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Human capital — a key factor of the Arctic economic development*

© **Natalia V. GOVOROVA**, Cand. Sci. (Econ.), leading researcher, Associate Professor

Tel.: +7-916-374-85-28. E-mail: n_govorova@mail.ru

The Institute of Europe of RAS, Moscow, Russia

Moscow Technological Institute, Moscow, Russia

Abstract. The article deals with the demographic, social and economic situation in the Arctic zone of the Russian Federation. Its demographic trends, main indicators of the economic and social development, the situation in the labor market, as well as providing the population with the necessary training and healthcare are studied. The central role in solving the complex problems of the Russian Arctic revival belongs to the workforce as it is the main factor of the current economic growth.

Keywords: *Arctic zone of the Russian Federation, demography, social and economic development, human resources, workforce, education, health.*

Introduction

In August 2017, the Government of the Russian Federation approved the new draft of the state program “Social and Economic development of the Arctic Zone of the Russian Federation” (AZRF)¹ — the key document for the home arctic policy making that outlined its aims, purposes and strategic priorities. It is not possible to reach all the goals without the preservation and development of the main resource of the modern economy – people, whose social and economic aspects and problems of life are particularly clearly manifested in the Arctic provinces. It is not for the first time, but on a new turn in the development of technologies and organizational decisions. The intensification of economic activity in the region is the most important state aim, which can be optimally solved by the application of the latest technology,² and here it is necessary to coordinate efforts at the federal and regional levels, incl. the state programs of the Russian Arctic territories. In view of the above, the analysis and objective assessment of the human potential of the region seem necessary and relevant. According to the modern development paradigm, investments in human capital bring higher dividends than other factors of production [1, Becker G.S.].

The purpose of the state program is to increase the level of social and economic development of the Russian Arctic, and the quality of life and protection of the population against the

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¹ Postanovlenie Pravitelstva RF ot 21 aprelya 2014 g. № 366 (v redaktsii ot 31 avgusta 2017 g. № 1064) [Russian Government resolution No. 366 of April 21, 2014 (as amended on August 31, 2017 No. 1064)].

² Federal budget allocations for the State Program in 2018-2025 will amount to more than 190 billion rubles. It is also planned to attract private investors.

background of significant differences within and between the polar regions, as well as between the indigenous and non-indigenous population, incl. demography.

Demographic profile

Demographic potential is the basis of human capital, characterizing the reproduction of the population and it is determined by the indicators of the natural and migratory movement of the population, the average life expectancy and their dynamics. Since 2015, the Russian Arctic has been identified as an independent object of statistical observation, the Federal Statistical Work Plan includes a section called “Indicators of the Socio-Economic Development of the Arctic Zone of the Russian Federation and Ensuring National Security”³. Judging by the available data, in recent years, there are multidirectional trends and vectors of demographic development in the area. According to Rosstat, in 2016⁴ the population of the Russian Arctic decreased by 6,579 thousand people.⁵ (in 2015, it was 13,4 thousand people) (table1). This happened in most of the studied territories, most of all in the Murmansk (-4.552 thousand people) and the Arkhangelsk regions (-2.112 thousand people). The Yamal-Nenets Autonomous District (YaNAO) demonstrated the most significant growth in the population (+1.945 thousand people). The decrease in the total number of residents was mainly due to a negative migration increase throughout the Russian Arctic (table 2). Especially serious was the decline in the Murmansk and the Arkhangelsk regions, the Krasnoyarsk region and the Yamal-Nenets Autonomous District. In this respect, the least affected were the Republic of Sakha (Yakutia), the Chukotka Autonomous District (ChAO) and the Nenets Autonomous District (NAO).

