people with higher education.

Thus, three conditions — economic independence, economic resources and level of education — largely determine the behavior of these people simultaneously in terms of social independence and institutional structure. Since institutional diversity is inevitable for the regions of Russia [17; 9], the examples of the regions of the north and south show territorial differences in the conditions of informal employment. It should be noted that the estimates of informal employment by different departments of the Russian Federation have different values. Thus, the Ministry of Labor classifies 18–20 million people as informally employed (this is 27.0% of the total number of people employed in the economy). Rosstat determines the number of people employed in the informal sector at 15 million people, or 20% of those employed [18]. In general, Russia is characterized by a tendency towards an increase in informal employment [18]. Therefore, issues of reducing the scale of employment in the informal sector are actively discussed in our country [19; 20]. But what is the scale of employment in the informal sector in the south and north of the country? The number of people employed in the informal sector in the south of the country is twice as large as in the northern regions (Table 7).

[17] Source: 2020 Census
[18] Rosstat: statistics digest. Survey of the labor force. Moscow, 2012. URL: https://rosstat.gov.ru/compendium/document/13265 (accessed 02 October 2023).

Table 7

Number of people employed in the informal sector in 2010–2021, % [19]

Area	2010	2012	2013	2015	2017	2021
Russia	19.5	19.0	19.7	20.5	19.8	20.3
South of Russia	34.3	33.6	36.7	37.5	36.7	38.0
North of Russia	14.2	13.7	15.2	15.2	15.1	15.1

Rosstat data show that during the period of active economic growth in the early 2000s, the number of people employed in the informal sector did not decrease, but on the contrary, increased: both in the country as a whole and in its northern and southern parts. Figure 2 clearly shows that their number grew more actively in the south, which is traditionally characterized by high levels of informality [21].

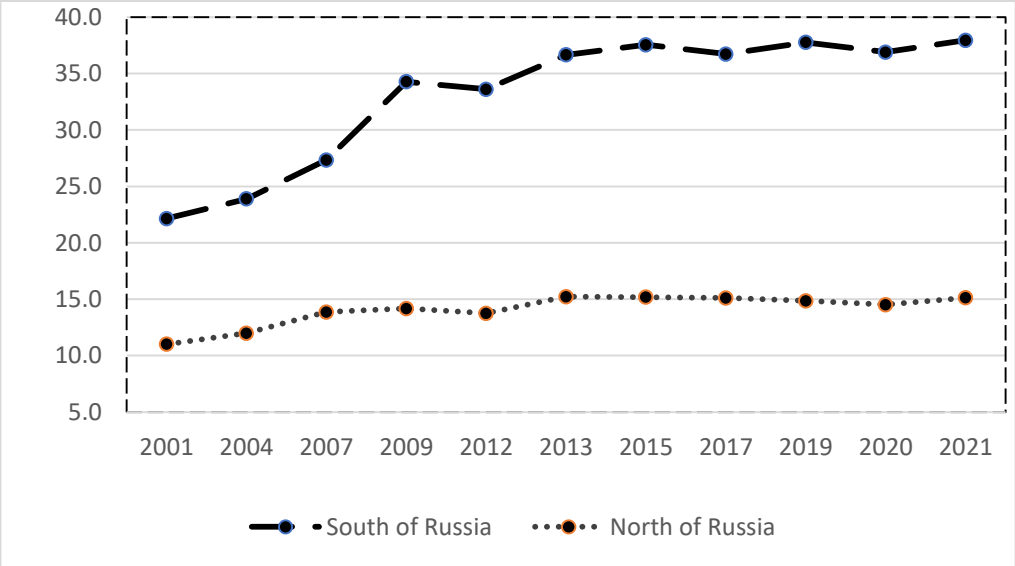


Fig. 2. Dynamics of the number of people employed in the informal sector for 2001–2021, % [20].

Starting from the second half of the 2000s, the informal sector stopped expanding. The flow from the formal to the informal sector has almost stopped. At the same time, the unemployment rate has tended to decrease over the past twenty years both in the south and in the north of the country. While the south of the Russia has high rates of informality and unemployment, the north is characterized by lower rates of informality and, accordingly, unemployment (Fig. 3).

[19] Source: calculated based on Rosstat data.
[20] Source: Rosstat data.

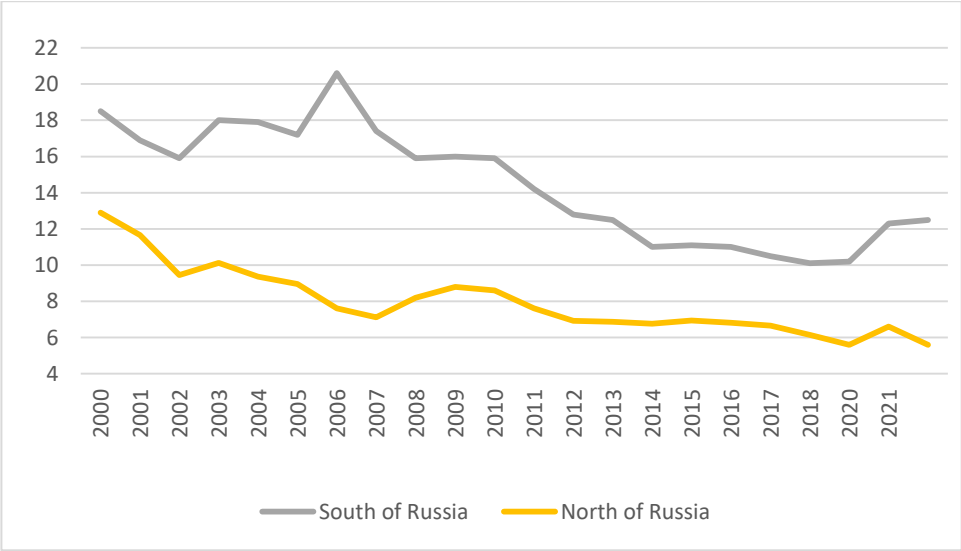


Fig. 3. Unemployment dynamics for 2001–2020 [21].

In general, as mentioned above, the unemployment dynamics have a downward trend both in the north and in the south of the Russian Federation. Fig. 2 and 3 demonstrate a drop in the unemployment rate and the expansion of the boundaries of the informal sector, which was growing until 2014, and after this year the growth rates significantly decreased, the trend acquired a "flat" character. Thus, has the potential of informality, which cushions the excessive regulation of legislation, which should create space for the development of entrepreneurship, stopped?

Can the informal sector in the south and north of Russia be called the "cradle" of entrepreneurship? In the informal sector of Russia, two tiers can be conventionally distinguished. The first tier is represented by various types of activities that can be united by the word "entrepreneurship", that is, self-initiative activity of people. The second tier includes workers employed by individuals or individual entrepreneurs (Fig. 4).

[21] Source: Rosstat data.

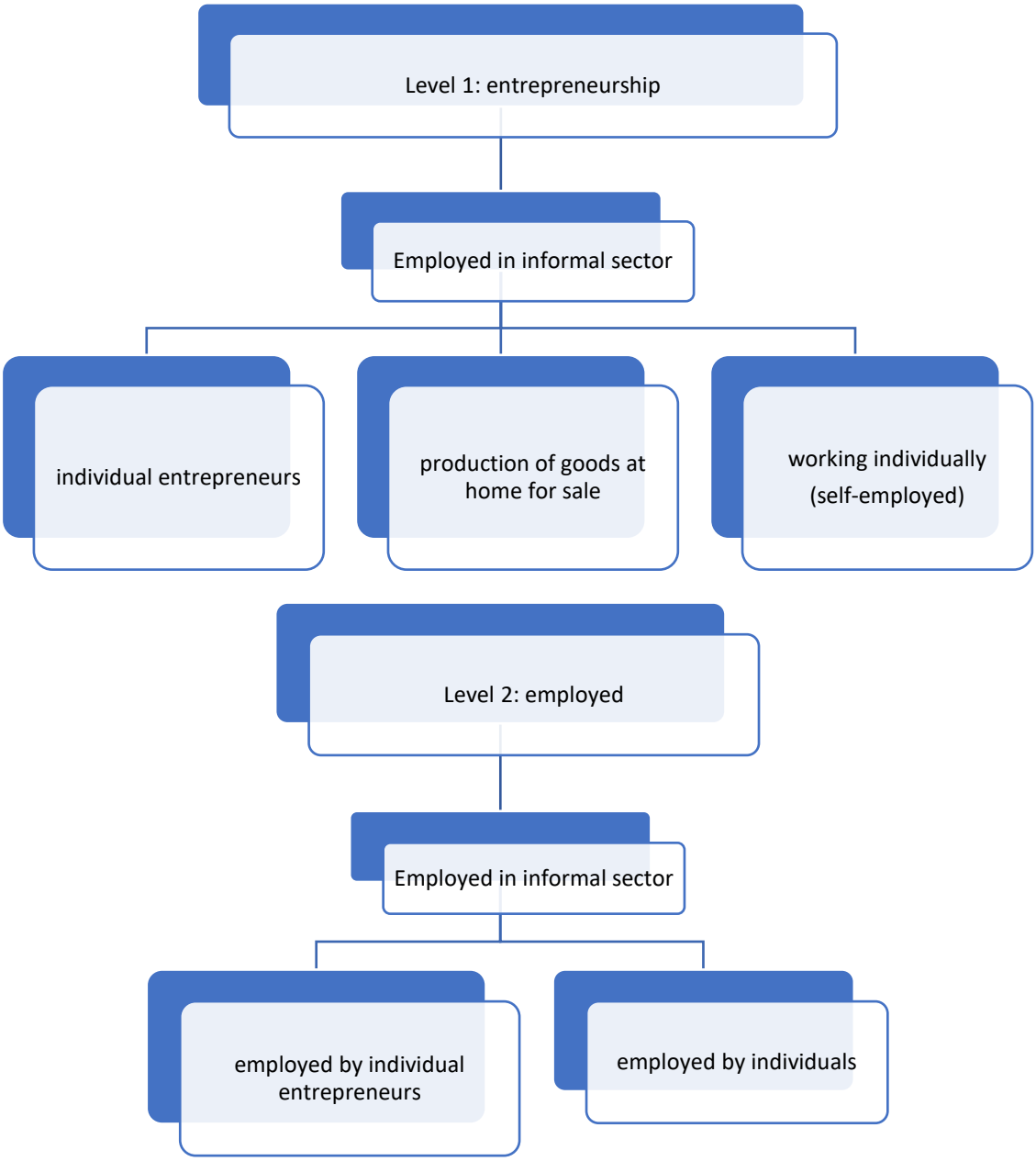


Fig. 4. Employment in the informal sector of the Russian Federation [22].

Russian studies [23; 24] show that the informal sector in our country is represented by people who are hired by individuals, individual entrepreneurs. In the north of Russia, according to labor force surveys, in 2021 the number of people employed in the informal sector aged 15–72 years was 502.0 thousand people, which was 12.9% of the total employed population, the remaining 87.1% of the employed population worked in the formal sector of the economy (Fig. 5).

[22] Source: compiled based on [21].

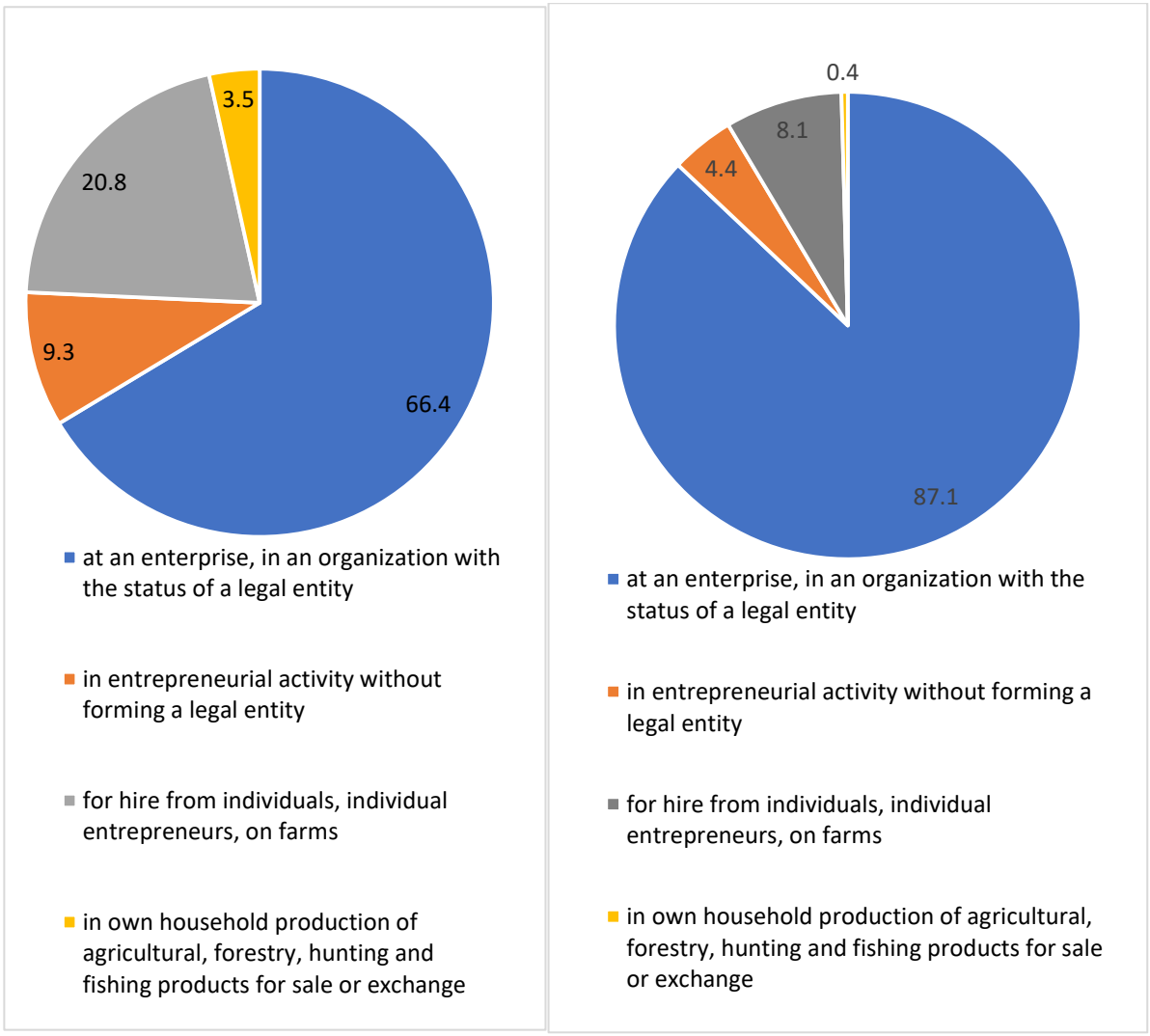
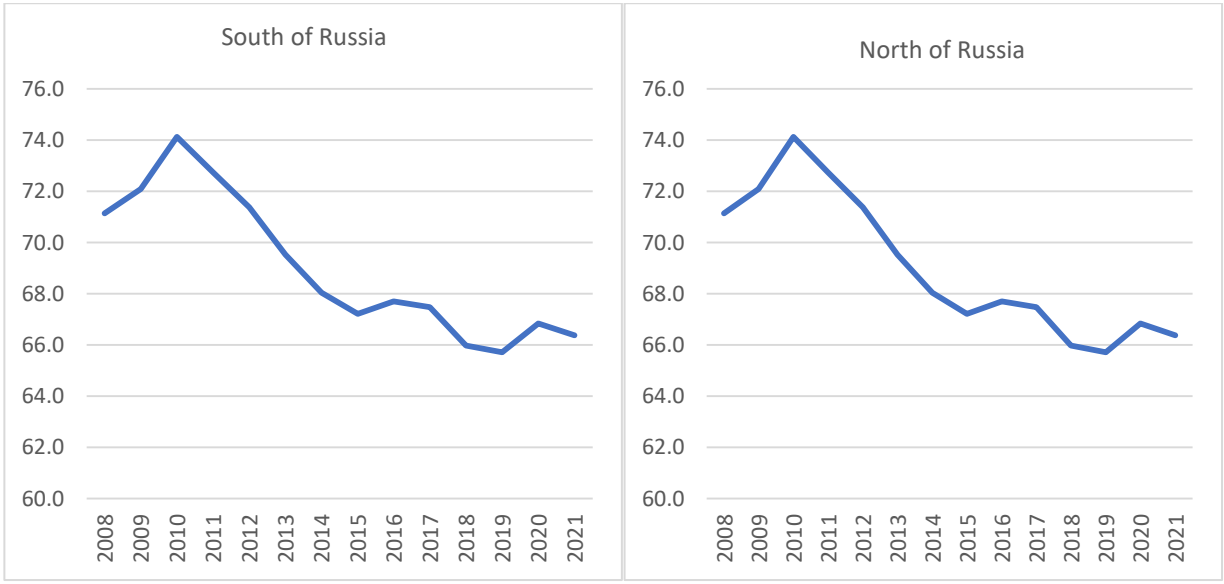


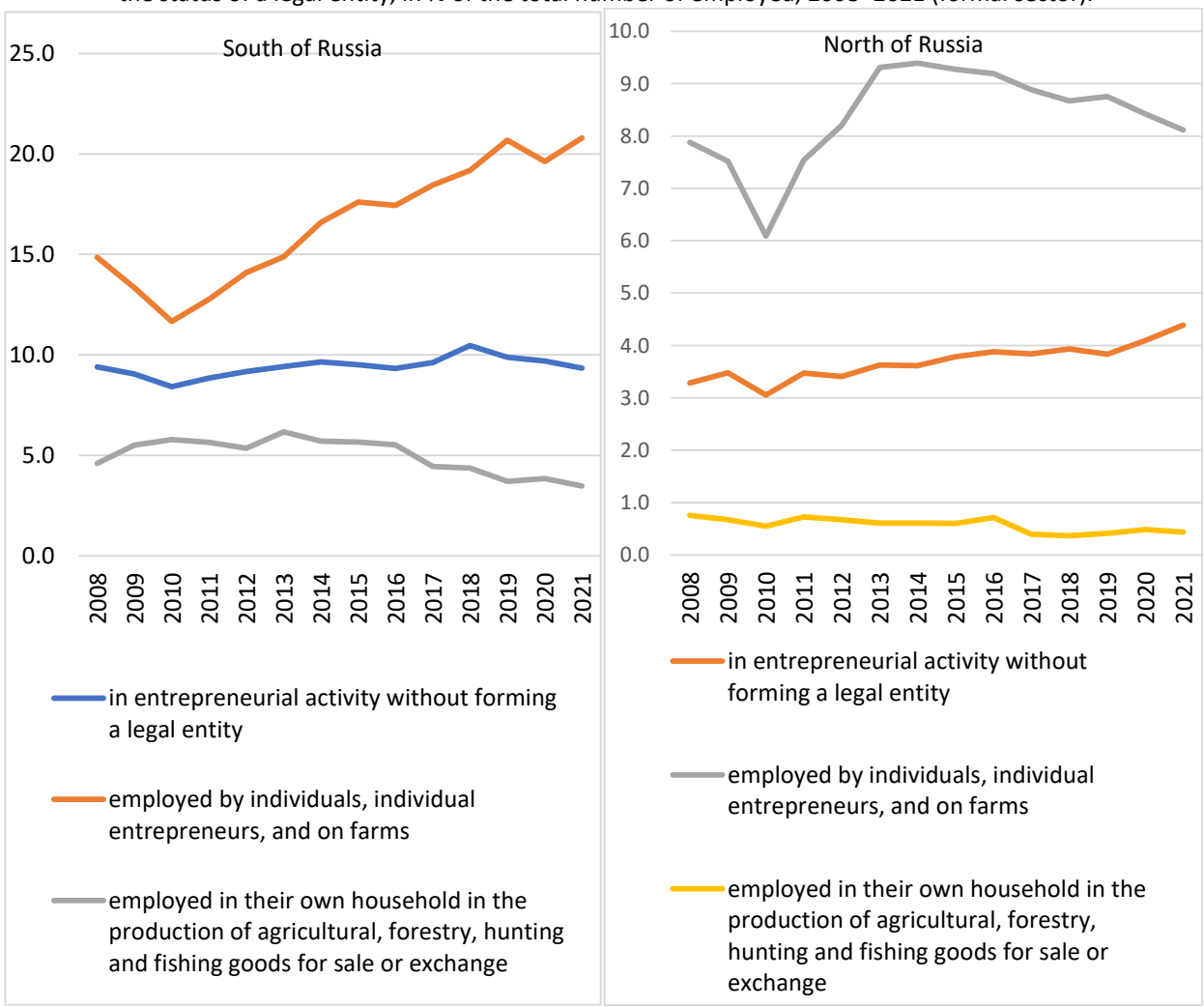
Fig. 5. Distribution of employed population aged 15–72 by place of main work, in % of total employed, 2021 (left — south of Russia, right — north of Russia) [23].

The peak of employment in the corporate sector occurred in both southern and northern regions in 2010, provided that we analyze the period from 2008 to 2021, respectively, the lowest employment in the sphere of entrepreneurial activity occurred in 2010, after which corporate employment begins to fall in the regions under consideration, and a narrowing of the corporate sector is observed (Fig. 6).

[23] Source: Rosstat data.



Dynamics of the employed population of the regions of Russia aged 15–72 at an enterprise, in an organization with the status of a legal entity, in % of the total number of employed, 2008–2021 (formal sector).



Dynamics of the employed population of Russian regions aged 15–72 by main place of work, in % of the total number of employed, 2008–2021 (informal sector).

Fig. 6. Dynamics of the employed population of Russian regions aged 15–72 by main place of work, in % of the total number of employed, 2008–2021 [24].

[24] Source: Rosstat data.

The economic crisis of 2009 affected both the formal and informal sectors of the economy. The number of people employed in the informal sector decreased by 0.1% in the north over 2 years, while in the south of the country this number decreased much more significantly: by 2.6%. Overall, over the period under review, employment in the corporate sector decreased more sharply in the south (by 8%), while in the north the contraction of corporate employment was less pronounced compared to the south (by 4%). However, despite the decline, the corporate sector still provides the bulk of employment (within 87% in the north and 66% in the south).

Entrepreneurial activity of the population in the Russian Federation should decline in the context of the crisis due to the increased level of instability in the economy [25]. Thus, in the southern regions of Russia, since 2010, we have seen a dynamic increase in the number of workers hired by individuals, individual entrepreneurs, in farming, but the share of entrepreneurs was falling. Already after 2018, both the number of people employed in entrepreneurial activity and the number of entrepreneurs was falling in the south of the country. The situation is the opposite in the north: until 2014, there was an increase in the number of workers hired by individuals, individual entrepreneurs, in farming, after which the number of employed began to fall, but the share of entrepreneurs grew. Thus, if the entire increase in informal employment over the past 11 years in the south of the country was ensured by the expansion of informal employment, in the north its predominant form was self-employment (positive dynamics).

To summarize: the informal sector has a significant impact on the economy of the region and the country in several respects. Firstly, it is often one of the main sources of employment for many people, especially in developing countries. It allows people to earn income when the formal sector of the economy is limited. In some countries, the informal sector can account for a significant share of employment and have important social significance for people, as well as make a significant contribution to the regional economy. Illegal enterprises and self-employed workers can generate income, create jobs and participate in trade and production of goods and services. Secondly, the informal sector is often called the “cradle” of small entrepreneurship, while informality is widespread in such industries as retail, services and agriculture. Thirdly, such a property of the informal sector as flexibility and adaptability to changing economic conditions is significant for the economy. The population and entrepreneurs working in the informal sector can quickly respond to changes in demand, adapt to new conditions and offer more flexible prices and working conditions. This is especially important during periods of economic crisis or instability. However, the informal sector also has its negative aspects for economic development. The main disadvantage of the informal sector is tax evasion, as well as lack of accountability to official statistical agencies, which in turn leads to a distortion of the real economic situation and creates problems for financing government programs, including social and infrastructure projects. Thus, the informal sector is important for the regional economy, but its impact can be both positive and negative: depending on the specifics of the country’s economic situation.

Conclusion

This paper assessed the scale of employment in the informal sector from a number of socio-economic indicators in the northern and southern regions of Russia. The results of the study confirmed the heterogeneity of employment in the informal sector at the level of regions in the south and north of Russia. An analysis of employment in the informal sector of the regions under consideration showed that informality is more common in the south of the country. Since climatic conditions are a powerful factor in differentiation in economic development, the study revealed that the southern regions are losing the competition to the northern regions in terms of GRP. However, in the "host" regions of the south, the Krasnodar, Stavropol, Rostov and Volgograd agglomerations emerged, and as a result, competition is intensifying here. In fact, we see that the population growth in the south of the country, represented by the emergence of agglomerations, which are the growth point of small business, has led to an increase in the number of people employed in small businesses, and the share of people employed in small businesses is three times lower than in the federal cities of Moscow and St. Petersburg, and has the same level as in the north of the country (no more than 11.0%).

Transformation processes did not bypass the southern and northern regions of Russia. These processes led to increased competition in the labor market, and in order to successfully adapt to the new conditions, the population began to actively receive education, which led to an increase in the number of people with higher professional education both in the south and in the north, since higher education provides a more "qualitative" level of socialization.

In addition, there is a connection between the GRP and informal employment indicators: southern regions with lower GRP have a greater coverage of informal employment, while the situation in the northern regions is the opposite.

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Asymmetrical Neighborhood of the Empire and a Small Nation in the Far North: The Image of the Russian "Otherness" and Russian-Swedish/Norwegian Relations in the 19th — Early 20th Centuries

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Abstract. The work examines the features of relations between the Russian Empire and Sweden and Norway in the context of the asymmetric proximity of the 19th – early 20th centuries. The authors have analyzed and identified specific features characteristic of the asymmetrical neighborhood of the empire and a small nation, as well as factors in the formation of ideas about the "Russian threat" to Sweden and Norway during this period and have traced the stages and dynamics of the transformation of these ideas in the Scandinavian countries. Russian-Norwegian and Russian-Swedish relations go back several centuries of asymmetrical proximity, contacts and conflicts, which, of course, influenced the formation of images of the "eastern neighbor". The Swedes and Norwegians' fears and expectations, based on perceptions of themselves, about their collective "Self", contributed to the formation of images of the Russian "Otherness", the attitude towards which was ambiguous and primarily depended on internal preconditions. Therefore, a detailed study of the transformation of images of Russia in Norway and Sweden allows us to take a new look at the history of relations between these countries, as well as to identify the domestic and foreign policy interests of Norwegian and Swedish societies associated with certain images of Russia.
Keywords: *Far North, empire, small nation, myth of the "Russian threat", Russian-Norwegian relations*

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Introduction

Russia, Sweden and Norway have a centuries-old history of neighborhood and relations in the Far North. The peculiarity of this neighborhood was that they were neighbors, different not only in their territorial size, but also in their internal dynamics of development [1, Zaikov K.S., Kuprikov N.M., Kuprikov M.Yu., pp. 2272–2279; 2, Zaikov K.S., pp. 154–174].

