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Population of the World Arctic: Russian and Foreign Approaches to Studying Demographic Problems and Settlement of Territories*



**Viktor V.
FAUZER**

Institute of Social, Economic and Energy Problems of the North of the Komi Science Center, Ural Branch of the Russian Academy of Sciences
Syktyvkar, Russian Federation, GSP-2, 26, Kommunisticheskaya Street, 167982
E-mail: fauzer.viktor@yandex.ru
ORCID: 0000-0002-8901-4817; Researcher ID: N-9048-2017



**Tat'yana S.
LYTKINA**

Institute of Social, Economic and Energy Problems of the North of the Komi Science Center, Ural Branch of the Russian Academy of Sciences
Syktyvkar, Russian Federation, GSP-2, 26, Kommunisticheskaya Street, 167982
E-mail: tlytkina@yandex.ru
ORCID: 0000-0003-1972-9080; Researcher ID: N-9076-2017



**Andrei V.
SMIRNOV**

Institute of Social, Economic and Energy Problems of the North of the Komi Science Center, Ural Branch of the Russian Academy of Sciences
Syktyvkar, Russian Federation, GSP-2, 26, Kommunisticheskaya Street, 167982
E-mail: av.smirnov.ru@gmail.com
ORCID: 0000-0001-6952-6834; Researcher ID: N-8102-2017

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Abstract. The researchers are considering the population, demographic processes and settlement of the World Arctic. It is noted that many issues have accumulated in the Arctic: from socio-demographic problems to resettlement ones. Each country solves these problems in its own way, using both universal and private approaches. The article is aimed at considering approaches used in the Russian and foreign practice to studying demographic processes and settlement of the World Arctic. Among the Russian and foreign approaches, it is necessary to mention the following ones: demographic zoning, gender, geopolitical, qualitative, combined, intersectoral, descriptive and historical, statistical, network, systemic, socio-psychological, sociological, technical and economic, ecological and biological approaches, and others. Using these approaches the process of settlement/colonization, the system of the population's resettlement, and demographic trends in the World Arctic have been considered. It is noted that the colonization of the European North of Russia was taking place from the 10th till the 17th century, Siberia and the Far East – from the end of the 16th till the middle of the 19th century. Settlement has been carried out by its own people; Russia had no need in attracting settlers from other countries. Based on the demographic approach it has been concluded that by the beginning of the 20th century the process of colonization had been completed, and the natural demographic development and further development of the marginal territories had begun. In the foreign Arctic early colonization was of a trade and field nature, then the extraction of raw material resources had started. From the first half of the 20th century the military interest started to dominate; today the economic interest in the development of the Arctic is prevalent. Two opposite trends have been noted in the demographic development: the recessive population dynamics in the Russian Arctic and its constant growth in the foreign one. The settlement network of the Russian Arctic was forming by the network of cities of different sizes, in the foreign one small settlements were created in the initial period; now the network of medium and large cities is expanding. In the recent years the work on a rotational basis has been widely used in the World Arctic.

Key words: the World Arctic, population, demographic processes, settlement of territories, approaches.

Introduction

The scientific interest in the World Arctic (the circumpolar North) is justified by the fact that in the 21st century this megaregion is turning from the northern periphery into the area of economic interests for all major states. Taking into account the strategic interests of the largest states, it can be assumed that the field of “economic and political standoffs” will be the struggle for energy resources. “There will be a dialectical coexistence of cooperation and competition forces – a scenario that can be called “a friendly race” [1, p. 361]. Within the next decades the Arctic can become “the main storage of energy and mineral resources, and, therefore, the attention to it from the world community will be special” [2, p. 16, 19;

3, p. 58–59]. Thus, according to the journal “Science”, 83 billion barrels of oil are located in the Arctic, which comprises 13% of the world's unexplored reserves. Natural gas resources compose 1550 trillion cubic meters [4], almost two thirds of them are located at the coast of Russia [5, p. 6]. According to the estimates of the US Geological Survey up to a quarter of the world's undetected hydrocarbon reserves can be situated in the Arctic¹.

The World Arctic includes eight states: Russia, Canada, the USA, Norway, Denmark, Finland, Sweden and Iceland. This list of arctic countries is provided in “The report on human

¹ *Data from the US Geological Survey.* Available at: <http://www.usgs.gov> (accessed: March 01, 2020).

development in the Arctic” [6, p. 18; 7] and in the materials of the Arctic Council². The composition of arctic territories of the named states, their population and natural and economic potential, and the state strategy have been considered in details [8].

At present, non-arctic states have great interest in the Arctic, such as: China, Japan, South Korea, Singapore, India, Great Britain, Germany, France, Italy, Spain, Switzerland and Poland. They have been granted the status of “observers” in the Arctic Council and take part in economic, social and cultural projects in the Arctic³.

The Arctic is the inhabitation area of indigenous people, who are represented as the “*fourth world*” in the international political discourse. In Russia they are called a special community of “the fourth dimension”, forming the ecological system of values, as well as “saviors of civilization” [9, c. 16–17].