Table 1

The number of the permanent population of the land territories of the Russian Arctic, January 1 (people)

Territories	2016	2017	Territories	2016	2017
Russian Arctic	2 378 234	2 371 655	The city district “Novaya Zemlya”	3 024	2 934
The Komi Republic	81 442	80 061	The city district “Novodvinsk”	38906	38 735
The city district “Vorkuta”	81 442	80 061	The city district “Severodvinsk”	186 138	185 042
The Republic of Sakha (Yakutia)	26 107	26 190	The Mezensky municipal district	9 241	9 049
The Allaikhovsky Municipal District	2 682	2 718	The Onega municipal district	31 456	30 762
The Anabar National (Dolgan-Evenki) Municipal District	3 431	3 500	The Primorsky Municipal District	25 787	25 639

³ Statisticheskaya informatsiya o sotsialno-ekonomicheskom razvitiy Arkticheskoy zony Rossijskoj Federatsii. [Statistical information on the social and economic development of the Arctic zone of the Russian Federation] URL: http://www.gks.ru/free_doc/new_site/region_stat/calendar2.htm (accessed: 16 May 2018). [In Russian]

⁴ Hereinafter, if no other source indicated, statistics are given from: *Regioni Rossii. Sotsialno-ekonomicheskie pokazateli*. [Regions of Russia. Socio-economic indicators] 2017. Rosstat. M., 2017. [In Russian]

⁵ Without municipalities the Belomorsky Municipal District, the Loukhsky Municipal District and the Kemsy Municipal District (the Republic of Karelia), the territory is included in the list of the land areas of the Arctic zone of Russia in accordance with Presidential Decree No. 287, June 27, 2017 “On Amending the Decree of the President of the Russian Federation of May 2, 2014 No. 296 “On the Land Areas of the Arctic zone of the Russian Federation”.

The Bulunsky Municipal District	8 366	8 404	The Murmansk region	762 173	757 621
The Nizhnekolymsky municipal district	4 386	4 366	NAO	43 838	43 937
The Ustyansky Municipal District	7 242	7 202	ChAO	50 157	49 822
The Krasnoyarsk region	227 546	227 220	YaNAO	534 104	536 049
City district "Norilsk city"	178 106	178 654	The Republic of Karelia ⁶	27809	27267
Taimyr Dolgan-Nenets Municipal District	32 871	32 290	Belomorsky municipal district	17 034	16 663
Turukhansk municipal district	16 569	16 276	Loukhi municipal district	12 056	11 771
The Arkhangelsk region without NAO	652 867	650 755	Kemsky Municipal District	15 753	15 496
The city district "Arkhangelsk"	358 315	358 594			

Source: Rosstat data.

In most of the Russian Arctic, the birth rate exceeded the mortality rate in 2016 (table 2), while the Nenets Autonomous District, the Republic of Sakha (Yakutia) and Yamal-Nenets Autonomous District occupied the 3rd, 8th and 11th places respectively in the Russian Federation in terms of birth rate. The demographic load factor in the regions of the Russian Arctic did not exceed the average Russian level of 764 people at the age of 0-15 and 60 and more per 1000 people of working age except for the Arkhangelsk region without NAO.

Table 2

Demographic indicators of the Russian Arctic in 2016

Territories	Natural population growth rate **	Migration growth rate **	Demographic load factor ***	Migration growth, people.
The Russian Arctic	3.1	-5.9	..	-14 021
The Komi Republic*	0.9	-18.0	725	-1 451
The Republic of Sakha (Yakutia)	7.0	-3.8	701	-99
The Krasnoyarsk region	7.3	-8.8	726	-1 990
The Arkhangelsk region without NAO	-0.5	-2.8	812	-1 811
The Murmansk region	-0.3	-5.7	674	-4 343
NAO	9.6	-7.3	736	-320
ChAO	3.6	-1.0	582	-516
YaNAO	10.1	-69.8	536	-3 491
The Republic of Karelia	-2.8	-16.0	811	..

* Data is provided for the subjects of the Russian Federation due to the absence of data by districts and districts.

** per 1000 people of the average annual population.

⁶ Municipal formations of the Republic of Karelia were included in the list of land territories of the Russian Arctic according to the Presidential Decree No. 287, June 27, 2017 "On Amendments to Presidential Decree No. 296 of May 2, 2014 "On Land Areas of the Arctic zone of the Russian Federation". Statistical data on these areas of the Russian Arctic has not yet been collected by Rosstat and, therefore, hereinafter, the data is presented for the subject in general, not for its entities.