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Russia was a huge multinational dynastic empire, following a conservative-traditionalist path of development, which consisted of the paternalistic nature of power, a cautious, often reactive attitude toward technological modernization and, at the same time, high tolerance to the presence of open border zones in the Far North of Europe.

Sweden and Norway, joined together in a union in 1814, were small states on a modernist Western European path of development. In the 19th century, Norway gradually moved towards building a national state and sought to outline hermetic political borders with the Russian Empire. Sweden, which tried to maintain its geopolitical significance in northern Europe throughout the 19th century, sought to keep Norway in the union as long as possible. Stockholm used any argument to strengthen this union, including the image of an external threat to consolidate the union states.

These external and internal differences, which were often asymmetrical and based on imaginary visions of the neighbor, formed the basis for Russia and Sweden-Norway to perceive the other side.

This problem remains relevant in the present period. Modern Russia is perceived by its northern neighbors as a source of threat to the "sustainable development" of European states. However, for the development of relations, it is extremely important to separate facts from speculation and reality from expectations. By studying the myth of the "Russian threat", it is possible to extract new meanings that will help to better navigate in the ideologised information space of our time. Of particular importance in this context is the study of the emergence and subsequent transformation of the myth of the "Russian threat" in Sweden and Norway in the 19th and early 20th centuries.

We believe that it significantly affected the dynamics of bilateral relations and sometimes, unfortunately, led to wrong foreign policy actions, which were reflected at the closest local level of the neighborhood between the countries. The purpose of this article is to rethink Russian-Swedish/Norwegian relations in the border space of the Far North of Europe in the 19th and early 20th centuries in the context of the asymmetry of the neighborhood of empire and small nation.

Materials and methods

The article is based on the array of historical documents from the archives of Russia, Norway and Sweden, as well as historiographical analysis of works by Russian and Scandinavian scholars. In order to study the interstate relations between Russia and Sweden-Norway in matters of transboundary cooperation in the Far North in the 19th – early 20th centuries, the funds of the State Archives of Norway (Oslo), the Hoover Institution Archive (USA) and the Foreign Policy Archives of the Russian Empire were used.

An important group of sources was the periodical press, in particular, materials from the newspapers "Aftenposten", "Svenska dagbladet", "Menigmands Blad" and others, since it is the

press that is of greatest interest for studying the formation and development of the myth of the "Russian threat" within the framework of the concept of ideology.

A wide range of sources from the funds of the Russian State Historical Archive, the State Archive of the Arkhangelsk Oblast, the State Archive of Oslo (Norway) were used to reconstruct the process of delimitation of the Russian-Norwegian border in 1826, Russian-Swedish negotiations on the problem of cross-border activities of the Finnish and Norwegian Sami, as well as to study the attitude and view of regional (Finnmark province, Arkhangelsk province, Grand Duchy of Finland) and central authorities of Russia and Sweden-Norway to the so-called "loparskaya problem" and cross-border relations in the period from 1826 to 1920.

The methodological basis of the analyzed historical material was the world-system and functional approaches, which recognize the multi-subjectivity and multi-spatiality of the process of territorialization of physical space in a historical perspective, which is important for studying the images of space and its influence on the development of the territory and cross-border relations.

The poststructuralist approach was used to study the "symbolic system" (images of space and neighbor) in Russian-Swedish/Norwegian relations, the influence of this system on the dynamics of the development of an asymmetric neighborhood within the framework of the dichotomy "empire — small nation".

Besides, one of the most important concepts of the study is the concept of "Self – Otherness" and the partly related concept of identity, in particular, the study of the problem of the myth of the "Russian threat" as a means of forming identity. Finally, the concept of communication and perception allows us to consider the mechanism of myth formation and dissemination.

The problematic field of the research goes beyond the scope of historical science, so it is necessary to take into account the methodology of related disciplines. One of the most important methods used in this work is the method of constructing models — mental constructs that simplify reality, "in order to emphasize the repetitive, general and typical, which is presented in the form of features and attributes" [3, Burke P., pp. 26–27]. This method is used in studying the process of formation and transformation of ideas about the "Russian threat" in Sweden and Norway. The main indicators within the models will be the security sector (economic, political, military, social), the source of the threat, the object of the threat and those who directly experienced fear about the threat. It is important to note that in this case we are talking not only about the myth (as it concerned primarily a direct military threat), but about the entire set of manifestations of a possible "Russian threat", some aspects of which were quite real.

In addition to the main analytical methods (analysis, synthesis, comparison), the authors use a set of specific methods due to the multidimensionality of the phenomenon under study. Thus, the retroductive method, built on criticism and comparison of theories and models, was the basis for the analysis of historiography. The abductive method, which includes a step-by-step, logical comparison of research concepts/hypotheses with the documents included in the analysis and the subsequent modification of the former, depending on the documents, became the basis for

the selection and analysis of sources related to the study of the symbolic system and dynamics of the asymmetric neighborhood of Russia and Sweden-Norway.

Discussion

The overwhelming majority of studies close to the topic of this publication are localized around certain aspects of the history of Russian-Norwegian relations. A collective monograph edited by Professor J.P. Nielsen and published in 2014 is devoted directly to the history of the asymmetrical neighborhood of Russia and Sweden-Norway, which became partly the methodological basis for this article [4].

The works of O.A. Johnsen, A. Podvysotskiy, N. Golubtsov [5; 6, pp. 6–7; 7] are devoted to individual issues of the history of the Russian-Swedish/Norwegian borderland, its political aspects. A compact generalization is presented in the publications of E. Niemi, in the "History of Southern Varanger" by A. Lunde [8; 9].

Diplomatic aspects of the history of the demarcation of 1822–1826 are partially studied in the publications by C.F. Palmstierna [10] and V.V. Roginsky [11]. The issue of adaptation of the indigenous population to the established border is studied in the works of A. Andresen and M. Lähteenmäki [12; 13].

Researches devoted to the study of images of Russia in various countries have significantly influenced the formation of approaches to the above-mentioned issues in both foreign and domestic historiography. First of all, it is worth mentioning the work of the Norwegian specialist in international relations I. Neumann [14] "Using the "Otherness". Images of the East in the Formation of European Identities". According to Neumann, the Russian "Otherness" was a means of forming national identity in European states, which, comparing themselves with Russia, emphasized their civilization. It is worth noting that Neumann notes the discursive ambiguity and ambivalence of the images of Russia.

A significant part of the works devoted to the issue of Russia in the 19th century belongs to historical journalism. In the 20th century, Swedish scholar F. Lindberg wrote the classic work "Den Svenska utrikespolitikens historia. 1872–1914" [15]. One of the largest studies devoted to the image of Russia in Sweden, and more specifically, the image of the "Russian threat", was conducted by historian G. Åcelius, professor at the Swedish National War College [16].

E. Niemi [17], T. Christiansen [18], and others were among the Norwegian authors studying the problems of perception of Russia and Russian-Norwegian relations, including in the Far North.

It should be noted that the existing historiography of the issue, unfortunately, is not represented by studies that comprehensively reconstruct Russian-Swedish/Norwegian relations in the Far North in the context of the asymmetrical neighborhood of the empire and a small nation in the 19th – early 20th centuries.

Results

The general agenda of relations between Russia and Sweden-Norway in the Far North in the 19th century, which included the issue of delimitation of the Russian-Norwegian borderland, regulation of Sami cross-border activities, as well as Pomor trade, was formed quite a long time ago, but only since the second decade of the 19th century these relations developed in a qualitatively different sense.

The prerequisite for changing the nature of bilateral relations were the events of the so-called era of the Napoleonic Wars, which radically changed the political map of Northern Europe.

The Napoleonic Wars became one of the most significant events that had a direct impact on the formation and development of mutual ideas and relations between Sweden, Norway and Russia. The creation of a union between Sweden and Norway became possible in many ways due to the political processes that took place in Europe in the first decade of the 19th century. According to some historians, the Russian Empire played a key role in this.

In September 1809, the Treaty of Fredrikshamn was signed between Russia and Sweden. The document, which began with the words “There shall henceforth be peace, friendship, and good understanding between his Majesty the King of Sweden, and his Majesty the Emperor of all the Russias”, put an end to direct military conflicts between Russia and Sweden, which has been repeatedly noted by historians of the two countries. Nevertheless, in 1809, the fact that this Russian-Swedish war would be the last was not obvious. According to the treaty, Sweden lost Finland (a third of the state’s territory and approximately a quarter of the population), which became part of the Russian Empire as an autonomous Grand Duchy of Finland: 1809 was truly annus mirabilis (“miraculous year”) in the history of Finland [19, Meinander H., pp. 76–77].

The “Finnish War” seriously changed the political situation in Sweden. Military failures and the deepest economic crisis contributed to the growth of discontent among the noble officers and young officials, which eventually led to the coup of March 13, 1809 [20, Andersson I., p. 308]: King Gustav IV was deposed, his uncle Charles XIII ascended the throne, and a constitutional monarchy with separation of powers was established in Sweden.

At the same time, the war and the events that followed it actualized the image of Russia in Swedish society, which was designated by the concept of “arvfiende” (hereditary enemy). This image had been formed over the centuries and was associated with the long-term military confrontation between Russia and Sweden in the Baltic region. O.V. Chernysheva, who conducted a study of this issue, noted that many Swedish travelers and diplomats of the 16th–17th centuries noted such traits of Russian character as “a tendency to drunkenness, deceitfulness, unreliability, hatred of everything foreign, self-confidence” [21, p. 102]. Such characteristics complemented the stereotype of “Russian barbarism”, which was widespread in many European countries at the time.

Such a distinction was not accidental. The image of the Russian “Otherness”, which was formed in Sweden, served to draw the line between “civilization” and “barbarism”. At the same time, the Swedes, opposing themselves to the Russians, endowed them with those traits that

should not be characteristic of “civilized” states. The context of the formation of this image is the time of Sweden’s dominance in the region, the so-called period of “Swedish great power”.

The Russian-Swedish wars of 1741–1743 and 1788–1790, associated with the ideas of possible revenge, the return of lost territories and influence, ended in defeat for Sweden. In 1789, a pamphlet entitled “On the Threat to the Political Balance in Europe” was published in London. It is believed that it was written “on the instructions of the Swedish King Gustav III” [22, Mezin S.A., p. 154] by the French journalist Mallet du Pan. This work examines three areas of Russia’s aggressive policy: Crimea, Sweden, and Poland; the author calls on European powers to fight against Russia. Nevertheless, by the end of the 18th century, Russia’s strengthened position, in the opinion of many, “gave it the right to play a role in European politics” [14, Neumann I., p. 124].

Thus, by 1809, anti-Russian sentiments were already quite strong in Sweden, which can be explained by the extremely difficult experience of relations between the two states in the Baltic. The last war was also in many ways a catalyst for the emergence, primarily among the nobility and officers, of a “fear of Russia” and a desire to find a powerful ally in the inevitable (as many believed) struggle with it.

As a result of the war with Sweden in 1809, Russia not only acquired Finland, but also the common borderland of Russia and Sweden-Norway was significantly lengthened and expanded from the Finnish salient in the northwest to the Rybachiy Peninsula in the northeast, increasing almost threefold [23, Pokhlebkin V.V., p. 307]. The Norwegian-Russian borderland no longer had the outlines of a single frontier, since the western and northwestern sections had acquired clear demarcation lines, but the northeastern part still retained the frontier status. The Russian presence on the Scandinavian peninsula was much stronger. The Grand Duchy of Finland and Finnish immigrants in Norway embodied the Russian presence, so the image of the border began to acquire an increasingly military-political significance among the Norwegian elite.

Russia, fearing political instability in newly acquired Finland, sought to reconcile the Finnish elite with the new imperial order as much as possible. In 1810, Finland acquired the status of a Grand Duchy, becoming one of the few territories of the Russian Empire to receive broad self-government. Certain independence in shaping domestic policy and St. Petersburg’s fears of losing Finland created a favorable environment for the Grand Duchy to influence the foreign policy agenda and bilateral relations between Russia and Sweden-Norway in the 19th century.

In 1814, after the dramatic events of the summer of that year — the war with Sweden — Norway defended its right to broad internal autonomy within the framework of the new union with Sweden. Although the foreign policy of these countries was formally common, Sweden’s desire to keep Norway in the union allowed Norway to shape its own agenda of Russian-Norwegian relations during the 19th century, with Stockholm often playing the role of arbiter in resolving issues between St. Petersburg and Christiania.

Thus, in 1814, the reformatting of the geopolitical map of the Far North of Europe was completed, as well as Russian-Norwegian relations.

One of the pressing issues on the agenda of bilateral relations between Russia and Sweden-Norway since 1814 remained the problem of delimiting the northern frontier, the so-called "common districts" located in the south of the Varanger Fjord. Since the 18th century, Norway, being in a union with Denmark, was unsuccessfully trying to initiate negotiations with Russia on delimiting the frontier [24, Goldin V.I., Zaikov K.S., Tamitskiy A.M., pp. 519–535; 25, Goldin V.I., Zaikov K.S., Tamitskiy A.M., p. 855]. For the inhabitants of Eastern Finnmark, the territories of the common districts were a vital space, which had long been used economically by the Norwegians. However, it was only in the union with Sweden that the border issue was given a new development. This was possible for a number of reasons.

Firstly, Sweden and Russia had formed a strategic alliance for the first time in many years, and at the same time, the danger of Russia's dominance in Europe forced the King of Sweden-Norway, Carl Johan, and the Stockholm court to be very cautious about the presence of open zones on the northern edge of Sweden-Norway. Therefore, when in 1816 the Norwegian government proposed to Carl Johan to initiate negotiations on the delimitation of the border in the "common districts", he approved the decision of the State Council without much delay. The King understood that Alexander I would obviously not send Russian troops to tear Finnmark away from the Kingdom, but in the longer historical perspective no one could guarantee that the disputed territories would not become a pretext for Russia's expansion to the northeast, as in the case of Finland. Furthermore, delimitation of the border was necessary for the internal consolidation of society in Sweden and for keeping Norway in the union.

Official negotiations on the delimitation of the northern frontier began in 1823, after the receipt of notes from the Russian ambassador Pyotr Sukhtelen to the Swedish-Norwegian Foreign Ministry in May–June 1822, with complaints from Russian subjects — the indigenous inhabitants of the common districts — the Skolts (Sami) about the activities of Swedish-Norwegian subjects on the territory of their pogosts.

In Russia, the Sami settlements were part of the Arkhangelsk province, and the Russian regional administration, supporting them, considered the disputed territories to be part of the Russian Empire and appealed to the Russian Foreign Ministry with a request to facilitate the expulsion of Norwegian subjects from the Russian land. The head of the Russian Foreign Ministry, Vice Chancellor Karl Nesselrode, did not study all the nuances of the issue of the status of the territories. The Vice Chancellor, acting reactively, considered the opinion of the Arkhangelsk officials to be the truth, sent a note of protest to Stockholm, which played the role of a catalyst in putting the issue of delimitation of the Russian-Norwegian border on the agenda of diplomatic relations between the two neighbors [1].

Stockholm replied to St. Petersburg with a proposal to organize studies of cross-border fishing conflicts. Nevertheless, Stockholm feared that the Russian note might have been prompted

[1] State Archives of the Arkhangelsk Oblast (SAAO). F. 4. Invt. 3. Arch. 642 1-50; F. 1367. Invt. 1. Arch. 87 (p. 1) – Sh. 10-140.

by Russia's unilateral desire to annex all the disputed territories, so after consultations with Christiania, it was decided to prepare projects for the delimitation of the frontier and at the same time to propose that Russia recognize this space as common and draw the border [2].

During 1823–1824, several border delimitation projects were prepared in Norway and Russia, which give us a clear picture of the asymmetrical perception of the border problem between Russia and Sweden-Norway, including the perception of each other [3].

In Russia in 1824, it was clear that the Governor-General of the Arkhangelsk Province Stepan Minitskiy had no conclusive evidence that the disputed territories belonged to Russia and that the territories disputed by the Norwegians were likely to have frontier status. Despite this, Alexander I, in his correspondence with the governor S.I. Minitskiy, recognizing the frontier territories, questioned the necessity of drawing the border [4].

Following the logic of imperial thinking, Alexander I was calmly disposed to the existence of an open frontier with Sweden-Norway, which did not pose a threat to Russia. The Emperor intended to preserve the frontier status of the Russian-Norwegian borderland in order to support the traditional industries of the subjects of Russia and Sweden-Norway. However, he decided to convene a bilateral delimitation commission to prepare a border delimitation project in the summer of 1825 due to the persistence of S.I. Minitskiy and the Swedish chargé d'affaires Nils Frederik Palmstierna.

In the winter of 1825, S.I. Minitskiy and N.F. Palmstierna actually forced the Emperor to make a decision. At the same time, not trusting both petitioners, the Emperor decided to entrust the delimitation of the border to an independent commission. The decision was prompted by St. Petersburg's attempts to find a compromise between the interests of the indigenous inhabitants of the Arkhangelsk province and the policy of good neighborliness with Sweden-Norway, and this circumstance required the Emperor to take into account the interests of Norway [5].

Ultimately, a joint border commission headed by Lieutenant Colonel Valerian Galyamin on the Russian side and Colonel Johann Sporck on the Swedish-Norwegian side was in charge of resolving this issue [6]. The draft delimitation prepared by the Galyamin–Sporck commission was in many points in line with the Storting Committee's project. It proposed shifting the border line to the southeast to the Jakobselva River and was successfully approved in Stockholm and Christiania, but the death of Alexander I made adjustments to the decision-making process on the border issue [7] [10, p. 234].

[2] State archive in Oslo. RA/UD, Prebensen samling, G05/10/boks 5213; 40, D-RA/S1076/F/Fb/L0001.
[3] SAAO. F. 1367. Invt. 1. Arch. 87 (p. 1); 42, RSIA. F. 1286. Invt. 4 Arch. 910; 40, D-RA/S-1076/F/Fb/L0001.
[4] National Archives of Norway (NAN). RA/PA–0409/V/L0003/boks — VI-1B; 39, SAAO, F. 1367. Invt. 1. Arch. 87 (p. 1) — Sh. 119–153.
[5] NAN, RA/PA–0409/V/L0003/boks — VII; 39, SAAO. F. 1367. Invt. 1. Arch. 87 (p. 1) — Sh. 139-139rev., 153; 41, NAN, RA/PA–0409/V/L0003/boks — VII; 41, NAN, RA/PA–0409/V/L0003/boks — IX.
[6] Archive of Foreign Policy of the Russian Empire (AFPRE). F. 1. Invt. II-6. Arch. 75 p. I — Sh. 9-21.
[7] NAN, RA/PA– 0409/V/L0003/boks — IX.

In March 1826, the new Emperor Nicholas I suddenly decided to make significant changes to the Galyamin–Sporck project and proposed drawing the border along the Paz River. However, already in April, the Emperor, wishing to maintain the policy of "good neighborliness" in relation to Sweden-Norway, decided to approve the Galyamin–Sporck project, according to which Russia ceded the districts of Neiden and Pasvig (the area of modern Kirkenes) to Sweden-Norway and agreed to draw the border from the Vorjema River (Norwegian — Jakobselva) [8].

In this story we see that, despite the asymmetry of the neighborhood of a great power and a small state, the mutual desire of St. Petersburg and Stockholm to maintain a positive atmosphere of bilateral relations led to the resolution of a complex, long-standing territorial dispute between Russia and Norway. Nevertheless, the main goal of the convention of 1826 to put an end to disputes and mutual distrust on both sides of the border was not resolved.

After acquiring new lands, Sweden-Norway became even more wary of its Russian neighbor. Paradoxically, the result of the demarcation, which was favorable for Sweden-Norway, created conditions for the cultivation of ideas about the "Russian threat", which had been popular here since the second third of the 19th century. In general, Christiania was satisfied with this border. At the same time, the restraint shown by Russian diplomacy in concluding the treaty became one of the prerequisites for the erroneous ideas about Russian expansionism in the North. The treaty was favorable to Norway, but the awareness of this fact by the Norwegian political elite contributed to the emergence of fears that Russia might later claim back some parts of the old common districts.

It was assumed that Russia would achieve great economic and military advantages by taking control of Finnmark with its ice-free sea bays. The thesis that Russia was hatching secret plans to annex the ice-free harbors of Northern Norway became widespread since the 1830s. It was assumed that the Russians did not have access to ice-free coastline along their own territory in the North, and therefore needed one or more Norwegian fjords to develop a navy. All this became the geopolitical basis for the idea of the existence of a "Russian threat" to Norway [26, Zaikov K.S., p. 67].

Therefore, the importance of the Russian-Norwegian borderland and cross-border ties in the bilateral relations between Sweden-Norway and Russia in the second half of the 19th century only increased.

In Russia, the treaty split the positions of the regional public and the central government. Residents of the Arkhangelsk province perceived the border of 1826 as a territorial loss. The treaty became the reason for the emergence and spread of the idea of a "Norwegian threat" in the Russian North, which was also shared by officials in the capital at the end of the 19th century [9].

Thus, the convention gave rise to new images of neighborhood in the Far North, which were reflected in the bilateral relations of the second half of the 19th century.

As noted earlier, another important event in the bilateral relations of the first half of the 19th century was the negotiations on the regulation of transboundary activities. The issue con-

[8] NAN, Fund — Collection of documents of Arnold Restad RA/EA-4036/H/Hc/L002.
[9] SAAO. F. 1367. Invt 1. Arch 87 (p. 2) — Sh. 232-233rev.; 42, RSIA. F. 1286. Invt 4. Arch 910 — Sh. 1-2, 107.

cerned the Finnish and Norwegian Sami along the Norwegian-Finnish section of the Russian-Swedish-Norwegian border.

The Grand Duchy of Finland did not participate in the negotiations on the delimitation of the Northern Frontier, but the convention of 1826 also established a Norwegian-Finnish section of the common border, which corresponded to the line established according to the Danish-Swedish border treaty of 1751. This fact was acceptable to the Norwegian side, but the Finnish Senate was outraged by the delimitation of the Norwegian-Finnish section of the common border without the participation of delegates from the Finnish side in the Galyamin–Sporck negotiations [27, Zaikov K.S., Tamitskiy A.M., p. 632].

The rules of the convention of 1826 also caused irritation. The Finnish Sami of Enara parish, who harvested on the territory of Neiden County, did not have their interests secured in the text of the convention. According to the paragraphs of the convention, privileges were partially preserved only for the indigenous inhabitants of the border settlements on the side of Arkhangelsk province. This concerned the Pazretskie Sami.

Even more significant issue was the question of what norms could be used to regulate the reindeer grazing of Norwegian-Finnish mountain Lapps. Until 1809, reindeer grazing was regulated by the Sami Code, an additional protocol to the Norwegian-Swedish border treaty of 1751. However, the economic needs of the Lapps changed at the beginning of the 19th century: the Finnish Sami became interested in sea and river fishing, which were significantly limited by the code. At the same time, the migration of Norwegian reindeer increased, which did not suit the Finnish border residents. The Senate of Finland hoped that the code could be abolished and new rules for cross-border activities could be developed. The question of the fate of the Sami code was left to a joint commission of border officials in 1832 in Pulmak.

During the negotiations in 1832 and 1834, the imperial Ministry of Foreign Affairs tended to favor the Norwegian position: the Sami code should be the basis for regulating Lapp's activities on the Norwegian-Finnish section of the border. Norway did not consider that there were any hidden motives behind Russia's actions, but gradually, from the mid-1830s, the assessment of Russia's actions in the negotiations on this issue began to change significantly [27, Zaikov K.S., Tamitskiy A.M., pp. 635–636].

Thus, in the 1830s, information about the existence of a military "Russian threat" to Norway appeared. In Russian historiography, it is generally acepted that the idea of a "Russian threat" to Norway is of foreign, primarily Swedish and English origin. However, it is important to make several reservations here. Firstly, relations between Russia and Norway in the first half of the 19th century can hardly be called idyllic; it is worth mentioning the point of view of E. Niemi, who believed that "the roots of the idea of a "Russian threat" go back primarily" to the 1810–1820s and are associated with Russia's economic expansion in the North [28, Niemi E., p. 19]. Secondly, Norwegian liberals sought to achieve greater independence within the union and at the same time

had a rather negative attitude towards the policies pursued by Russia. It is obvious that the images of a "Russian threat" to Norway are also associated with internal factors.

Despite the struggle of the Storting, Sweden had a dominant position in the union during this period, which was clearly demonstrated by the so-called "Bodø affair". English smugglers, acting with the connivance of the Swedish authorities on the territory of Norway, stole the goods confiscated from them, and subsequently demanded that Norway pay them compensation. Sweden did not oppose this, which led to a rather serious cooling of relations. The "Bodø affair" is also interesting for us because John Rice Crowe, the British vice-consul in Hammerfest, who combined diplomatic service and entrepreneurial activity, was involved in it.

Due to his involvement in this case, Crowe was removed from office in 1836, but he made a very interesting political move in this situation. The British Foreign Secretary Lord Palmerston, known for his anti-Russian views, received a report from Crowe that "Norwegian Finnmark will soon be seized by Russia" [29, Davydov R.A., p. 361]. Crowe was soon promoted to consul and returned to Hammerfest. It is difficult to say whether Crowe really believed this or simply used the hypothetical "Russian threat" for promotion, but he was well aware of the tense situation that existed in the "border districts" until 1826.

During about the same period, the Scottish traveler Samuel Laing argued in his book "Journal of a Residence in Norway" that Russia would try to seize northern Norwegian territories (although Laing never reached Finnmark on his journey). In his opinion, this was due to the fact that Russia had seized Finland — those territories that were in close proximity to the Norwegian border. The assumption that Russia needed ice-free harbors on the Norwegian coast gave certain logic to the idea of a military "Russian threat". Laing noted Russia's natural attraction to the seas, concluding that the "scenario of events on the Scandinavian Peninsula is not an idle speculation" [30, Laing S., p. 187]. It is important to note that in this case we are no longer talking about an economic threat, but about a hypothetical military invasion of Norway by Russia. This idea found support among the military commanders of the kingdom. The Swedish liberals, in turn, were aggravated by Carl Johan's friendly relations with Nicholas I, while the Norwegian liberals expressed their negative attitude towards Russian policy in Europe.