The Arctic’s development has led to the appearance of many problems in various areas: demographic, ecological, social and resettlement ones [10, c. 18–25]. All arctic countries are trying to solve them, using different approaches. The focus of our attention will be concentrated on considering demographic processes and settlement of the Arctic. On this basis, the article is aimed at revealing the approaches to studying demographic processes and settlement of the territory of the World Arctic (the WA). The following tasks have been set by the authors: to carry out a comparative analysis of existing approaches to studying demographic problems and settlement of arctic territories; to identify the main characteristics of population and demographic processes in the World Arctic; to

define the features and trends in the processes of settlement and the system’s evolution in resettlement of arctic territories.

The object of the study is the World Arctic including the territories of eight states. The subject of the study is the country peculiarities of approaches to studying demographic problems and settlement of arctic territories. The scientific novelty of the article is justified by the integrated retrospective and comparative analysis of approaches to studying demographic problems and settlement of arctic territories. The practical significance of the study lies in the fact that the obtained results can be used by the executive authorities in elaborating the programs and strategies for the development of the northern and arctic territories.

Approaches to studying demographic problems of arctic territories

Various approaches are used to study demographic problems in domestic and foreign practice. Let us consider the main ones.

The *statistical approach* is the most prevalent one in demographic studies. It includes obtaining statistical information regarding the population, processing of the received data, building the time series and distributions, analysis of regularities, as well as calculation of reproduction indicators. Statistical methods allow modeling the population’s reproduction as a whole, and the certain demographic phenomena.

The *descriptive and historical approach* used for determining the total population and its structure in certain historical periods in relation to the world population, the population of particular countries or parts of the world relies on the same information base and methods of processing.

The *sociological approach* is widely used in demographic studies for fundamental understanding of the factors underlying in the processes of natural reproduction of the

² *Arctic Administrative Areas*. Available at: https://arctic-council.org/images/PDF_attachments/Maps/admin_areas.pdf (accessed: March 01, 2020).

³ *Observers*. Available at: https://arctic-council.org/ru/about/observers_ (accessed: March 01, 2020).

population, marriage and family relations and migration mobility. The approach allows analyzing not only the factors themselves, but also their reflection in the human consciousness.

The *geopolitical approach* allows evaluating the impact of migration outflow and natural population decline on the national security. Decrease in population up to the critical level, leading to the depopulation of arctic territories, their low settlement against the background of neighboring countries with upward demographic dynamics in the absence of free land for the growing population, can result in a number of serious disagreements regarding geopolitics.

The *socio-psychological approach* is aimed at finding the causes regarding the certain intensity of processes, in the context of socio-psychological characteristics of individuals or social groups. A relatively new point here is the shift from identifying the subjective interests of the individual, family and society as a whole, characteristic of early research, to studying the socio-psychological aspects in demographic behavior of the certain groups of the population.

The *gender approach* takes into account the diversity of factors affecting demographic processes and the crisis of the current demographic situation, especially in marriage and family relations, through “the phenomenon of social self-organization in the relations between the largest and primary social groups – men and women” [11, p. 66]. The importance of using the gender approach is mentioned in the report of the United Nations Economic and Social Council⁴.

Demographic zoning is the *approach* that allows determining the population structure of arctic territories. Three types of territories are identified. Firstly, they are the territories with relatively favorable natural and climatic

conditions, where medical and geographical indicators allow forming the permanent population. Secondly, they are the territories that are uncomfortable for living for the permanent population, in which the priority should be given to the rotational method of the territory development. Thirdly, they are the territories, where, despite the need in resettlement of the surplus population, it is necessary to preserve at least the part of the permanent population⁵ [12, p. 22–23, 128].

The *intersectoral approach* is effective in analyzing demographic processes. For example, in order to reduce mortality, “the opportunities should be used not only from health service, but also from all sectors affecting health, providing the improvement of the environment, working conditions, increase in revenues, lifestyle recovery, etc., so that funds for these purposes are considered as investment in human capital” [13, p. 288–290, 292].

The *technical and economic approach* treats the demographic behavior and differences in population growth rates from the standpoint of “rationality in economic interests of the society, family and individual” [14].

The *ecological and biological approach* considers demographic development in terms of its impact on the natural environment and the ecological situation.

The *combined approach* includes analyzing the combination of socio-economic and biological relations between the human and nature, in which the substantive work is crucial for demographic processes and behavior. This method represents multiplicity or pluralism in evaluating all manifestations of demographic development of the world population, and allows identifying negative consequences of the population’s growth/decline [15, p. 27–30, 48, 56, 57].

⁴ *The Report of the Economic and Social Council over 1997*. The UN, 1997. 156 p.

⁵ In the early 1990s, according to various estimates, the surplus population of the Russian North composed from 20 up to 40%.

The *economic-socio-material approach* is applied at the national level in almost all arctic states in order to offset the severe natural and climatic conditions of the Arctic, isolation from “the mainland” and difficult manufacturing conditions. Application of this approach allows to attract human resources to arctic territories, and to form stable manufacturing collectives there.

The *qualitative approach* goes away from evaluating the role of material factors and focuses on the impact of historical, spiritual and moral, ideological, psychological and other factors on demographic processes.

