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Human Security in the Arctic: Threats through the Prism of the “Northern Mentality” *

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Abstract. The article is devoted to the analysis of threats to human security in the Russian Arctic, taking into account the peculiarities of the “northern mentality”. The authors note that the concept of “human security” is relatively new for the Arctic zone of the Russian Federation (AZRF), as until recently security in the northern regions of Russia was defined mainly from the state-centric positions. The universalist approach is hardly applicable in practical policy: it is impossible to build a policy of “human security in general” and transfer it to the conditions of the Arctic zone of the Russian Federation. The concept of human security and corresponding policies must be adapted to the specific conditions of the Russian Arctic. Today, however, the AZRF faces a set of new threats to human security that require a response. The authors examine several groups of threats to human security that are relevant to the AZRF, the reasons for their emergence and the extent to which they affect the further development of the region. In conclusion, the authors conclude that the transition of the AZRF to sustainable development is only possible if the threats to human security discussed in the article are neutralised. The key directions of human security policy, which is based on the principle of enhancing the viability and self-development of the peoples permanently living in the Arctic, are highlighted.

Keywords: *Arctic zone of the Russian Federation, human security, security challenge, social-economic development.*

Introduction

The Arctic has always been seen as Terra Incognita, dangerous for mankind due to harsh conditions. For a long time, the peoples, inhabiting the northern territories, adapted to the harsh conditions of the Arctic and accumulated a unique experience of survival. Notably, the key to survival is the quality of human relationships and harmonious coexistence with the natural environment rather than confrontation between people and nature [1, Kozlov A.I., Kozlova M.A., Vershubskaya G.G., Shilov A.B., p. 6]. Ensuring the safety of a person was most directly embedded in the system of relationships within the family and the local community (clan, tribe).

The 20th century brought serious changes in life in the Arctic due to the industrial development of resources with the leading role of the state. Social relations, natural environment, and traditional way of life have undergone serious transformations. Climate change, which is partly anthropogenic in nature, makes its own adjustments. Under these circumstances, the concept of human security in a permanent living environment in the Arctic requires reinterpretation.

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Studying security through the prism of the “northern mentality” is relevant because it helps to specify the concept of human security. In UN documents, this concept has the broadest content, including political, cultural, economic, food, environmental, individual dimensions¹. Meanwhile, such a universalist approach is hardly applicable in practical politics. It is impossible to build a policy of human security “in general” and transfer it to the conditions of the Arctic zone of the Russian Federation (AZRF). The concept of human security and the corresponding policy should be adapted to the specific conditions of the Russian Arctic.

In political sciences, human security is studied in two aspects: (1) how it is perceived by the subject of security and (2) what security threats are formed objectively under the influence of the external environment. This article attempts to consider both aspects of security and to identify the relationship between them in relation to people permanently living in northern conditions. The authors proceed from the conviction that it is necessary to identify the perceptions of security that have been shaped by centuries of practical experience and cannot disappear instantly under changing socio-economic conditions. New threats to security, reflected in human consciousness, pass through the prism of already established stereotypes. Considering that a person in the Far North has always had to survive in a rapidly changing situation, then the “traditional” experience of perceiving danger and methods of response are a good addition to the “modern” experience, mainly based on general scientific and technological achievements. Taking into account the relationship between objective and subjective aspects of security allows us to clarify the directions, forms and methods of ensuring human safety in specific conditions. Though a lot of papers on different aspects of human safety in the Arctic has been published [2, Konyshov V., Sergunin A.; 3, Finger M., Heininen L.; 4, Hoogensen G., Bazely D.; 5, Laurelle M.; 6, Salminen M., Hossain K.], the specificity of this problem in relation to the Russian Arctic remains insufficiently studied.

What are the features of threat perception in terms of the “northern mentality”? What is the attitude towards contemporary dangers to security among the peoples who have been living in the Arctic Zone of the Russian Federation (AZRF) for a long time? What is the objective content of threats to human security in the Russian Arctic in the context of industrial development of the region? To what extent can the traditional experience of indigenous people in ensuring human security be applied today to the development of state policy? This article is devoted to the search for answers to these questions.

¹ Human Development Report 1994. NY, Oxford University Press, 1994. URL: http://hdr.undp.org/sites/default/files/reports/255/hdr_1994_en_complete_nostats.pdf (accessed 31 August 2021).

Problem statement

The last decade has seen rapid development of the AZRF in many directions. Currently, the region produces 10% of the country's GDP², while the population in the Arctic zone is estimated at 1.6%–1.8% of the total population of the Russian Federation. There are objective factors in the AZRF that create increased risks to any human activity: harsh climatic conditions; negative consequences of climate change; insufficient development of life support infrastructure; transport and communication systems; remoteness from the industrialized centers of the country; low population density; lagging behind the quality of life indicators in the AZRF from the national values; low level of availability of high-quality social services and comfortable housing; increased risk of the emergence and development of occupational diseases; vulnerability of ecological systems.

The concept of “human security” is relatively new for the AZRF, since, until recently, security was defined mainly from state-centric positions. This is due, firstly, to the historically established model of management, when the leading role belonged to the federal authorities throughout the entire 20th century. Secondly, since 2008, the AZRF has received the status of a state resource base for the foreseeable future³. However, in practice, it became clear that both approaches do not fully correspond to modern realities. On the one hand, it became obvious that the state alone cannot adequately respond to new challenges and threats to security. Therefore, interaction with other actors is necessary: private business, public organizations, municipal authorities, the indigenous population. On the other hand, a narrowly understood “resource” approach can make the AZRF a peripheral territory of Russia with a high level of population outflow to other regions and, as a result, create new problems on the northern borders of the state.

Today, the official rhetoric has changed: the main task of the Arctic policy of the Russian Federation is the sustainable development of the region, which presupposes the harmonization of the economic, social and environmental aspects of the life. This is reflected in the updated strategic documents adopted in 2020: “Fundamentals of State Policy of the Russian Federation in the Arctic up to 2035”⁴ and the Decree on the approval of the “Strategy for the Development of the

² Rosstat: zhiteli Arkticheskoy zony obespechivayut desyatuyu chast' VVP Rossii [Rosstat: residents of the Arctic zone provide a tenth of Russia's GDP]. URL: <https://www.strana2020.ru/mediaoffice/rosstat-zhiteli-arkticheskoy-zony-obespechivayut-desyatuyu-chast-vvp-rossii/> (accessed 17 April 2021).

³ Osnovy gosudarstvennoy politiki Rossiyskoy Federatsii v Arktike do 2020 goda i dal'neyshuyu perspektivu. Uтверzhdeny Prezidentom Rossiyskoy Federatsii D.A. Medvedevym 18 sentyabrya 2008 goda. Ukaz № 1969 [Fundamentals of the state policy of the Russian Federation in the Arctic up to 2020 and further prospects. Approved by the President of the Russian Federation D.A. Medvedev on September 18, 2008. Decree No. 1969]. URL: <https://rg.ru/2009/03/30/arktika-osnovy-dok.html> (accessed 12 December 2021); O Strategii razvitiya Arkticheskoy zony Rossiyskoy Federatsii i obespecheniya natsional'noy bezopasnosti na period do 2020 goda. Uтверzhdeny Prezidentom Rossiyskoy Federatsii D.A. Medvedevym 20 fevralya 2013 goda [On the Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period up to 2020. Approved by the President of the Russian Federation D.A. Medvedev February 20, 2013]. URL: <http://static.government.ru/media/files/2RpSA3sctElhAGn4RN9dHrtzk0A3wZm8.pdf> (accessed 12 December 2021).