Crown Prince Oscar I, who became the head of Sweden-Norway in 1844, was not satisfied with Russia's dominance in Scandinavia after 1809. It is known that he wanted revenge for the loss of Finland and was waiting for a favorable foreign policy situation in order to receive additional guarantees of stability of political borders with the eastern neighbor. At the same time, one of the first, as it seemed at the time, logical explanations for the existence of a Russian threat to Sweden-Norway appeared.

The idea was that Russia's true interests in Scandinavia were aimed at capturing the ice-free fjords in Norway's Finnmark. This idea was formulated in the late 1830s by British consul John Rice Crowe, who became an ardent advocate of the idea in the British and Swedish-Norwegian Foreign Ministries. It appealed much to Oscar I's views on Russia and, in addition, complemented

the general image of Russia that was popular among the majority of the Swedish-Norwegian elite. In the 1840s, Russia symbolized the "gendarme of Europe" — the main reactionary force that was holding back the development of European society. It seemed obvious that the main motive for Tsarist Russia's foreign policy towards the Kingdom was Russia's desire to expand its territorial borders at the expense of Norway and Sweden. The image of the "Russian threat" became a guideline in the development of Sweden-Norway's foreign policy towards Russia. This was encouraged by the clumsy and contradictory actions of the imperial Ministry of Foreign Affairs on the issue of the trans-border activities of the Finnish Sami [31, Zaikov K., pp. 34–38; 13, Lähteenmäki M., p. 226].

The claims of the Finnish side were constantly expanding. The Senate insistently demanded to change the border line approved in 1826 or to exchange territories. In the 1840s, the Finnish population experienced severe famine, and one of the salvations was the fishing industry in Norway, which was hindered by the norms of the Sami code, imposing some restrictions on coastal fishing for Finnish Lapps. The Russian government, fearing the death of imperial subjects, yielded to the Senate and agreed to support the radical line in negotiations with the United Kingdom [10].

In 1840, Sweden-Norway offered Russia an exchange of territories. The object was the so-called "Finnish salient" of the Norwegian-Finnish section of the border. In exchange, Stockholm offered Russia part of the holy lands in Jerusalem and property in Moscow. This proposal was received positively in St. Petersburg also because it partially coincided with the project for the exchange of territories, presented to Alexander I by the Russian envoy in Stockholm, Count Sukhtelen, in October 1826, on the eve of the Emperor's death.

The project was outlined in a dispatch to Vice-Chancellor Nesselrode. Sukhtelen proposed entering into new negotiations with the Swedish government on revising the border. It was about exchanging territories, and the Count proposed exchanging the territory of the Grand Duchy — the so-called Finnish salient — for a part of the former common districts in Norway, located from the river Paz to the middle of the Varanger fjord (modern Varangerbotn) and from it to the river Tana [11].

In the 1840s, Nicholas I decided to take Sukhtelen's project as a basis and, if approved by the Swedish court, to include the acquired southern Varanger in the Grand Duchy. This would allow Finland to acquire a corridor to the Arctic coast and solve the problem of trans-border activities. However, this proposal was rejected by the Norwegian government. Subsequent negotiations in 1846–1848 also had no result: the Norwegian representatives avoided granting the Finnish Lapps any privileges. Feeling futility in attempts to settle the issue on the basis of the 1751 code, which was more beneficial to the Norwegian Sami, the Imperial Ministry of Foreign Affairs decided to recognize the Sami code as optional and negotiate more aggressively.

[10] NAN, RA/PA-0409/V/L0003/boks — XIII.
[11] AFPRE, F.1. II-6. Arch 75. P. I.Sh. 288–289.

On the eve of the next round of negotiations in 1851, at the preparatory interdepartmental consultations, the Russian Foreign Ministry decided to present Norway with an ultimatum: Norway must recognize the legal non-binding nature of the 1751 code and accept the proposal to expand the rights of the Finnish Lapps. If Norway did not agree to this, then Russia would declare the code non-binding and close the Norwegian-Finnish section of the border for cross-border activities.

The curators of the negotiations, Count A.S. Menshikov and Senator K.F.F. Langenskjöld, were confident that the ultimatum would persuade Norway to accept the Russian project. They believed that the Norwegian side would make a concession. The Norwegian mountain Lapps needed pastures in northern Finland no less than the Finnish Lapps on the Norwegian northern shores. No one assumed that Norway would neglect the interests of the mountain Lapps. Moreover, the Russian Ministry of Foreign Affairs really believed that there was no point in preserving any rights for the Norwegian mountain Lapps if only one side was receiving advantages [27, Zaikov K.S., Tamitskiy A.M., p. 638].

The abrupt change in the position of the Imperial Foreign Ministry received a different logical explanation in Sweden-Norway. Stockholm interpreted the Russian claims as a potential desire by Russia to expand its sovereignty in the future and annex the ice-free harbors in Norway's Finnmark. The Norwegian side considered that in the future, Russia could use Finnish migrants in Norway as a pretext for territorial claims. In this situation, the "Russian threat" outlined by John Crowe found "fertile ground", which seemed logical in the context of the general anti-Russian sentiment in Western Europe. In 1848–1849, Russia took an active part in suppressing the Hungarian rebellion in the Austrian Empire, which for many years fixed Russia's image as a reactionary force in Europe. This also strengthened anti-Russian sentiments in Stockholm and Christiania, making Swedish-Norwegian officials very susceptible to Crowe's anti-Russian Doctrine, and the situation with the negotiations on the Finnish Sami only confirmed their fears. Therefore, Stockholm preferred to close the Norwegian-Finnish section of the border to cross-border activities, which was done in 1852 [10, Palmstierna C.F., pp. 294–295].

In the 1850s, the impression was formed in Norway that Russian guarantees of border inviolability were not enough. Distrust in the motives of Russia's foreign policy and desire to obtain additional guarantees of inviolability of the 1826 border pushed Oscar I to a new political agreement with England and France, Russia's main rivals of that period.

On the eve of the end of the Crimean War, it became clear that Russia was losing its status as a European hegemon, and in November 1855, the so-called "November Treaty" was signed between the three players. Sweden-Norway pledged not to enter into an alliance with Russia; in return, Great Britain and France guaranteed the inviolability of the Kingdom's borders.

Along the entire length of the Russian-Norwegian border from Kolto Jaure Island to the mouth of the Vorma River, the border was given clear political and ideological guidelines. This

predetermined the gradual politicization of the border activities of the Russian Lapps in the second half of the 19th century.

The main controversial point of the Convention of 1826 was the question of the rights of part of the border pogosts of the Skolts, namely the lands of the Pazretskie Sami on the territory of Sweden-Norway. The point is that a part of their pogost territories, where the areas of traditional activities (fishing, sheep and reindeer herding) were located, was transferred to Sweden-Norway as a result of the demarcation. Traditional ideas about the space and boundaries of the semi-nomadic culture of the Sami did not correspond to the political imagination of the space of the young Norwegian state, which was concerned with achieving full independence, and therefore sought to delineate the borders of its own territory as soon as possible. At the same time, the Russian Empire, whose presence in the Far North was ensured mainly by the loyalty of the Sami communities, which had broad autonomy, was interested in preserving the extraterritorial forms of economic activity of the Skolts for maintaining the stability of its power.

A partial solution to the problem caused by the mechanical division of the pogosts in 1826 was the so-called “additional protocol of 1834”. According to it, the Pazretskie Sami retained the right to salmon fishing in their former fishing grounds on the territory that was ceded to Sweden-Norway. All other fisheries in Norwegian territory were forbidden. This partial indulgence did not make the treaty of 1826 less unfair for the Skolts and less restrictive of their ancestral possessions. At the same time, the servitude legalized by the additional protocol on the border burdened the Norwegian side and was perceived as evidence of Russia’s readiness to violate the sovereignty of a neighboring state. Therefore, this servitude, adopted to protect the traditional nomadic economy of the indigenous inhabitants of the border area, became a prerequisite for the emergence of the problem of the so-called “Lapps fisheries” in the history of Russian-Norwegian relations. Norway made attempts to limit the scope of the Skolt’s fishing rights on its territory as much as possible, and Russia tried to protect these rights [12].

Due to the spread of public education and growing political mobilization in support of Norwegian autonomy in the second half of the 19th century, the idea of building a unified ethno-national state began to dominate in Norwegian society. According to this understanding of political space, the territory of the state corresponded to the territory of settlement of the nation, which was interpreted in a narrow ethno-cultural sense. Accordingly, the predominance of the non-Norwegian population in Eastern Finnmark and especially in the area of the Russian-Norwegian border was perceived as a foreign invasion — the penetration of Russia into Norwegian territories. The new national social imagination saw the reason for this situation not in the centuries-old history of the region, but in the vulnerability of the border territories [50, Niemi E., pp. 153–158]. Fears of Russian expansion were fueled by the injustice of the 1826 borders in the Russian press [13].

[12] AFPRE. F. II Dep. I-3 Invt 446. Arch 104 — Sh. 238-243; 41, NAN. RA/UD, Prebensen samling, G05/10/boks 5213.
[13] NAN, RA/UD, Prebensen samling; 41, NAN, RA/UD, G05/10/boks 5213; ASV 1877.

The active construction of a national state in Norway and the fear of the huge multinational Russian Empire, which seemed to the Norwegian authorities and the public to dominate their small country, led to the fact that the insignificant Skolt fisheries on Norwegian territory were seen by Norway as a symbol of the Russian presence.

Until the end of the 1870s, the Finnmark authorities, fearing a new involvement of St. Petersburg in the issue of regulating the fishing territories, turned a blind eye to the fact that the Russian Sami were violating the articles of the 1834 protocol. In the 1880s, the situation changed. The real reason for this was the increase in fishing competition between the Sami and the Norwegian colonists. The Norwegians began to use more progressive fishing methods, and the competition for salmon became unequal. The servitude of 1834 was extremely inconvenient for the inhabitants of Finnmark, and in this sense, the inclusion of the problem of the Lapps fisheries in the context of the doctrine of the Russian threat served as additional argumentation for promoting in Christiania and Stockholm the idea of Sweden-Norway withdrawing from the protocol of 1834 in order to make the Russian-Norwegian border more "hermetic" [14].

In Russia, albeit several decades late, there was also a rethinking of the problem of the Lapps fisheries. At the turn of the 19th and 20th centuries, Russia gradually began to catch up with Norway in the development of political thought; the ideology of Russian ethnic nationalism began to crystallize on the territory of the empire, gradually penetrating into the Arkhangelsk province [33, Tolz V., pp. 16–17, 174–175; 34, Hosking G., pp. 449–462].

This nationalism was mixed with the former imperial patriotism, and it can be said that the regional intelligentsia and bureaucracy were seized by a kind of imperial nationalism — the idea of cultural and economic consolidation of the Russian North, where a unified ethno-cultural space was considered a necessary factor in ensuring the socio-economic development of the region. In fact, the concept of the "Russian North" appeared and began to be actively used in journalism and scientific historical literature in the 1890s. This generalizing and unifying category replaced the previous perception of the region as a set of separate lands and groups of local populations (Lapps, Pomors, Nenets).

The complex of Russian imperial nationalism was based, among other things, on the concept of "natural borders", which became widespread in the second half of the 19th century and which made it possible to reconcile the idea of a historical national territory with the policy of expansionism. Many officials and journalists who travelled along the Russian-Norwegian border drew attention to a strange "salient" that did not correspond to the modern "scientific" principle of natural borders. The "artificial nature" of the border in the area from the Church of Boris and Gleb and further southeast to the Vorema River led to the loss of the salmon fishing grounds of

[14] HIA; HI/Russian Missia; Norway/Missia; Sweden/Lapps/box127/11.

the Pazretskie Sami. Thus, more than half a century later, in a completely different intellectual and political climate, the problem of the "Lapps fisheries" became relevant again [15].

A new and larger national mobilization around the problem of the northern borders was supported at the beginning of the 20th century by the regional and metropolitan press, which supported the "Lapps fisheries" in Norway. It was no longer a question of protecting the traditional privileges of the Sami, but of countering the threat of infringement of the "Russians" (who in this case were recognized as the Orthodox Sami). Calling for a revision of the 1826 border, newspapers constantly turned to the image of the "old border", i.e. the demarcation line proposed in the 1820s by Governor-General Stepan Ivanovich Minitskiy [35, pp. 30–56).

The growth of mutual mistrust and accusations of expansionist plans led to negotiations between Russian and Norwegian diplomats in 1896–1903. The Russian Ministry of Foreign Affairs supported the position of the Arkhangelsk public, which, on the wave of national consolidation and mobilization, formulated a program of revenge for the "territorial concession" of 1826: in fulfillment of the "moral duty to the Lapps", to register the Skolt salmon fisheries on Norwegian territory as private property, including a ban on fishing in the fisheries for Norwegian subjects [16] [36, Pokhlebkin V.V., p. 74]. On the contrary, the Norwegian side, which sought to eliminate the servitudes, tried to test the possibility of a unilateral withdrawal from the 1834 protocol or at least to limit the commercial activities of the Russian Sami as much as possible [12, Andresen A., pp. 80–100].

The negotiations came to nothing. The idea of achieving extraterritoriality not only for their subjects, but also for their commercial hunting grounds on the territory of a neighboring sovereign state did not find understanding on the Norwegian side. Russian diplomats failed to formalize the "frontier" regime in an official treaty, allowing the Pazretskie Skolts to supplement salmon fishing with all the accompanying activities (reindeer and sheep grazing, catching other types of fish), permitted by the Norwegians in 1861.

In 1905, in the midst of the crisis of the union of Norway and Sweden, Russia had an opportunity to change the geopolitical balance of power in Scandinavia that had been established in November 1855. The possible withdrawal of Norway from the union gave an opportunity to weaken the influence of Great Britain on the peninsula.

At that time, the struggle of the Entente and Triple Alliance blocs for the division of spheres of influence in the world was gradually leading to a major war. Russia needed to secure its northern borders from a hypothetical threat that could come from the northern direction. The withdrawal of Norway from the union automatically cancelled the treaty of 1855.

An independent Norway was beneficial to St. Petersburg, but the Stockholm cabinet and Great Britain tried to intimidate Norway with the Russian threat in order to keep it in the union. The Russian Ministry of Foreign Affairs, avoiding the isolationist position of other powers regard-

[15] RSIA. F. 1286. Invt 31. Arch 452; Essay, 1895: 36; 42, RSIA. F. 560. Invt 28. Arch 520. — Sh. 1-13; SAAO. F. 4. Invt 16 vol. 1. Arch 988 — Sh. 4–14; 43, AFPRE. F. 155, 1–5. Invt 930. Arch 2. — Sh. 168rev.
[16] HI/Russian Missia; Norway/Missia; Sweden/Lapps/box127/11.

ing the recognition of Norwegian independence, tried to indirectly make it clear to Christiania that Russia was ready to support its independence [36, Pokhlebkin V.V., pp. 12–16]. This was demonstrated during the visit of the Russian cruiser "Bakan" to Norway in the summer of 1905 and during the negotiations on the dissolution of the union of Sweden and Norway in Karlstad in September 1905 [36, Pokhlebkin V.V., p. 6].

On October 11, 1905, the head of the Russian Ministry of Foreign Affairs V.N. Lamsdorf assured the Norwegian Prime Minister Hr. Mikkelsen that Russia would recognize the Norwegian state immediately after ratification of the Karlstad agreements, and already on October 29, Russia was the first in the world to recognize Norwegian independence. Russia's open gestures, however, did not allay fears that Norway, in search of more significant guarantees of territorial integrity, would try to enter into an alliance with its opponents. The Ministry of Foreign Affairs received information from several channels in London and Stockholm that Great Britain and Sweden were trying to restore the anti-Russian November treaty [36, Pokhlebkin V.V., pp. 48–49].

The central issue in the November treaty was the inviolability of the border, which became the most pressing issue for independent Norway. The reason for uncertainty was the fear that Russia was seeking to seize southern Varanger. In this context, the fishing disputes on the Russian-Norwegian border were a convenient moment for public manipulation, fueled by the Swedish press.

The Ministry of Foreign Affairs was afraid that the Norwegian government might be influenced by these sentiments. Russia had to get ahead of its rivals, to be the first to announce its guarantees of Norwegian territorial integrity and to assure Norway that there were no special political considerations under the Lapps question. The corresponding note was transmitted by the Russian envoy in Christiania A.N. Krupenskiy to the Norwegian Minister of Foreign Affairs J.G. Løvland on 7/20 December 1905 [36, Pokhlebkin V.V., pp. 61–65]. Confirming Russia's further peaceful and friendly intentions, the note contained a proposal to conclude a collective agreement to guarantee Norway's territorial integrity.

The Treaty on the Integrity of Norway (Integrity Treaty or Christiania Convention), concluded in 1907, secured the balance of power in Northern Europe. According to this treaty, the great powers guaranteed Norway's territorial integrity. Initially, Norway planned to conclude the treaty so that, if necessary, it could unite with Sweden and Denmark to jointly protect neutrality (the first Norwegian king was the Danish prince Carl, under the name Haakon VII). This was disadvantageous to Russia, whose policy in the Scandinavian region was aimed at preventing a pan-Scandinavian union due to fears that it would pursue a pro-German policy. The final version of the treaty suited Russia, since this agreement prevented Norway from getting closer to Sweden and could also prevent English influence on Norway. As a result, the Treaty on the Integration of Norway was signed by Britain, France, Germany and Russia in 1907.

Norwegian historian Jens Petter Nielsen wrote that after gaining independence, the Norwegian attitude towards Russia can be described as "Bjørnsonian": "It is necessary to show Russia

trust and establish good relations with this country in order to stop its expansionist tendencies" [37, Nielsen J.P., p. 22]. Nevertheless, certain problems in Russian-Norwegian relations of that period were connected with the process of delimitation of maritime borders in the Arctic region. Many Norwegians earned money outside their national borders: this concerned the traditions of fishing, whaling and seal hunting. Therefore, Norway sought to extend its sovereignty to some Arctic island territories, and also took care to protect the borders of its territorial waters. In this area, the clash of interests between Norway and Russia led to conflicts, the resolution of which had an impact on the relations between the two states.

For example, the issue of Novaya Zemlya caused certain disagreements related to the actions of Norwegian fishermen. In 1908, A.N. Krupenskiy, the Russian ambassador to Norway, commented in a letter to the Minister of Foreign Affairs A.P. Izvolskiy on the situation with the Tromsø skipper society declaring the northern part of Novaya Zemlya a "no one's land". He noted that this was done with the aim of "securing the right of Norwegian hunters to hunt on Novaya Zemlya" [38, Komarov A.A., p. 39]. Russia's position on this issue was unwavering: Krupenskiy called such hunters poachers. Later, Norway recognized that Novaya Zemlya was part of the Russian Empire.

Economic contacts in the North and the inevitable contradictions associated with them also influenced the perception of Russia. In December 1910, an article entitled "The North and its industrial wealth" appeared in Novoe Vremya, a socio-political newspaper published in St. Petersburg. The main content of this text can be summarized as follows: Norwegians who were fishing off the coast of Murman were accused of poaching and even of pirate attacks on Pomor ships. This article caused serious indignation in the Norwegian press, and Olaf Brock, who translated it into Norwegian, played a significant role in this process.

As we have already noted, Olaf Brock idealized the Russian people in many ways while criticizing the state. As a professional Slavist, he repeatedly noted that there were very few Russian surnames among Russian politicians. Brock saw hope for the Russian people in the revolution of 1905–1907. However, when the revolutionary movement declined, Brock criticized the return to the "old regime" because it did not solve the problems that had been clearly identified during the revolution. Thus, the publication in Novoe Vremya once again convinced Brock that the government of the Russian Empire should be treated with caution.

One can agree with the opinion that these events became the first "diplomatic crisis" [39, Nielsen J.P., pp. 4–17] in bilateral Russian-Norwegian relations. For Olaf Brock, the situation threatened the loss of direct ties with Russia; there is evidence that the Norwegian Foreign Minister Irgens repeatedly discussed this issue with representatives of the Russian mission in Christiania. Ultimately, this incident ended well for Brock, but it testified to the fact that significant contradictions remained in Russian-Norwegian relations at the beginning of the 20th century.

Conclusion

The history of bilateral relations between Russia and Sweden-Norway can be divided into two periods in terms of the dynamics of relations and perceptions of each other: from 1814 to 1855 and from 1855 to 1905.

The period from 1814 to 1855 was mainly spent under the conditions of the so-called “alliance of 1812” or “good-neighborliness policy” between Russia and Sweden-Norway, which was formed as a result of the alliance of Karl Johan and Alexander I against Napoleon. It is not surprising that this period was marked in the history of bilateral relations by several major diplomatic achievements: the delimitation of the Russian-Norwegian border in 1826 and the signing of a new trade agreement with Russia in 1838. At the same time, the good-neighborliness policy in the 1840s gradually began to change towards a policy of mistrust of Russia and a certain fear of it. By the mid-1850s, the image of the “Russian threat” had finally become established as a kind of doctrine for the perception of Russian foreign policy towards Sweden-Norway, which was popular among the liberal elite in Stockholm and Christiania.

Under the influence of this asymmetrical perception of Russia, the issue of cross-border activities of the Finnish Sami in Norway was resolved in the 1840s and 1850s, the results of which became the biggest defeat of Russian diplomacy in the Far North in the first half of the 19th century. However, the final turn towards a policy of containing Russia in the Far North was made in 1855 with the signing of the November treaty between Sweden-Norway on the one hand and Great Britain and France on the other. Thus, the November treaty became a kind of boundary for bilateral relations in the context of perception of the neighborhood of a small national state and a large empire, which had far-reaching consequences.

In the period from 1855 to 1905, the image of the Russian threat becomes one of the factors in building Norway’s internal border policy, as well as one of the factors in shaping the agenda of bilateral relations. At the same time, serious changes were taking place in Russia, despite the restrained attitude of the Ministry of Foreign Affairs to the November treaty and the anti-Russian sentiments in the capitals of Sweden and Norway. In the 1870s–1880s, the image of a Norwegian threat was gradually spreading among the bureaucracy and intelligentsia of the Arkhangelsk province, and from the 1890s — among the capital officials of the Russian Empire. These two asymmetries of perception were most clearly reflected in the bilateral negotiations on the cross-border fisheries of the Russian Sami in Norway in 1880–1905.

The moral debt to the “Russian Lapps” for the unfair demarcation of 1826 forced the imperial authorities to try to revise the terms of the treaties. The fear of the unjust use of force against a small national neighboring state contributed to the failure of these negotiations. The episode presented is related to a sluggish border conflict and illustrates the difficulties of the asymmetrical neighborhood of a huge empire with a small border state that experiences constant tension from such a neighborhood, but at the same time seeks to assert itself at its expense.

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On the New US Military Strategy in the Arctic

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Abstract. The article discusses the new US military strategy in the Arctic, announced by the administration of J. Biden in July 2024. It replaced a similar document issued under D. Trump in 2019. The authors raise the question of what has changed in the approaches to Arctic security, given the sharp nature of the contradictions between Republicans and Democrats. The article demonstrates that, in general, the US Arctic military policy has maintained continuity; the only difference is the attempt of the Democrat administration to formulate more specific areas of activity to protect US security interests. In the text of the strategy, when assessing threats, China, not Russia, is placed in the first place in terms of importance. At the same time, the formulation of threats to US security in the region is too general and seems far-fetched. The main areas of implementation of the current US military strategy include measures to develop communication, command, control and intelligence systems; to improve military infrastructure; to strengthen the US and NATO military presence in the Nordic countries and to develop defense cooperation. In general, the strategy is confrontational in nature, especially since the US, having obtained geopolitical benefits after Finland and Sweden joined NATO, clearly intends to use them to gain unilateral advantages. However, there are limiting conditions that will prevent the US from fully realizing the plans of this strategy. The main threat to Russia's security in the region is the constant military presence and build-up of US/NATO military infrastructure in close proximity to its Arctic borders, as well as Washington's intention to implement the principle of "freedom of navigation" in the Arctic Ocean, including the Northern Sea Route.
Keywords: *Arctic, military strategy, United States, Russia, China, security threats*

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Introduction

The new Arctic strategy of the US Department of Defense was published in July 2024 [1]. On the one hand, it replaced the previous document, developed under the administration of Republican D. Trump in 2019, and on the other hand, it was intended to clarify the military aspects of the national Arctic strategy of the J. Biden administration, approved in October 2022. Taking into ac-

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[1] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).

count the dynamic changes in world politics and the tough inter-party confrontation within the American ruling circles, the release of the new strategy was significantly delayed: the term of the J. Biden administration was coming to an end.

The publication of this document raises a number of questions. Who is it addressed to? Will the administration that comes to power in January 2025 seek to implement a new military strategy in the Arctic, even if the Democrats remain in power? Will the Republicans agree to revise it if they win the elections in November 2024? It is also unclear how realistic this strategy is in terms of its budgetary support and organizational measures. Is it a strategy in the strict sense of the word?

As is known, unlike other regions, Washington cannot boast of its power in the Arctic. Even the US military complains about the fact that, having two outdated and constantly breaking ice-breakers in the Coast Guard, not having a single deep-water port in Alaska capable of receiving military and commercial vessels of large displacement, the US Navy has a very "pale appearance" in the region [2]. The famous NORAD (the joint aerospace defense system of the United States and Canada, designed to protect North America from a missile attack through the North Pole) has also become quite dilapidated in recent times. The emergence of hypersonic weapons in Russia and China has raised doubts about its effectiveness. In this regard, the question is relevant: to what extent is Washington's new military strategy in the Arctic capable of solving these accumulated problems?

Due to the uncertainty of the domestic political situation in the United States, which will exist at any election outcome, as well as the rapidly changing international situation, it is very difficult to answer these questions. However, it is important to understand what is fundamentally new that the new strategy offers, how it differs from the previous document, and most importantly, what challenges will its implementation create for the security of the Russian Federation in the northern strategic direction?

"The Arctic legacy" of D. Trump and the administration of J. Biden

It should be noted that under D. Trump, no national Arctic strategy was developed; only "departmental" documents were adopted that did not offer a general vision of the US course in this region. The Arctic strategy of the Department of Defense of 2019 was one of these documents [3]. It marked a radical turn in Washington's policy in the Far North, clearly indicating the US transition from cooperation to competition in the region [1, Konyshev V.N., Sergunin A.A.]. This turn was caused not by a reassessment of the Arctic policy itself, but by a general trend towards neo-

[2] Mongilio H. Coast Guard Commandant Fagan Highlights Polar Security Cutters, Indo-Pacom Expansion. US Naval Institute News, 20 March 2024. URL: https://news.usni.org/2024/03/20/coast-guard-commandant-fagan-highlights-polar-security-cutters-indo-pacom-expansion (accessed 29 March 2024).
[3] The Department of Defense Arctic Strategy: Report to Congress. June 2019. Washington: The Department of Defense, 2019. URL: https://media.defense.gov/2019/Jun/06/2002141657/-1/-1/1/2019-DOD-ARCTIC-STRATEGY.PDF (accessed 21 September 2024).

isolationism and a rejection of equal international cooperation on a fairly wide range of issues, which affected many states.