*** per 1,000 people of working age.

.. no data available.

Source: Rosstat data.

In the Russian Arctic, the life expectancy at birth in recent years has grown along with the nationwide positive trend, and in 2016 it was 71.36 years, but less than the average Russian indicator (71.87 years). This level was exceeded only in the Yamal-Nenets Autonomous District (72.13 years), close to that of the NAO (71.08), and the largest gap, as in the previous period (2014-2015), was demonstrated by the ChAO (64, 42 years), occupying the second place from the end among the subjects of the Russian Federation after the Republic of Tyva. This index is also low in the Republic of Karelia (69.78 years). The average age of the residents of the Russian Arctic is lower than in Russia (40.7 years), except for the ChAO (41.5 years), while the share of children and persons of working age is higher (except for the Arkhangelsk region in the latter case).

Low life expectancy and depopulation in the Russian North, marked in recent decades, reduces the demographic security of the region [2, Sinita A.L., pp. 14-23]. They are associated not only with very severe natural and climatic conditions that cause high morbidity and mortality, but also with a low quality of life due to inadequate development of the health care system, incl. the access to quality health services.

Level and quality of life

The level of life means the primarily income; the quality of life includes also the concepts of longevity and educational level as they are generalized characteristics of the health, objective indicators of the medical and educational services' quality, and the implementation of national programs in the relevant areas [3, Lukin Yu.F., pp.77-95; 4, Sukneva S.A., pp. 97-98].

The gross regional product (GRP) is the most important indicator of social and economic development; GRP per capita is above the national average in all the territories of the Russian Arctic, except for the Arkhangelsk region without NAO. Leaders are NAO, YaNAO and ChAO, where this indicator is more than the average for the constituent entities of the Russian Federation at 11.2; 7.6 and 2.9 times respectively. The share of GRP produced in the Russian Arctic in the total GRP of the subjects of the Russian Federation is steadily growing: in 2014–2016, it increased by from 0.3% to 5.3%. The share of the added value of high-tech and science-intensive industries in the GRP of the Russian Arctic reached by 7.1%, while the share of science-intensive innovative goods and services declined in the same period. The per capita income of the population, due to the regional coefficients and surcharges to wages for work in the regions of the Far North, is higher than the average for Russia, except for the Krasnoyarsk region. In this area, in the sectoral structure of gross added value, the processing industries predominate, and not the extraction of minerals (table 3). At the same time, the share of the population with incomes below the subsistence level, established in the subject of the Russian Federation, exceeds the average Russian indicator (13.4%) in the Komi Republic (16.7%), the Arkhangelsk region without NAO (14.3%), the

Krasnoyarsk region (18.4%) and the Republic of Sakha (Yakutia) (19.8%). Problems of low-security of the northerners threaten the complex tasks of the state arctic policy [5, Gontmakher E., pp. 15-24]. Gini coefficient⁷ exceeds the national average (0.412) in the Nenets and Yamal-Nenets autonomous districts. Overall unemployment is noticeably lower than the average Russian level in the Yamal-Nenets Autonomous District and the Chukotka Autonomous District. They are among the leaders in terms of labor force participation and employment in the country.

Table 3

Social and economic indicators of the Russian Arctic, 2016

	The output of skilled workers and employees / specialists of middle / senior level, thousand people.	Morbidity, pers. per 1,000 people	Average per capita monetary income per month.	Employment level, %	Unemployment rate, %
RF	198.6 / 469.1 / 1161.1	785,3	30 744	65.7	5.5
The Komi Republic*	1,9/ 2.9 / 4,8	1121.2	31 527	64.6	8.7
The Arkhangelsk region without NAO*	2.6 / 3.5 / 5.8	1002.2	31 043	61.7	7.1
NAO	0,1 / 0,2 / ..	1380.7	69 956	67.1	8.5
The Murmansk region	1.0/ 2.4 / 3.2	875.8	36 115	68.8	7.7
YaNAO	0.8/ 1.6 / 0.2	1180.4	67 521	75.1	2.6
The Krasnoyarsk region*	4.2/ 9.5 / 18.9	783.1	28 030	64.3	6.1
The Republic of Sakha (Yakutia)*	2.4/ 4.1 / 4.7	1043.8	38 933	64.5	7.2
ChAO	- / 0.1 / 0,1	1289.4	63 909	79.6	3.5
The Republic of Karelia*	1.0 / 2.2 / 3.0	1126.2	25 744	62.2	9.2

* Data is provided for the subjects of the Russian Federation due to the absence of data by districts and districts.

