Long-term dynamics of the social space in the Russian Arctic

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Abstract. Social development processes in the Russian Arctic are of special importance. Arctic mineral, fuel and energy resources play a key role in satisfying the demands of the Russian national economy for strategically important types of raw materials. The nature of work activities in the Russian Arctic is distinctive so that labour as a production factor requires a special approach due to stressful climate, which makes living conditions uncomfortable. Dispersion dynamics, distance barriers, small population size in remote settlements, and transport accessibility level contribute to increased resource intensity and energy consumption for life-sustaining activity. Furthermore, the local population is adapted to the harsh Arctic climate and natural environment so that a special Arctic policy of keeping people in the region comes to the forefront. Nevertheless, Russian Arctic is currently remaining a challenging zone due to its complex and non-uniform territorial social and economic development, lack of scientific-based territory management and ineffective social and economic policies implemented there. Nowadays, we need new approaches to elaborate a research and practical agenda for the development of the Russian Arctic. A scientific research methodology must be formulated to transform the system of government control of Arctic region development. An important aspect is to analyse long-term dynamics of the social space in the Russian Arctic of the social space of the Russian Arctic. The article addresses the study results for the dynamics of the social space in the Russian Arctic regions between 1950 and 2018. Transformations in the long-term consistent dynamics of the Russian Arctic were identified to have been determined by the intensity of the region’s industrial development, the scale of government support, and long-term interests of the national economy. Researchers identified stages of the long-term consistent dynamics of the social space in the Russian Arctic region as follows: 1950 to 1990, 1990 to 2000, 2000 to 2008 and 2008 to 2017. This study was supported by the Russian Science Foundation, project № 19-18-00025 «Socio-economic dynamics and forecast for the development of the Russian Arctic, taking into account geopolitical, macroeconomic, environmental, and mineral factors».

1. Introduction
The European part of the Russian Arctic is formed by the Murmansk Oblast, Nenets Autonomous District, Belomorsky, Loukhsy and Kemsky Municipal Districts of the Republic of Karelia, Vorkuta in the Komi Republic, Arkhangelsk, Novodvinsk, Severodvinsk, Novaya Zemlya, Oneghsky, Primorsky and Mezensky Municipal Districts of the Arkhangelsk Oblast [1].

The industry of the Murmansk Oblast is based on the manufacturing ofapatite, nephelinic and baddeleyite concentrates, the production of nickel, iron-ore concentrate and refined copper.
The Nenets Autonomous District is home to the northern part of the Timan-Pechora Oil and Gas Province. Tundra is a source of significant amounts of solid minerals such as coal, manganese ores, rare ores, precious ad non-ferrous metals, mining raw materials and fluor spar [2].

The Arctic part of the Republic of Karelia is home to natural ornamental and building stone fields, scarce metal and non-metal minerals, platiniferous ore occurrences, apatite and carbon titanium ore occurrences, a major clay deposit and the largest field of almandine (semi-precious stone) [3].

Vorkuta has a significant mineral and raw materials potential and is the largest raw materials source for the metallurgy, energy and chemical-recovery industry. Over 30 coal fields were discovered there, as well as carbonates and clays, sand and gravel mixes, industrial sand reserves, unique fields of high-quality barytes, occurrences of gold and chromite, copper, manganese, phosphorite, lead and zinc, iron pyrite, iron ore, raw gemstones, nickel and boron and fluorite veins [4].

The resources of the Arctic parts of the Arkhangelsk Oblast consist of diamond and bauxite fields, gas, oil and building materials.

The Asian part of the Russian Arctic is formed by the Yamalo-Nenets and Chukotka Autonomous Districts, Norilsk, Taimyrsky Taymyr Dolgano-Nenets Municipal District and Turukhansky District of the Krasnoyarsk Territory, as well as the Arctic regions (nomad camps) in the Republic of Sakha (Yakutia) [5].

The Yamalo-Nenets Autonomous District is the major supplier of hydrocarbons to the domestic as well as Eastern and Western Europe markets.

The industrial zones in the Chukotka Autonomous District include the development of coal, oil, gas, gold, tin and copper fields, as well as forecasted platinum group metal resources.

The resources base in the Arctic parts of the Krasnoyarsk Territory [6] includes coal, oil, gas, gold, copper, titanium, complex ores, antimony, boron, mercury, phosphorite, iron, tantalum niobate, blacklead and chrysolite reserves.