There were two key ideas in D. Trump's military strategy for the Arctic. Firstly, despite the relatively low level of threats of military escalation, the Arctic was nevertheless labelled as a potential region of strategic rivalry between the United States and Russia and China. Secondly, the text of the strategy noted that the United States considers it possible to use NATO forces in the Arctic to deter a potential aggressor [4].

Additionally, several related documents were published, reflecting the vision of regional security issues by other US security agencies: the Coast Guard, Navy, Air Force and Ground Forces. Thus, the Arctic military strategy of the D. Trump administration was reduced mainly to declarative provisions on potential threats in the future, increasing military readiness, updating the icebreaker fleet and expanding operations. In general, the role of the Arctic in the system of foreign policy priorities of the D. Trump administration was relatively low [1, Konyshev V.N., Sergunin A.A.; 2, Konyshev V.N., Sergunin A.A.].

It should be noted that although the text of the strategy did not mention Ukraine as a factor influencing the aggravation of rivalry in Arctic politics, the ideas to extrapolate Russia's policy in Syria and Ukraine to the Arctic region were introduced at the expert level. This was done through the concept of hybrid warfare [3, Konyshev V.N., Parfenov R.V.], which Russia allegedly successfully used in Ukraine in 2014, having annexed Crimea, and will continue to extrapolate this experience to the Baltics and the Arctic [4, Konyshev V.N.].

Despite the tough inter-party struggle and the rejection of most of D. Trump's foreign policy initiatives, the Biden administration continued to develop the trend of confrontation in the Arctic. The Arctic problems were directly linked to Russia's special military operation in Ukraine, a course was taken on the forced accession of Finland and Sweden to NATO, the protection of the interests of NATO countries in the region and the hostility of Russia and China's activities in the Arctic to the West were announced [5, Konyshev V.N., Sergunin A.A.].

On the one hand, J. Biden's Arctic military strategy was intended to present a more specific, practical vision of military policy in the Far North, overcoming the shortcomings of the previous strategy. There is an opinion that the delay in developing a military strategy for almost two years after J. Biden's national Arctic strategy was due to the fact that it took a long time to reach an agreement between the US military departments and representatives of the expert and analytical community who wanted to make the document more specific and realistic. On the other hand, the new document responds to the actually changed geostrategic situation in the Arctic, which has finally lost its status as a "zone of peace and cooperation".

The document is divided into three parts: analysis of American interests in Arctic security, description of the strategic environment, and measures to respond to new security challenges.

[4] Ibid. Pp. 2, 4, 5, 7.

US interests in Arctic security

As for the interests of the United States and its NATO allies in the security sphere, the Department of Defense' strategy develops the documents previously adopted by the Biden administration (National Security Strategy 2022, National Defense Strategy 2022, National Strategy for the Arctic Region 2022, and Defense Policy Guidance on Homeland Security 2023). They outline the national interests of the United States in maintaining stability in the Arctic, which should be ensured by a policy based on cooperation with NATO allies, environmental protection, sustainable economic development of Alaska (the only Arctic region of the United States) and the entire Arctic as a whole, and adaptation to climate change [5]. The new military strategy sees the basis for stability in the development of infrastructure and the US/NATO military presence in the region.

New emphases have emerged in Biden's Arctic military strategy. Firstly, the United States is introducing the Arctic into NATO's area of responsibility. In particular, it is noted that strengthening the NATO bloc in the Arctic will facilitate the implementation of the US military strategy in the region. This confirms the assumption that the alliance will continue to serve primarily the interests of the United States. It is noteworthy that each time the mention of the Arctic states in the text of the strategy is accompanied by an indication of their membership in NATO, emphasizing that the sovereign member states of the alliance will be ensured their collective security.

Secondly, the inclusion of Sweden and Finland in the NATO bloc significantly expands the strategic capabilities of the United States:

- military potential concentrated in the North American part of the Arctic will serve as the northern flank for operations in the Indo-Pacific region;
- strengthening control in the European part of the Arctic significantly facilitates the task of projecting forces into Europe and protecting sea lanes between North America and Europe [6].

In general, the new strategy continues the long-term US policy of achieving global dominance, outlining a broader strategic perspective. The "turn to the East" in order to control energy supplies to China from the sea along the "Persian Gulf – South China Sea – East China Sea" line began under B. Obama [6, Konyshev V.N., Sergunin A.A.] and then continued under D. Trump. But if under B. Obama China was considered a rival, then under D. Trump it was transferred to the category of "revisionist" countries that pose a threat to US interests in the Indo-Pacific region [7, Ivanov O.P.]. J. Biden's military strategy links the Arctic and the Indo-Pacific region for a global confrontation with China.

[5] See, e.g.: The National Strategy for the Arctic Region. October 2022. Washington: The White House, 2022. URL: https://www.whitehouse.gov/wp-content/uploads/2022/10/National-Strategy-for-the-Arctic-Region.pdf (accessed 21 September 2024).

[6] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).

The projection of power into the European Arctic is supported by a series of bilateral US security treaties with Denmark, Norway, Sweden and Finland, which were signed on the eve of the publication of the strategy, during 2023–2024. According to these agreements (similar in content), the United States receives access to military bases on the territory of these countries and the right to deploy equipment, technology, weapons and warehouses there at its own discretion, as well as to conduct exercises in various formats [7]. Thus, the US military presence near the Arctic borders of Russia receives a flexible and guaranteed mechanism: either through NATO or through bilateral security agreements with Arctic states.

Strategic environment

According to the text of the document, the strategic situation in the Arctic is changing dynamically under the influence of the following main factors: the policies of the Russian Federation and China in the region, including their cooperation; NATO expansion at the expense of Finland and Sweden; the consequences of climate change. Possible destabilization can only be compensated for by deepening defense cooperation between Western countries.

The most serious obstacle to the US military strategy is the global challenge from China. China is trying to realize its global ambitions by deepening military and economic cooperation with Russia in the Arctic. This may negatively affect strategic stability in the Arctic, because, according to the American point of view, all China's research and economic activities have a dual purpose, including testing underwater robots, adapting aviation to polar conditions, and implementing the Polar Silk Road transport project. In the same spirit, the strategy evaluates the signed memorandum of understanding on shipping issues between the PRC Coast Guard and the Russian Federal Security Service [8].

The US Department of Defense strategy also sees a threat in China's economic cooperation with the Arctic states. For Washington, China's 2018 Arctic strategy and the Chinese concept of "global commons" in relation to Arctic resources only cover up Beijing's real intentions to gain

[7] Defense Cooperation. Agreement between the United States of America and Norway. Treaties and Other International Acts Series 22-617. URL: https://www.state.gov/wp-content/uploads/2022/08/22-617-Norway-Defense-SDCA-Ready-for-Review.pdf (accessed 1 September 2024); Agreement of Defense Cooperation between the Government of the Kingdom of Sweden and the Government of the United States of America. URL: https://www.government.se/contentassets/9938ae28ed8544d2b60b229e91fd0513/agreement-on-defense-cooperation-between-the-government-of-the-kingdom-of-sweden-and-the-government-of-the-united-states-of-america-date-and-place.pdf (accessed 4 September 2024); Agreement of Defense Cooperation Between the Government of the Republic Finland and the Government of the United States of America. URL: https://finlandabroad.fi/documents/35732/0/Finland%20US%20DCA%20-%20Finland%20Prime%20-%20English%20%281%29.pdf/ff602539-1854-bb30-8a5d-483304b08a59?t=1702559666029 (accessed 4 September 2024); Agreement of Defense Cooperation between the Government of Denmark and the Government of the United States of America. URL: https://via.ritzau.dk/files/2012662/13765902/57437/da (accessed 4 September 2024).

[8] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).

control over the Arctic. The Polar Silk Road project (the Chinese version of the development of the Northern Sea Route) is considered as a part of this long-term plan [9].

The strategy points out that the US has gained advantages in relation to Russia due to the accession of Finland and Sweden to NATO. This is, first of all, the expansion of a permanent military presence in the European part of the Arctic and more reliable cover for the North Atlantic. It is there, through the Faroe Islands–Iceland Gap, that Russian strategic submarines go on patrol to the shores of North America. But, according to the US Department of Defense, Russia is demonstrating the ability to modernize and effectively use conventional forces, the nuclear triad, and special operations forces, thereby creating risks for the US and its allies in the future.

The text of the strategy notes that the current threats to US security interests are posed by Russia's provocative actions in the form of suppression of GPS signals, the allegedly "unprofessional" interception of military aircraft of Western countries near the northern borders of the Russian Federation, and the alleged "illegal ambitions" of the Russian Federation to restrict free navigation along the Northern Sea Route, which contradict the UN Convention on the Law of the Sea, but are ensured by the force potential of the Northern Fleet. In terms of content, these arguments of the US look very controversial, and this has been repeatedly shown by Russian experts [8, Todorov A.A.; 9, Vylegzhanin A.N., Nazarov V.P.; 10, Gudev P.A.; 11, Gudev P.A.]. However, their use in the analyzed document speaks in favor of the intention to pursue an offensive policy in the near future to the detriment of Russia's legitimate rights in the Arctic Zone of the Russian Federation (AZRF).

It should be noted that the text of the strategy does not indicate anything specific regarding the threats from China and the Russian Federation. There is no mention of strategies, military construction, potential, operational capabilities, the nature of the exercises, interstate contradictions in the Arctic that would threaten military conflicts with the participation of the Russian Federation. The text of the American strategy does not present anything to Russia other than "low-level destabilizing activity" [10].

In the same spirit of uncertainty, Iris Ferguson, the US Assistant Secretary of Defense for Arctic Policy, commented shortly before the publication of the military strategy: "... they [the Russians] continue to invest significantly in [military] infrastructure in the Far North. They do this partly for economic reasons. But when we pay attention to this, we see that their potentially defensive investments can turn into offensive capabilities" [11].

As a threat to US security, J. Biden's military strategy accuses China of intending to increase its influence on Arctic policy decision-making and several military maneuvers in the Arctic with

[9] Ibid.
[10] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).
[11] Pentagon's Upcoming Arctic Strategy: «We Talk to Norway, Finland, and Sweden a Lot». URL: https://www.highnorthnews.com/en/pentagons-upcoming-new-arctic-strategy-we-talk-norway-finland-and-sweden-lot (accessed 14 September 2024).

Russia's participation [12]. But, for example, the US Department of Defense in its official statements did not see a real threat from joint flights of Russian and Chinese fighters in the Alaska region, since this does not violate international law in any way [13]. Commenting on the text of the strategy, foreign experts point out that nothing in China's actions in the Arctic indicates military preparations, and in this sense, the text of the strategy also appears ideologically biased when it attributes military threats to the US from China [14].

Thus, both the text of the strategy and the comments of the US military clearly indicate the far-fetched nature of military threats to US security in the Arctic.

Climate change has dual implications for US military strategy in the region. On the one hand, it poses a threat to infrastructure, while on the other, melting ice increases the economic and military importance of the Barents, Chukchi, Bering Seas, and the Bering Strait. By 2030, the Arctic is expected to offer significantly expanded opportunities for maritime transit and seabed resource development, with all the associated risks. At the same time, the European part of the Arctic is more favorable for the US Department of Defense due to its milder climate and developed infrastructure [15].

Directions and ways of implementing the US Arctic strategy

The most significant part of the analyzed document is devoted to the way in which the US intends to ensure its interests in the Arctic.

The first direction is related to the development of systems for monitoring the operational environment and reconnaissance of enemy actions in the interests of high-tech joint forces, designed to carry out a wide range of military and non-military missions in the Arctic. For this purpose, the plans include further improvement of the integrated military control system C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance). Particular attention will be paid to increasing the satellite constellation to ensure stable communications and improving the early warning system for a missile attack. The US cooperates with Norway in this area [16]. About 250 new aircraft (mainly F-35 fighters) will be deployed in NATO Arctic states. In her comments on the strategy, US Undersecretary of Defense for Political Affairs Kath-

[12] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).
[13] McCusker E. The Defense Arctic Strategy — Continuation of Words. URL: https://www.aei.org/foreign-and-defense-policy/the-defense-arctic-strategy-a-continuation-of-words/ (accessed 13 September 2024).
[14] Martin J. The U.S. DOD's 2024 Arctic Strategy is a Welcome Respite from Fatalistic Views on China. URL: https://chinaus-icas.org/research/the-u-s-dods-2024-arctic-strategy-is-a-welcome-respite-from-fatalistic-views-on-china/ (accessed 4 September 2024).
[15] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).
[16] USA and Norway: Will Build Satellite Station at Andøya For Early Missile Warning. URL: https://www.highnorthnews.com/en/usa-and-norway-will-build-satellite-station-andoya-early-missile-warning (accessed 16 September 2024).

leen Hicks clarified that the Arctic will be used to test artificial intelligence systems and unmanned platforms [17].

According to the text of the strategy, the reconnaissance system should be based on the continued modernization of the US-Canadian NORAD system, which combines air defense and missile defense functions, as well as radars installed in Northern European countries. Western experts note that NORAD is "capable of detecting and tracking certain targets" (in other words, not all targets) [18]. Canada will actively participate in the modernization, having allocated $27.8 billion for these purposes in 2022.

Another NORAD function being developed is maritime surveillance. In addition, the Department of Defense is expected to invest in projects for the use of unmanned aerial vehicles. The plan is to ensure data exchange between land, sea, air, and space-based platforms not only in the United States and Canada, but also in European Arctic states.

Under the NORAD modernization agreement announced by the US and Canadian defense ministers in 2021, most of the projects will be completed by 2030, including the introduction of over-the-horizon radars to increase NORAD's range; underwater sensors off the coast of North America; advanced navigation systems to complement the existing GPS, satellite and radio communications systems for the Canadian armed forces; and the delivery of improved short-, medium and long-range air-to-air missiles [19].

However, the United States has yet to achieve full coverage of the Arctic with a system of communications satellites above 65 degrees north latitude. Electromagnetic interference typical of Arctic latitudes objectively hampers stable communications. For this purpose, it is planned to use military and commercial satellites of the United States and its European NATO allies. In addition, by 2030, it will be necessary to ensure the transfer of large amounts of data via communication systems to support the aviation group, unmanned aerial vehicles, the unified radar system, near-Earth satellites and other infrastructure [20].

Harsh weather and complex geomagnetic conditions create a special challenge for high-tech inter-service forces. There are difficult tasks of developing new or adapting existing equipment and weapons to low temperatures, repairing infrastructure suffering from melting permafrost and long-term underfunding, and conducting operations in Arctic conditions.

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[17] Vincent B. DOD's New Arctic Strategy Calls for Better Tech to 'Monitor and Respond'. URL: https://defensescoop.com/2024/07/22/dods-new-arctic-strategy-better-tech-monitor-respond/ (accessed 16 September 2024).

[18] Erwin S. Pentagon's Arctic Strategy Emphasizes Space and Satellite Capabilities. URL: https://spacenews.com/pentagons-arctic-strategy-emphasizes-space-and-satellite-capabilities/ (accessed 16 September 2024).

[19] NORAD Modernization Project Timelines. URL: https://www.canada.ca/en/department-national-defence/services/operations/allies-partners/norad/norad-modernization-project-timelines.html (accessed 12 September 2024).

[20] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).

There is also a military-scientific task of reliably predicting weather conditions using modeling of processes occurring in the ocean, atmosphere, and ionosphere [21]. Assessing these plans, it should be noted that such studies and models require constant data acquisition, including from numerous sensors distributed over the vast expanses of the Arctic Zone of the Russian Federation. But the blocking of international scientific cooperation with the Russian Federation in the Arctic on the initiative of the West made this data inaccessible to Western scientists, which means that the models will not be reliable enough. In this regard, the task set in the strategy of the US Department of Defense remains far from an effective solution.

The second direction of the implementation of the US military strategy in the Arctic is associated with the involvement of not just individual NATO countries, but also the structures of the alliance itself. The strategy states that the alliance has a strategic interest and obligation under the treaty "to protect NATO territory in the Arctic" [22]. In fact, this means the inclusion of the Arctic in NATO's zone of responsibility in response to Russia's unwillingness to join a "rules-based" world order, i.e., rules imposed by the West at its discretion.

The strategy supports NATO's regional policy plan, which will serve as the basis for developing the alliance's Arctic operations concept [23]. The US Department of Defense will coordinate with its allies through the Arctic Security Policy Roundtable (Russia was excluded in 2014), meetings of Arctic defense ministers, the Arctic Coast Guard Forum, and other organizations. At the domestic level, the Department of Defense plans to interact with the State Department, the Department of Homeland Security, the Ted Stevens Center for Arctic Security Studies, and scientific organizations conducting polar research. For coordination purposes, the Arctic Strategy and Global Resilience Office was created in 2022. As for expanding the mobilization resource, the strategy also envisages continuing joint training of special operations forces: both at the level of bilateral military cooperation and through NATO. It is planned to involve the Reserve (National Guard) and Coast Guard forces in training programs for operations in the Arctic.

The third direction of strategy implementation is ensuring a military presence in the Arctic through independent and joint exercises, patrols, and the permanent deployment of joint forces in Alaska, which form the first line of deterrence against the enemy.

The strategy envisages a further increase in the intensity of exercises in the Arctic, including the most important ones for the Department of Defense — Arctic Edge; Northern Edge (involving Indo-Pacific Command); Ice Camp (submarine fleet); Nanook (Northern Command and NORAD); Noble Defender, Vigilant Shield (Northern Command); Nordic Response, Dynamic Mongoose,

[21] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).
[22] Ibid.
[23] Regional Perspectives Report on the Arctic. Strategic Foresight Analysis. Norfolk: HQ SACT Strategic Plans and Policy, 2021. URL: https://www.act.nato.int/wp-content/uploads/2023/05/regional-perspectives-2021-04.pdf (accessed 1 September 2024).

Arctic Challenge (joint forces in the European Arctic) [24]. For illustration: 20 thousand military personnel from 13 NATO countries took part in the Nordic Response exercises in Northern Norway from March 3 to 14, 2024 alone. Fifty submarines, frigates, corvettes, aircraft carriers, amphibious ships, 100 fighters, transport aircraft, and maritime reconnaissance aircraft were involved [25]. In turn, they were only part of the Steadfast Defender exercises, which took place in January–June with the participation of 90 thousand military personnel from 31 NATO countries — the largest exercise since the Cold War and aimed at practicing the alliance's actions in the event of an attack by Russia (including the transfer of forces from the United States, landing from the sea, and strategic deployment) [26].

The US joint forces in Alaska can be increased on a rotational basis if necessary. The forces are intended for action not only in the Arctic, but also in any part of the world, interacting with NATO allies if necessary. In addition to traditional tasks, the joint forces will carry out maritime patrols in the Arctic, including the Faroe-Icelandic border, patrols in Icelandic airspace, and support deployment operations of US and NATO forces in the Arctic states. Finland and Norway will obviously be of primary interest.

Much is already being done in practice to support the implementation of the strategy. The US Department of Defense has stated that it will support the construction of at least 8 icebreakers for civilian and military needs. This project will be carried out through cooperation with Canada and Finland, which Washington announced in July 2024 [27]. The fact is that the United States has not built heavy icebreakers for almost 50 years and is counting on technological assistance from its allies. However, given the failure of the previous US icebreaker program, there are serious doubts about the new initiative.

A. Ferguson stated that although there is no complete clarity on the financing of Arctic military programs, the budget at least covers the costs of reconstructing the Pituffik Space Force base in Greenland ($7 million), purchasing special equipment adapted to low-temperature conditions for the 11th Airmobile Division, which forms the core of the American armed forces in Alaska ($280 million), and creating a high-frequency satellite communications system with protection against interference for US forces operating in the Arctic ($1.8 billion) [28].

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[24] 2024 Arctic Strategy. Washington: The Department of Defense, 2024. URL: https://media.defense.gov/2024/Jul/22/2003507411/-1/-1/0/DOD-ARCTIC-STRATEGY-2024.PDF (accessed 1 September 2024).

[25] Media site — Nordic Response 2024. URL: https://www.forsvaret.no/en/exercises-and-operations/exercises/nr24 (accessed 9 September 2024).

[26] Zverev Yu. Steadfast Defender: What to Expect from NATO's Largest Exercises in the 21st Century. URL: https://eurasia.expert/steadfast-defender-chego-zhdat-ot-krupneyshikh-ucheniy-nato-v-khkhi-veke/?ysclid=m0xvortru870160848 (accessed 3 September 2024).

[27] Rosen Y. Alaska highlighted in new Department of Defense Arctic strategy. URL: https://alaskapublic.org/2024/07/29/alaska-highlighted-in-new-department-of-defense-arctic-strategy/ (accessed 16 September 2024).

[28] Burchett C. US military's Arctic strategy calls for new tech, better communications to maintain regional stability. URL: https://www.stripes.com/theaters/us/2024-07-22/pentagon-arctic-climate-change-china-russia-14564133.html (accessed 1 September 2024).

Expert assessments of the new strategy

The new US military strategy in the Arctic has received mixed assessments from the American and global expert and analytical communities.

Amid the crisis in foreign policy, neo-isolationist sentiments are gaining popularity inside the US, uniting a group of critically minded experts. They believe that the new military strategy in the Arctic exaggerates military threats from Russia and China. For example, according to the author of "The American Conservative", Russia's modernization of its Arctic military infrastructure is connected with the importance of the region for the country's economic development, while its conventional offensive potential is very modest. China's activity in the Arctic is primarily economic in nature. Moreover, relations with Taiwan and the situation in the Taiwan Strait are much more important for Beijing. This is where China is preparing for possible military action [29].

Part of this group of experts believes that the new strategy has not completely overcome the declarative nature (which was characteristic of D. Trump's strategy), it lacks internal integrity, and it does not specify the place of the Arctic among other priorities of American security policy. In their opinion, the slogan of the strategy "monitor and respond" indicates that the Arctic will not be among the top priorities, and the policy will rather be of a passive-reactive nature. For example, the text of the strategy contains a phrase that it will be necessary to balance between the Arctic and other threats to US national security in order to find optimal ways to respond [30].

A serious argument questioning the feasibility of the strategy is the lack of official comments on the provision of the new strategy with the US military budget [31]. The attention and resources of the Pentagon, as follows from the briefing of US Deputy Secretary of Defense K. Hicks, are primarily required by Ukraine, the Middle East, and the Indo-Pacific region. The Norwegian military attaché in the US, O. Hagen, also noted that disputes are possible between the US and its European allies due to the lack of funding for Arctic policy [32].

The second group consists of American experts with a moderate position. In their opinion, the strategy is not aimed at increasing confrontation with China and Russia. They note that the text of the strategy speaks of the increasing activity of China and Russia, but they are not called allies or partners who have the same strategic goals of anti-American nature. A comment by Assistant Secretary of Defense I. Ferguson, one of the authors of the strategy, states that "this document [the strategy] is not about a confrontation... despite this alignment, we still see it as a little bit superficial at the military level... and I don't want to suggest in any way that they [Russia and

[29] Little A. NATO's Arctic Strategy is an Overreaction. American Conservative. August 26, 2024. URL: https://www.theamericanconservative.com/natos-arctic-strategy-is-an-overreaction/ (accessed 16 September 2024).
[30] McCusker E. The Defense Arctic Strategy — Continuation of Words. URL: https://www.aei.org/foreign-and-defense-policy/the-defense-arctic-strategy-a-continuation-of-words/ (accessed 13 September 2024).
[31] Ibid.
[32] Grandy J. Pentagon Arctic Strategy Aims to Enhance U.S. Presence, Exercise More Often. URL: https://news.usni.org/2024/07/23/pentagon-arctic-strategy-aims-to-enhance-u-s-presence-exercise-more-often (accessed 17 September 2024).

China] are in that [high interoperability] level of cooperation" [33]. It can be assumed that consensus on military policy in the Arctic has not yet been reached in US governing circles. Many American officials directly involved in Arctic policy see the problem of growing confrontation with Russia in the Arctic as clearly artificial against the backdrop of the Ukrainian crisis, although there are many supporters of a tough confrontation with Russia and China in the Arctic in the US Department of Defense.

The third group of experts agrees with the offensive pathos of the US military strategy in the Arctic and assigns NATO a key role as a guarantor of stability. However, even they note that the nature of threats emanating from Russia as the main military opponent of the US is not actual (requiring a substantive response to the threat), but only potential: "Russian military capabilities in the Arctic pose potential threats to the US and its allies" [34]. According to this point of view, in order for NATO as an organization to guarantee stability in the region, it is necessary to create logistical capabilities in the Arctic for the military presence of non-Arctic NATO members. An arms race will be an undesirable but inevitable process, since Russia has a number of advantages, such as an icebreaker fleet [35], which NATO will have to neutralize.

Non-Western experts tend to assess Washington's new military strategy in the Arctic more negatively. In particular, Chinese military experts, assessing the US strategy, note its confrontational nature, which is determined not by the regional agenda, but by the general deterioration of relations between Russia and the West. They believe that China's military capabilities and ambitions in the Arctic are clearly exaggerated and have an ideological (anti-Chinese) character. They point out that China has come first in threat assessments that are based on unsubstantiated attribution of aggressive intentions to it, which speaks in favor of the deterioration of US-Chinese relations both in the Arctic and in other regions [36].

In their opinion, the US strategy will contribute to the further escalation of military threats and the arms race in the Far North. They believe that the restoration of coordination mechanisms and military confidence-building measures in the Arctic may take a long time. Non-Arctic observer states in the Arctic Council can make a certain contribution to normalization by participating in consultations and creating new mechanisms for regional coordination. China's interest in military cooperation with Russia in the Arctic can be explained by its intention to prevent Russia from becoming excessively weakened under increasing pressure from the US/NATO and to preserve the

[33] Martin J. The U.S. DOD's 2024 Arctic Strategy is a Welcome Respite from Fatalistic Views on China. URL: https://chinaus-icas.org/research/the-u-s-dods-2024-arctic-strategy-is-a-welcome-respite-from-fatalistic-views-on-china/ (accessed 4 September 2024).

[34] Erwin S. Pentagon's Arctic Strategy Emphasizes Space and Satellite Capabilities. URL: https://spacenews.com/pentagons-arctic-strategy-emphasizes-space-and-satellite-capabilities/ (accessed 16 September 2024).

[35] US Department of Defense releases 2024 Arctic Strategy. URL: https://www.army-technology.com/analyst-comment/us-department-of-defense-arctic-strategy/?cf-view&cf-closed (accessed 16 September 2024).