** per 1000 people of the average annual population.

*** per 1,000 people of working age.

.. no data available.

Source: Rosstat data.

The real sector of the Russian Arctic economy is mainly represented by the defense-industrial complex, the mining industry, enterprises connected with the transport infrastructure and ensuring the activities of the Northern Sea Route. In the sectoral structure of gross added value, the extraction of minerals is on the first place everywhere, except for the Krasnoyarsk region; the share of processing industries is high except in the Komi Republic, the Arkhangelsk and the Murmansk regions [6, Govorova N.V., pp. 63-64].

⁷Statistical indicator of the social stratification degree of the country or area that describes the differentiation of the monetary incomes of the population.

New development of the Russian Arctic requires a system of secondary, higher and additional education for adults and it plays a central role in the formation of human capital, enabling future specialists to master working professions at an intermediate stage of training. However, in the region, corresponding to the all-Russian trend, the output of specialists with higher education predominates (table 3). The composition of the employed population in the Arctic in terms of the level of vocational education in 2016 looked as follows: the highest proportion of the employed population with higher education is in the Yamal-Nenets Autonomous District (41.2% vs. 33.5% of the Russian Federation average) the lowest one is in the Komi Republic (25.8%). The leader in secondary vocational education of the workforce is the Arkhangelsk region without NAO (56.3%), NAO (54.8%), followed by ChAO (36.0%), which is almost 10% less than the national average (45.1%). The highest percentage of unemployed with university education is in the Yamal-Nenets Autonomous District (26.0% vs. 20.5% of the Russian Federation average), the lowest — in the NAO (4.3%).

In order to create a modern educational, scientific and innovative infrastructure [7, Vedeneva V., pp. 68-80], to strengthen regional educational institutions and their links with the economy and the social sphere, to keep the competitive personnel potential corresponding to the tasks of renewing the economic activity in the Russian Arctic in the sphere of higher education, federal universities we established: the Siberian Federal University (Krasnoyarsk), the Northern (Arctic) Federal University named after M.V. Lomonosov (Arkhangelsk), the Far-East Federal University (Vladivostok) and North-East Federal University named after M.K. Ammosov (Yakutsk). In April 2017, the Murmansk Arctic State University, the largest higher educational institution in this area, became one of the regional core universities. Its mission is the accumulation of regional, home and foreign scientific and educational potential for the effective personnel and scientific development of the Russian Arctic. The main universities have a total of about 20 branches of studies, they include institutes and colleges, providing not only continuous education, but also education access to residents of different categories of settlements.

In the Arctic universities, the admission of students to budget places is increasing, while the most of them are in engineering specialties, in general, more than the national average. However, about 20% of graduates are employed outside the Russian Arctic, and today the expanding the interaction of universities and enterprises in the field of training and subsequent employment of graduates is urgent. The largest companies-employers of the region need qualified operators of machinery with programmatic control, turners, milling machines, electric welders, etc. Also, there is an objective need for training specialists in the fields of shipbuilding, machinery and instrumentation, economics and management of shipbuilding production and training within the framework of the targeted recruitment (in the specialties and training areas, indicated by the state or the leading employers of the region). All these together with additional professional education and professional development can solve the most acute personnel problems in the Arctic.

The most painful problem of human capital development in the Russian Arctic is health. The health indicators of the population in the Arctic are inferior to all-Russian: the life expectancy in the region is lower (according to some expert estimates, it is 53 years⁸), and the level of morbidity, especially parasitic and cancerous diseases, is significantly higher (except for the Krasnoyarsk region). It indicates the need to train medical personnel for the Arctic, considering this specific. There is a pressing need for the development of pharmacological controls of the thermal state, which could increase survival under the influence of low rates, as well as the development of vaccines against infections that existed tens of thousands of years ago, against the background of thawing permafrost.