⁴ Osnovy gosudarstvennoy politiki Rossiyskoy Federatsii v Arktike na period do 2035 goda. Uтверzhdeny Prezidentom Rossiyskoy Federatsii V.V. Putinyim 5 marta 2020. Ukaz № 164 [Fundamentals of the state policy of the Russian Feder-

Arctic Zone of the Russian Federation and Ensuring National Security for the Period up to 2035”⁵. An important innovation of the two documents is a clearly expressed priority — improving the safety and quality of life of people living in the Russian Arctic. Although the documents do not use the term “human security”, in fact they refer to many aspects of this concept.

It should be taken into account that the AZRF is a heterogeneous region not only in terms of socio-economic development, but also in terms of ethnic composition of the population, cultural and linguistic traditions, economic structure, belonging to indigenous peoples, and the peculiarities of labour organisation (“shift workers” and “locals”). This diversity affects the perception and composition of threats to security and requires the development of appropriate approaches to the content of the concept of “human security” in the conditions of the Russian Arctic. However, the focus of the security policy should be directed, first of all, to those groups of the population that are oriented to permanent residence in the Far North. Only in this way, one can expect to achieve sustainable development of the region as a whole and create long-term human security conditions.

Mentality peculiarities of the indigenous peoples of the North and security perception

The “northern mentality” can be understood as a set of common features of worldview, which are objectively formed among the inhabitants of the Far North. In general terms, the population of the Russian Arctic can be divided into indigenous peoples (Komi, Yakuts, Russians), small indigenous peoples (17 groups of peoples with a population of less than 50 thousand people) and recent internal migrants associated with the modern economic development of the North [7, Kharlampieva N.K., p. 77–78]. Unlike the first two groups, representatives of the latter category, for obvious reasons, have a more modest historical experience of adaptation to the conditions of living in the North.

The tundra parts of the Arctic from Scandinavia to Chukotka were inhabited approximately 20–30 thousand years ago, due to constant relocation across vast spaces. The modern Finno-Ugric and Samoyed peoples were formed from the aboriginal tribes of hunters, fishermen and more southern nomadic herders who came from Asia. The nomads reached the Kola Peninsula, Yamal, Gydan, Taimyr and gradually assimilated [8, Mazharov A.V., Smorchkova V.I., p. 9–10]. Russian settlers came mainly to the European North in the 11th–12th centuries, but they have only partially

ation in the Arctic for the period up to 2035. Approved by the President of the Russian Federation V.V. Putin March 5, 2020. Decree No. 164]. URL: <http://static.kremlin.ru/media/events/files/ru/f8ZpjhpAaQ0WB1zjywN04OgKil1mAvaM.pdf> (accessed 13 December 2021).

⁵ Strategiya razvitiya Arkticheskoy zony Rossiyskoy Federatsii i obespecheniya natsional'noy bezopasnosti na period do 2035 goda. Utverzhdena Prezidentom Rossiyskoy Federatsii V.V. Putinyam 26 oktyabrya 2020 [Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035. Approved by the President of the Russian Federation V.V. Putin on October 26, 2020]. URL: http://www.scrf.gov.ru/security/economic/Arctic_strategy/ (accessed 10 March 2021).

preserved their traditional economic way of life and represent a rather specific Russian cultural group, referred to as Pomor.

For many northern peoples, nomadism was associated with prosperity, while sedentarism — with disaster [9, Golovnev A.V., p. 10]. Until now, many indigenous peoples living in the Arctic are distinguished by a special, nomadic culture (nomadism), which is characterized by complex systems of beliefs, knowledge, ethics and social relations, as well as high adaptability to changing conditions and mobility, which are implemented on huge spaces [10, Golovnev A.V., p. 164]. Nomadism is opposed to the local (sedentary) type of development, focused on the resources exploitation within fixed boundaries. Hence, one can understand why, the concept of security as peace is associated with constant movement in space — nomadism [10, Golovnev A.V., p. 165].

Due to the harsh conditions that put a person on the brink of survival, the northern mentality is distinguished by a constant readiness to confront undefined and multiple threats to security and active actions to overcome threats. For the peoples of the North, extreme situations are the norm rather than the exception. Unpredictable risks drive innovative solutions. In this sense, nomadic culture includes the skills of quick and flexible response in case of danger, without waiting for outside help and striving to get ahead of further changes in the situation [11, Golovnev A.V., p. 155]. At the level of Yakut and Evenki mythology, readiness for danger is cultivated through the popularity of “scary” plots in which a person encounters hostile otherworldly forces, often taking invisible forms [12, Kaduk A.V., p. 235]. Anthropologists attribute the function of society's adaptation to real threats to such a mythology, which is not only widespread, but is often perceived as a reality.

The state of security in the mentality of nomadic and sedentary indigenous peoples is closely related to the idea of harmonious coexistence with nature. The manifestation of the “northern mentality”, according to U.A. Vinokurova and Yu.V. Yakovets, is ecosophy as “the worldview of ecological harmony, or ecological balance, expressed in two standards — human self-realization and biospheric equality”. Nowadays, the ideas of ecosophy have a significant impact on the perception of nature and people-saving by indigenous peoples [13, Vinokurova U.A., Yakovets Yu.V., p. 36, 46]. It is noteworthy that the ideas of ecosophy are consonant with the modern concept of sustainable development.

Ecosophy is primarily about accumulated knowledge on survival in extreme conditions of the Arctic, which underlies strategies of coexistence with nature and the consolidation of norms of behaviour through the creation of cultural and religious symbols [13, Vinokurova U.A., Yakovets Yu.V., p. 40]. But interaction with the environment is based not just on deep knowledge, but also on animating nature and representation of oneself as an integral part of it. This relationship with nature is much richer than the “food chain” system or profit making, so characteristic of modern civilizations. For example, for the “northern mentality”, animal hunting is always limited to a rational need, and the principle of natural balance is behind it. The Khanty and Nenets living on the

banks of the Ob River endow beavers with human qualities, which does not prevent them from hunting valuable animals [14, Gramatchikova N.B., p. 118].

Socially, responding to sudden danger in the “northern mentality” is closely related to the idea of collectivism, which implies mutual assistance. Living conditions taught the northern peoples to rely mainly on their own strengths and initiative. But, on the other hand, in case of extreme danger, a person has no doubts that he can always rely on the help of neighbors and the support of relatives.

The above-described features of danger perception from the point of view of the “northern mentality” help to clarify the specifics of modern threats to human security, which are objective in nature, as well as ways of responding to them.

Threats to the traditional livelihoods of indigenous peoples in the AZRF

Threats to traditional lifestyles for indigenous peoples are crucial, as they are often amount to their existence. The problem of how to adapt the traditional way of life to modern conditions is far from being resolved. Do Arctic Indigenous Peoples even need modernisation? Can modernisation be partial, without the prospect of loss of identity? How can traditional and modern ways co-exist in the conditions of the Russian Arctic? While discussions are underway on these issues, the state remains an urgent task of preserving the traditional way of life of indigenous peoples.

Traditional way of life for people living in the North has several dimensions, including the preservation of traditional types of production, crafts and labour relations; stable (reproducible) natural environment; features of family and social relations, cultural, linguistic and religious identity.