[36] Xu Keyue. US hypes 'threats from China, Russia' in Arctic strategy, to push for militarization in the region: expert. Global Times, 23 July 2024. URL: https://www.globaltimes.cn/page/202407/1316573.shtml (accessed 21 September 2024).

Northern Sea Route as an alternative route to Europe, given the instability in the Persian Gulf and Suez Canal [12, Petrovskiy V.E.].

The Russian expert community notes that the new US military strategy in the Far North fits into plans to ensure a permanent presence in the Arctic in economic, political and military dimensions, as well as to gain dominant positions in the region [37]. This document shows that the US is going to take full advantage of Finland and Sweden joining NATO and the prospect of freeing the Arctic seas from ice by 2030.

At the same time, according to a number of Russian analysts, firstly, the text of the strategy prioritizes stability over increasing strategic competition in the region. Secondly, the US is not yet ready for a military confrontation in the Arctic, if only because it does not possess a "full-fledged grouping of forces and means to conduct large-scale operations". Thus, Russia has a pause of several years from direct military pressure, which does not cancel other, non-military means of deterrence from the West. In addition, the US intends to actively attract investment from allies to create a common military infrastructure in the Arctic [38].

It can be assumed that the US Department of Defense will adopt an additional document, more clearly disclosing the concept and action plan within the framework of the strategy. This is indirectly confirmed by the "National Intelligence Estimate", published by the National Intelligence Council, to which experts from the US Congressional Research Service refer: as a result of global warming, competition for Arctic resources will increase, which will lead to an aggravation of relations between Arctic and non-Arctic states, an increase in military activity in the region by non-Arctic states to protect their investments, new transport routes and to gain strategic advantages over competitors. According to the National Intelligence Council, an open military conflict is possible in the Arctic in the future. It could either involve Russia and unnamed non-Arctic states if they persistently show military activity in the straits of the Northern Sea Route, which Russia considers to be internal waters (obviously, we are talking about US allies). Or it will be a conflict between China and the Arctic states in the event of its economic consolidation in the Arctic [39].

Conclusion

The new US military strategy in the Arctic considers the policies of the Russian Federation and China as a destabilizing factor in the region and leaves no space for cooperation with them, which may lead to an escalation of tensions in the region in the medium term. The US has gained a significant geopolitical advantage due to its guaranteed military presence in Finland and Sweden. At the same time, the strategy does not contain a clear statement of the threats that come from

[37] American "dancing on arctic ice" will get warm Russian reception. URL: https://19rusinfo.ru/politika/75390-amerikanskie-tantsy-na-arkticheskom-ldu-vstretyat-goryachij-russkij-priem (accessed 16 September 2024).
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[39] Changes in the Arctic: Background and Issues for Congress. CRS Report R41153. Washington: Congressional Research Service, 2024. Pp. 29–30. URL: https://sgp.fas.org/crs/misc/R41153.pdf (accessed 18 September 2024).

the Russian Federation and China. The plans for a very specific build-up of infrastructure and the US/NATO military presence in the Arctic are a response to imaginary threats that could only hypothetically arise from the Russian Federation and China. Apparently, there is still no consensus within the US Department of Defense and the expert and analytical community on the content of the US military policy in the Arctic. This is largely due to the reluctance to get involved in a military escalation with Russia and the understanding that the US has insufficient resources for a more offensive policy in the Arctic.

The United States has de facto included the Arctic in NATO's zone of responsibility, and the official announcement of this by the alliance itself remains a formality. In the Arctic, Russia's land border with NATO has increased to one and a half thousand kilometers. The US sees the expansion of the alliance to include Sweden and Finland as a step to strengthen its global dominance and as a springboard for containing Russia and China in the Arctic.

In the perspective of 2030, the new strategy is aimed at the progressive expansion of the US military infrastructure in Alaska and Northern European countries; accumulating experience in conducting operations in the North American and European parts of the Arctic; further increasing the number and duration of anti-Russian military maneuvers with the development of deployment elements and offensive actions. The depth of military cooperation between Finland and the United States and whether the new military strategy is provided with funding will be of key importance for Russia's security. At the same time, the US will try to shift a significant portion of military costs to European countries, especially to NATO "neophytes" such as Finland and Sweden.

The build-up of permanent US/NATO military presence and military infrastructure in Finland, Sweden and Norway creates the main threat to Russia's security. If the US strategic plans are implemented, not only Russia's strategic nuclear arsenal on the Kola Peninsula, but also densely populated industrial areas and military-industrial enterprises located both in the North-West and in the central regions of Russia, will be at risk. The increasing risks of a military conflict in the Arctic will be linked to Russia's survival and will require appropriate response measures.

The US military strategy in the Arctic is unlikely to cause serious disagreement between Republicans and Democrats after the presidential elections in November 2024, regardless of the outcome of the vote. The only restraining factor will be the budgetary capabilities of the US administration that comes to power. In fact, the new military strategy of J. Biden has not overcome the declarative nature of D. Trump's strategy, but the hegemonic ambitions have been continued. Apparently, the clarification of the priorities of the US Arctic military strategy will take place after reaching a domestic political consensus in the US following the elections, if it happens at all. Otherwise, a significant distance will remain between the ambitious US military plans and reality.

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Northern Sea Route: Past, Present, and Future. Results of the International Scientific Megaproject

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Abstract. The author characterizes the idea, concept, implementation process and results of the international scientific project devoted to the history, modernity and prospects of the Northern Sea Route development, which resulted in a collective monograph published in 2022. The content and structure of this publication are presented, its participants, scientists from four European countries, are indicated. The author examines how this book reveals the most significant milestones of the historical past of this maritime communication, starting with the development of navigation in the European part of the Arctic and the emergence of the idea of the possibility of passage between Europe and Asia, from the Atlantic to the Pacific Ocean along the Eurasian northern coast of Russia, which was called the Northeast Passage. The research compares the results of scientific investigations and search for a through passage from Europe to Asia by this waterway, as well as exploration of its parts and organization of navigation. The author characterizes the transformation of the Northeast Passage into the Northern Sea Route and the organization of its permanent operation and through navigation in the 20th century. The article analyzes the contradictory trends in the development of the Northern Sea Route in the beginning of the 21st century, as well as possible scenarios for its future. The article also reveals the process of studying the history of the Northeast Passage/Northern Sea Route over several centuries and identifies the most significant studies published in Russia and abroad.

Keywords: *Northeast Passage, Northern Sea Route, historical experience of exploration and development, modernity and prospects, challenges and risks, international scientific megaproject*

Introduction

The end of the 20th — the beginning of the 21st centuries were characterized by a sharply increased interest in the Arctic, which has become a new region of international relations. The progressive development of this region presupposes the solution of a wide range of its problems, among which communications play a special role, primarily the leading one — the Northern Sea Route. The high dynamics of the modern development of this maritime communication is based on the understanding of its historical experience and lessons of its development; the government program for the development of the Northern Sea Route until 2035 is in force. The history, modernity and future of the Northern Sea Route are of great scientific interest, as evidenced by the

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implementation of a number of international research programs since the 1990s. The purpose of this article is to analyze the results of an international scientific megaproject, which was launched in the late 20th century and resulted in a collective monograph by researchers from European countries and Russia, published in 2022.

Degree of study

By the end of the 16th century, the first publications of collections of documents describing British attempts to find and explore the Northeast Passage [1; 2] were published, and somewhat later, unpublished manuscripts of the compiler of these collections, the English clergyman R. Haklitt, were issued. They also contained evidence from the Englishmen about the active use of Arctic sea routes by Russian sailors [3].

In the 18th century, the works, documents and instructions of the outstanding scientist and encyclopedist M.V. Lomonosov were published, proving the possibility of passage through the Siberian/Northern Siberian Ocean to East India [4, pp. 417–506, 519–535]. He prophetically wrote in his work "A brief description of various trips to the North Seas and an indication of a possible passage of the Siberian Ocean to Eastern India": "Thus, the path and hope of outsiders will be suppressed, Russian power will grow through Siberia and the Northern Ocean and will reach the main European settlements in Asia and America" [4, p. 498].

The book by the English historian W. Cox, published in 1780, told about Russian and foreign voyages, the goals of which were to explore the western and eastern parts of the Northeast Passage [5].

In the 19th century, numerous descriptions of travelers, reports on expeditions related to the history of the development of the Northeast Passage were published. Among them, it is necessary to especially note the book of the Swedish navigator A.E. Nordenskiöld with a report on the journey in 1878–1880 on the steamship Vega around Europe and Asia, when he managed to overcome the Northeast Passage for the first time in two navigations, proving the feasibility of this sea route [6].

The book by F.D. Studitskiy, published in 1883, dedicated to the history of search, development and discovery by Russian and foreign expeditions of the sea route from Europe to the Siberian rivers and to the Bering Strait, beginning with the Great Northern Expedition (1733–1743) and ending with the travels of A.E. Nordenskiöld [7], should be noted. The book by the famous Norwegian navigator and Arctic explorer F. Nansen, published in Russia in 1915, devoted to the Great Northern Route from Europe to Siberia, deserves mentioning [8].

In the 20th century, the Northern Sea Route was intensively developed, exploited and studied, which resulted in a wide range of publications, including book format, devoted to the history of its development. Here, first of all, it is necessary to mention the four-volume work prepared and published in the USSR, devoted to the history of the Northern Sea Route [9], as well as books by M.I. Belov [10], V.N. Bulatov [11], M.Yu. Vize [12] and others.

In the 21st century, due to the active development of the Northern Sea Route, various aspects and problems of its activities in the past and present are being intensively studied, which is embodied in a series of publications in book format [13; 14; 15].

The history of the Northern Sea Route development in English- and German-language studies was covered in the article by Novosibirsk historian D. A. Ananyev [16]. Foreign researchers address the problems of navigation in the Arctic, including along the Northern Sea Route [17].

Looking ahead and referring to the collective monograph published in 2022, we note that its bibliography contains approximately 900 titles of works on the Northeast Passage/Northern Sea Route in different languages, published in European countries, on the American continent and in Japan.

Origin and realization of the European scientific publishing project on the history of the Northern Sea Route

This project and the resulting collective monograph had, if it may be said so, three starts. According to the review of this research and publishing project, the beginning was the Murmansk speech of M.S. Gorbachev, General Secretary of the CPSU Central Committee, on 1 October 1987, which proposed a large-scale program for transforming the Arctic from a region of rivalry and confrontation into a region of cooperation, including the opening of the Northern Sea Route to international shipping. In the 1990s, within the framework of the International Northern Sea Route Programme (INSROP), one of the projects was the preparation and publication of four working reports on the history of the Northern Sea Route, prepared by four scientists from different countries — J.P. Nielsen (Norway), E. Okhuizen (Netherlands), V.N. Bulatov (Russia) and T.E. Armstrong (Great Britain), which covered the period from the 16th century to 1991, the dissolution of the USSR.

In 2013, an international scientific expedition along the Northern Sea Route took place as part of the Floating University program of the Northern (Arctic) Federal University named after M.V. Lomonosov, dedicated to the 100th anniversary of the expedition along this route by the famous Norwegian polar explorer F. Nansen. Within the framework of this scientific expedition in 2013, a wide range of problems of the Northern Sea Route, its past, present and development prospects were discussed on board the research vessel Professor Molchanov, and after its completion, a decision was made to form an international scientific team to prepare a collective monograph dedicated to the history of the Northern Sea Route.

In 2013–2014, a team of authors was formed, which included the previously mentioned professors J.P. Nielsen (The Arctic University of Norway, Tromsø) and E. Okhuizen, as well as professor, former director of the Fridtjof Nansen Institute in Oslo W. Østreng (Norway), doctor of historical sciences, professor of the Arctic University of Norway V.V. Tevlina, who was also a professor at NArFU, candidate of historical sciences A.E. Goncharov from the Siberian State University of Science and Technology named after Academician M.F. Reshetnev (Krasnoyarsk), head of the car-

tography section of the Library of the Academy of Sciences in St. Petersburg O.A. Krasnikova and the author of the article.

After the formation of the team of authors, the work on the project, its concept, collection of materials in archives and libraries of different countries started. It should be noted that V.N. Bulatov and T.E. Armstrong had passed away by that time, but their published materials were used in the preparation of the collective monograph, and they were included in the team of authors as its full participants with their names indicated in the relevant sections of the publication. Thus, this project and the book published as a result of it were the outcome of the work of a scientific team consisting of representatives from Great Britain, the Netherlands, Norway and Russia.

During the work on this project, scientific seminars of the members of the authors' team were held in Russia and Norway. The last of them took place in autumn 2017 in Oslo. Subsequently, the book was submitted for publication to the well-known international publishing house "Brill". The main work on preparing the book for publication was carried out by its editors — J.P. Nielsen and E. Okhuizen. In preparing the publication, a lot of work was done to find illustrations, and the organizational and editorial work in this direction was carried out, along with the already mentioned editors, by V.V. Tevlina and O.A. Krasnikova. It should be noted that this book is beautifully illustrated. The scientific coordinator of the project was V.V. Tevlina. The collective monograph was published in English in autumn 2022 [18].

This publication starts with an introduction by the Chairman of the St. Petersburg branch of the Polar Commission of the Russian Geographical Society, Honorary Polar Explorer of Russia V.I. Boyarskiy. He described the features and significance of this international scientific publishing project and highly praised the content of this collective monograph.

The foreword by Professor W. Østreng, who was Director of the Fridtjof Nansen Institute in Oslo for a quarter of a century (1978–1993), as well as Head of the Joint Scientific Committee and Secretariat of the International Northern Sea Route Research Program in 1993–1999, describes the initiation and implementation of this program, which involved 468 researchers and experts from more than 100 institutions in 14 countries and 3 continents. Within the framework of this program, 104 projects were implemented, 167 working documents were prepared and a large number of books and articles were published. One of the results of the implementation of this program was the planned project on the history of the Northern Sea Route.

The introduction, written by the editors of the book E. Okhuizen and J.P. Nielsen, provides a general description of the history of the development of the Northeast Passage/Northern Sea Route and the process of transformation of the Northeast Passage into the Northern Sea Route, introduces the main concepts and terms used in the book, contains a brief review of the literature on the topic, names and reveals the natural and climatic factors that have influenced and are influencing this sea communication today.

The structure of the main part of the publication includes 7 parts and 34 chapters. The book covers more than a thousand years of history of exploration and development of the North-

east Passage/Northern Sea Route to the present day, and also presents a look at the future of this Arctic sea route. Unlike the original plan, which was mentioned earlier, this monograph covers the period not from the 16th century, but from the 9th century. It begins with the legendary sea voyage of the Norwegian Viking Ottar (Ottar, Ohthere) around 870–880 along the coast of Scandinavia and the Kola Peninsula to the White Sea with a possible entry into the Northern Dvina River. In general, this part of the book, entitled "Out of the Northern Mist", reveals the period of early navigation in the western or European sector of the future Northern Sea Route until the middle of the 16th century.

The second and more voluminous part of this monograph is called "The West-European Search for a Northeast Passage and the Russian Navigation of the Eurasian Maritime Arctic". It covers the period from the middle of the 16th to the middle of the 18th century. The term "Northeast Passage", as the Northern Sea Route was officially called for several centuries, was associated with the assumption of the possibility of passage from Europe, from the Atlantic Ocean to the Pacific Ocean, by the northern route along the Arctic shores of Russian Eurasia to China and India. This was due to the fact that the agreements of Spain and Portugal seized and divided the traditional ocean routes from Europe through the Atlantic Ocean to the countries named.

The four chapters of this second part of the publication are devoted respectively to the Western European search for an alternative trade route to the East; the Russian exploration and commercial use of the Eurasian maritime Arctic; the First Kamchatka Expedition of 1725–1730 and the Great Northern (Second Kamchatka) Expedition of 1733–1743. This period was characterized by outstanding achievements, which are examined in detail in the book. The third part of the book includes five chapters and is titled, paradoxically, "The 'Non-heroic Exploration' of the Eurasian Maritime Arctic (mid-18th – mid-19th centuries)". This is explained in the text of the book by the fact that the exploration during this period was quite evolutionary and progressive in comparison with the outstanding results of the Kamchatka expeditions of the previous period and with the unprecedented navigation of A.E. Nordenskiöld, who later passed through the entire Northeast Passage. At the same time, it is noted that the period under consideration seems less impressive and unheroic only at first glance, while in reality important and large-scale events took place, although there were also perplexing ones. Tense geopolitical relations between Russia and the Western countries at the extreme eastern end of the developed Northeast Passage were also developing, which are characterized in the publication.

The fourth part of the monograph, which includes six chapters, covers the period from the mid-19th century to 1917 and is called "The Opening Up of the Northern Sea Route to Siberia". The proof of the possibility of a through passage from Europe to Asia via the seas of the Arctic Ocean along the Eurasian Arctic coast of Russia by the expedition of A.E. Nordenskiöld in 1878–1879, as well as commercial voyages and hydrographic survey of this sea route contributed to the fact that at the beginning of the 20th century the term "Northeast Passage" was replaced by the term "Northern Sea Route".

This part of the book examines a wide range of different issues: early exploration and navigation to the mouths of the Ob and Yenisei; Russian-Norwegian relations from the Crimean War to the Russian Revolution of 1917; navigation along the Northeast Passage; protection of the Northern Sea Route until 1905; the Russo-Japanese War and the realization of the potential military and strategic significance of the NSR; the Northern Sea Route on the eve of the Russian Revolution of 1917.

The fifth part of the monograph, consisting of ten chapters, is devoted to the Soviet era of the Northern Sea Route development, when profound changes took place in the management system, research, further exploration and development of this Arctic sea route, and the deployment and arrangement of its infrastructure. The book specifically highlights and characterizes such periods in the development of the Northern Sea Route as 1917 — early 1920s; subsequent decades of the interwar period; the years of the Great Patriotic War; the post-war period, within which 1945 – mid-50s, mid-50s — 60s are distinguished, and the time from the 1970s to 1991 is called the "return to the glory days".

All these complex and multifaceted processes of development of the Northern Sea Route with the peculiarities of development and exploitation of the western and eastern sectors of the Northern Sea Route were closely connected with the large-scale and complex processes of development of the Soviet Arctic as a whole. We are talking about the formation of economic infrastructure and social transformations, about the development of Soviet polar science, as well as about strengthening the defense capability of this huge, complex and extended region of Russia and the protection of its sea communications taking into account the experience and historical lessons of the First and Second World Wars, the Cold War period, etc.

The sixth part of the monograph covers the extremely contradictory post-Soviet period of the history of the Northern Sea Route. On the one hand, in the 1990s, it became possible to use it as an international transport route, and access for foreign ships was opened, provided they met the requirements set by the Northern Sea Route Administration. However, on the other hand, the collapse of the USSR and the breakdown of the former system of management and economic relations led to a sharp reduction in cargo traffic, destruction of infrastructure, and jeopardized the functioning of the Northern Sea Route.

Within the framework of three highlighted stages: 1) the 1990s — early 2000s; 2) 2008/2009 — 2013; and 3) 2014 — early 2020s, the processes of development of the Northern Sea Route and its legal regulation, the formation of its new management system are characterized, the dynamics of growth in cargo transportation and transit problems, hopes and growing difficulties and challenges that had to be overcome are considered. They were associated with a wide range of issues: international relations and geopolitics; search for an optimal management system; economics; infrastructure; logistics, etc.

The final seventh part of the monograph, entitled "The Past and Present in Shaping the Future of the Northern Sea Route and the Northeast Passage", summarizes and comprehends the accumulated historical experience, characterizes, on the one hand, the problems and obstacles to

the development of this sea route, and on the other hand, the constant and changing drivers that affect its use; and on this basis, attempts to predict the future of the Northern Sea Route are made. In this regard, it should be noted that this publication, objectively speaking, goes beyond purely historical narrative, but characterizes the main problems of the present and analyses the prospects for the development of the Northern Sea Route.

In this regard, already going beyond the chronological framework of this book, which ends with the events of the very beginning of the 20s, it should be noted that if already since 2014, Western sanctions had a retarding effect on the development of the Northern Sea Route, international transit along this highway, then the implementation of a special military operation by Russia and a series of new Western sanctions that fell on Russia, including enterprises operating in the Russian Arctic and on this sea communication itself, required fundamental changes in the functioning of the Northern Sea Route, in particular, the redirection of the flow of goods from the European to the Asian direction and the solution of a new and wide range of complex problems.

Returning to the content and structure of the book being characterized, we should note that its final part contains information about the history of this scientific-publishing project, as well as 26 pages of bibliography, lists of used geographical names and personalities.

Conclusion

In conclusion, this was a successful international research and publishing project, and the publication will be useful not only for historians, but also for specialists working in a wide range of disciplines, doctoral students, postgraduates, undergraduates and people interested in the past, present and future of the Arctic. In addition, we would like to express a wish that the scientific contacts that have been developed should not be interrupted, and that the accumulated experience of joint international research activities of scientists from different countries should be used in the future, despite the current political confrontation. In this case, joint scientific creativity and scientific diplomacy could contribute to the détente in international relations.

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Abstract. The article summarizes the general results of the 27th St. Petersburg International Economic Forum (SPIEF-2024, Forum), which took place in St. Petersburg from 5 to 8 June 2024. The author participated in two main Arctic sessions, which were devoted to the Northern Sea Route and international aspects of Arctic development, and interacted with practitioners from federal and regional ministries and transport companies. This article is devoted to analysing these sessions.
Keywords: *Russia, Arctic, Roscongress Foundation, international cooperation, Asian countries, Northern Sea Route*

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Introduction

The main event of the 27th St. Petersburg International Economic Forum was the plenary session, where the President of Russia V.V. Putin made a speech. In his speech and in answering numerous questions, the Head of state gave a deep analysis of the international situation, the development of the Russian economy, and highlighted problems, including those related to the resolution of the Ukrainian crisis. As for the Arctic, the President announced the formation of a commission in the State Council of the Russian Federation for the development of the Arctic regions of Russia and the Northern Sea Route (NSR). He noted, “The Northern Sea Route is becoming an in-demand global artery. Last year, 36 million tons of cargo passed through it, and in the future, the traffic may exceed 150 million tons. For this purpose, we will continue to develop the infrastructure of the Northern Sea Route, build transport approaches to Arctic ports. A special role in this work is assigned to the leaders of our northern constituent entities of the Federation. In this re-

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gard, we will form a commission within the State Council for the development of the Arctic regions and the Northern Sea Route." [1]

According to A.A. Kobyakov, Advisor to the President of the Russian Federation, Executive Secretary of the SPIEF Organizing Committee, 21.3 thousand delegates and guests from 139 countries, 3.5 thousand Russian and foreign companies took part in the forum events. Foreign delegations from 95 countries came to the forum, including 63 heads of diplomatic corps and 48 ministers. Over the four days, 982 agreements totaling 6.43 trillion rubles were signed at the forum, excluding agreements constituting a commercial secret [2]. SPIEF-2024 was held under the slogan "The basis of multipolarity is the formation of new growth centers".

The main results of the work of previous forums on Arctic issues were directly discussed in the journal "Arctic and North" in the articles by V.P. Zhuravel [1; 2] and D.S. Timoshenko [3]. It should be noted that in 2022–2023, Arctic issues were discussed at numerous events of the business program "Arctic: Territory of Dialogue", organized by the Russian Ministry for the Development of the Far East and the Arctic. This was largely due to Russia's chairmanship of the Arctic Council. In 2024, the Arctic theme was modestly represented at the Forum in terms of the number of events. Specifically, the issues of the Northern Sea Route and international problems of Arctic development were considered. This article is devoted to their analysis.

Northern Sea Route: expanding Arctic horizons

The Northern Sea Route has received special attention at all St. Petersburg International Economic Forums. On June 6, 2024, the session "Northern Sea Route: expanding Arctic horizons" focused on the medium- and long-term prospects of the Northern Sea Route and their impact on the development of Russian Arctic regions. Opening the session, its moderator Mikhail Bazhenov, partner and head of the infrastructure and project financing practice at Trust Technologies, invited the participants to assess the significance of the NSR as an international transport corridor alternative to the route through the Suez Canal.

The participants of the event were interested in the speech of the Advisor to the President of the Russian Federation, Special Representative of the President of the Russian Federation for International Cooperation in Transport I.E. Levitin, who outlined the need and principles for forming an international transport corridor on the basis of the NSR and strengthening its railway component. He expressed his opinion as follows: "The prospects for this transport corridor are very serious. The problem we have is that the only railway exits are in Murmansk, Arkhangelsk and Vladivostok. We need an exit to the Northern Sea Route somewhere in the Urals or Siberia. At least

[1] Plenary session of the St. Petersburg International Economic Forum. Vladimir Putin took part in the plenary session of the 27th St. Petersburg International Economic Forum. URL: http://www.kremlin.ru/events/president/transcripts/74234 (accessed 20 June 2024).
[2] Agreements worth 6.43 trillion rubles were signed at SPIEF-2024. URL: https://rg.ru/2024/06/08/reg-szfo/v-pmef-2024-priniali-uchastie-213-tysiachi-chelovek-iz-139-stran-mira.html (accessed 20 June 2024).

one or two [additional] railway exits to the Northern Sea Route, then it will be competitive." [3] Justifying this thesis, he drew attention to the need to increase container transportation along this route. At the same time, he noted that "the volume between Asia and Europe is very significant, and the Trans-Siberian Railway, the Eastern Polygon will not be able to provide these volumes, going through South Africa is also unprofitable. Without the NSR, there will be no global logistics, in one form or another. Breakthrough technologies are expected from Russia in the development of this international transport corridor." [4] This statement of the question is, in our opinion, fundamentally important, it implies, if not a change in the approach to the further development of the Northern Sea Route in the near future, then its significant adjustment due to the strengthening of the mainland of the Russian Federation in its interests.