The Arctic regions of the Republic of Sakha (Yakutia) encompass promising areas with hydrocarbons, coal, lode and stream gold reserves, silver and tin, as well as unique diamond fields and a niobium and rare metal field.

Some of the differences between the European and Asian parts of Russian Arctic are outlined below.

The area of the Asian Arctic is 5.5 times larger than that of the European part with the population size of these Asian Arctic territories being almost twice smaller than that of the European territories (the population density of the Asian Arctic is 8.9 people per square kilometre vs 311.9 people per square kilometre in the European Arctic zone).

A total of 13.7% of the population of the Asian part of the Russian Arctic is represented by indigenous minority peoples (the Nenets, the Khanty, the Mansis, the Evenkis, the Chukchi, the Eskimos, the Even, the Chuvan, the Yukagir, the Koryaks, the Kerek, the Dolgans, the Kets, the Nganasans, the Selkup, the Enets and the Chulyms), while indigenous minorities in the European part make up 0.6% (the Sami (Lapps) and the Komi).

Unlike the European part of the Russian Arctic, the Asian part features low continuity of the population (it is a less inhabited sector of Russian Arctic). The Asian part of Russian Arctic also features extreme climate and low transport accessibility and energy supply attributable to a considerable territorial expanse.

Nowadays, Russian Arctic remains a challenging zone [7] due to its expanse and non-uniform social and economic development of its territories, lack of scientific-based territory management [8] and ineffective social and economic policies implemented [9]. This way, based on the current conceptual framework of Russia's national Arctic policy, the country's Arctic zone is a strategic national priority and a platform for workforce mobilisation. However, the government's efforts in this area are targeted solely at creating the best configuration of key industrial factors, including fixed assets, required infrastructure, servicing complexes, utilities for workforce, etc. A higher rate of productivity growth is emphasised as one of resulting indicators of this management approach and that with a significant contribution of the country's Arctic regions to gross regional product despite a small population size [10]. For example, with its population size being a mere 1.64% of the country's total population, the
share of the aggregate produced gross regional product of the Murmansk Oblast, Yamalo-Nenets, Chukotka and Nenets Autonomous Districts of the overall gross regional product in the country exceeds 5%.

The strategic value of the Arctic microregion of Russia mainstreams the need in developing new approaches to the research and practical agenda for Arctic development [11] and a scientific research methodology to transform the system of government control of Arctic region development [12]. However, an important aspect is to analyse long-term [13] consistent dynamics of the social space in the Russian Arctic.

2. Long-term dynamics of the social space in the Russian Arctic between 1950 and 2018

1950s saw the inception of the North Roadmap in the Soviet Union with the North seen as a consolidated economic and administrative region. It differed from the previous vision of Arctic development prevailing between 1930s and 1950s as it had a scientific rationale behind the special position and uniqueness of the North which made the development of Arctic resources an essential condition for the continuous growth of national production forces [14]. One of the main goals of the country's national development through the use of the Arctic resources was to build a permanent community in that region. As opposed to the pre-war period, when the Arctic territories were developed by prisoners in camps, 1950s were marked by the migration activated by intensive industrial development which resulted in the formation of a permanent community taking roots in the Arctic.

The population density in the Murmansk Oblast between 1955 and 1985 increased from 3.3 to 7.6 people per square kilometre (the number of cities grew from 6 to 11), while a respective growth in the Komi Republic was 1.6 to 3 people per square kilometre (with the number of cities increasing from 6 to 10). The size of the urban population in Severodvinsk (Arkhangelsk Oblast) was 144.5 thousand people in 1970 vs 78.6 thousand people in 1959; these numbers for Zapolyarny (Murmansk Oblast) and Ukhta (Komi Republic) were 22.1 thousand people vs 6.2 thousand people and 62.9 thousand people vs 36.1 thousand people, respectively.

The most numerous group of migrants consisted of young people aged 20 to 24 years. A positive trend in the social and economic development of the Arctic territories in that period was improved educational level of the population to the effect that in 1959, a total of 34 per 1,000 people employed in the Murmansk Oblast had a university degree and the number increased to 167 people in 1989.

The discovery of hydrocarbon reserves in the northern parts of Western Siberia between 1960s and 1980s preconditioned the construction of an oil and gas production facility there and fuelled active social development of the region. This way, the population size in the Yamalo-Nenets Autonomous District increased from 64,000 to 158,000 people.