The economic basis of the traditional way of life for most of the indigenous peoples of the AZRF is reindeer husbandry. Reindeer husbandry is a peculiar form of human adaptation to extreme living conditions, and it is so perfect, diverse and comprehensive that scientists even talk about the “reindeer civilization” [15, Dolmatova S.A.]. However, the state of reindeer husbandry today is very ambiguous. The situation is most favorable in Yamal and the Kola Peninsula, and much worse in Chukotka. This is due both to the peculiarities of nomadic traditions (Nenets, Sami, Chukchi), and to the socio-economic situation.

Since Soviet times, reindeer husbandry has played an important role economically, both as part of the traditional way of life and as an industrial enterprise. Chukotka and Yamal were world leaders with a total reindeer population of 490 thousand, respectively. By now, in Yamal, the livestock has grown to 700 thousand, and in Chukotka it has dropped catastrophically — to 150 thousand. On the Kola Peninsula, there was a more moderate reduction, from 77 to 58 thousand heads. Experts associate the current degradation of reindeer husbandry in Chukotka with the nationalization of herds instead of preserving private livestock, as well as the introduction of all-round technology that destroys pastures, and the outflow of qualified personnel against the background of economic devastation, looting and soldering of reindeer herders [9, Golovnev A.V., p.

12–13]. Threats to security of the traditional way of life are to a greater extent associated with social factors of the 1990s–2000s. Their consequences had specific negative effects for reindeer husbandry. In particular, in Chukotka, with the decline of households, the number of wild reindeer has increased, which, falling into domestic herds, can break it up into groups and take it away from reindeer herders. On the other hand, reindeer grazing requires the skills of the herders, which are accumulated over decades, and therefore the loss of the most skilled personnel can be irreplaceable both for maintaining the reindeer herds and for the lives of many Chukchi families [9, Golovnev A.V., p. 14, 19–21, 37]. This problem is typical for many regions of the Russian North.

Due to the transfer of lands for industrial enterprises and pollution of the territory by emissions, the indigenous population is deprived of pasture lands and hunting grounds, traditional fishing grounds, areas for gathering wild plants. But the situation is not so simple, because, according to the estimates of the Institute of Ethnology and Anthropology of the Russian Academy of Sciences, only 25% of the aboriginal population currently leads a permanent nomadic way of life, while the rest are sedentary⁶. Part of the indigenous peoples traditionally leads a semi-nomadic life, besides reindeer herding they engage in other types of nature management: hunting, fishing, and animal trapping.

Another ambiguity arises from the long-standing policy of stimulating the transition of nomadic peoples to sedentary life. Part of these measures was the separation of children from the nomadic family and placing them in boarding schools (with the aim of their socialisation). Such a practice violates the age-old continuity, leads to “disconnection from traditional culture” and a sharp shortage of personnel in traditional industries. On the other hand, many young people who have left for cities do not adapt to modern living conditions⁷. Departure to the city is often accompanied by social adaptation problems, provoking alcoholism and drug addiction.

The introduction of federal laws regulating the use of natural resources was not effective enough to protect and preserve the traditional way of life. For the economic communities of indigenous peoples, due to the ambiguity of the legislation, restrictions remain on their commercial activities within the framework of the traditional way, as well as on the creation of territories of traditional nature management [16, Kryazhkov V.A., p. 55]. The issue, however, is not fully resolved simply by issuing permits to indigenous peoples. The preservation of elements of the traditional way of life is also important for other inhabitants of the North who live in similar conditions.

For example, fishing collective farms in Pomor villages, after the introduction of new fishing rules in 2007, are losing auctions for catching quotas to large farms, since they are less competi-

⁶ Tishkov V.A. *Korennyye narody rossiyskoy Arktiki: istoriya, sovremennyy status, perspektivy* [Indigenous peoples of the Russian Arctic: history, current status, prospects]. URL: <http://www.russiancouncil.ru/analytics-and-comments/comments/korennyye-narody-rossiyskoy-arktiki-istoriya-sovremennyy-stat/> (accessed 31 August 2021).

⁷ Kirko V.I., Zakharova K.N. *Khozyaystvennaya deyatel'nost' — etnosokhranyayushchiy obraz zhizni* [Economic activity is an ethno-preserving way of life]. *Arktika i Sever* [Arctic and North], 2013, no. 12. URL: <http://narfu.ru/upload/iblock/6f8/03.pdf> (accessed 22 March 2021).

tive [17, Tulaeva S.A.]. Federal Law No. 475 on recreational fishing allows Pomors to fish only for their own needs, and not for sale⁸. The Pomors are not included in the indigenous small-numbered peoples of the North, but, like other permanent residents who live off the sea trade, they are entitled to benefits. Some experts generally consider the Pomors to be a cultural and ethnic group, equated to the indigenous peoples of the North, and then the question of the appropriate benefits for the use of natural resources and self-government arises directly [18, Lukin Yu.F.].

In terms of the preservation of cultural and linguistic identity, experts note a tendency towards the loss of native language among aboriginal ethnic groups, related to the long-standing assimilation policy pursued in Soviet times. However, since 1991, there has been a tendency to maintain a linguistic identity among the nomadic indigenous groups⁹. The state at the federal level supports the work of nomadic schools, and the languages of the northerners are taken under state protection¹⁰. In the AZRF, the languages of the Republic of Sakha (Yakutia) are considered to be the most legally protected, and the languages of the autonomous okrugs (NAO, KhMAO-Yugra, ChAO, YaNAO) are supported by separate regulatory acts [19, Tishkov V.A. et al., p. 220]. At the same time, in most regions, native languages are not included in the compulsory curricula, but are taught mainly in boarding schools. As a result, parents are faced with a choice between giving a good education to their child or teaching them their native language. In addition, native languages are sometimes perceived as less prestigious, since officials regard them as “the languages of the tundra and taiga” [19, Tishkov V.A. et al., p. 223].

The ratio of the ways of life of the indigenous and “newcomers” population of the Far North is usually considered as a conflict (especially in the second half of the 20th century), although in fact, as noted by the famous anthropologist A.V. Golovnev, there is also a lot of mutual enrichment with social practices in this interaction [10, Golovnev A.V., p. 165], which concern the conditions of human security. This should be taken into account, since the inconsistencies in the cultural code bring the potential for conflict, as well as false stereotypes about the alleged “backwardness” of the traditional way of life of the indigenous peoples.

As for the mutual influence of traditions and modern innovations in the Arctic, as far back as the 1930s, the USSR had a positive experience with reintroducing animal populations. Considering that the status of a protected area with a ban on hunting contradicted the traditional way of

⁸ Federal'nyy zakon «O lyubitel'skom rybolovstve i o vnesenii izmeneniy v otdel'nye zakonodatel'nye akty Rossiyskoy Federatsii» ot 25.12.2018 N 475-FZ [Federal Law "On recreational fishing and on amendments to certain legislative acts of the Russian Federation" dated December 25, 2018 No. 475-FZ]. URL: http://www.consultant.ru/document/cons_doc_LAW_314261/ (accessed 31 August 2021).

⁹ Tishkov V.A. Korennye narody rossiyskoy Arktiki: istoriya, sovremennyy status, perspektivy [Indigenous peoples of the Russian Arctic: history, current status, prospects]. URL: <http://www.russiancouncil.ru/analytics-and-comments/comments/korennye-narody-rossiyskoy-arktiki-istoriya-sovremennyy-stat/> (accessed 31 August 2021).