The Russian Minister for the Development of the Far East and the Arctic A.O. Chekunkov noted that the active development of the Northern Sea Route is possible only with the integrated development of the Arctic regions of Russia. "The NSR will not happen without the residents of the Far North. This route is impossible without creating comfortable living and working conditions for all residents. There are 2.5 million people living in the Russian Arctic." [5] He did not substantiate this statement, but he is referring to the idea recently put forward by the ministry to create 16 agglomerations in the Arctic Zone of the Russian Federation. In this direction, the ministry and the regions are carrying out significant organizational and analytical work to prepare master plans for key settlements. Some of them were initially presented during the SPIEF-2024. A.O. Chekunkov noted that the ministry is forming a register of the best domestic and world practices of work in the north in order to create an international standard. The minister's statements about best practices attracted considerable interest from the forum participants, but then it became clear that this was a prospect in the ministry's activities. Speaking about the growth of cargo traffic along the Northern Sea Route, he noted that the "36.2 million tons transported in 2023 is a record, which recently was still scary to think about, since in 2012 the cargo turnover was 1 million tons. In order to increase volumes, it is necessary to transport cargo within Russia along the NSR." This task is partially solved by subsidized cabotage voyages. Until recently, the nuclear-powered lighter carrier Sevmorput was used for this purpose, but now other vessels are being engaged for these purposes on a competitive basis. In 2022, there were 8 ship calls, in 2023 — 16 ones, in 2024, according to A.O. Chekunov, 18 calls are planned. All this is being done in order to "roll out" the route, to show shippers that the NSR is not scary. It is predictable and, importantly, the same cost as the railway." [6] As always, the minister's speeches were full of figures, he noted that "in the next 11 years,

[3] Expert: Two railway accesses to the NSR in the Urals and Siberia could increase its competitiveness. URL: https://tass.ru/ekonomika/21014357?ysclid=ly8i7sgh6d417909712 (accessed 20 June 2024).
[4] Ibid.
[5] Ibid.
[6] SPIEF-2024: Without the NSR there is no global logistics. URL: https://www.rzd-partner.ru/wate-transport/comments/pmef-2024-bez-smp-net-mirovoy-logistiki-/ (accessed 20 June 2024).

transportation via the NSR will reach 1.8 billion tons of cargo with a total value of 111 trillion rubles. It will also generate 20 trillion rubles of tax revenues." [7]

Special Representative of the Rosatom State Corporation for Arctic Development V.A. Panov tried to justify the threats to global maritime logistics. These include piracy along the coast of Africa, the incident in the Suez Canal with the container ship Evergreen, the recent shallowing of the Panama Canal, the military conflict in the Red Sea, and the events in Ukraine. In his opinion, these are "black swans" that affect the directions of cargo flows and the formation of new trade ties. The Suez Canal reached a record in terms of transportation volume in the last reporting year, before the events in the Red Sea — 1.5 billion tons. A huge figure! But after the events in the Red Sea, cargo traffic has fallen by two-thirds. At the same time, shipping around Africa has grown by about 75%. The most expensive container cargo goes around Africa, and all LNG tankers, including Russian ones, have gone there. It is expensive, time-consuming, but safe. The loss of an expensive tanker can cost much more [8]. According to V.A. Panov, sea transportation along the NSR today is limited to the period of summer-autumn ice-free navigation. For the transition to year-round transportations, it is necessary to build Arctic container ships of the Arc7 ice class [9]. He noted that 10 icebreakers are currently operating, of which 7 are nuclear-powered, and another 5 nuclear-powered icebreakers are under construction. Four more non-nuclear icebreakers with a capacity of at least 40 megawatts are in the preparation stage for contracting. And we plan to order them this year [10]. In his speech, he also noted that in 2024, record transit cargo traffic through the NSR is expected to reach 3 million tons, as well as another record for cargo traffic on the NSR. We are talking about 40 million tons. He named this figure later, on August 8, 2024, speaking at the plenary session of the "Arctic — Regions" forum, which was held in Arkhangelsk. In his speech at the forum, he announced the first meeting of the Russian-Chinese subcommittee on the development of the Northern Sea Route for October 2024. At the forum, the Russian and Chinese parties signed an agreement of intent to organize a year-round container line between Russia and China using the waters of the Northern Sea Route. It should be noted that in 2023, the Chinese company entered the Northern Sea Route for the first time and carried out 7 voyages between the ports of China and Russia; in 2024, it plans to carry out 12 voyages.

State Secretary Deputy Minister of Industry and Trade of the Russian Federation V.L. Yevtukhov, in turn, noted that to realize the potential of the NSR, a large-tonnage ice-class fleet is needed, capable of ensuring year-round transportation of goods. According to the plans of the ministry, 14 icebreakers will operate on the NSR by 2035. The completion of the ultra-modern ice-

[7] Northern Sea Route route was rolled out at SPIEF-2024. URL: https://www.prometall.info/ludi/menedgeri/na_pmef_2024_raskatali_marshrut_sevmorputi (accessed 20 June 2024).
[8] Ibid.
[9] Rosatom will develop NSR project. URL: https://regnum.ru/news/3893971 (accessed 20 June 2024).
[10] Record traffic jams, NSR, Russian Railways and BRICS. The first day of SPIEF-2024 in a special report of Vgudok from the forum. URL: https://vgudok.com/lenta/rekordnye-probki-smp-rzhd-i-briks-pervyy-den-pmef-2024-v-specialnom-reportazhe-vgudok-s-poley (accessed 20 June 2024).

breaker Lider at the Zvezda shipyard is scheduled for late 2029 — early 2030. A vessel of this class will be able to cope with the ice in the Laptev Sea, which even 60-megawatt icebreakers cannot handle. According to the ministry's plans, 15 rescue vessels are planned to be built by 2026, and there will be 40 units in total [4, Aleksushin G.V.]. The Volga shipyard has begun building the first of 3 hydrographic vessels for the NSR. In his speech, he noted that the key task is to build domestic gas carriers for the transportation of liquefied natural gas, equipped with Russian and Chinese technologies. According to V.L. Yevtukhov, another challenge for Russian shipbuilders is the need to create their own low-speed engine with a capacity of more than 8 MW for large ships. He noted that such units are manufactured abroad at three plants: Vartsila, Man and under license in China, in Russia the Volgograd plant "Krasny Oktyabr" is ready to undertake this project. He informed that shipbuilders are working on the idea of developing the construction of large vessels on turbine units; the Russian Federation has such potential. He reported that until recently the shipyard was working in a technological partnership with colleagues from the Republic of Korea, who unilaterally, violating the terms, withdrew from the project.

Foreign participants spoke constructively. Sultan Ahmed Bin Sulayem, Chairman of the Board and CEO of DP World, a leading businessman of the United Arab Emirates, noted that there is no regular and high-quality service on the NSR yet, i.e. it is too early to talk about the Northern Sea Route as an alternative route, but, according to the speaker, there will be fewer of them when logistics hubs are built in Vladivostok and Murmansk. He noted that due to geopolitics, supply chains are changing, shippers are no longer looking at the cost of transport, they are now interested in delivery times or even the possibility of delivering cargo. Earlier in 2023, speaking at the SPIEF-2023 session "Northern Sea Route: new challenges", he noted that over the past 60 years, no new routes have appeared, with the exception of the Northern Sea Route [11].

Ke Jin, CEO of China Freight Forwarding Company, was pleased to report that in 2023 his company completed the first eight container voyages from China to St. Petersburg, Kaliningrad and Arkhangelsk, particularly highlighting transportation between China and Russia via the port of Arkhangelsk, which reduces the transit time for cargo delivery during the navigation period. In his opinion, Arkhangelsk has an ideal (close) location to Moscow (only 1.1 thousand km) for the transshipment of imported goods from China [5, Zaikov K.S., Spiridonov A.A., Fadeev A.M.].

The Governor of the Murmansk Oblast A.V. Chibis noted that the Northern Sea Route is a powerful growth point for the Murmansk Oblast [6, Zhuravel V.P.]. He emphasized: "Murmansk is the base port of the NSR. Cargo turnover at the end of 2023 amounted to 58 million tons. An increase of almost 3% compared to the previous year. The Murmansk port is deep-water and ice-free, and is one of the five largest in Russia. We are working together with the Russian government and companies on the task set by Russian President V.V. Putin to increase the capacity of the

[11] UAE business expresses interest in using Northern Sea Route. URL: https://lenta.ru/news/2023/06/15/oae/?ysclid=lyag1krde3953645055 (accessed 25 June 2023).

Murmansk port to 110 million tons per year." [12] He also emphasized that "one of the key projects of the region is the Murmansk transport hub, which includes the construction of a port and almost 50 km of railway line. The port of Lavna is the first new port in the Murmansk Oblast since the Soviet Union times, which will operate on the western shore of the Kola Bay, where the new railway goes. This is 18 million tons; we plan that it will start operating this year." [13] He was also pleased to tell the forum participants about the establishment of the Center for the Construction of Large-Tongue Marine Structures in the village of Belokamenka, which has no analogues in the world and is a key facility for the LNG equipment manufacturing industry being created in Russia. Currently, the construction of the first liquefaction line for the Arctic LNG 2 project has been successfully completed, and work to create the second line is underway. This project is being implemented by PAO NOVATEK.

The Governor of the Arkhangelsk Oblast A.V. Tsybulskiy, continuing the discussion, noted: "It is important that the coastal infrastructure, the most important part of the overall NSR system, is ready to perform new large-scale tasks." He then listed the advantages of the Arkhangelsk transport hub: year-round navigation (with icebreaker assistance) with access to the World Ocean without crossing the territorial waters of other states; modern "digital port" system that makes it possible to obtain detailed data and process it in real time; readiness to double the volume of cargo transshipment; regular transport links with other regions — rail and road; expertise in shipbuilding and ship repair; full-fledged base for training personnel for the industry [14]. It should be noted that in September 2023, the Comprehensive Plan for the Development of the Arkhangelsk Transport Hub until 2035 was approved [15]. The plan provides for the development of the deep-water area, the expansion of shipping routes on the Dvina and Pechora rivers and water approaches to enterprises, railways and roads, the renovation and creation of new scientific centers and professional educational institutions. It also provides for the construction of a sea terminal for the shipment of lead-zinc concentrate on the Novaya Zemlya archipelago. The commissioning of the new terminal and the deep-water area of the Arkhangelsk seaport is scheduled for 2031. It is planned that the estimated capacity of the new terminal by 2040 will be 25 million tons per year.

The Governor of Chukotka V.G. Kuznetsov began his speech by noting that the Northern Sea Route is one of the most important elements of the economy of the Chukotka Autonomous

[12] Andrey Chibis at SPIEF: "Murmansk can become the main container hub in the Arctic if the appropriate infrastructure is provided". URL: https://gov-murman.ru/info/news/523098/?ysclid=m0p8yvg05y779388794 (accessed 20 June 2024).
[13] Ibid).
[14] Today at SPIEF-2024 — "Arctic Day" and a discussion on the topic "The Northern Sea Route: Expanding Arctic Horizons". URL: https://goarctic.ru/news/segodnya-na-pmef-2024-arkticheskiy-den-i-diskussiya-na-temu-severnyy-morskoy-put-rasshiryaya-arktich/ (accessed 20 June 2024).
[15] Order of the Government of the Russian Federation of September 22, 2023 No. 2555-r. URL: http://publication.pravo.gov.ru/document/0001202310020003?ysclid=loykmyr8e9578950869 (accessed 25 October 2023).

Okrug. More than 80% of all cargo is delivered via the NSR for the needs of the Okrug [16]. He also emphasized that the regional government, together with the Rosatom State Corporation and the Ministry for the Development of the Russian Far East, is working to launch a single sea operator for northern delivery in 2025 [17] as part of a pilot project based on the Chukotka Autonomous Okrug. At the forum, this proposal was enshrined in a tripartite agreement, the implementation of which should help improve cargo transportation to the Okrug. Chukotka was chosen because it is fully provided with northern delivery. Cargo can only be delivered there by air or by sea. It is better to do this by sea.

Director of the Department of Educational, Scientific and Technical Activities of the Russian Emergencies Ministry A.I. Bondar reported that on June 4, 2024, an Arctic-integrated emergency rescue center was opened in Russia's northernmost city, Pevek (Chukotka Autonomous Okrug). He noted that for the first time, the Emergencies Ministry's rescue unit, employees of the Federal Medical and Biological Agency, and the Federal State Budgetary Institution "Morspasluzhba" are jointly located, which significantly reduces the project's funding and increases the efficiency and coherence of employees' actions in emergency situations. The center will employ 50 specialists equipped with modern emergency rescue vehicles, all-terrain vehicles, airboats, and boats. In the future, the department plans to create similar centers in other settlements along the Northern Sea Route: Sabetta, Dikson, and Tiksi [7, Shenshin V.M., Nazarova I.S., Utkin N.I.].

Rector of Bauman Moscow State Technical University M.V. Gordin drew attention to the importance of training engineering personnel for the domestic industry and stimulating the motivation of young people to obtain an engineering profession. In this regard, it is important to reformat the main approaches to training personnel in order to meet modern challenges and achieve technological sovereignty, including in Arctic technologies. In this regard, a significant event was the signing of an agreement on scientific and educational cooperation with the Rector of the Far Eastern State Transport University V.V. Burovtsev.

The results of the session show that interest in the NSR is constantly growing. Unlike friendly countries, unfriendly states are trying to slow down the development of its infrastructure and limit its logistical capabilities. The western part of the Northern Sea Route is developing and being exploited better.

International problems of the Arctic

The next day, a session entitled "Arctic plan. International aspect" was held. Representatives of China, Japan, and Norway spoke at it. The Russian side was represented by officials from the Ministry for the Development of the Russian Far East, the Arkhangelsk Oblast, the Rosatom

[16] Chukotka delegation participates in St. Petersburg Economic Forum. URL: https:// chaogov.ru/press-tsentr/novosti-chao/delegatsiya-chukotki-uchastvuet-v-peterburgskom-ekonomicheskom-forume/ (accessed 20 June 2024).
[17] Federal Law of 04.08.2023 No. 411-FZ "On Northern Delivery". URL: http://publication.pravo.gov.ru/document/0001202308040016?ysclid=ll1356qrls698740393&index=1 (accessed 24 August 2023).

State Corporation, GDK Baimskaya LLC (Chukotka Autonomous Okrug), VEB.RF and the Arctic and Antarctic Research Institute of Roshydromet.

In terms of content, it was a continuation of the discussion on the problems of the Northern Sea Route, the development and exploration of the Arctic, with an emphasis on some international problems of the Arctic [8, Marchenkov M.L.; 9, Palilov D.E.].

Chekunkov A.O., Minister of the Russian Federation for the Development of the Far East and the Arctic, noted the importance of the Arctic for the development of the world economy. The Arctic is "mineral resources — fertilizers, nickel, cobalt, platinum, copper; hydrocarbons — oil, gas; pulp and paper production and products of the forest industry complex, diamonds. And shipbuilding" [18], and also outlined the growth in the volume of transportation along the Northern Sea Route: "The dynamics of the NSR development are obvious to everyone: growth over 12 years is 36 times, from 1 million tons to 36 million tons. Plans already invested by companies to produce goods that will need to be exported along the NSR are 2 billion tons over the next 12 years. This is a whole layer of the economy, which is worth more than 100 trillion rubles in today's prices, which alone should generate 20 trillion rubles in tax revenues in Russia." [19] These figures are impressive but require significant efforts by the state, Arctic regions, commercial structures, financial resources and the direct work of northerners.

V.A. Panov, special representative of the Rosatom state corporation for Arctic development, drew attention to the complex nature of the Arctic region's development: "The Arctic will develop through an ecosystem that will consist of four balanced elements. The first is, of course, the mineral resource base. The second is energy, the third is logistics, or transport, and the fourth is international cooperation, because almost all of our projects in the Arctic are export-oriented in one way or another." [20] In our opinion, this formulation of the question is an attempt to justify the scientific nature of work in the Arctic, although in reality these processes are largely independent, and it is unclear what the "ecosystem" has to do with it. Although we agree with the expert that environmental issues are becoming increasingly important in the Arctic region.

A.V. Tsybulskiy, Governor of the Arkhangelsk Oblast, noted that all tasks related to the development of the Arctic and the NSR should be addressed at an accelerated pace [21]. All speakers agreed with this idea.

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[18] SPIEF: "Arctic Plan", the President's speech, creation of a new commission for the development of the Arctic and the Northern Sea Route. URL: https:// goarctic.ru/news/pmef-arkticheskiy-plan-vystuplenie-prezidenta-sozdanie-novoy-komissii-po-razvitiyu-arktiki-i-severno/ (accessed 20 June 2024).

[19] Current development rates of the Northern Sea Route correspond to planned indicators – experts. URL: https://www.korabel.ru/news/comments/tekuschie_tempy_razvitiya_sevmorputi_sootvetstvuyut_planovym_pokazatelyam_-_eksperty.html?ysclid=m0ma8l6qr7764095867 (accessed 20 June 2024).

[20] Rosatom says four-element ecosystem will be foundation for Arctic development. URL: https://tass.ru/ekonomika/21044807 (accessed 20 June 2024).

[21] SPIEF: "Arctic Plan", the President's speech, creation of a new commission for the development of the Arctic and the Northern Sea Route. URL: https:// goarctic.ru/news/pmef-arkticheskiy-plan-vystuplenie-prezidenta-sozdanie-novoy-komissii-po-razvitiyu-arktiki-i-severno/ (accessed 20 June 2024).

M. Khomich, Chief Executive Officer, Chief Strategist of VEB.RF, Director of Special Projects of the Agency for Strategic Initiatives for the Promotion of New Projects, pointed out that the Russian Government has set very ambitious goals related to the development of the Arctic zone, and they cannot be achieved without international cooperation.

Fotin G.V., General Director of the mining company GDK Baimskaya, noted that the Baimskiy project will not only strengthen Russia's position in the international market, but will also radically transform life in the eastern Arctic territories of the country. The company holds a license for metal mining within the Baimskaya area, which includes the Peschanka copper-porphyry ore deposit in the Chukotka Autonomous Okrug. Ore processing, copper and gold production will require significant amounts of electricity.

Director of the Arctic and Antarctic Research Institute A.S. Makarov dedicated his speech to discussing the global climate agenda and drew attention to the importance of scientific research in the region [9, Savinova V.A.].

Ms. Fan Yuxin, Chairman of the Chinese logistics company NewNew Shipping Line, pointed out that the development of the Arctic is the mission of the era. At the same time, she called the Northern Sea Route and the developed Arkhangelsk—Shanghai route "Arctic Express No. 1". In her opinion, the Northern Sea Route creates welfare and prosperity for the whole world.

Hide Sakaguchi, President of the Ocean Policy Research Institute of Japan, Executive Director of the Sasakawa Peace Foundation, noted that the Arctic region has enormous economic potential due to its mineral resources, strategic location and tourism opportunities. According to her assessment, the Russian Arctic contains significant hydrogen reserves, and technologies for their use can have a considerable effect on the regional and global economy.

Mads Quist Frederiksen, Executive Director of the Arctic Economic Council (speaking online), said that Norway's chairmanship of the Arctic Council is gaining momentum; its six working groups have resumed their activities, and the attitude towards Russia, which is a full member, has become friendlier. He noted that "we have global goals, and we are confident that cooperation will develop and intensify in the future." Given the problems in the activities of the Arctic Council and Norway's chairmanship, the Russian Federation needs to analyze the developing Arctic situation more deeply [11, Nevskaya N.A.].

Conclusion

For more than a quarter of a century, the Forum has become a global platform for establishing cooperation ties, an authoritative and representative world-class event that took place against the backdrop of a special operation in Ukraine, large-scale sanctions and the departure of a significant number of foreign companies from Russia.

The sessions contributed to a comprehensive understanding of the real situation in the Arctic, made it possible to develop specific steps and effective solutions to fulfill the tasks set by the Russian leadership to ensure balanced sustainable development of the Arctic region. The

country's leadership and the heads of the subjects of the Arctic Zone of the Russian Federation understand that this region is an important and promising territory of Russia. In the foreseeable future, according to experts, economic projects, including with Asian countries, will become the main ones. Unfortunately, it is increasingly rare to hear at forums about the problems that hinder the development of the Arctic. This is largely due to the fact that the same experts speak every year.

The dynamic development of the Northern Sea Route and its transformation into a year-round international transport corridor directly depends on both the growth of transit traffic and the development of Russian Arctic territories. Its development opens up serious economic and logistical prospects for the Arctic regions, and gives a powerful impetus to improving the quality of life and creating highly paid jobs in various fields. It was stated that in order to fully realize the potential of the NSR, it is necessary to have a year-round transport system.

The Arctic has enormous economic potential and is a key area for global development and economic integration. At the same time, restored international cooperation should play a significant role in the development of this territory. Under these conditions, the Northern Sea Route will open up new opportunities for international trade and export of Arctic resources.

Russian experts in their speeches avoided assessing the state and prospects of international cooperation in the Arctic, with the exception of V.L. Evtukhov, who noted that the Republic of Korea refused to sign an agreement on the construction of icebreakers and is not returning funds under the contract, and A.A. Makarov, who expressed hope for achieving breakthrough results in Arctic science based on restored international cooperation.

For some speakers of the Arctic sessions, participation in the SPIEF-2024 had its own working and personnel continuation. The Governor of the Murmansk Oblast A.V. Chibis was the first among the leaders of the Arctic regions to receive approval from the President of the Russian Federation V.V. Putin on August 6, 2024 for master plans for the development of the supporting settlements of the Murmansk Oblast [22], and was elected Governor of the Murmansk Oblast for the second time. On June 12, 2024, V.L. Evtukhov was appointed Head of the Presidential Administration for State Policy in the Sphere of the Defense Industrial Complex [23], and the Rector of Bauman Moscow State Technical University M.V. Gordin was included in the Council under the President of the Russian Federation for Science and Education on August 19, 2024 [24]. Now they have an additional opportunity to pay more attention to Arctic problems in their activities.

[22] Russian President Vladimir Putin approved master plans for the development of Arctic key settlements in the Murmansk Oblast. URL: https://gov-murman.ru/info/news/526452/?ysclid=m0qxnft5uh353465491 (accessed 15 June 2023).

[23] Decree of the President of the Russian Federation dated 12.06.2024 No. 483 "On officials of the Administration of the President of the Russian Federation". URL: http://publication.pravo.gov.ru/document/0001202406120010 (accessed 20 June 2023).

[24] Decree of the President of the Russian Federation dated 19.08.2024 No. 706 "On approval of the composition of the Council under the President of the Russian Federation for Science and Education and the composition of the Presidium of this Council". URL: http://publication.pravo.gov.ru/document/0001202408190015 (accessed 20 June 2023).

Unfortunately, at these two sessions, the forum participants did not recall the contribution of the recently deceased (June 1, 2024) Hero of the Soviet Union, Hero of the Russian Federation, State Duma deputy, special representative of the President of the Russian Federation for international cooperation in the Arctic and Antarctica, Artur Nikolaevich Chilingarov to the study and development of the polar regions.

The delegation of the Institute of Europe of the Russian Academy of Sciences, represented by its leading research fellows V.P. Zhuravel, N.A. Nevskaya and M.V. Vedernikov, took an active part in the work of the 27th St. Petersburg International Economic Forum. V.P. Zhuravel is the head of the Center for Arctic Studies, the author of more than 100 scientific papers on the problems of development of the Arctic; N.A. Nevskaya is the head of the Center for Macroeconomic Research, the author of more than 90 works, including the author's textbook of federal significance "Macroeconomic Planning and Forecasting", which has gone through three reprints; M.V. Vedernikov is the deputy editor-in-chief of the journal "Scientific and Analytical Bulletin of the Institute of Europe of the Russian Academy of Sciences", the author of more than 90 scientific papers, and a native of the Arkhangelsk Oblast.

The organizer of the 27th St. Petersburg International Economic Forum was the Roscongress Foundation, a socially oriented non-financial development institution and a major organizer of all-Russian, international, congress, exhibition, business, public, youth, sporting and cultural events. It was created in accordance with the decision of the President of the Russian Federation in 2007 with the aim of promoting economic development and national interests of Russia within strengthening its image. Following the results of SPIEF-24, on July 22, 2024, the Head of state approved a special list (Pr-1381), consisting of 21 instructions. In instruction 6, the Roscongress Foundation is tasked with ensuring the analysis and summarization of the final materials of the forum by October 1, 2024. In this regard, the question naturally arises about how the agreements signed at previous forums are being implemented. Thus, following SPIEF-2022, 695 agreements were signed for a total of 5 trillion 670 billion rubles [25], while at SPIEF-2023, more than 900 agreements were signed for a total of 3 trillion 860 billion rubles [26]. These are agreements, the amount of which is not a commercial secret.

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Russian Arctic in the Contours of the Maritime Doctrine of the Russian Federation

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Abstract. During the decade of implementation of strategic planning in modern Russian reality, planning imperatives have also been introduced into the processes of geo-economic and political development of the Arctic, defining the system of goals and functional dominance of this geostrategic region, in particular, in medium-term perspective of budget policy implementation in 2024 and for the planning period of 2025 and 2026 [1]. During this period, Russia's importance in the system of international relations increased, the country's reputation and confidence in acquiring the status of a great maritime power, as well as in taking strong positions on land, as a state with centuries-old traditions of developing a large continental civilization, has been strengthened. At the same time, the role of the Arctic has noticeably increased, both among the regional directions of national maritime policy and in Russian foreign policy. Essentially, the Arctic began to determine the degree of state's greatness at sea and in the world. This requires the comprehensive development of maritime potential. The main thing is to ensure, through the maritime potential, Russia's guaranteed access to Arctic marine resources and space, including ensuring uninterrupted, preferably year-round, functioning of the national transport communication in the Arctic — the Northern Sea Route — the basis of the system of maritime communications. The Arctic nuclear icebreaker fleet and fleets of reinforced ice-class vessels are rightly considered the symbol of the Arctic maritime potential.
Keywords: *maritime power, Arctic, maritime potential, nuclear icebreakers, Maritime doctrine of the Russian Federation, strategic planning*

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Introduction

Among the regulatory documents of strategic planning of recent years [1], the Maritime Doctrine of the Russian Federation of 2022 [2] and the Concept of Foreign Policy of the Russian Federa-

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[1] With the adoption of the Federal Law "On strategic planning in the Russian Federation" No. 172-FZ of June 28, 2014. URL: https://www.consultant.ru/document/cons_doc_LAW_164841 (accessed 09 February 2024).

[2] Maritime Doctrine of the Russian Federation. Decree of the President of the Russian Federation of July 31, 2022 No. 512 "On Approval of the Maritime Doctrine of the Russian Federation". URL: https://base.garant.ru/405077499/?ysclid=lmt5iq45yo296296627 (accessed 12 February 2024).

tion of 2023 [3] stand out in particular, since these documents define the degree of Russia's positioning on the geopolitical and economic atlas of the modern world as a great maritime power. Such acts were adopted in the new Russia with a certain periodicity, but only the latter are classified as strategic planning documents that represent the target dominant of Russia's development, in particular, in the implementation of budget policy in the medium term [1].

In the 21st century, three versions of the Maritime Doctrine of the Russian Federation are known, which reflect the totality of official views on the national maritime policy and maritime activities of the Russian Federation. These are the Maritime Doctrines of the Russian Federation approved by Decrees of the President of the Russian Federation in 2001, 2015 and 2022, respectively (MD-2001 [4]; 2015 [5]; 2022).

MD-2001, based on its geographical characteristics (the longest maritime borders in the world, its own coastline on the Pacific and Arctic Oceans, and relatively free access to the North Atlantic), defines Russia as a "historically leading maritime power". The same is emphasized in MD-2015 and other strategic planning documents regulating Russia's maritime and naval activities, in particular [6, 7].