In 1980s and 1990s the Yamalo-Nenets Autonomous District acquired the settlement network is has nowadays [15]. The development of Sutorminskneft, oil and gas production administration founded in 1982 to support the accelerated start-up of the Sutorminskoye and Muravlenskoye oil fields, gave rise to the city of Muravlenko in 1984. In 1986, the city of Gubkinsky appeared with such major natural gas production facilities as RN-Purneftegaz LLC and Komsomolsky and Gubkinsky remote structural units of Gazprom Dobycha Noyabrsk LLC.

The demographic situation in the Soviet Arctic areas of that time was distinguished by the fatality rate below the country's average (the crude mortality rate for the Arctic areas in 1985 was 8.5‰ vs 11.2‰) and the natural increase of the population above average (the rate of natural increase of the population in 1985 was 10% vs 5.3‰).

Accordingly, the crude mortality rate in 1987 was 2.9‰ in the Yamalo-Nenets Autonomous District, 3.1‰ in the Chukotka Autonomous District, 5.6‰ in the Nenets Autonomous District and 5.7‰ in the Murmansk Oblast against the country's average of 10.5‰. The national average natural increase of the population in 1987 was 6.6‰, while it was 10.1‰ in the Murmansk Oblast, 14.4‰ in the Chukotka Autonomous District, 15.8‰ in the Nenets Autonomous District and 19.4‰ in the Yamalo-Nenets Autonomous District.
The intensity of the migration-based natural increase of the population in the Soviet North was especially impacted by continuous legislation updates regarding northern preferences. It stipulated main and additional benefits for employed population such as pay supplements, additional paid leaves, increased seniority equivalent entitling to an old-age pension and others.

Driven by the government protectionism of the social and labour relations in the North, the monthly average salary in the Arctic regions was 1.8 times above the country's average. For instance, the monthly average salary in the Arctic areas of the Tyumen Oblast in 1985 was RUB 425 with the region's average being RUB 338 and in the Krasnoyarsk Territory it was RUB 369 vs RUB 243, respectively.

The industrial development of the Arctic in that period was accompanied by the active development of social industries. For example, the number of hospital beds per 10,000 people in the Murmansk Oblast increased 1.5-fold between 1950 and 1990, while the number of physicians (per 10,000 people) grew 2.5 times and the number of public libraries, 1.9 times. The number of hospital beds (per 10,000 people) in the Arkhangelsk Oblast in 1990 was 22.4 vs 8.3 in 1950, the number of physicians per 10,000 people was 43.3 vs 13.5, respectively.

The population size in the Arctic regions of the Soviet Union peaked in 1989 and 1990 and urban settlements mostly with up to 5,000 residents reached their maximum number.

The replacement of the socialist ideology with the market-based vision resulted in the transfer of Arctic facilities to the self-financing model, reduced output and deficit of local Arctic budgets.

The pressing challenge for Russian Arctic between 1990 and 1999 was to stabilise its population size. That period was marked by population reduction (with the population of such regions from 1990 to 1999 declining by 11%).

The issue of ageing population moved to the foreground. With reduced government protectionism of the social development of Arctic territories and the demographic burden of employable population with people older than working age increased 1.5-fold between 1970 and 2000 (2.2-fold in the Murmansk Oblast and 5.4-fold in the Chukotka Autonomous District).

A mortality rate increased significantly (12.4‰ in 1999 vs 8.2‰ in 1990 with 10.1‰ vs 6‰ in the Murmansk Oblast and 7.1‰ vs 3.9‰ in the Chukotka Autonomous District, respectively).

A trend towards a natural population decline started in 1993. If the Arctic regions of Russia had experienced a natural increase in their population size before 1992, the period since 1993 has been marked by a natural decline in population (~2‰ in 1993 and ~3.3‰ in 1999).

The problem for the demographic development of such regions was reduced life expectancy. In particular, life expectancy in the Republic of Karelia for people born in 1990 was 69.29 years, while in 1999 it was 63.78. Life expectancy in the Arkhangelsk Oblast in that period dropped by 5.5 years and in the Komi Republic, by 2.6 years.