V.N. Barsukov and O.N. Kalachikova define economic, socio-economic, socio-psychological, institutional, population (biosocial, biogenetic), civilizational (historical and cultural) and phenomenological approaches according to the priority factor of demographic development. The work describes in detail on which theory or concept each approach is based, the personalias are given [16, p. 23–32].

There are a number of private approaches to researching the fertility, mortality, migration and family. They propose the measures to overcome the crisis of marriage and family relations, the degree of possible interference in the regulation of fertility, what measures of public policy can change the reproductive attitudes of the family to have few or no children, how to make Russia attractive for migration, and justify depopulation with spiritual ill-being of the family and society [11, p. 63]. “The whole variety of viewpoints can be reduced to two paradigms – the modernization paradigm and the family crisis paradigm” [17, p. 239].

Within the development of the Arctic, foreign approaches differ from the Russian ones in many directions: in demographic context, in constructing inter-budget relations, and in infrastructure development [18, p. 30]. So, our northern neighbors are betting on solid

development and settlement of the territory. We almost forcibly settle out northerners to the “mainland”, but the authorities of Alaska subsidize (200–250 US dollars per month) to old residents and pensioners, who remain here for living [19, p. 60, 63], they “encourage relocation, actively create new infrastructure, and working and living conditions are more and more coming close to the standards of quality of life, peculiar to America’s middle latitudes” [20, p. 13].

In Russia arctic territories need a financial mechanism for development, but only stabilization one is proposed [21, p. 129]. Arctic regions transfer to the federal budget more than they get transfers back; the level of fiscal capacity is less than the indicator average of Russia [22, p. 38]. And it is well known that inequality results in economic and demographic losses [23, p. 40]. Foreign companies use their technologies and local population for developing the Arctic. Our situation is rather different. In the attempt to reduce costs, companies of the extractive industry incline to attract foreign suppliers of machinery and equipment, and hire highly skilled foreign labor [24, p. 28].

As for the infrastructure, its lag is caused by the established practice of developing the North and the Arctic, which in the Soviet period was based on the social standards of the Gulag and did not provide creating normal living conditions for people [25, p. 90–95; 12, p. 14–15]. The attitude towards the North and the Arctic has been as to the “resource storage” during the royal and the Soviet time, and remains like that at present. The development of the social sphere was significantly lagging behind, and it has been carried out “quickly and carelessly”. Huge spatial potential was not almost taken into account; those resources that could be sold without advanced processing have been used [26, p. 99].

Approaches to settlement of northern and arctic territories

First of all, it is necessary to define the goals and priorities of developing the arctic space. Today two opposing approaches have been formed. According to the *first approach*, the Arctic is considered as a source of natural resources, which makes preferential the rotational method of development while reducing the permanent population. The *second approach* declares the Arctic as a foothold of the innovative economic breakthrough, which allows to achieve sustainable development of arctic territories and to provide national security [27, p. 98–99].

Two approaches to spatial planning for the Arctic's development derive from this understanding of development priorities. *Rotational* one is used in “resource” regions having the lack of local labor resources or under the conditions of insufficient infrastructure saturation of the territory. It is focused on implementing primary advantages of arctic territories – the reserves of natural resources. The weakness of this approach lies in fixing of the region's specialization in extraction of raw materials, and unevenness of development and evolution.

Network approach (linear-nodal) is oriented toward the formation of large nodes in arctic agglomerations, which due to the agglomeration effect and high level of infrastructure development will be able to perform the role of a core in network structures of the economy. Concentration of labor in large nodes creates “the scale effect”, and the rest of the territory acts as a raw material base (Russia, Norway – Svalbard archipelago, Denmark – Greenland). However, such organization leads to the outflow of labor and human potential outside the “cores” of resettlement [28, p. 98].

Taking into consideration the large territory of the Arctic and limited human resources within the resettlement of the population, *the intensive and extensive approaches* are applied. The first one involves the development of agglomerations and group resettlement systems, interconnected economically and by transport; the development of limited territories at the minimum of costs is observed. The *extensive approach* involves the formation of the developed resettlement system, covering as large territory as possible, creating the network of basic settlements, especially in border areas, taking into account the interests of the country's defense capacity [29, p. 8].

The resettlement system in the foreign Arctic is considered within the concepts of proximity and remoteness, the network approach, and the transport connectivity of settlements [30; 31]. The important feature is the presence of settlements at the edge [32] and rotational settlements [33, 34]. It is noted that the evolution of the resettlement system in the future will be influenced by climate changes taking place in the Arctic [35; 36; 37].

Thus, having considered the most commonly used approaches in the national and foreign practice, let us demonstrate their application in studying and analyzing demographic processes and the system of the population's resettlement in the World Arctic.

The population and demographic processes of the World Arctic

The research on demographic processes of the World Arctic has been reflected in the foreign academic literature [6; 7; 38]. The link between demographic processes, migration of the population and cycles of natural resources extraction has been noted [39; 40; 41; 42]. In recent years the number of publications regarding the socio-demographic characteristics of the population has been increasing [34; 43; 44].