However, MD-2022, based on the "national interests of the Russian Federation, which extend to the entire World Ocean and the Caspian Sea", defines Russia as a great maritime power. In addition to the presence and content of national interests in the World Ocean, the state of maritime potential is of key importance in confirming the status of a great maritime power. This is, first of all, the presence of competencies to maintain the economic, technical and technological base for ensuring the constant mobilization readiness of the Russian fleet and the means of developing resources of the World Ocean, especially oil and gas of the continental shelf, at the level of modern standards, as well as the availability of opportunities for the reproduction of naval and marine equipment on an industrial scale.

The national interests of Russia in the World Ocean, presented in MD-2022, partially combine and/or repeat the provisions of MD-2001 and MD-2015, but are mainly new, taking into account the modern realities of the development of the country's maritime activities. The emergence of such significant national interests in the field of national maritime policy indicates the

[3] Concept of the foreign policy of the Russian Federation. Decree of the President of the Russian Federation No. 229, 31 March 2023. URL: http://www.kremlin.ru/events/president/news/copy/70811 (accessed 12 February 2024).
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change in the status of Russia from a leading maritime power to a great one and the strengthening of the country's role in the maritime activities of the modern world.

This is, first of all, Russia's preservation of the status of a great maritime power [8] in the context of a developing polycentric world (clause 3, Article 9) [9] based on the development of the Russian fleet (clause 4, Article 9) [10] and the implementation of effective naval activities (clause 8, Article 9) [11]. In the new geopolitical conditions, the Russian Navy performs new tasks to ensure the safety of pipeline transportation of hydrocarbons by sea (clause 6, Article 9) [12] and guaranteed access to the world's systems of maritime communications, including the most important straits (clause 7, Article 9) [13].

For the first time in the history of the new Russia, MD-2022 includes among the country's national interests in the World Ocean the rational use of the strategic resources of the Arctic, with special emphasis on the full-scale development of the Arctic continental shelf, including beyond the 200-mile exclusive economic zone [14] (EEZ, clause 13, Article 9) [15], if this is provided for by Article 76 of the UN Convention. The current Maritime Doctrine MD-2022 particularly emphasizes the need for the formation and development of the Northern Sea Route as a national transport communication as part of the attributes of a great maritime power (clause 14, Article 9) [16]. Thus, the

[8] Consequently, in the short period of seven years between the adoption of the two Naval Doctrines of 2015 and 2022, our country has transformed from a leading (in other words, a regional) maritime power into a great one, and this status should be maintained. During this period, fundamentally new elements of Russia's maritime potential were created: three frigates of the "Admiral" series (Project 22350 "Admiral Gorshkov") and other carriers of the sea-based hypersonic strike system "Zirkon" and the unmanned underwater vehicle "Poseidon" were launched and entered service as part of the Northern Fleet; a unique series of icebreakers consisting of seven ships of Project 22220 is being created at JSC "Baltic Shipyard" in St. Petersburg, including the icebreaker "Leningrad", laid down on January 26, 2024. Against this background, the NSR cargo turnover in 2023 reached a record high of 36 million tons, more than 5 times exceeding the highest achievement of the USSR. Source: Address of the President of the Russian Federation Vladimir Putin to the Federal Assembly of the Russian Federation on February 29, 2024. URL: https://kremlin.ru/events/president/news/73585 (accessed 01 March 2024). But most importantly, during this period, the dynamics of global warming (the ratio of the area of ice melting to the previous similar period) was the most intense [2, pp. 146-157], and this created the illusion and gave hope that year-round navigation along the NSR could be ensured by a relatively small number of icebreakers, by building seven Project 2220 ships by 2030. At the same time, as a result of global warming, access to vast energy resources of the Arctic will be opened up.

[9] Maritime Doctrine of the Russian Federation. Decree of the President of the Russian Federation of July 31, 2022 No. 512 "On Approval of the Maritime Doctrine of the Russian Federation". URL: https://base.garant.ru/405077499/?ysclid=lmt5iq45yo296296627 (accessed 12 February 2024).

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] The sovereign rights of a coastal state in the maritime zones of the World Ocean are defined by the 1982 United Nations Convention on the Law of the Sea (UN Convention) in terms of the territorial sea (Articles 3-4), contiguous zone (Article 33), EEZ (Articles 55-59) and continental shelf (Article 76), including beyond the EEZ. The Northern Sea Route (NSR) is allocated as a separate maritime zone as a historically established unified national transport communication. Navigation along the NSR is established by the legislation of the Russian Federation in accordance with Article 234 (Ice-covered areas) of the Convention. Source: UN Convention on the Law of the Sea 1982. URL: https://doc.mil.ru/documents/quick_search/more.htm?id=12093641%40egNPA (accessed 16 February 2024).

[15] Maritime Doctrine of the Russian Federation. Decree of the President of the Russian Federation of July 31, 2022 No. 512 "On Approval of the Maritime Doctrine of the Russian Federation". URL: https://base.garant.ru/405077499/?ysclid=lmt5iq45yo296296627 (accessed 12 February 2024).

[16] Maritime Doctrine of the Russian Federation. Decree of the President of the Russian Federation of July 31, 2022 No. 512 "On Approval of the Maritime Doctrine of the Russian Federation". URL: https://base.garant.ru/405077499/?ysclid=lmt5iq45yo296296627 (accessed 12 February 2024).

formation of Russia's maritime greatness is inextricably linked with the Arctic, with the increasing importance of this region in the development of the country. Therefore, the waters of the Arctic Ocean and the Arctic seas are (clause 3, Article 14) [17] vital areas for ensuring Russia's national interests in the World Ocean.

Consequently, the order of prioritization in determining Russia's national interests in the World Ocean and vital areas of support for the latter proves that the status of a great maritime power is confirmed, first of all, in the Arctic, in the Arctic regional direction of the national maritime policy. This determines the level of the country's diversified presence in this geostrategic region.

The special allocation of the Arctic among regional directions is also noted in Art. 50 [18]. The Arctic is the second most important region in Russia's foreign policy after the Near Abroad and stands ahead of the Eurasian continent, essentially China and India. This innovation of 2023 is associated with the geopolitical upheavals of previous years: in the Concept of Foreign Policy of the new Russia, including 2016 [19], the three regional priorities looked as follows: 1. CIS countries; 2. the European Union and NATO; 3. the USA.

The foreign policy concepts of the new Russia consider our country to be more of a continental than a maritime power [20], since the maritime component adequate to a great power is localized only in the Arctic [21], while in the other maritime regions of the country, there is essentially no ocean-going sea zone fleet. The location of oceanic sea zone ships by the fleets of the Russian Federation is presented in [3].

It is especially important that Russia is one of the two largest nuclear powers with all the competencies to ensure the functioning and maintenance of strategic nuclear forces (SNF) as part of the nuclear triad, especially sea-based SNF. In general (Article 4 [22]) the centuries-old experience of independent statehood together with the countries of the Near Abroad and adjacent states allows us to identify "the special position of Russia as an original state-civilization, a vast Eurasian and Euro-Pacific power", that is, stretching in the space between Europe and the Pacific Ocean and representing the axis of the "Heartland" or the basis of continental civilization [6].

In general, maritime and continental powers coexist in the unity and opposition of world civilizations in the concept of "continent-vis-ocean" as two sides of the same coin.

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[17] Ibid.

[18] Concept of the foreign policy of the Russian Federation. Decree of the President of the Russian Federation No. 229, March 31, 2023. URL: http://www.kremlin.ru/events/president/news/copy/70811 (accessed 12 February 2024).

[19] Ibid.

[20] In the 20th century, the Soviet Union was considered a great continental power of the world by one of the leading naval theorists S.G. Gorshkov [5].

[21] An indicator of the high class of Russia's maritime activities as a great maritime power is the UMKA-21 exercise, conducted in March 2021 (during the period of maximum ice formation intensity) in the high Arctic latitudes of 820N. During the exercise, three strategic missile submarines (SSBNs) — two Project 667BDRM Delfin, generation 2++, and the latest Project 955 Borei, generation 4 submarine — simultaneously surfaced in the ice at intervals of 300 m. This was the first time such a maneuver in the ice was performed. Source: "Umka" warns Washington: a military expedition in the Arctic with elements of science and show. URL: https://argumenti.ru/army/2021/03/715970 (accessed 12 February 2024).

[22] Concept of the foreign policy of the Russian Federation. Decree of the President of the Russian Federation No. 229, March 31, 2023. URL: http://www.kremlin.ru/events/president/news/copy/70811 (accessed 12 February 2024).

In the diversity and on the basis of these powers, maritime and continental civilizations (essentially, great powers) are formed. In the confrontation of great powers, the main thing is the ability to inflict unacceptable damage on a potential or obvious enemy, which can be varied: military, political, economic or other [7, pp. 506–507]. The concept of unacceptable damage is so individual and subjective that, in fact, it cannot be unified in any way. In order to be a great power by definition, it is necessary to be a state that is able to resist the power of any other power and respond symmetrically (or asymmetrically) to all the challenges and threats of the latter. However, a truly great power should be considered a state that is recognized as such by the majority of the world's population.

The "continent-vis-ocean" concept and Russia's rights in the Arctic

The "continent-vis-ocean" concept is embodied in the form of a discontinuous (broken) line of contact between two world civilizations, the thalassocratic (maritime) and the tellurocratic (continental), with the basis for the existence of this structure being the unity and insurmountable opposition of these two civilizations. Constant contact leads to the fact that in the depths of one civilization elements of another are gradually born, which over time, with a shift in the harmony of the combination, are rejected by the basic (mother) civilization. In the combination of civilizations, the principle of harmony certainly operates: not directly, but indirectly.

In the vicinity of the line "continent — vis — ocean", there are coastal centers and zones that are in alliance with continental or maritime powers of the current state of geopolitical or other conjuncture. This is a discontinuous belt, the orientation of the components of which at any given moment depends precisely on the direction of the current vector of the conjuncture. While in the second half of the 20th century, the determining factor in the formation of alliances were economic considerations due to the specifics of the development of the dominant liberal economic model (LEM), in the 21st century, geopolitics is acquiring increasing importance. All the features of the coexistence of the "lords of the sea" and the "lords of the land" are successfully demonstrated in [8].

It should be emphasized that the "continent-vis-ocean" system is the basis of the universe. The disappearance of one of the components will lead to a global collapse and the destruction of the system of coexistence of world civilizations. An example of this is the collapse of the Soviet Union, which predetermined the geopolitical drama of Russia at the turn of the century [9].

In the context of global development and the establishment of the LEM in the world order based on rules, both civilizations strive for global superiority, that is, for world domination or dominance.

At the current stage of the decline of globalization, the tendency to assert national power according to the principle of "Make America (Russia, China) Great (Again)" and/or regional advantage is gaining strength. This means that on the geopolitical and economic atlas of the modern world, alliances of strong regional (or sectoral, for example, OPEC and OPEC+) states are being created, not yet powers, but which are quite capable of competing with the latter.

The maritime worldview is based on the well-known geopolitical concept of marinism, which was formed at the turn of the 19th and 20th centuries under the influence of the scientific ideas of naval theorists F. Colomb [10] (Concepts of absolute possession of the sea) and A.-T. Mahan [11; 12] [23] (Theories of "Sea Power"). The main positive assertion of marinism is considered to be the universal maxims [12]: "power at sea decides the fate of history" and "who controls the sea, controls everything". That is, global superiority (dominance) or world domination is ensured through the implementation of the principle of "absolute possession of the sea" [24] [10].

In the theory of "sea power", the World Ocean is a unifying communication, a communication line that ensures the integrity of countries and regions "separated by water" localized along this communication — "the sea separates and unites", forming continental and/or maritime agglomerations.

From these positions, on the basis of the Arctic Ocean and the Arctic seas along the NSR, there is a communication unification of three oceans: the Atlantic, the Arctic and the Pacific, which ensures the connectivity and territorial integrity of Russia and the Eurasian continent from the north. From the south, the same function is performed by the communication unification of the Atlantic, Indian and Pacific Oceans. The unifying ring (Eurasia – America) is closed by communication: Pacific Ocean – Arctic Ocean (Northwest Passage) – Atlantic Ocean from the north and Pacific Ocean – Atlantic Ocean from the south.

The methodological basis for the formation of continental civilization is the concept of "Heartland" (core land), formulated in [6], which implements the maxim (by analogy with "Sea power"): "whoever owns the Heartland (that is, Central Eurasia), owns the world island (the continent of Eurasia), and whoever owns the world island, owns everything". Two worlds, two civilizations form a systemic whole. This is how the harmony of the universe is ensured.

By the beginning of the 20th century [6], the policies of European states and Europe as a whole, and consequently the main contours of world politics were determined by two established powers, two empires: the British (maritime) and the Russian (continental). The confrontation between them began with the Battle of Malta (1800) and over the course of a century developed and took shape in a geopolitical epic known as the "Great Game". The basis of the confrontation was that in the 18th–19th centuries, in the depths of the continental civilization of Russia, elements of the great maritime power of that time emerged and developed, which was demonstrat-

[23] These works were published as a reader with abbreviations in the Soviet Union by 1940. The ideas of A.-T. Mahan and F. Colomb were consonant with the prevailing views of the USSR's positioning in the world at that time: "Whoever owns the fleet, owns the sea, and whoever owns the sea, owns the world" (I.V. Stalin). The military shipbuilding program of that time (adopted in 1936) was grandiose and corresponded to the tasks of a great maritime power in the field of creating an ocean-going fleet: it was supposed to build 533 ships of the main combat classes, including 8 unrivalled battleships (type A "Sovetskiy Soyuz", displacement of 65.15 thousand tons), four of which were laid down in 1939, as well as 16 heavy cruisers of the "Kronshtadt" class. The implementation of this program was disrupted with the beginning of the Great Patriotic War [13, p. 173].

[24] The concept of "absolute possession of the sea" was introduced into scientific circulation by F. Colomb in 1890 [10] and includes military, geographical and economic components. As an example of the situation of "absolute possession of the sea", the position of the allies in the Crimean campaign of 1853–1856 is shown.

ed to the world by a series of glorious naval victories from Gangut (1714) in the Baltic Sea to Sinop (1853) in the Black Sea [25].

Legal regulation of the Arctic space is carried out by bilateral agreements and national legislation of eight [26] Arctic countries, as well as international law, including the UN Convention [27] on the Arctic Ocean and Arctic Seas. If the Arctic space is limited from the south by the Arctic Circle, the area of the Arctic is about 21.0 million km^2, including sea (including islands and land) — 13.6 and land — 7.4 million km^2. Russian territory in the Arctic is 3.3 million km^2 or about 45% of the total land.

Russia borders three Arctic countries: Norway and Finland in the west and the United States in the east. There are no border disputes and claims to continental territory, that is, the entire land territory of the Arctic is included in the zones of national jurisdiction of the Arctic countries. In the 1920s, that is, long before the adoption of the UN Convention, the sectoral principle of delimitation of the boundaries of polar possessions was formed. Canada, the USSR, Norway and the USA declared Arctic lands and islands located within the boundaries of the allocated sectors as zones of national jurisdiction.

In particular, the Soviet sector of polar possessions was formed in April 1926 by the Resolution of the Central Executive Committee of the USSR [28], which included all polar islands and lands [29] currently belonging to Russia with a total area of 0.2 million km^2 in the zone of national jurisdiction of the USSR. It should be emphasized that the sector principle that still exists determines the legal status of only islands and lands, without affecting other maritime zones, including the EEZ and continental shelf in the Arctic [14, pp. 4–12].

Russia, like other Arctic countries, strives to obtain sovereign rights to the Arctic waters covering the waters and airspace above them, as well as the continental shelf [30] within the boundaries of the declared sector.

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[25] This era did not last long and ended with defeat in the Crimean campaign (1853–1856) and the loss of the Black Sea Fleet. In the future, Russia did not have any significant naval victories and did not create a fleet of a great naval power. A separate sad story is the tragedies of the newest nuclear submarines “Komsomolets” (1989) and “Kursk” (2000).

[26] Five Arctic countries — Denmark (Greenland), Canada, Norway, Russia and the United States have direct access to the waters of the Arctic seas; three — do not have access to the sea and do not make claims in terms of sovereignty over the Arctic sea areas, islands and lands. These are Iceland, Sweden and Finland.

[27] UN Convention on the Law of the Sea. 1982. URL: https://doc.mil.ru/documents/quick_search/more.htm?id=12093641%40egNPA (accessed 16 February 2024).

[28] On the declaration of the lands and islands located in the Arctic Ocean as territory of the USSR. Resolution of the Presidium of the Central Executive Committee of the USSR of April 15, 1926. URL: http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=ESU&n=8470#010794462544365202 (accessed 22 February 2024). This Resolution secured the rights of the USSR to “all lands and islands, both discovered and those that may be discovered in the future”, located between the coast of the USSR and the North Pole in the sector between the meridians 320 04’ 35’’ E and 1680 49’ 30’’ W. In 1935, it was established that, in connection with the Spitsbergen Treaty, the western border of the polar possessions of the USSR runs along the Spitsbergen square along the meridian 350E between the parallels 74N and 81N.

[29] The most significant islands and lands of the Russian Arctic include: Franz Josef Land, Novaya Zemlya, Severnaya Zemlya, Wrangel Islands, Kolguyev and Vaigach islands.

[30] According to the US Geological Survey, the Arctic contains 22% of the world’s undiscovered hydrocarbon resources: 90 billion barrels of oil, about 50 trillion cubic meters of natural gas, and 44 billion barrels of gas condensate. 84% of

According to the UN Convention, the length of the relevant maritime zone of a coastal state is determined by the total length of the baselines, and the maximum width is determined by the established values: territorial sea — 12 miles, contiguous zone — 24 miles and EEZ — 200 miles. The sovereign rights of a coastal state to these waters are limited by freedom of navigation, including transit passage of warships, and other types of maritime activities provided for by the UN Convention. The waters and surrounding waters beyond the EEZ are classified as high seas and cannot be an object of sovereign rights of coastal states. It should be noted that there is a special permissive procedure for navigation of foreign vessels in the waters of the NSR.

One of the ways to determine the outer boundary of the continental shelf (CS) is to fix this boundary at a 200-mile distance from the baselines, from which the width of the territorial sea is measured. This does not require confirmation by the UN Commission on the Limits of the Continental Shelf (Commission).

Thus, the conventional areas of the EEZ and the CS of Russia in the Arctic coincide and amount to 4.1 million km^2 with a total area of the polar sector of 5.8 (5.842) million km^2. That is, given evidence confirmed by the Commission, the maximum possible increase in the Russian CS zone is approximately 1.7 million km^2. The initial (December 2001) and revised (August 2015) applications confirm Russia's rights to expand the zone of national jurisdiction of the CS beyond the 200-mile [31] maritime zone by 1.2 (more precisely, 1.191) million km^2. A decision on this Russian application has not been made for more than 20 years [32]. The external geopolitical circumstances around Russia (sanctions) do not add optimism in the soonest positive resolution of this issue.

In the space of the Russian sector of polar possessions, a missing zone of the CS has formed with an area of 5.842 – 4.1 – 1.191 = 0.551 or about 0.6 million km^2 in the polar region covered by

these resources are located in the Arctic, 16% — in the subsoil of land territory. Source: International Legal Status of the Arctic. Dossier. URL: https://tass.ru/info/895685?ysclid=lswvnmm09p785067079 (accessed 22 February 2024).

[31] If the continental margin extends more than 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, the outer limit of the continental shelf is determined using Article 76 of the UN Convention with one significant limitation (paragraph 5 of Article 76 of the UN Convention) — the maximum possible distance of the outer limit of the continental shelf from the baselines may not exceed 350 miles, and from the 2500-meter isobaths — no more than 100 miles. The second criterion is applied only to underwater elevations. At the same time, the expansion of the rights of the coastal state to the continental shelf does not change the legal status of the superjacent waters and airspace of the allocated area (Article 76 of the UN Convention).

[32] Russia signed and ratified the UN Convention in 1997, prepared and sent to the Commission (December 2001) a reasoned Submission (application) for the expansion of the Russian CS beyond the 200-mile maritime zone by including the Mendeleev and Lomonosov rises as a continuation of the underwater continental margin of the Eurasian continent. However, the Commission did not find the arguments of the Russian side regarding the continental nature of the Mendeleev and Lomonosov rises convincing and proposed to revise this application. Following additional studies, in August 2015, a revised application was submitted to increase the expansion of the continental shelf boundaries in the Arctic by 1.2 (1.191) million km^2 by adding the Central Arctic underwater elevation complex — the Lomonosov Ridge and other areas of the seabed, including the Podvodnikov Basin, the Mendeleev Rise, the southern end of the Gakkel Ridge, the Chukchi Basin and the Chukchi Rise, as well as the North Pole zone. According to the lowest estimates, this will increase potential hydrocarbon reserves by 5 billion tons of conventional fuel. In April 2019, the UN Subcommission (a structural subdivision of the Commission) preliminarily approved the Russian application to expand the Arctic shelf and confirmed the geological affiliation of the objects included in the expanded boundaries of the continental shelf to the structures of the continuation of the Russian shelf beyond the 200-mile maritime zone and the continental margin of the Eurasian continent.

ice all year round. There is no answer to the question of whether this area is a continuation of the underwater margin of the Eurasian continent or not. Therefore, the belonging of this area to the continental margin of North America or Eurasia or the non-continental origin of this section of the shelf are equally probable.

This is how the contours of Russia in the Arctic are determined with unconfirmed sovereign rights to 1.2 million km^2 and the unspecified legal status of 0.6 million km^2 of the Arctic Shelf.

Around the Arctic regions, and especially in the NSR zone, a completely expected confrontation has developed between the US and Russia in the established traditions of "continent-vis-ocean". The essence of the remaining fundamental contradictions is that the US is striving for the internationalization of the Arctic Ocean space, including the NSR, while Russia insists on the principle of the sectoral division of the CS and the internal status of the NSR [15, pp. 59–67].

On the icebreaker fleet of a great maritime power and ensuring the NSR cargo turnover

The basis of the Arctic fleet, capable by definition of navigating in thin and solid ice, is formed by icebreakers and vessels of the reinforced ice class Arc4–Arc9.

The symbol of Russia's maritime power in the modern Arctic is rightly considered to be nuclear-powered icebreakers, which have virtually unlimited autonomy and are capable of overcoming even multi-year ice fields, creating a developed system of maritime communications to ensure the connectivity of the regional space.

The creation of the nuclear icebreaker "Arktika" project 10520, which was the first among surface ships in active navigation to reach the North Pole in August 1977, was an undoubted success of its time. This element received worldwide recognition as an achievement of a great maritime power. The entire series of six units of Project 10520 (Arktika and Sibir) and Project 10521 (Rossiya, Sovetskiy Soyuz, Yamal and 50 Let Pobedy) was launched and put into service over a period of 20 years, starting in 1972.

During the Cold War, the design of these vessels (in particular, Rossiya and Sovetskiy Soyuz) provided for the possibility of mobile inversion (re-equipment) into auxiliary cruisers, the corresponding equipment was placed on board these vessels and partially in the base warehouse.

The core of the Arctic icebreaker group at the turn of the century, until the decommissioning of Sovetskiy Soyuz in 2010 and Rossiya in 2013, consisted of vessels of Projects 10520 and 10580 [33]; These vessels ensured the safety of navigation along the NSR, mainly in the waters from the Gulf of Ob to the Yenisei Gulf in the areas of the large investment projects "Arctic Gate" and

[33] The nuclear shallow-draft icebreakers (draft 8.1 m versus 11.0 m for icebreakers of Project 10520) retained the best qualities of diesel icebreakers (type "Kapitan Sorokin"), but received practically unlimited fuel autonomy, which is required for the most important test line Dudinka–Murmansk, where there is a draft limitation on the depth of the fairway on the route section in the lower reaches of the Yenisei River. In the series of Project 10580 there are two icebreakers of Finnish construction at the shipyard "Holström Histalahti" in Helsinki, "Taimyr" and "Vaygach" with the assembly of the nuclear power plant at the Baltic Shipyard and delivery to the customer in 1989 and 1990, respectively. In 2017, the service life of the propulsion plant was extended until 2027 in parallel with the icebreaker Yamal in order to avoid an "ice pause" during the change of generations of nuclear icebreakers in the Arctic before the icebreakers of Project 22220 enter service.

"Yamal-LNG" (oil and gas) in the Gulf of Ob and "Norilsk Nickel" (non-ferrous metals) in the lower reaches of the Yenisei River (Dudinka).

A fundamentally new series of icebreakers of Project 22220 (Table 1) is intended to replace these vessels of Projects 10520, 10521 and 10580, the service life of which (except for the icebreaker "50 Let Pobedy"), taking into account the latest extension of the service life of the propulsion plant, ends in 2027 (Table 1).

Table 1

Project 22220 nuclear Icebreakers [34]

Name	Commissioning, year		Current status	Operator	Flag
	plan	fact			
Arktika*	December 2017	October 2020	Operate	Atomflot	Russia
Sibir*	May 2020	January 2022	Operate	Atomflot	Russia
Ural*	August 2021	November 2022	Operate	Atomflot	Russia
Yakutiya	December 2024		Launched, November 2022		
Chukotka	December 2026		Laying down, December 2020		
Leningrad**	December 2028		Laying down, January 2024		
Stalingrad**	December 2030		Laying down, plan, 2025		

* The lead ("Arktika") and the first two serial icebreakers ("Sibir" and "Ural") were put into operation with a significant delay of 1.5 to 2.0 years, which is due to the implementation of import substitution programs for components in the field of marine power engineering, in particular, turbogenerators for the icebreaker "Arktika", power plants for "Sibir" and turbines for "Ural". The situation with the substitution of supplies of imported components from Ukraine and the EU countries was stabilized by 2020. The total volume of imported components on ships of Project 22220 is about 10% [17, pp. 166–167].

** The laying down of the 5th and 6th serial icebreakers (Leningrad and Stalingrad) was postponed for a year from 2023 and 2024 according to the Plan [35] for 2024 and 2025, respectively, due to the difficulties of budget financing.

The modern icebreaker of project 22220 differs from the previous project 10520 by an increased service life (40 years versus 25), which is achieved by using the RITM-200 nuclear reactor with an optimal resource of 320 thousand hours, with core reloading performed once every seven years. In addition, the integrated location of the core and steam generators in a single housing allows for a significant reduction in the weight and size of the nuclear power plant, which reduces overall operating costs by increasing the reliability and safety of the nuclear power plant as a whole.