¹⁰ Mikhaylovskaya M. Kak sokhranit' yazyki korennykh narodov Severa [How to preserve the languages of the indigenous peoples of the North]. *Parlamentskaya gazeta* [Parliament newspaper]. URL: <https://www.pnp.ru/social/kak-sokhranit-yazyki-korennykh-narodov-severa.html> (accessed 31 August 2021).

life, state officials allowed hunting only for local fur trappers, who were also responsible for the restoration and maintenance of the population [14, Gramatchikova N.B., p. 124]. On the other hand, nowadays the nomads of the North have quickly mastered such convenient means as snowmobiles and GPS navigators, and they consider drones and small helicopters as promising means for searching and gathering reindeer herds, facilitating the work of herders. In Taimyr and Yamal, the reindeer meat processing plants are being set up to process the product without waste, from where it is marketed in Russia and exported to Germany, Sweden and Finland ¹¹. Nowadays, the nomadic peoples of the AZRF creatively combine tradition and innovation in maintaining a traditional way of life. Moreover, the experience of traditional life suggests the principles, consonant with the era of globalization, which are in demand in the development of the AZRF: mobility, flexibility, modularity, transformation of methods and types of activities [9, Golovnev A.V., p. 40]. The combination of traditional knowledge and new technologies is gradually becoming one of the characteristic features of the modern North development.

Threats to the environment

Environmental degradation in the Russian Arctic is mainly associated with anthropogenic impact. Active pollution of the Arctic began in the Soviet period due to the development of port cities and industry, the construction of military facilities, the dumping of submarines with nuclear reactors at the seabed, and the accumulation of other unprocessed waste. Currently, the Russian Arctic has the largest number of so-called environmental “hot spots” ¹², which were identified within the framework of the UNEP/GEF Project “Russian Federation — Support to the National Action Plan for the Protection of the Arctic Marine Environment (NAP–Arctic)”. In total, more than 100 “hot spots” were identified, 30 of them were prioritized [20, Lukin Yu.F., p. 16]. Surveys of the population from industrial centers of the Murmansk Oblast (conducted in 2008, 2015 and 2016) also show that among the threats to everyday life, the greatest concern is caused by the state of environment as a result of man-made accidents [21, Klyukina E.S., p. 99]. The protection of the unique Arctic natural environment is a policy priority for all Arctic countries, including Russia.

In 2010, V. Putin launched a “general clean-up” of the Arctic from pollution, which was started by the military, and then supported by volunteers from various public organizations. In 2019, V. Putin announced the results of the work done: “since 2012, more than 80 thousand tons

¹¹ YaNAO za 10 let v 10 raz uvelichil eksport oleniny v strany Evrosoyuzya [Yamal-Nenets Autonomous Okrug has increased the export of venison to the EU countries by 10 times in 10 years]. URL: <https://www.ros-net.ru/export-oleniny-s-yamala-v-strany-es-vyros-v-10-raz.html> (accessed 31 August 2021).

¹² Proekt YuNEP/GEF Rossiyskaya Federatsiya – Podderzhka natsional'nogo plana deystviy po zashchite arkticheskoy morskoy sredy 2008 [UNEP/GEF Project Russian Federation - Support for the National Action Plan for the Protection of the Arctic Marine Environment 2008]. URL: <https://docplayer.ru/45130554-Proekt-rossiyskaya-federaciya-podderzhka-natsionalnogo-plana-deystviy-po-zashchite-arkticheskoy-morskoy-sredy.html> (accessed 22 March 2021).

of wastes have been removed and disposed of”¹³. Experts note that estimates of the amount of pollution are still very different: from 2 to 12 million tons of waste. Some of the facilities needing cleaning are difficult to access, and the cleaning itself requires high-tech technological solutions. As a result, it is difficult to estimate the scale of work, their cost and performers¹⁴. Apparently, this is why the Strategy for the Development of the Russian Arctic and Ensuring National Security for the Period up to 2035 contains only a general formulation about the need to continue work to eliminate the accumulated harm to the environment¹⁵. Institutional, financial, technological, and personnel mechanisms need to be improved.

In addition to the accumulated environmental damage, the modern construction of industrial enterprises, the development of transport systems and human life also have a negative impact on the natural environment of the Russian Arctic, which is particularly vulnerable. As a result, natural balance occurs very slowly, or even becomes completely impossible. Since the Arctic plays an important role in maintaining the biodiversity of the entire planet, the environmental problem in the AZRF has not only regional but also global significance.

The tendency towards environmental degradation in the Arctic is also related to the fact that the state's environmental policy lagged significantly behind the pace of economic development of the region. The problem of environmental conservation was further exacerbated by the general economic growth after the 1998 crisis. The government made serious mistakes, since the Ministry of the Environment was abolished in 1996, and the State Committee for Environmental Protection was liquidated in 2000. Only in 2008, environmental functions were added to the Ministry of Natural Resources and Environment [22, Turn to Nature, p. 89]. At the initial stage, the Russian Arctic was defined as the “resource base” of the country; therefore, the main attention was paid to the development of the resource potential of the region. Environmental issues, on the other hand, were not among the priorities until recently.

The situation in the Arctic is aggravated by the failure of the “garbage reform” in Russia (2019). According to the Accounts Chamber, no more than 7% of waste is still processed in Russia,

¹³ Putin: Za sem' let iz Arktiki vyvezeno i utilizirovano svyshe 80 tys. tonn otkhodov [Vladimir Putin: Over 80,000 tons of waste have been removed and disposed of in the Arctic over seven years. April 09, 2019]. URL: <https://er.ru/activity/news/putin-za-sem-let-iz-arktiki-vyvezeno-i-utilizirovano-svyshe-80-tys-othodov> (accessed 31 August 2021).

¹⁴ Trushin A. Arktika ispravit? [Will the Arctic be fixed?]. Ogonek, no. 50. URL: <https://www.kommersant.ru/doc/4614622> (accessed 02 August 2021).

¹⁵ Strategiya razvitiya Arkticheskoy zony Rossiyskoy Federatsii i obespecheniya natsional'noy bezopasnosti na period do 2035 goda. Utverzhdena Prezidentom Rossiyskoy Federatsii V.V. Putinyem 26 oktyabrya 2020 [Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035. Approved by the President of the Russian Federation V.V. Putin on October 26, 2020]. URL: http://www.scrf.gov.ru/security/economic/Arctic_strategy/ (accessed 10 March 2021).

and landfills and dumps do not meet sanitary requirements, poisoning the air, water and soil. If more than 90% of waste in Russia is sent to landfills, the European average is 50%¹⁶.