Figure 1. The map of population density in the arctic territories at the beginning of 2019

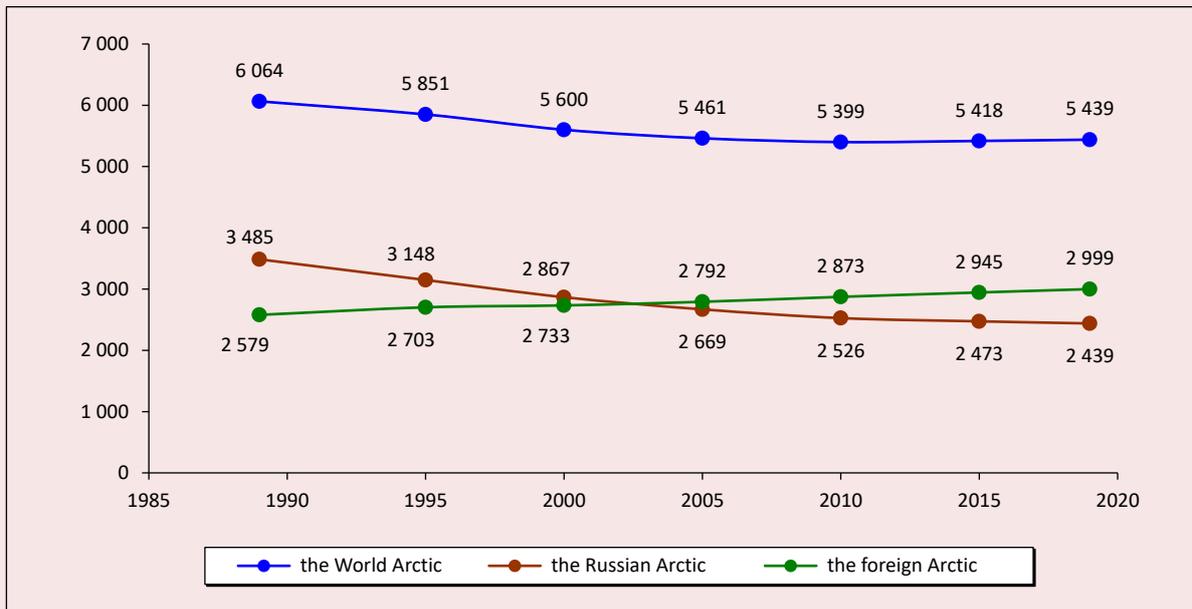


Compiled by the authors according to the data from the official statistical agencies of eight arctic countries.

In the World Arctic, which occupies the eleventh part of the Earth's land, the population equals 5 million 438.5 thousand people, or 0.07% of the world's population. Such "scissors" between the indicators has made the Arctic the underpopulated territory – 0.41

people per sq. km. The least populated areas are Canada and Greenland – 0.03 people, the USA has 0.43 and Russia has 0.51 people per sq. km. (Fig. 1). Therewith, the WA has produced 232.5 billion dollars of GRP, which comprises 0.31% of the world GDP [45, p. 15].

Figure 2. Population size of the World Arctic, 1989–2019, thousand people



Compiled according to the data from the official statistical agencies of eight arctic countries excluding the territories of Nunavik and Labrador in Canada. In order to evaluate the population size for the years having no available data, the method of proportional parts by neighboring values has been used.

The dynamics of population in the WA is determined by demographic processes taking place in the Russian Arctic. From 1989 till 2019 it has lost 1 million 46 thousand people, or 30% of the original population size. In the foreign Arctic, on the contrary, there has been an increase in the population size during all the years – from 2 million 579 thousand people in 1989 up to 3 million people in 2019, the increase comprised 420.5 thousand people, or 16.3%. As a result, the share of the Russian Arctic in the total population size of the WA has decreased from 57.5% in 1989 to 44.9% in 2019. In 1989 906.4 thousand more people lived in the Russian Arctic than in the foreign one, however, in 2019 the population size of the foreign Arctic began to exceed the size of the Russian one by 560.1 thousand people. The numerical superiority has been lost at the turn of 2002/2003. In general, the population of the WA has constantly decreased from 1989 to 2019

(from 6.06 to 5.44 million people, or by 625.6 thousand people, Fig. 2).

In the dynamics of the population size in the arctic states two opposite trends have been observed: the downward dynamics in the Russian Arctic and the ascending dynamics in the foreign one (Greenland and the Faroe Islands had diverse dynamics). The numerical losses of the Russian Arctic have comprised 1046 thousand people and could not cover the positive population increases of the arctic states: the USA – 202.2, Iceland – 105.1, Canada – 42.2, Norway – 28.9, Finland – 25.7, Sweden – 11.6, the Faroe Islands – 3.9 and Greenland – 0.8 thousand people. There is one more feature – in the arctic part of Canada, Iceland and the USA, the population growth rate has been ahead of the observed one in the country as a whole: 51.7, 41.7 and 37.8%; 38.5, 41.1 and 33.7%, respectively, which indicates the active settlement of the arctic territories.