In 2016, in accordance with the order of the Ministry of Health of the Russian Federation to improve the quality of the medical personnel training for the polar territories, the Arctic health care scientific and educational cluster was created. It includes the North-West State University named after I.I. Mechnikov (St. Petersburg) and the Northern State Medical University (Arkhangelsk). The specialization of the Northern cluster is the Arctic medicine, and the main task is to improve the quality of training and efficiency of universities, as well as the development of research activities. It is also planned to increase the mobility of students and teachers.

To improve the health conditions, it is required to accelerate the development of the departure-governmental forms of work, providing care through mobile/satellite communications, expansion of sanitary helicopters and upgrading of medical infrastructure. These measures, along with the improvement of disease prevention and a healthy lifestyle of the population can significantly improve the health of the northerners.

Conclusion

Today, Russia is a world leader in the development of Arctic projects: infrastructure (Northern Sea Route, auto, air and railway lines), oil and gas extraction and mining (gas pipeline "Bovanenkovo-Ukhta-Torzhok", etc.), industrial (ship and engineering) and informational. The territory of the Russian Arctic will continue to grow: the authorities of Karelia justified the inclusion of two territorial units in the Russian Arctic (the Segezha district and the town of Kostomukshi). Russia's revenues from the use of the Arctic resources are also gradually increasing: in the first quarter of 2018 compared to the same period in 2017, LNG exports is doubled in real terms and almost 2.5 times in value, and a significant part of these indicators falls on the Yamal (Yamal LNG) plants. There, on Yamal (and in Greenland also) scientists from the RAS Ural Branch together with the French Academy of Sciences will carry out a project to study the impact of climate change on the Arctic fauna to preserve biodiversity in the Arctic.

Given the harsh meteorological and geophysical conditions, the difficult environmental situation in the high-latitude areas, as well as the impact of Western sanctions, the implementation

⁸ Эксперт: Продолжительность жизни в Арктике почти на 20 лет ниже средней по России [Expert: Life expectancy in the Arctic is almost 20 years lower than the average for Russia]. URL: <http://sakhaday.ru/news/ekspert-prodolzhitelnost-zhizni-v-arktike-pochti-na-20-let-nizhe-srednej-po-rossii/> (accessed: 16 May 2018) [In Russian]

of economic and infrastructure projects in the Arctic at the new stage of its development will be determined by the potential of home science and industry, their ability to create competitive products. In turn, the implementation of these opportunities is closely related to the quantity and quality of human potential, the development index of which is lower than the average Russian human potential in most regions of the Russian Arctic by the method of the UN Development Program [8, Human Development Report in the Russian Federation 2011, pp. 306-307]. The use of all other development resources depends on human capital [9, Schultz T.W.; 10, Becker G.S.]; without a healthy, educated and decent worker in the Arctic, it would be impossible to carry out the development of the real sectors of the economy [11, Govorova N.V., pp. 37-45]. This means that you need to take measures to stabilize the demographic situation and to increase the attractiveness of the region as a place of permanent residence [12, Dushkova D., Krasovskaya T., Evseev A., pp. 3-11], to creation of social innovative technologies, incl. medical and educational.

The results of the data analysis on human development in the Arctic indicate heterogeneous processes: one of the main trends is the increased level of population and, as a result, the reduction in the number of residents of many areas against the background of higher natural population growth in comparison with the Russian Federation as a whole. The data on social and economic development show a mixed picture: on the one hand, there are high nominal monetary incomes, their relatively uniform distribution and high level of employment of the population with low unemployment; on the other hand, there is a lack of specialists at different levels of professional training for the economy and social sphere of the region. Given the above, we can conclude about the likelihood of fracture of the negative trends of social and demographic development on the background of complex natural-climatic conditions and considerable territorial differences is possible only under condition of well-being and high quality of life, environmental health, promoting the development of indigenous economic activities, and the optimal conditions for personal and professional fulfillment of the northerners.

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