Experts identify several important tasks to ensure the environmental safety of the Arctic in the context of intensive economic activity:

- Increasing the level of waste disposal. A huge number of landfills pollute soil and water resources. In the Russian Arctic, the most unfavorable situation is in the Krasnoyarsk Krai and the Republic of Sakha-Yakutia. The largest volumes of waste are produced by the mining enterprises PJSC Mining Company Polyus, MMC Norilsk Nickel, AK ALROSA, and OJSC Yakutugol.
- Prevention of further air pollution by industrial enterprises. The largest contributions are made by JSC Vorkuta Ugol, MMC Norilsk Nickel, JSC RUSAL Krasnoyarsk, CJSC Vankorneft, LLC Lukoil Komi, LLC Gazprom Transgaz Ukhta, LLC Gazprompererabotka. The AZRF exceeds the Russian average by 3 times in terms of emissions per gross regional product (GRP).
- Protection and restoration of aquatic ecosystems. The largest volumes of wastewater pollution come from the mining and processing and pulp and paper enterprises of the Arkhangelsk and Murmansk oblasts, the Republic of Karelia and the Krasnoyarsk Krai. Among them are OJSC Kondopoga, PPM OJSC Segezha, OJSC Ilim Group, JSC Apatit. Regions of oil and gas production give relatively less pollution. The dynamics of pollution changes downward and, on the whole, coincides with the all-Russian one.
- Conservation of the natural environment and biodiversity. The most important condition for solving this problem is the creation of a network of specially protected natural areas (SPNA). Such a network should neutralise anthropogenic impact on nature and contribute to its self-recovery. According to expert estimates, 17% of the AZRF territories should be allocated for protected areas. In general, there is positive dynamics in the Russian Arctic, but the lowest values of this indicator are observed in the Republic of Karelia and Chukotka.
- Development and implementation of environmentally friendly technologies. Most of these technologies include waste recycling, air and water purification. The low level of innovation in this area is associated with the general crisis state of the Russian economy, the slowdown of modernization of production, which are aggravated by the regime of international sanctions (the share of foreign equipment in the oil and gas industry is about 60%) [23, Smirennikova E.V., Ukhanova A.V., Voronina L.V., p. 59–78].

¹⁶ Dembinskaya N. Vse v odnu kучu: pochemu musornaya reforma okazalas' na svalke [All in one pile: why the garbage reform ended up in a landfill]. URL: <https://ria.ru/20201012/musor-1579044617.html> (accessed 02 August 2021).

- Elimination of the consequences of radiation contamination. The pollution is related to testing of Soviet nuclear weapons (1955–1990), the discharge of liquid and the sinking of solid radioactive waste from nuclear submarines and icebreakers. In addition, radioactive waste was being dumped in the Kara and Barents Seas by French and British radiochemical plants in the English Channel and the Irish Sea. Nuclear waste has also been accumulated on the Kola Peninsula, but work is underway to utilize and safely store it with international participation. In general, the radiation situation in the AZRF is within the natural radiation background and has a tendency to decrease since 2016 [24, *Modern Problems of Hydrometeorology*, p. 570–572].

In the Russian Arctic, the problem of maintaining the balance of the environment depends on the interaction of indigenous peoples leading a nomadic way of life in vast areas, and industrialists represented by private and state enterprises. But industrial enterprises have low motivation for investment in support of scientific research on environmental protection [25, Bobrovnikskiy I.P., Nagornev S.N., Khudov V.V., Yakovlev M.Yu., p. 7]. At the same time, further economic development of the AZRF inevitably raises the issue of the spatial limitation on the nomadic way of life and the reduction of pastures. This fundamental contradiction, expressed in competition for free territories, requires a balanced solution that would distribute “nobody's” pastures for responsible use, introduce reasonable regulation and restrictions on the activities of private and state reindeer herding farms [11, Golovnev A. V., p. 166–167].

There are also contradictions between indigenous peoples and state bodies, which are manifested, for example, in the management of forestry in the Russian Arctic. The boundaries of the pre-tundra forests, which make up 60% of the forest fund and perform climate-regulating and protective functions, have not been reliably determined. This leads to damage to valuable forests during sanitary felling and violations of the regime of use by poachers and tourists. In addition, in order not to lose the rents and nature use fees, the forestry units resist the conversion of forest land to agricultural land, in which indigenous communities are interested [26, Kharitonova G.N., p. 154–168]. Regional authorities, local governments and representatives of indigenous peoples do not have the ability to influence decisions on granting rights to use subsoil plots of federal significance, since the procedure provides only for an auction, where the winner is determined by the size of a one-time payment [27, Masloboev V.A., Makarov D.V., p. 89].

At the same time, government agencies do not sufficiently use the experience and knowledge of indigenous peoples about the environment. Several scientific projects, in which indigenous peoples assisted with monitoring, helped to discover important features of marine mammals previously unknown to science. A project with the participation of Chukotka residents identified the impact of climate warming on coastal and continental biocenoses. In a joint Russian-American project with the participation of residents of Alaska and Chukotka during 2006–2010,

dozens of scientists have documented the accumulated knowledge and observations of the Arctic peoples of the environment. This knowledge and observations helped to obtain a more complete scientific picture of the evolution of ecosystems, proving not only the possibility, but the necessity of such a partnership. The uniqueness of the data received from local residents is that they “monitor the state of the weather, ice, surrounding landscape and biota every day, at any time of the day, 365 days a year. They summarize their personal data with those that they heard from other hunters, received from the elders, or inherited from their ancestors” [28, Bogoslovskaya L.S., Krupnik I.I., p. 331]. Moreover, observation is carried out according to many indicators, which corresponds to the principle of a comprehensive study.

Threat of demographic potential decrease

At the beginning of 2020, according to various estimates, 2.5–2.6 million people lived in the Russian Arctic (1.6%–1.8% of the country's population) [29, Fauser V.V., Smirnov A.V., p. 4–5]. In recent years, there have been multidirectional trends in the population in the Russian Arctic. The overall decline in the permanent population in the Far North continues. For example, from 1989 to 2014, the AZRF population has almost halved. From 2012 to 2020, the population of the Russian Arctic decreased from 2 736.4 to 2 618.7 thousand people, or by 117.7 thousand. The population decreased in seven of nine Arctic regions of Russia, and it increased in two of them (Nenets and Yamalo-Nenets Autonomous Okrugs) [29, Fauser V.V., Smirnov A.V., p. 5]. The result of the general decline in the population was a shortage of highly qualified labour force in the region and concentration of the population in large cities, mainly in the west of the Russian Arctic.

The proportion of people of working age among the departing migrants is higher than the Russian average. The outflow of the population from the Russian Arctic is associated with several reasons of a different nature: economic decline in the 1990s, reduced demand for workers in the extractive industries, depletion of deposits, decline in living standards, departure of young people and those of retirement age, deterioration of infrastructure. Reorientation of state officials to a “rotational” method of natural resources development played an important role in the decline of the demographic potential of the AZRF. As a result, the permanent population in the “old” industrial centers (Norilsk) was left to fend for themselves [7, Kharlampieva N.K., p. 92, 96], resulting in a trend of population outflow to other regions of Russia.

The migration processes have a rather complex and contradictory nature. During the whole period of Arctic exploration and up to the 1990s, there was an inflow of population with active participation of the state, followed by its general outflow. Historically, the migration flow was formed on a dual basis: as voluntary (economic incentives from the state) and as compulsory. While in the first half of the 20th century, migration to the European part of the Far North prevailed, later migration to the Eastern part of the region also dominated. This was due to the priority development of the oil and gas industry. Most of those who currently come to live in the Arctic,

consider it a temporary place for saving money and further move to southern regions. In addition, a significant part of the labour force is made up of “shift workers”: Yamalo-Nenets Okrug — 46%, Nenets Autonomous Okrug — 25%, Republic of Sakha — 20%. According to official data, in 2020, 208 thousand (15%) people work on a rotational basis in the Arctic zone of the Russian Federation¹⁷. “Shift workers” exacerbate the problem of unemployment for the local population, which increases social tension [7, Kharlampieva N.K., p. 88–90], causing discontent among local residents and local authorities.