However, the long dynamics of the population growth is fraught with the fact that visitors will replace local residents [46, p. 89]. The shares of population living in the arctic area are insignificant: they are minimum in the USA – 0.2, Canada – 0.3 and Russia – 1.7%, and maximum in Sweden – 5.0, Norway – 9.2 and Finland – 12.0%. In most countries they are declining, which has led to the decrease in the share of population living in the World Arctic as a whole: from 1.4 to 1.0%.

Let us consider indicators that reflect the similarity and difference in the demographic

development of the arctic part and the country as a whole. The analysis the population structure by gender shows that in all foreign countries of the World Arctic, the share of males is more than 50% and upwards than in the arctic countries in general. In the Russian Arctic the share of male is the lowest – 48.0%, which could not help but affect the gender structure of the population in the WA, where it comprises 49.6%. The enhanced share of people of working age has led to the fact that in the World Arctic the demographic load on the working-age population is lower (775) than in the arctic

Table 1. Demographic indicators and population settlement rates of the World Arctic's countries and their arctic territories

Country	Population size at the beginning of the year, thousand people			Changes in population size during 1989–2019, %	The share of males, %	Demographic load per 1000 people of working age*		TFR, 2018	The share of indigenous population, %**	the ELE at birth, years***	
	1989	2000	2019			by the young	by the elderly			male	female
Arctic territories of the World Arctic	6064.1	5600.4	5438.5	-10.3	49.6	349	426	1.71	7.5	73.0	80.4
Russia	3485.2	2867.0	2439.2	-30.0	48.0	346	334	1.66	4.0	67.1	77.3
The USA	535.2	626.9	737.4	37.8	51.5	409	403	1.97	14.8	75.0	81.7
Finland	638.0	651.1	663.7	4.0	50.4	306	608	1.59	1.4	78.3	84.3
Sweden	509.1	514.8	520.7	2.3	51.0	336	619	1.69	3.9	79.8	83.4
Norway	460.3	466.7	489.2	6.3	50.9	325	527	1.54	11.4	78.9	83.4
Iceland	251.9	279.0	357.0	41.7	50.2	355	400	1.71	-	81.0	84.1
Canada****	81.6	93.3	123.8	51.7	50.8	382	285	2.09	53.3	74.1	78.2
Greenland	55.2	56.1	56.0	1.4	52.8	372	300	2.00	89.7	69.5	72.5
The Faroe Islands	47.6	45.3	51.5	8.2	51.7	437	510	2.48	-	80.1	84.8
Arctic countries in general	444571	485940	541893	21.9	48.6	351	476	1.67	0.4	73.7	80.9
Russia	147400	146890	146781	-0.4	46.4	337	467	1.58	0.2	67.8	77.8
The USA	246819	281422	329969	33.7	49.5	365	472	1.73	0.03	75.1	81.8
Finland	4964	5181	5523	11.3	49.4	354	635	1.41	0.2	78.6	84.2
Sweden	8493	8883	10324	21.6	50.3	358	537	1.75	0.2	80.6	84.1
Norway	4227	4478	5328	26.0	50.4	338	469	1.56	1.1	79.7	83.7
Iceland	252	279	357	41.1	50.2	355	400	1.71	-	81.0	84.1
Canada	27282	33477	37797	38.5	49.1	285	497	1.50	4.9	79.9	84.0
Denmark	5133	5330	5815	13.3	49.7	329	535	1.73	0.9	79.0	82.9

Compiled according to the data from the official statistical agencies of eight arctic countries: gks.ru, fedstat.ru, census.gov, stat.fi, scb.se, ssb.no, statice.is, statcan.gc.ca, stat.gl, hagstova.fo, statbank.dk. The World Arctic data is the average weighted value of arctic countries according to the population size.

* Finland and Canada: males – 15–59 years, females – 15–54 years; other countries: males – 16–59 years, females – 16–54 years.

** Russia – indigenous small nationalities of the North in 2010, the USA – the Indians and natives of Alaska in 2010, Finland – the Saami in 2009, Sweden and Norway – the Saami in 2017, Canada – the aboriginal population in 2016, Greenland – the Inuit inhabitants in 2018.

*** Norway – 2011–2015, Sweden – 2014–2018, Finland and Canada – 2015–2017, the USA – 2017, Denmark – 2017–2018, Russia and Iceland – 2018.

**** Yukon, Northwest Territories and Nunavut are taken into account.

countries as a whole – 827 per 1000 people. It is lower in Canada – 667 and in Greenland – 672, and it is quite high in Sweden – 955 and in the Faroe Islands – 947.

The relatively young age population structure in the Arctic provides the high fertility rate. If in the arctic parts the total fertility rate (TFR) comprises 1.71, then in the arctic countries as a whole it equals 1.67. The highest TFR has the Faroe Islands – 2.48, Canada – 2.09 and Greenland – 2.00. The lowest fertility rates are in Norway – 1.54 and Finland – 1.59. The TFR correlates with the share of indigenous residents in the population structure: where it is more than 15%, then the fertility is higher there.