Achieving the shaft power (three shaft lines of 20 MW) to 60 MW allowed increasing the icebreaking capacity from 2.25 to 3.0 m. The width of the vessel (33 m at the cruising waterline) allows laying a channel 37 m wide (however, this is not enough to conduct gas tankers of the Yamalmax type with reinforced ice class Arc7 with a width of 50.13 m); following the icebreaker in

[34] According to the data from [17, Table 3] and the speech of the President of the Russian Federation V.V. Putin on February 26, 2024 at JSC Baltic Shipyard.

[35] The Plan of Development of the Northern Sea Route for the period up to 2035. Order of the Government of the Russian Federation of August 1, 2022, No. 2115-r. URL: https://www.garant.ru/products/ipo/prime/doc/405010751/ (accessed 4 March 2024). The plan includes more than 150 events with a total funding volume of about 1.8 trillion rubles.

the channel, the gas tankers break the edge of the channel to the optimal size. The 47.7 m hull width of the Project 10510 Lider icebreaker will allow laying a channel up to 52.0 m wide.

However, the main thing is that this icebreaker is universal for use both in shallow waters in the bed of Siberian rivers and on deeper sea routes of the NSR, since it has a ballast system for changing the draft from 9.03/9.3 to 10.5 m. The draft can be set at any level within the specified reversible values by filling/draining the ballast tanks. A full transition from 9.03 to 10.5 m and back is carried out using pumps in four hours. The use of one such icebreaker instead of two (heavy Arktika type project 10520 and shallow-draft Taimyr type project 10580) allows reducing the total cost of icebreaker escort by 1.5–1.8 times [36], depending on the number of changes in the draft level.

The construction of this series of icebreakers is carried out at JSC Baltic Shipyard [37], the customer is the State Atomic Energy Corporation Rosatom [38], which also partially participates in the financing of the third ("Yakutia") and fourth ("Chukotka") serial hulls of Project 22220.

According to the Plan [39], the financial resources of the federal budget and extra-budgetary sources (own funds of Rosatom State Corporation and/or borrowed funds under the guarantee of Rosatom State Corporation) for the construction in terms of preparation for launching and launching, completion afloat and conducting MTs (mooring tests) of Yakutia in 2022–2024 amounted to (clause 3.2.2 of the Plan) 10.00 and 15.51 billion rubles, a total of 25.51 billion rubles. The same for "Chukotka" in 2022–2026 with an extended program of preparation for launching (clause 3.2.3) amounted to 6.50 and 33.25 billion rubles, a total of 39.75 billion rubles. The construction of the fifth icebreaker ("Leningrad") over five years (2024–2028) and the sixth icebreaker ("Stalingrad") over six years (2025–2030) from the moment of laying will cost the Federal Budget (clauses 3.2.6 and 3.2.7) 56.61 and 61.34 billion rubles, respectively [40]. Budget financing is also planned (24.8 billion rubles in 2023–2027) for the construction of a nuclear-technological service vessel

[36] Characteristics and construction history of nuclear icebreakers of project 22220. URL: https://tass.ru/info/19827819 (accessed 26 March 2024).

[37] State shipbuilding asset within the United Shipbuilding Corporation (USC) since 2007. Decree of the President of the Russian Federation No. 394 of March 21, 2007 "On the open joint-stock company "United Shipbuilding Corporation". URL: https://base.garant.ru/190816/ (accessed 4 March 2024). In August 2023, USC was transferred to the trust management of VTB Bank.

[38] The nuclear icebreaker fleet of Russia came under the jurisdiction of the State Corporation Rosatom in 2008 as part of the Federal State Unitary Enterprise Rosatom on the basis of the Decree of the President of the Russian Federation No. 369 of March 20, 2008 "On measures to create the state corporation for atomic energy Rosatom". URL: https://base.garant.ru/192963/ (accessed 4 March 2024).

[39] Order of the Government of the Russian Federation of August 1, 2022, No. 2115-r. URL: https://www.garant.ru/products/ipo/prime/doc/405010751/ (accessed 4 March 2024).

[40] Against this background, the Russian Government's plans to reduce funding for the construction of four icebreakers in 2024–2026 by 4.28 billion rubles, or 3.2% of the Plan26 amount (Yakutia and Chukotka together — 0.56; Leningrad and Stalingrad — 2.36 and 1.36 billion rubles, respectively) appear to be a routine budget adjustment. Source: Financing for Baltic Shipyard icebreakers squeezed. "Fontanka" asked experts what all this means. URL: https://www.fontanka.ru/2023/10/20/72831971/?ysclid=lrutcewrhp23537488 (accessed 6 March 2024).

(clause 3.2.8) and Rosatom State Corporation (220 billion rubles in 2023–2030) for the creation of four non-nuclear icebreakers [41] (clause 3.2.11).

In order to ensure year-round navigation of vessels along the Northern Sea Route, combined options for the placement of icebreakers in the areas of the NSR routes are possible depending on the characteristics of the latter and the period of navigation, which is determined by the Rules [42].

Taking into account the peculiarities of navigation in the waters of the Arctic Ocean and the Arctic seas, the RMRS [43] distinguishes six classes of "Arctic" vessels, that is, vessels that have the necessary structural reinforcements for navigation in the Arctic seas. These vessels of the reinforced ice class Arc4–Arc9 (Arc8 and Arc9 exist only in theory) can navigate in Arctic ice independently or in a channel behind an icebreaker under certain ice conditions (Table 2).

Table 2

Characteristics of ice classes, ice thickness, m

	Independent navigation		Navigation in the channel behind the icebreaker	
	Winter (December–May)	Summer (June–November)	Winter (December–May)	Summer (June–November)
Arc4	**up to 0.6[1]**	**up to 0.8[1]**	**up to 0.7[2]**	**up to 1.0[2]**
Arc5	up to 0.8[1]	up to 1.0[1]	up to 0.9[2]	up to 1.2[2]
Arc6	up to 1.1[1]	up to 1.3[1]	up to 1.2[2]	up to 1.7[2]
Arc7	**up to 1.4[3]**	**up to 1.7[3]**	**up to 2.0[2]**	**up to 3.2[2]**
Arc8	up to 2.1[4]	up to 3.1[4]	up to 3.4[5]	without limitation [6]
Arc9	up to 3.5[7]	up to 4.0[7]	Episodic ice crossing by raids	

[1] in thin one-year ice
[2] in one-year ice
[3] in compact one-year ice
[4] in two-year ice
[5] in compact one-year and two-year ice
[6] in multi-year ice
[7] in compact multi-year ice

Ice fields in the Arctic are formed unevenly: the western part of the Russian Arctic is influenced by the Gulf Stream, therefore vessels of the reinforced ice class Arc4 and higher have the

[41] The strategic goal of building non-nuclear icebreakers with a shaft capacity of 40 MW is to replace the main nuclear icebreakers of Projects 10520 and 22220 in the deployment plan in the Gulf of Ob and Yenisei Gulf, including the lower reaches of the Yenisei River (i.e. close to the coastal and port infrastructure for the possibility of prompt replenishment of reserves), while ensuring the most important projects for this region by Novatek, MMC Norilsk Nickel, Gazprom Neft, Rosneft and Severnaya Zvezda to free up nuclear icebreakers for work in the eastern sector of the Russian Arctic with a planned increase in cargo turnover of the NSR to 220 million tons in the long term by 2035. Diesel icebreakers of such capacity can be built in Russia (well-known foreign shipyards are not considered for obvious reasons) only at two shipyards — Baltic Shipyard and Zvezda Shipyard, however, both enterprises, as is known, are loaded with orders within the current planning horizon up to 2030. Source: Rosatom has decided to build four diesel icebreakers at its own expense. URL: https://www.vedomosti.ru/business/articles/2023/11/03/1004014-rosatom-reshil-postroit-chetire-dizelnih-ledokola?ysclid=lte3k2npv9688996252 (accessed 5 March 2024).

[42] Rules for navigation in the waters of the Northern Sea Route. Resolution of the Government of the Russian Federation of September 18, 2020, No. 1487 (in the current edition of 01.09.2023). URL: https://base.garant.ru/74664152/ (accessed 5 March 2024).

[43] Russian Maritime Register of Shipping. URL: https://rs-class.org/?ysclid=lteaaz10ab528729011 (accessed 5 March 2024).

structural capability to safely navigate year-round in the Barents Sea and in the southwestern part of the Kara Sea [16, pp. 37–43]. That is, in this water area the thickness of thin one-year ice does not exceed 0.6 and 0.8 m, respectively, in winter and summer.

For free navigation in the southeastern part of the Kara Sea, including the Yenisei Gulf, in the summer, vessels should have an ice class of at least Arc7; the same class is provided for vessels when navigating behind an icebreaker in the "channel" or "caravan" mode in winter [16, pp. 37–43] [44]. In these waters, the thickness of compact one-year ice does not exceed 1.7 m in summer, and 2.0 m in winter.

For work in the most difficult conditions of the eastern Arctic, where shore ice reaches a thickness of about 4.0 m, Rosatom State Corporation plans to build three hulls of Project 10510 "Lider" with a shaft capacity of 120 MW at the Zvezda shipyard by 2033. With such vessels, it will be possible to ensure year-round navigation along the entire NSR. The main hull of the Rossiya was laid down at the Zvezda shipyard in July 2021 using funds from the Federal Budget; 127.6 billion rubles has already been allocated [17, p. 165].

Thus, by 2030, the Arctic icebreaker group will consist of ten nuclear-powered icebreakers (project 22220 (7); 10510 (2); 10520 (1) — "50 Let Pobedy"), reinforced by non-nuclear (diesel) icebreakers. The strategic goal and planned dominant of this grouping is to ensure the safety of year-round navigation on the NSR routes, as well as the implementation of the NSR Development Plan for the period up to 2035 in terms of increasing cargo turnover, which reached 36 million tons in 2023 with a planned figure of 46.82 million tons.

The planned increase in NSR cargo turnover to 80 million tons [45] in 2024, to 90 million tons [46] in 2030 and to 130 million tons [35] in 2035 is provided for by strategic planning documents. These indicators are adjusted in the Plan [47], which sets the target indicator of annual NSR cargo turnover at 80, 150 and 220 million tons in 2024, 2030 and 2035, respectively.

The current Russian icebreaker group operating in 2024 has 41 ships, including 7 nuclear and 34 diesel-electric, including port ones. The most powerful of the non-nuclear icebreakers is the Viktor Chernomyrdin, Icebreaker8, which has a propulsion power of 25 MW, allowing it to op-

[44] Based on these considerations, the Arctic tanker fleet of the largest energy projects was built: three Arc6 oil tankers ("Vasiliy Dinkov" type) for the Varandey project and two Arc6 oil tankers ("Mikhail Ulyanov" type) for the Prirazlomnoe project in the Pechora Sea; seven Arc7 oil shuttle tankers ("Shturman Albanov" type) for the Arctic Gate project and fifteen Arc7 gas tankers ("Christophe de Margerie" type) for the Yamal LNG project in the Ob Bay, as well as five Arc7 container ships ("Norilsk Nickel" type) for MMC Norilsk Nickel (Yenisei Gulf and the lower reaches of the Yenisei River).

[45] Decree of the President of the Russian Federation, No. 204, 07 May 2018 (in the edition of July 21, 2020) "On the national goals and strategic objectives of the development of the Russian Federation for the period up to 2024". URL: http://www.kremlin.ru/acts/bank/43027 (accessed 26 February March 2024).

[46] Decree of the President of the Russian Federation No. 645, 26 October 2020 "Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035". URL: https://www.garant.ru/products/ipo/prime/doc/74710556/ (accessed 26 February March 2024).

[47] Order of the Government of the Russian Federation dated 01 August 2022, No. 2115-r "The Plan of the development of the Northern Sea Route for the period up to 2035". URL: https://www.garant.ru/products/ipo/prime/doc/405010751/ (accessed 4 March 2024).

erate in Arctic ice up to 3 m thick. This icebreaker, built in Russia (Admiralteyskie verfi shipyard), was commissioned in November 2020.

To replace the main nuclear icebreakers of Project 22220 and 10520, the NSR Route Allocation Plan in the Ob Bay and Yenisei Gulf area requires diesel (non-nuclear) analogues with a capacity of 40 and even 45 MW. This will ensure the entrance and mooring of container ships and oil tankers to the ports of the Yenisei Gulf (Dudinka, Dikson, Sever Bay), as well as the maneuvering of gas tankers for the Yamal LNG and Arctic LNG 2 projects at the entrance to the Ob Bay.

However, modern non-nuclear icebreakers of Russian construction, such as "Viktor Chernomyrdin" with a lower propulsion capacity (25 MW), are optimal for work in the Gulf of Ob. The Aker ARC 130A icebreaker support vessels Alexander Sannikov and Andrey Vilkitskiy with a capacity of 22 MW are also used there to support terminal operations for the Arctic Gate oil project; these icebreakers were built at the Vyborg Shipyard in June and December 2018 by order of PJSC Gazprom Neft.

In previous years, all non-nuclear icebreakers currently operating in the Arctic were built in Finland, which imposes well-known geopolitical sanctions restrictions on the maintenance and repair of these icebreakers by the manufacturer. These are icebreakers built in the 1970s of the Ermak type (a series of three units) and Kapitan Sorokin type (a series of four units) with a propulsion capacity of 26.5 and 16.4 MW, respectively, as well as vessels of the 2010s of the Moskva type (a series of five icebreakers of Project 21900 and 21900M). The capacity of these icebreakers is not sufficient for year-round operation even in the relatively mild ice conditions of the southwest of the Kara and Barents Seas.

As the number of vessels passing along the NSR route increases, the arrangement of icebreakers also changes. Rosatom State Corporation assumes that, with the planned cargo turnover values, to ensure year-round navigation in the eastern sector of the NSR in the period from 2026 to 2030, five nuclear-powered icebreakers should be arranged at an interval of no more than 500 miles from each other. In the future, from 2031 to 2035, year-round navigation in the eastern sector of the NSR will be provided by nine nuclear icebreakers, spaced at intervals of no more than 250 miles from each other. The total need for icebreakers for the entire NSR for these periods is 14 (9 nuclear and 5 non-nuclear) and 18 (13 nuclear and 5 non-nuclear) vessels, respectively [48].

Conclusion

The basis of the Russian icebreaker fleet in the Arctic is organically supplemented by military icebreakers, Project 23550 ships with a capacity of 12.6 MW "Ivan Papanin" and "Nikolay Zubov" (built by JSC "Admiralteyskie verfi" for the Navy), "Purga" and "Dzerzhinskiy" (built by the Vyborg Shipyard for the Coast Guard of the Federal Security Service of the Russian Federation). In addition, a series of three 10.4 MW diesel-electric icebreakers of Project 21180 were built by JSC

[48] According to the Arctic Development Office of Rosatom State Corporation. Expert: by 2030, the density of nuclear icebreaker deployment on the Northern Sea Route will reach 500 miles. URL: https://dzen.ru/a/ZCVYx5PvUC4J0eLo (accessed 10 March 2024).

"Admiralteyskie verfi" by order of the Navy — "Ilya Muromets" (part of the Northern Fleet since 2017), "Evpatiy Kolovrat" (part of the Pacific Fleet since 2024) and "Svyatogor", which was laid down in 2023 [3, p. 55].

If Russia's naval power in the Arctic is rightfully associated with the world's strongest group of nuclear icebreakers, then in the World Ocean a great power should have an equally powerful fleet of the oceanic maritime zone.

At the turn of the century, along with the collapse of the USSR, the Russian fleet lost ships and left the World Ocean [3, pp. 53–55]. Of the ships of the oceanic maritime zone, there are only five left in the Russian Navy: of the four missile cruisers of Project 1164 "Atlant" built in the 1980s at the 61 Communard Shipyard (Nikolaev, Ukraine), only two remained in service by 2024: Marshal Ustinov (Northern Fleet) and Varyag (flagship of the Pacific Fleet); the missile cruiser Moskva (flagship of the Black Sea Fleet) sank while being towed in April 2022; the missile cruiser Admiral Lobov was transferred to Ukraine in 1993 when the Black Sea Fleet was divided. It should be noted that the competence to build missile cruisers of this class was lost along with the collapse of cooperative ties with Ukraine. Of the seven heavy aircraft-carrying cruisers (TAKR Project 1143 "Krechet"), built in 1970–1987 at the Chernomorskiy Shipyard in Nikolaev, today the Russian Navy (Northern Fleet) has only 1143-5, Admiral Kuznetsov, which after almost seven years (2017–2024) of repairs is expected to return to service by the end of 2024. The rest were either sold for scrap (1143-1, 2, 3 — one to China and two to South Korea), or modernized into warships for India (1143-4) and China (1143-6), one 1143-7 was dismantled on the slipway in 1992. The competence to build TAKRs has also been lost, and today Russia is simply unable to build such a ship.

The pride of the Russian shipbuilding industry is a series of heavy nuclear-powered missile cruisers (TARKR, Project 1144 "Orlan") consisting of five ships, built in the 1970–1980s at the Baltic Shipyard in Leningrad. However, this series of ships also shared the fate of the Russian fleet in the 1990s: the construction of the fifth hull was cancelled back in 1990. The lead hull ("Admiral Ushakov", Northern Fleet) and the next ("Admiral Lazarev", Pacific Fleet) hulls served in the USSR Navy from 1980 to 1990, then for more than 25 years they were prepared for modernization, then for disposal, until they were sent for scrap in 2021.

By 2024, there are two such ships left in the Russian Navy: "Admiral Nakhimov", which is undergoing long-term and deep repairs at Sevmash, with more than 200 billion rubles already spent, and the flagship of the Northern Fleet (in service since April 1998) "Pyotr Velikiy", which also requires similar expensive repairs.

Thus, if MD-2022 refers to Russia's status as a great global maritime power, then in the current geopolitical conditions Russia is simply unable to build and maintain a fleet (not only naval, but also tanker fleet, including gas tankers, as well as dry cargo ships and bulk carriers) adequate to this status.

If we are talking about the fleet of a great maritime power in the Arctic with access to the North Atlantic and the Mediterranean, then a series of ships of the far sea zone (Project 22350

"Admiral Gorshkov" built by JSC "Severnaya verf"), armed with hypersonic "Zirkons", the cost of which is 7–8 times lower than the "Orlans", is sufficient. At the same time, it is very important to ensure prompt inter-fleet crossings of surface ships by the Northern Sea Route all year round.

As it happens, the starting position for "preserving the status of a great maritime power" has been maintained only in the Arctic, so we should start from this point and make Russia great again.

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The Concept of Knowledge Co-production in the Context of Arctic Research

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Abstract. The review article focuses on the concept of knowledge co-production, which began to be developed at the beginning of the 21st century. Its appearance is associated with the transition to a new paradigm of scientific research, the need for which was caused by the complexity and social significance of global problems. The principle of transdisciplinarity was taken as a basis, which involves going beyond the limits of normative science and including various media and types of information in the production of knowledge. As a result, an approach to scientific research based on the joint production of knowledge was formed. Currently, the concept of "knowledge co-production" is debatable. A review of theoretical and methodological approaches to its definition made it possible to identify the main stages of the knowledge co-production process and the methodological difficulties faced by scientists. In most cases, they are associated with the presence of many different stakeholders in the process of knowledge co-production, differences in understanding of the purpose and objectives of research between representatives of the academic and non-academic community, lack of organizational and financial support. It is shown that the concept of knowledge co-production has received the greatest application in research on the sustainable development of the Arctic, where special attention is paid to the knowledge of indigenous peoples and their co-production.
Keywords: *knowledge, co-production, concept, methodological approach, transdisciplinarity, sustainable development, indigenous peoples, Arctic*

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Prerequisites for the emergence of the concept of knowledge co-production

In 1994, American sociologist Michael Gibbons published the book "The new production of knowledge: the dynamics of science and research in contemporary societies", in which he outlined the transition to a new paradigm of scientific research [1, Gibbons M.]. It was based on the principle of transdisciplinarity, which implies going beyond the boundaries of a particular scientific discipline and including various types of information produced by the non-academic community in the process of knowledge production. The new paradigm, called "Mode 2", was proposed as an alternative to the traditional method of scientific research with its characteristic hierarchy of disciplines and the autonomy of scientists. Despite subsequent criticism from academics who defended the

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need to preserve the objectivity and "purity" of scientific knowledge, the ideas presented in it received positive responses from those who were looking for more advanced mechanisms for interaction between science and society.

In 2001, the book "Re-thinking science: Knowledge and the public in an age of uncertainty" by M. Gibbons' co-author, Austrian sociologist Helga Nowotny, was published, in which the author and her colleagues presented additional arguments in favor of a new research paradigm [2]. In their opinion, the need for new ways of producing scientific knowledge is a response to the complexity and social significance of emerging environmental, economic, social and other problems. The authors believe that in conditions of openness and accessibility of information, this knowledge should be "socially sustainable", that is, created in cooperation with all parties interested in obtaining this knowledge, and its value should not be determined exclusively by the scientific community.

The ideas outlined in the books by M. Gibbons and H. Nowotny formed the basis of the concept of knowledge co-production, which began to be developed at the beginning of the 21st century. Its proponents believe that monodisciplinary scientific knowledge is not enough to solve the global problems of the modern world, so it is necessary to apply a transdisciplinary approach that promotes the expansion of methods of knowledge production through cooperation with the non-academic community [3, Lang D.J., Wiek A., Bergmann M.], [4, Brandt P., Ernst A., Gralla F. et al.], [5, Polk M.].

As it developed, the concept of knowledge co-production became most popular in studies on sustainable development [6, Miller C.A., Wyborn C]. In some Western countries, such as the USA, Great Britain, Germany, the knowledge co-production approach has been included in strategic plans for sustainable development. Despite the fact that this term has become widely used in public administration and scientific research, approaches to its definition are quite diverse [7, Metz A., Boaz A., Robert G.].

The process of knowledge co-production

According to existing research, the process of knowledge co-production includes several stages. First, scientists select stakeholders to develop research questions and solve a specific scientific problem. Then, data collection takes place: at this stage, researchers work closely with other participants in the process to ensure the reliability and accuracy of the information collected. Once the initial data is collected, scientists, together with other stakeholders, interpret the information and analyze the results. The research team then proceeds to draw conclusions that can be used to develop joint solutions [8, Brandt P., Ernst A., Gralla F. et al.].

Compared to the monodisciplinary approach, the advantage of the knowledge co-production approach is that it brings together scientists with people directly affected by the problem, as well as those who have managerial decision-making power. In this way, knowledge co-production allows for more effective solving of complex problems.

Despite the innovative nature of the concept, scientists point out a number of methodological problems of the knowledge co-production approach. According to Swedish researcher Malin

Mobjörk, these problems are related to the question of "whether knowledge co-production is aimed at taking into account the opinions of stakeholders or at their actual participation in the process of producing new knowledge?" [9]. Back in 2005, researchers M. Lemos and B. Morehouse noted that co-production of knowledge can be successful if stakeholders are involved in the process at all stages of the research, starting with defining the problem, developing the research question, research design and ending with data collection, analysis and dissemination of results [10, Lemos M.C., Morehouse B.J.]. The same opinion is shared by D. Hegger and C. Dieperink, who consider the broad involvement of stakeholders, achieving a common understanding of the research purpose and a clear distribution of responsibilities for the project to be the main conditions for the success of knowledge co-production [11, Hegger D., Dieperink C.].

Swedish researcher Albert Norström, based on his own experience in various processes of knowledge co-production in the field of sustainable development, identified four fundamental principles: contextuality, pluralism, goal-setting and interactivity [12, Norström A.V., Cvitanovic C., Löf M.F. et al.]. M. Polk used the results of comparison of transdisciplinary research projects to determine the effectiveness of five elements of knowledge co-production, namely: stakeholder involvement, their participation in data collection, interaction between participants, evaluation of results and analyzing their applicability. As a result, stakeholder involvement and data collection were found to be the most effective, while analyzing the results and evaluating them were the least effective [5].

According to scientists, the presence of many different stakeholders in the co-production process can pose some challenges. The main problems include the differences in understanding the purpose and objectives of the research between representatives of the academic and non-academic community, the lack of organizational support for interaction activities, as well as a lack of time and finances [13, Cvitanovic C., Hobday A.J., van Kerkhoff L. et al.]. As the concept developed, effective ways of involving stakeholders in joint work and knowledge production were studied. For example, M. Reed refers to stakeholder consultation and training [14, Reed M.S.]. Brandt et al. point out the need for interaction and collaboration at all stages of the research [15, Brandt P., Ernst A., Gralla F. et al.]. At the same time, M. Polk notes that even in those centers dealing with transdisciplinary research, participants encountered a mismatch of expectations between researchers and stakeholders [5]. Due to these and other problems, some researchers have described the knowledge co-production approach as controversial and requiring the development of a strategy for its implementation in practice [16, Thompson M.A., Owen S., Lindsay J.M. et al.].

Knowledge co-production in the context of Arctic research

Since the early 2000s, the concept of knowledge co-production has been increasingly discussed in the context of research on the Arctic, where indigenous peoples live. Scientists believe that indigenous knowledge is key to interpreting natural and social processes in the Arctic, especially those resulting from climate change [17, Degai T., Petrov A.N., Badhe R. et al.].

Research activities in the Arctic are aimed at better understanding these changes and developing adaptation strategies. For a long time, these studies were conducted by the scientific community without taking into account the opinions of indigenous peoples. Changes in methodological approaches to research occurred due to the development of the concept of resilience and the realization that solutions to global problems should be sought at the local level [18, Nenasheva M.V.]. Since then, scientists have called for the integration of scientific and indigenous knowledge to address the challenges in the Arctic [19, Yua E., Raymond-Yakoubian J., Daniel R. et al.]. Today, the knowledge co-production approach is used to assess changes in the Arctic environment and make management decisions in the field of ecology [20, Obermeister N.], in climate change adaptation research [21, Raymond-Yakoubian J., Daniel R.], in studying the sustainable use of lands inhabited by indigenous peoples [19], etc.

On June 20, 2021, the International Congress of Arctic Social Sciences was held in Arkhangelsk, where much attention was paid to the knowledge of indigenous peoples. One of the results of the Congress was a joint statement proposing specific steps to involve indigenous peoples in Arctic research and knowledge co-production. In particular, it was proposed to support indigenous peoples in conducting research according to their own priorities and methodologies, to recognize the intellectual right of indigenous peoples to knowledge about the Arctic, and to work on creating an intellectual space for indigenous knowledge holders [22, Petrov A.N., Burn Silver S., Stuart Chapin F. et al.].

Conclusion

Knowledge co-production is an approach that provides a new perspective on the relationship between science and society. It is based on the principle of transdisciplinarity, which implies going beyond normative science and involving all parties interested in obtaining scientific knowledge and developing comprehensive solutions to a scientific problem in the process of scientific research. The methodology of knowledge co-production has not been fully defined, but there is no doubt about the practical significance of the new concept, the application of which can contribute to the sustainable development of the territories most affected by global challenges.

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