Labour migrants on a “shift” and permanent basis are attracted to the Arctic from the central and southern regions of Russia, as well as from the post-Soviet republics: Ukraine, Kyrgyzstan, Armenia, Tajikistan, Uzbekistan. The northern territories have always attracted by high wages and social guarantees. While in 2020–2021, the average salary in Russia was 36.000 rubles, then in Murmansk it was 43.670 rubles, in Kamchatka — 50.600 rubles, in Yakutia — 53.460 rubles, in Chukotka — 56.100 rubles, in the Yamalo-Nenets Autonomous Okrug — 70.620 rubles, etc.¹⁸. An exception is the Arkhangelsk Oblast, where the situation looks quite different: a high unemployment rate, relatively low salaries (in 2014, the average salary barely exceeded 36 thousand rubles, and the unemployment rate was the highest: 7.3%) [7, Kharlampieva N.K., p. 93] contribute to the fact that the number of people leaving for other regions of the country (including because of job search) exceeds the entry by several times.

A negative feature of migration from the Arctic is the outflow of highly educated and qualified personnel, which poses a threat of “degradation of human capital” in the Russian Arctic¹⁹. According to experts, from 2021, several tens of thousands of specialists will be required annually, “one third of them are workers with higher education, and almost half — are mid-level specialists, including skilled workers and employees”²⁰. At the same time, Arctic educational institutions are not able to solve the problem of a shortage of highly qualified personnel completely due to a decrease of students’ admission to state-financed places and the closure of regional branches of universities. As a result, the Arctic universities reduced admission from 12 thousand to 5.4 thousand students for 10 years, and their branches — from 11.7 thousand to 1.5 thousand²¹. As a result,

¹⁷ Opređelena kadrovaya potrebnost' v Arkticheskoj zone Rossijskoj Federatsii do 2035 goda. 08.12.2020. Ministerstvo RF po razvitiyu Dal'nego Vostoka i Arktiki [The personnel requirement in the Arctic zone of the Russian Federation until 2035 has been determined. 12 August 2020. Ministry of the Russian Federation for the Development of the Far East and the Arctic]. URL: <https://minvr.gov.ru/press-center/news/29471/> (accessed 13 May 2021).

¹⁸ Statistika sravneniya srednikh zarplat Rossii po regionam [Statistics comparing average wages in Russia by region]. URL: <https://visasam.ru/russia/rabotavrf/zarplaty-v-rossii.html> (accessed 12 May 2021).

¹⁹ Shaparov A.E. Migratsionnye protsessy v regionakh Arkticheskoj zony Rossijskoj Federatsii [Migration processes in the regions of the Arctic zone of the Russian Federation]. Rossiya: tendentsii i perspektivy razvitiya [Russia: trends and development prospects]. URL: <https://cyberleninka.ru/article/n/migratsionnye-protsessy-v-regionah-arkticheskoj-zony-rossijskoj-federatsii> (accessed 08 May 2021).

²⁰ V Arktike sozdatut bolee 180 tys. novykh rabochikh mest za 15 let [More than 180,000 new jobs will be created in the Arctic in 15 years]. URL: <https://tass.ru/ekonomika/10203915> (accessed 08 May 2021).

²¹ Opređelena kadrovaya potrebnost' v Arkticheskoj zone Rossijskoj Federatsii do 2035 goda. 08.12.2020. Ministerstvo RF po razvitiyu Dal'nego Vostoka i Arktiki [The personnel requirement in the Arctic zone of the Russian Federation

about half of school graduates are forced to go to universities in other cities and do not return to their homeland. The shortage of personnel is compensated by “shift workers”.

In the long term, specialists expect the stabilization of the AZRF population, though it is uneven. There is an increase in the population in Salekhard and Novy Urengoy, but in Vorkuta and Norilsk, there is a decrease associated with the end of resource development cycles (accompanied by a drop in the profitability of production) [30, Smirnov A.V., p. 270–290]. Among the indigenous peoples, a noticeable increase in population is noted in the Yamalo-Nenets Autonomous Okrug, which is associated with the success in the development of reindeer husbandry. The number of such peoples as the Nenets, Chukchi, Khanty and Even stabilized²².

The positive dynamics include an increase in the birth rate and life expectancy for those born in most subjects of the AZRF, which is approaching the national average [31, Govorova N.V., p. 52–61]. At the same time, the northern aborigines are traditionally characterized by relatively late marriages, which naturally limited the fertile period of women. According to experts, “this custom can be regarded as social adaptation to the conditions of a nomadic lifestyle: a too young mother could not provide the child with adequate protection and care” [1, Kozlov A.I., Kozlova M.A., Vershubskaya G.G., Shilov A.B., p. 31]. For example, the so-called “declaration” of marriage at an early age, accompanied by the transfer of a girl to her husband’s family, was very common, but at the same time, during the first few years, young people usually did not engage in sexual relations [29, Afanasyeva G.M.]. As a result, the total number of births among northern peoples was relatively low, as in other nomadic or semi-nomadic societies. The low birth rate of indigenous peoples is also due to the influence of biomedical factors: “the lifestyle of women in hunter-gatherer societies ... contributes to a decrease in fertility” [1, Kozlov A.I., Kozlova M.A., Vershubskaya G.G., Shilov A.B., p. 31–35].

Today, the actual life expectancy in AZRF is 53 years, which is significantly lower than the national average — 73.4 years²³. The development of demographic potential of the Russian Arctic is mainly due to the economic attractiveness of large cities and investment projects. But a steady demographic growth also requires attention to the creation of necessary conditions in medium and small settlements of the Far North [30, Smirnov A.V., p. 286] with a permanent population, which remains an unresolved problem.

until 2035 has been determined. 12 August 2020. Ministry of the Russian Federation for the Development of the Far East and the Arctic]. URL: <https://minvr.gov.ru/press-center/news/29471/> (accessed 08 May 2021).

²² Tishkov V.A. Korennyye narody rossiyskoy Arktiki: istoriya, sovremennyy status, perspektivy [Indigenous peoples of the Russian Arctic: history, current status, prospects]. URL: <http://www.russiancouncil.ru/analytic-and-comments/comments/korennyye-narody-rossiyskoy-arktiki-istoriya-sovremennyy-stat/> (accessed 31 August 2021).

²³ Manukyan E. Srednyaya prodolzhitel'nost' zhizni rossiyan dostigla istoricheskogo maksimuma [The average life expectancy of Russians has reached a historical maximum]. URL: <https://rg.ru/2020/04/21/sredniaia-prodolzhitelnost-zhizni-rossiian-dostigla-istoricheskogo-maksimuma.html> (accessed 17 April 2021).

Threats to public health

Extreme climatic conditions in most regions of the Russian Arctic put serious pressure on the human body and lead to serious diseases. Studies show that in the Arctic, cold leads to a drop in the efficiency of physical labour by 15–25% compared to the middle latitudes of Russia, a decrease in working capacity, an increase in sensitivity to industrial poisons due to an increase in lung ventilation. As a result, the risks of respiratory and circulatory diseases increase. Deficiency of ultraviolet radiation from the sun, prolonged polar night, and frequent geomagnetic disturbances have an adverse effect on the health of northerners. Persistent pollution of the Russian Arctic, associated with river flows in the northern direction and transboundary transfers, cause diseases of the cardiovascular, endocrine and immune systems, reduce the reproductive capabilities of the population [32, Nagornev S.N., Khudov V.V., Bobrovnikitskiy I.P., p. 6–7].