The integral indicator of quality of life and public health, which is the expected life expectancy (ELE), in general is higher over the arctic countries, than in their arctic parts, excluding the females of Finland. This can be explained by gender differences in the ELE – they are more significant in the arctic territories, and here the overall mortality rate is higher. The highest life expectancy in the Arctic has the females of the Faroe Islands – 84.8, Finland – 84.3 and Iceland – 84.1 years. The high ELE among males has been noted in Iceland – 81.0, in the Faroe Islands – 80.1 and in Sweden – 79.8 years (*Table 1*).

Settlement of the World Arctic

The settlement of the northern and arctic territories from the standpoint of the descriptive and historical approach has taken place in the form of colonization. In addition to economic resettlement, colonization influenced the culture of nations. The specifics of the Russian colonization were manifested in the fact that the surplus population did not move to other countries, but to the remote areas of the Russian state. The Russian resettler did not feel himself like leaving the homeland [47, pp. 3, 6,

7]. The difference between colonization and resettlement lies in the fact that “resettlement is an act of private life, and colonization is of a state one” [48, p. 24].

The most critical prerequisite of the successful colonization is the state’s right for the country’s natural wealth, first of all, for the land. But in the process of settling the territories, inhabited by the aboriginal population, the necessity arises to reconcile opposing interests and to conduct the land policy in such a way as not to offend neither those, who want to preserve their land, nor the people, who want to acquire it [49, pp. 5, 6, 10]. In his works L.L. Rybakovsky considers in sufficient detail how the process of colonization has taken place in Russia, America and in other parts of the world [50, p. 38].

The colonization of the European North began in the 10-12th centuries with the entry of the Slavs to the underpopulated lands with the Finno-Ugric population (the Karelians, the Komi, the Nenets, the Vepses, and the Saami) and ended in the 17th century with the entry of the North to the Moscovite state. The accession of Siberia and the Far East took place from the end of the 16th and the beginning of the 17th centuries, and ended in the middle of the 19th century [51, p. 6]. Using the *demographic approach*, we can conclude that by the beginning of the 20th century the process of colonizing the Russian outskirts, including the Arctic, was completed. “In the stead of the main component of increasing the population size – the resettlement, comes another component – the natural population growth” [50, pp. 41–43].

Let us briefly consider the history of colonization in the foreign Arctic. In the Northern Norway it began in the early Middle Ages, in the Viking era. The Norwegian North has undergone the accelerated transition from the

old community life and “the welfare state” to the rigid market relations. Today the future of the country is connected with the oil and gas industries [46, pp. 77–78, 90]. The colonization of Alaska occurred in the middle of the 18th century by the Russians. The trade and field activities were the form of cooperation with the local population. Coal mining began in the 19th century. In 1867 Alaska was sold to the USA, and then there were gold and copper rushes. In 1930–1950s the military construction was actively carried out. In general, it contributed to the sharp increase in the population size.

The first Europeans appeared in the Canadian North in the 9–10th centuries, but until the middle of the 18th century the process of settlement was weak, only the occupation of Canada by England accelerated the entry of the Europeans to the Canadian North. In the 20th century the military construction and the availability of natural resources gave the impetus to the settlement process [52, pp. 22–41, 129–133]. In the 21st century the process of consistent settling the WA, and forming the network of permanent settlements and the pattern of resettlement has continued. The main economic interest of all countries in the World Arctic belongs to energy resources.

There are some features of territories’ development peculiar to both the Russian and foreign Arctic: the rise in prices of the most types of activities; spatial unevenness and discontinuity, low population density and infrastructure location; small amount of settlements. O.M. Blagodeteleva describes in sufficient detail the stages and specifics of forming the settlement systems in the World Arctic [20, p. 8].

For the Russian Arctic the vector in population resettlement for the long term is defined by the “General Resettlement Scheme on the territory of the Russian Federation”. It proposes a number of principled **approaches**:

- “not to form permanent settlements in places with unfavorable medical and geographical conditions, therefore, it is proposed to make a transition from the policy of residence to the policy of presence for non-indigenous people;

- to develop large urban settlements – basic centers of the population’s residence, to concentrate residents in the promising settlements with a stable socio-economic base, not to create new small settlements, and to introduce more widely such method of labor organization as the work on a rotational basis;

- it is recommended to cut growth of cities as much as possible; to ensure the rigorous selection of people arriving in the northern districts according to their occupation and health status; the gradual transition to implementing the planned shifting of workers;

- to overcome the increasing stagnation of small and medium urban settlements, which determine the economic and social life of surrounding rural areas”⁶.

The modern settlement system has been formed by the industrial nature of developing the Arctic, which determined the increased share of the urban population in it and the specifics of arctic urbanization [53, p. 40–45]. However, when assessing the level of urbanization, we are faced with the existing methodological difficulty of classifying settlements as urban ones. In most countries the population size serves as the criterion for having the status of a city. The UN proposes to accept the population size of 2 thousand inhabitants as a lower bound, which does not cancel the national specifics. So, in Norway settlements having 5 thousand inhabitants and more, are referred to cities, in the USA – 2.5 thousand

⁶ *General Resettlement Scheme on the territory of the Russian Federation* (approved by the Government of the Russian Federation, the record no. 31 dated December 15, 1994).

and more residents, in Sweden, Iceland and Denmark – 200 and more inhabitants [54, p. 65]. In Russia, the residential area with a number of inhabitants no less than 12 thousand is considered a city, but there are some cities having smaller population size. In the Russian Arctic along with cities there are urban-type settlements as a transitional form between the real cities and rural settlements [55, pp. 10–11]. The diversity of approaches makes it difficult to compare the degree of the arctic territories' urbanization.

Two opposite trends have emerged in the development of settlements: the number of the smallest residential areas having the number of inhabitants up to 5 people is increasing with simultaneous concentration of the population in large settlements, having over 5 thousand inhabitants [56, pp. 9–10]. Today the world statistics take into account settlements having the number of inhabitants over one thousand people, which narrows the information base.

In the World Arctic there are 416 settlements having the population size more than a thousand people⁷. Among them 34.9 are located in Russia, 13.9 in Sweden, 13.7 in Finland, 12.5 in Norway, 8.2 in Iceland, 6.7 in the USA, 5.3 in Denmark and 4.8% in Canada. The density of settlements in the WA is very low – 0.32 settlements per 10 thousand sq. km. The vast majority of them have the population size up to 5 thousand people – 71.6%, from 5 to 10 thousand people – 11.8, from 10 to 20 thousand people – 8.4, over 20 thousand people – 8.2%. The highest share of settlements having the number of residents up to 5 thousand people

is in Denmark – 86.4 and Canada – 85.0; the lowest one is in Russia – 66.2 and the USA – 60.7%. The maximum population of settlements in the USA comprises 16688 people and 15944 people in Russia, and the minimum one is in Canada – 4281 people and in Denmark – 3472 people.

The most part of the WA's population lives in settlements, having up to 50 thousand people – 3 million 213 thousand residents (59.1%), and in Iceland the number of this group comprises 215.1 thousand people (63.6%). In Finland 358.1 thousand people live in settlements having the population size up to 20 thousand residents (53.7%). In the USA and Sweden half of the population lives in small settlements, having the population size up to 10 thousand people – 378.1 (51.0%) and 275.0 (53.2%) thousand residents, respectively. In Norway, Canada, Greenland and the Faroe Islands the population is concentrated in small settlements (up to 5 thousand people) – 404.9 thousand people, or 24.5% from the total population of the World Arctic living in such settlements (*Table 2*).

In 2017 in the World Arctic there were 15 cities, having the population size more than 50 thousand people, among them 9 cities are located in Russia, 5 – in Western Europe, and 1 – in the USA. The largest arctic cities of Russia – Arkhangelsk (351 488 people), Murmansk (298 096), Severodvinsk (183 996), Norilsk (178 018); the USA – Anchorage (298 192 people – 40.2% from the total population of Alaska); Finland - Oulu (198 358 – 29.8% from the urban population), Rovaniemi (52 481); Iceland – Reykjavik (123 246 – 36.4% from the urban population); Sweden – Umea (87 238); Norway – Tromse (64 448). A number of countries have only small cities: in Canada – Whitehorse (25 085 people) and Yellowknife (19 569); in Greenland – Nuuk (17 796) and in the Faroe Islands – Thorshavn (13 130).

⁷ The data on the number of the Russian urban settlements is obtained from the Rosstat bulletin regarding the population size of the Russian Federation according to municipal entities (http://www.gks.ru/free_doc/doc_2017/bul_dr/mun_obr2017.rar), rural ones – from the results of the All-Russian Population Census conducted in 2010, foreign settlements – from the website <http://www.citypopulation.de>, aggregating the data of the national statistical agencies from different countries.

Table 2. Distribution of population in the World Arctic, %

Country	Population size, in total	In particular according to the settlements with a number of inhabitants						
		up to 1000	1000–4999	5000–9999	10000–19999	20000–49999	50000–99999	100000 and more
The World Arctic	100.0	18.2	12.2	6.3	10.4	12.0	6.8	34.1
Russia	100.0	5.9	9.0	3.9	11.3	13.0	6.8	50.1
The USA	100.0	37.0	5.9	8.1	-	8.8	-	40.2
Finland	100.0	24.9	11.5	10.1	7.2	8.6	7.9	29.8
Sweden	100.0	26.7	19.9	6.6	13.6	16.3	16.9	-
Norway	100.0	37.7	17.2	9.4	14.2	8.3	13.2	-
Iceland	100.0	4.8	17.6	7.5	14.8	18.9	-	36.4
Canada	100.0	29.1	27.5	6.4	16.2	20.8	-	-
Greenland (Denmark)	100.0	17.5	40.8	9.8	31.9	-	-	-
The Faroe Islands (Denmark)	100.0	39.2	34.5	-	26.3	-	-	-

Compiled according to the data from the official statistical agencies of eight arctic countries. The data is presented on urban settlements of Russia at the beginning of 2017, rural ones – according to the census of 2010, the USA and Canada – in the middle of 2016, other countries – at the beginning of 2017.