Violation of the traditional way of life of the Arctic indigenous peoples has an additional negative impact on the health of the indigenous population of the northern territories. In this regard, the so-called “social diseases” require attention [13, Vinokurova U.A., Yakovets Yu.V., p. 55], such as tuberculosis, alcoholism, drug addiction, infectious diseases. Indigenous peoples have developed their own special ways of achieving a comfortable psychological state in extreme conditions, relieving stress and tension: various calendar holidays, certain rituals, shamanism. However, during the Soviet era, most of the traditional customs and rituals were severely deformed or eradicated. As a result, alcohol has become a stress reliever, replacing traditional “healthy” ones.

The emergence of a craving for alcohol among indigenous peoples is also associated with a change in diet: “refusal from the protein-lipid diet, traditional for northerners, can contribute to an increase in craving for alcohol. A decrease of fat in the diet leads to an increase in the concentration of corticosteroids and, accordingly, an increase in the level of anxiety, which a person often seeks to relieve in a tried and tested “alcohol” way”. A serious problem is female alcoholism among northerners, which is caused by the special gender attitudes of traditional Arctic cultures [1, Kozlov A.I., Kozlova M.A., Vershubskaya G.G., Shilov A.B., p. 69, 73], according to which alcohol consumption is not considered shameful for a woman, in contrast to European society.

As for the anthropogenic factor, international studies conducted under the AMAP (Arctic Monitoring and Assessment Program) showed that health damage to Arctic residents from contamination with persistent toxic substances occurs mainly through the food chain, through the accumulation of toxins in terrestrial animals, birds, predatory fish and especially marine mammals. As a result, the incidence increases and the immune functions decrease in the permanent residents of the Russian Arctic [35, Dudarev A.A., Odland Y.O., p. 3–14].

It is important to note that the incidence of the indigenous population is additionally associated with “genetically determined factors: lower levels of thyroid hormones, insulin, C-peptide, blood lipids ...” [13, Vinokurova U.A., Yakovets Yu.V., p. 55]. As noted above, changes in the type of nutrition in modern conditions (the transition from protein-lipid to the European carbohydrate

type of diet) provoke the development of immunodeficiency states, which is one of the causes of disability and an increase in mortality of the indigenous population.

In addition to objective problems, experts point to the weak efficiency of the healthcare system in the Russian Arctic. This concerns health protection of the working population, prevention of occupational diseases, infections and other mass diseases. The problem of access to medical care for indigenous peoples, especially those leading a nomadic way of life, is acute. This is explained not only by the lack of medical institutions and personnel, but also by the lack of knowledge about the characteristics of the spread and course of diseases in the Far North [33, Nagornev S.N., Khudov V.V., Bobrovnitskiy I.P., p. 18]. With all the advantages of modern medicine used by indigenous peoples, they are complemented by traditional methods of maintaining health, based on the use of local resources and nomadism. Traditional methods remain in demand not only because of the remoteness and limitations of modern medical care, but also because of their effectiveness in specific conditions.

Constant movement was considered to be the main factor in maintaining the health of people and deer among all nomads. At the same time, human health was thought to be inseparable from the health of reindeer, and even some plants with medicinal effect entered traditional medical practices as a result of observation of animal nutrition. The Chukchi, who did not know medical preparations, used fermented walrus meat, which preserves vitamins, as well as a number of plants and berries that enhance immunity for the prevention of health. In the 19th–20th centuries, they successfully practiced the long-term self-isolation (with complete self-sufficiency), which became popular in the Covid-19 period.

The Evenks of Northern Baikal are treated in ways similar to the practice of a modern par-
amedic. They focus on using medicines with a broad spectrum of action. The rich knowledge accumulated over generations about the properties of minerals (potassium alum for fusing bones), animals (fat of dogs, seals, bears for lung diseases) and plants (golden root, badan, yanda) allow Evenki to find medicines around them. It is especially important that they know how to get necessary medicines in various landscapes, store them in a concentrated form, combine with animals and mineral sources of medicines. It is also noteworthy that, turning to shamanistic rituals for healing, Evenks willingly go for help to modern medicine, if such an opportunity arises [36, Davydov V.N., Belyaeva-Sachuk V.A., Davydova E.A., p. 60–69].

Threats of climate change

The observed climate change in the Arctic is nonlinear, and its nature is not completely clear, given the correlation between human influence and natural cycles of cooling and warming. Global natural cycles are known to have occurred about every 400 thousand years, but scientists also note many smaller cycles during meteorological observations. According to some reports, in the period between 2020 and 2030, Arctic warming will slow down, and ice cover in the Barents

and Kara Seas will grow. But some experts still believe that the Arctic Ocean will be free of ice by 2050 [37, Voronkov L.S., p. 9–18]. The ambiguity of assessments becomes a pretext for various political speculations.

In any case, in recent decades, the Arctic has been warming 2–2.5 times faster than the global average. According to Roshydromet, for the period 1990–2019, the average annual temperature rise in the Arctic was 2.4 degrees, and in the Kara Sea — 4.7 degrees²⁴. The melting of permafrost is accompanied by the release of carbon dioxide and methane into the atmosphere. In addition, methane is released from gas hydrates located on the sea shelf. These processes, according to the principle of feedback, accelerate climate warming [38, Zhilina I.Yu., p. 70], lead to reduction of the ice cover in the Arctic and melting of permafrost.

The influence of climate change manifests itself in a non-uniform way in the territorial dimension. The most noticeable negative consequences occur in the coastal zone and on the islands of the Arctic seas located in high latitudes. This is associated with a complex system of interconnections and mutual influence of the state of atmosphere, ice and the Arctic Ocean [39, Davydov A.N., Mikhailova G.V., p. 29–34].

Permafrost degradation leads to ground subsidence and destruction of industrial facilities, residential buildings, power lines, bridges and roads. On Yamal, the destruction of coastlines and the shallowing of river mouths due to water erosion of the banks were recorded. As a result, navigation in the mouths of the Ob and Irtysh rivers becomes difficult. Ice melting in the sea is accompanied by increased winds and the formation of high waves, leading to deterioration of navigation conditions and destruction of the sea coastline, ports, jetties and protective structures [40, Khvostova M.S., p. 9–15]. According to some reports, the shores of the Laptev Sea and the East-Siberian Sea are receding by about 0.8 m per year²⁵. The growing wave activity can have the opposite effect on further ice melting.

Climate change is accompanied by an increase in the risks of natural disasters, the origin and dynamics of which are insufficiently studied. Scientists refer to such threats as “cryovolcanism”, when volcanoes spew water, ammonia and methane. Since 2014, 17 huge craters from gas explosions, which are formed under the permafrost layer, have been discovered on Yamal.

Another hazardous phenomenon is glacial lakes, formed by melting glaciers in depressions of the Earth's crust. As the ice melts, the rocks along the shores of the lake can suddenly collapse due to geophysical processes (rock relaxation). For example, the melting of the Moscow State University glacier in the Polar Urals threatens with the release of a huge mass of water into a narrow

²⁴ Доклад об особенностях климата на территории Российской Федерации за 2019 год [Report on climate features in the territory of the Russian Federation for 2019]. Moscow, 2020. 97 p. URL: <http://cc.voeikovmgo.ru/images/dokumenty/2020/o-klimate-rf-2019.pdf> (accessed 03 August 2021).