Considering the dynamics regarding the population size of large cities during 1989–2017, it can be noted that in all cities of the foreign Arctic there has been an increase, and in the Russian one – only in 2 cities out of 9 (Noyabrsk and Novy Urengoy). The largest decline in residents is recorded in Vorkuta, Monchegorsk, Murmansk and Apatity. It is important to preserve cities, because they are the poles of economic growth; “binding transport hubs; important information, research and cultural centers for surrounding areas” [45, pp. 12–15; 57].

The following conclusions can be drawn from the material mentioned above:

1. Despite the fact that in most works and policy papers the preference is given to the method of working on a rotational basis, it should be noted that core or basic cities are needed for the development of the rotation shift [58, p. 25–30]. They can be cities that have been successfully functioning for more than a decade under the conditions of the North and the Arctic. For example, for all oil fields in Siberia, the basic one is the city of Tyumen, and the city of Mirny, in addition to servicing oil fields, supplies

rotation shifts to diamond fields [24, p. 27]. In the Komi Republic such a city is Usinsk; Vorkuta and Inta can become them as well.

2. The need to maintain the network of permanent settlements is related to the geopolitical approach: 1) in order to confirm its sovereignty in the Arctic, it is necessary to have the constantly living population there, which is adapted to local climatic conditions [27, p. 100], 2) to bet on medium and small cities, because agglomerations attract the population, bare the surrounding area, make them “no one’s”, tempting lands for other states, 3) it does not seem advisable to transfer the formed cities to the category of rotational ones both for technological and social reasons [59, p. 7–8].

Conclusions

Attention to the World Arctic has steadily grown over the past hundred years and will continue to rise due to the natural wealth. Despite the increased interest of the governments of the arctic states, the presence of strategic plans, significant investments, many problems have not been solved yet and require their new interpretation and understanding. As in the previous period, the approach

to cost minimization maintains. Taking this into account, the following approach to the settlement of the Arctic is proposed: to make a transition from the policy of residence to the policy of presence regarding the arriving population, under especially extreme conditions, to use the method of working on a rotational basis as much as possible.

Still there is no joint point of view on how to settle the Arctic. Supporters of the intensive approach propose to develop the Arctic pointwise, creating large agglomerations, and group resettlement systems, which reduces costs. From the perspective of the geopolitical and extensive approaches, it is necessary to form the resettlement system that maximally covers the border arctic space.

The experience gained in the process of developing the North and the Arctic shows that the significant part of small and medium settlements with depletion of the resource base will cease to exist, because they do not have any options for changing specialization. The mining city of Inta can be mentioned here as an example. In the best case scenario, some of them can become the basis for the intraregional rotation shift, if the corporate interest in using the rotational and expeditionary method is not prevalent⁸.

In the World Arctic there has been observed the following peculiarity in developing demographic processes: in the foreign Arctic – the ascending dynamics of the population size, in the Russian – the downward one, which

decreases already low population density of the territory. This has led to the fact that according to the population size the foreign Arctic started to exceed the Russian one by 0.5 million people. In the Arctic the age structure is younger, the demographic load is lower, and the ELE is quite high. In a number of arctic countries, the TFR almost provides a simple reproduction of the population.

The North and the Arctic are highly urbanized. In the Russian Arctic the advanced resettlement system has been formed, including the cities having different population size, the full-fledged infrastructure, and transport has been developed. At first, the foreign Arctic was developing by the rotational and expeditionary method with few settlements of narrow specialization, but over the past decades there has been an increase in urban settlements with the advanced infrastructure, which does not differ from the main part of the country.

The contribution of this article to the research of the problem under study lies in the fact that one work summarizes almost all known approaches to studying demographic problems and settling of arctic territories. The proposed approaches used in analyzing demographic problems and considering the resettlement features of the entire World Arctic can be referred to the elements of novelty. In the future it is necessary to study the experience of solving demographic problems and settling the population in the World Arctic.

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Information about the Authors

Viktor V. Fauzer – Doctor of Sciences (Economics), Professor, Chief Researcher, Institute of Social, Economic and Energy Problems of the North of the Komi Science Center, Ural Branch of the Russian Academy of Sciences (26, Kommunisticheskaya Street, Syktyvkar, GSP-2, 167982, Russian Federation; e-mail: fauzer.viktor@yandex.ru)

Tat'yana S. Lytkina – Candidate of Sciences (Sociology), Senior Researcher, Institute of Social, Economic and Energy Problems of the North of the Komi Science Center, Ural Branch of the Russian Academy of Sciences (26, Kommunisticheskaya Street, Syktyvkar, GSP-2, 167982, Russian Federation; e-mail: tlytkina@yandex.ru)

Andrei V. Smirnov – Candidate of Sciences (Economics), Senior Researcher, Institute of Social, Economic and Energy Problems of the North of the Komi Science Center, Ural Branch of the Russian Academy of Sciences (26, Kommunisticheskaya Street, Syktyvkar, GSP-2, 167982, Russian Federation; e-mail: av.smirnov.ru@gmail.com)

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