²⁵ Zheleznyak M. RF teryaet ezhegodno okolo 11 kv. km sushi iz-za tayaniya vechnoy merzloty [RF annually loses about 11 square km of land due to melting permafrost]. URL: <https://www.arms-expo.ru/news/incidents-and-crime/mikhail-zheleznyak-rf-teryayet-ezhegodno-okolo-11-kv-km-sushi-iz-zatayaniya-vechnoy-merzloty/> (accessed 03 August 2021).

valley and subsequent destruction. Over the past 50 years, the area of glacial lakes on the planet has increased by half.

The process of acidification of the Arctic Ocean is associated with warming, when cold water is quickly saturated with carbon dioxide from the atmosphere and river runoff and becomes less alkaline. The acidification mechanism is not completely clear, but it is obvious that more acidic water not only dissolves the shells and skeletons of marine organisms, but also disrupts food chains, and ultimately will affect commercial fishing and marine fishing of indigenous peoples [40, Khvostova M.S., p. 12–15].

Further warming and the accompanying phenomena endanger the survival of indigenous peoples, since they significantly change the habitat and the traditional way of life. Along with the melting of ice, the living conditions for some biological species, including polar bears, seals, and walruses, are significantly worsening. The range of arctic fish species is shrinking, which are being replaced by species that are more southerly. Large land areas will be subject to waterlogging and flooding. Increases in annual river flows and their seasonal redistribution, with an increase in the power of spring floods are being observed. The change in the water regime, along with warming, is accompanied by bacterial pollution of streams and lakes, where the aboriginal peoples get drinking water. There is swamping of some territories and drying up of others, a reduction in the area of the tundra, abrupt changes in meteorological conditions. In periods of winter warming, with snow and rain, the tundra becomes covered in ice, and reindeer starve to death. The largest loss of livestock occurred in 2013 in Yamal, where 61 thousand heads out of 340 thousand deer died. In summer, nomads face the instability of the landscape and rivers due to thawing of permafrost [38, Zhilina I.Yu., p. 82].

Warming threatens biological emergencies. The melting of permafrost in 2016 resulted in an outbreak of anthrax in Yamal, leading to the mass death of more than 2.5 thousand deer and human diseases. The disease had not manifested itself for more than 70 years and came as a surprise. An attempt to find a solution to overcome the crisis showed that government policy lacks flexibility through feedback from the indigenous population. On the part of biologists and officials, the question of reducing the reindeer herds was raised in order to stop the disease and at the same time avoid the depletion of pastures. From the indigenous peoples' perspective, a greater number of reindeer is a measure of well-being. Management decisions of state officials should take into account the opinion of the leaders of reindeer husbandry, who ensured rapid growth in Yamal in conditions when the country experienced a decline in production in most industries [11, Golovnev A.V., p. 164–165]. Similar outbreaks have occurred in the past, leading to the formation of about 60 places where animals have died, and as the permafrost thaws, they can again become sources of disease. Moreover, reindeer breeders do not always know these places and unaccounted cattle burial grounds, and the veterinary service of Yamal is poorly funded [40, Khvostova M.S., p. 11–12]. There is a high probability that such a situation will be repeated in other regions of the

Russian Arctic, therefore in 2021 Russia launched a project (implemented by the North-Eastern Federal University in Yakutsk (NEFU) together with the State Research Center of Virology and Biotechnology “Vector”) to study prehistoric viruses that have survived in the permafrost and that may emerge as a result of climate change

At the same time the nature management of the northern peoples has a high adaptive potential due to climate changes that have happened more than once in history (against the background of the Small Ice Age of the 14th–19th centuries, there were warming periods). The adaptability of the Sami communities of the Kola Peninsula was facilitated by a combination of lake and sea fishing, hunting for animals, gathering, and reindeer husbandry. The choice of the way of management corresponded to the season, to the peculiarities of the landscape and to the climatic changes. The adaptability of the Sami to external conditions was also facilitated by cultural flexibility, for example, in the 4th century, they were active in fur trade with the Roman provinces. In turn, this led to a decrease in the settled rate. The expansion of the fur trade was related to the relative cooling of Europe. Adaptability helped the Sami, like other peoples of the North, to maintain their identity for several thousand years [41, Murashko O.A., p. 63–70].

Conclusion

In order to solve the problem of human security in the Russian Arctic, it is necessary to develop a model of modernisation, which is based not on subsidised livelihood, but on increasing the viability and self-development of peoples permanently living here. The archaic features of mentality and way of life of the population of the Far North help to clarify not only the nature of threats, but also approaches to ensuring safe and sustainable life. An acceptable level of human security can be achieved through the creation of a set of inseparable measures: economic, social, cultural and environmental ones.

The policy to protect the traditional way of life of the inhabitants of the AZRF requires a comprehensive approach, which:

- takes into account not only the interests of indigenous peoples of the North, but also all the citizens of Russia living there, in order to avoid the effect of reverse discrimination. At the same time, it should be borne in mind that indigenous peoples are in the most vulnerable position;
- does not single out the issue of ethnicity as a basis for special rights, creating equal conditions for cultural and socio-economic development for all groups of the population, because historically, different peoples and religious confessions have always coexisted quite peacefully in the North;
- creates conditions for multistructurality and reasonable and flexible combination of traditional and modern economic and social practices. At the same time, it is necessary to take into account the low competitiveness of traditional types of farming, which is asso-

ciated with small production volumes, transport costs, and the lack of modern technologies for the complex processing of raw materials.

For effective neutralisation of threats to the Arctic environment, it is advisable to involve indigenous peoples not only to monitor the environment in the interests of science or natural resources control, but also to invite them to discuss and develop government decisions on sustainable environmental management.

Strengthening the demographic potential requires consolidating of population, focused on a long-term stay in the Arctic. This is facilitated by creation of attractive living conditions not only in large cities, but also in small settlements. The education system in Arctic universities should be restored and aimed at training personnel in demand in the Russian Arctic.

In order to maintain health, treat and prevent diseases, it is necessary to eliminate the shortage of medical institutions and medical personnel, and to develop telemedicine. At the same time, it is necessary to find ways of a reasonable combination of achievements of modern medicine and traditional methods of treatment, which is especially important for indigenous peoples leading a nomadic and semi-nomadic lifestyle.

The consequences of climate change for the indigenous population will be predominantly negative due to the fact that the habitat will change significantly, which will also cause the erosion of the traditional way of life. The nature, depth and stability of changes require scientific study. At the same time, experience shows that indigenous peoples have their own adaptation mechanisms that have shown their effectiveness in history, and their knowledge about the environment will allow them to find optimal solutions to neutralise emerging threats and use them in public policy.

The issue of human security today has acquired a special meaning for the Russian Arctic in the context of implementation of one of the most important tasks of the state policy in the Arctic — the sustainable development of the region. The successful development of AZRF presupposes the creation of basis for the country's socio-economic development, and this requires neutralisation of existing challenges and threats in the field of human security. The concept of human security seems to be quite applicable for documents regulating the state socio-economic, cultural and environmental policy in the Russian Arctic. It allows the formation of a single set of all the above-mentioned problems.

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