The fall of the Soviet Union, unstable economic situation, decline in production, growing differentiation in remuneration between state-financed and private sectors, growing unemployment and sharp increase in the cost of living resulted in a large-scale migration outflow of the population. The young people of employable and child-bearing age who had been born in the Arctic started to leave the region in large numbers.

Between 1990 and 1999, the social and economic development of the Russian Arctic featured the cyclical nature of resource-based area development due to depletion of raw materials and the emergence of depressed territories where production was dying away.

Reduced business activity caused social tension in the Arctic labour markets, as well as lower standard of living and quality of life. For example, the level of labour force participation between 1990 and 1999 dropped by 13% in the Republic of Sakha (Yakutia), by 9.6% in the Komi Republic and by 3% in the Chukotka Autonomous District.

In the same period, the level of unemployment grew 4.6 times in the Chukotka Autonomous District, 4.1 times in the Komi Republic and Sakha (Yakutia) and 3 times in the Murmansk Oblast, Republic of Karelia and Arkhangelsk Oblast.

Unemployed population per announced vacant position grew 7.9 times in the Nenets Autonomous District, 5.8 times in the Chukotka Autonomous District and 3.4 times in the Komi Republic.
Poverty was on the agenda with 28.7% of the population in the Russian Arctic being below the poverty line in 1999, including 55.7% in the Chukotka Autonomous District, 50.2% in the Nenets Autonomous District, 19.8% in the Murmansk Oblast and 13.3% in the Yamalo-Nenets Autonomous District.

There was an emerging trend towards growing crime rate. For example, the number of registered crimes (per 100,000 people) grew 1.6-fold in the Murmansk Oblast and 1.5-fold in the Republic of Karelia between 1991 and 1999.

The next stage for the development of the Russian Arctic (2000 to 2008) was driven by the need to build internal factors of economic development for such areas to secure their sustainable development. The stage was marked by the elaboration of the Roadmap of government support for the economic and social development of the regions of the North.

The Roadmap in particular stipulated creation of conditions for the self-development of the Arctic territories based on an increased role and competitiveness of local backbone enterprises as well as streamlining of the employment structure and population size driven by government impact on migration flows.

The Roadmap was to be implemented at three stages:
1) 2000 to 2003: stabilisation of social and economic development and transition to strong economic growth, including stabilisation of the real income of the population and formation of a trend towards unemployment reduction;
2) 2004 to 2010: stable economic growth, including stabilisation of the population size, consistent increase in the standard of living and quality of life and reduction of unemployment; and
3) 2011 to 2015: balanced social and economic development featuring stable rates based on economy demands and capabilities.

The analysis of social development indicators for the Russian Arctic between 2000 and 2015 prompted the following conclusion on the effectiveness of efforts with the Roadmap of government support for the economic and social development of the regions of the North.

The first stage of Roadmap implementation was marked by a trend towards reduced unemployment, but the population experienced a significant drop in cash income per capita (as compared to the nationwide) between 2000 and 2003.

The outcomes of the second stage of Roadmap implementation included a decrease in population size (by 5.2%), continuing trends towards unemployment reduction (except the Republic of Karelia) and the same cash income of the population per capita.

Generally, Roadmap analysis of the period mentioned herein (2000 to 2015) implies the pretentiousness and ineffectiveness of the government policy targeted at the social and economic development of the Arctic regions.

The Russian Arctic failed to achieve steady rates of balanced social and economic development which is seen by a stable reduction in population size (by 8.6% between 2000 and 2015) and low standard of living. Thus, although the share of the population with an average cash income per capita below the living wage decreased, the poverty level in 2015 exceeded the Russian average indicator making 16.3% vs 13.3%.

The current stage of development of Russian Arctic (2008 to date) is conditioned by the strategic planning of the social and economic development of the Arctic regions and support of homeland security of Russia. The conceptual framework is formed by Decree of the President of the Russia on the Land Domain of the Arctic Zone of the Russia, dated May 02, 2014, Strategy of Development of the Russian Arctic and Homeland Security until 2020, By-Law of the Government of the Russia on Approval of the National Programme of the Russia 'Social and Economic Development of the Russian Arctic until 2020' dated April 21, 2014.

The resulting indicators of the social aspect at the current stage of Russian Arctic development include the rate of natural increase of the population in the Arctic regions (per 1,000 people), regional R/P 10% (the ratio of incomes of 10% of the richest people and 10% of the poorest people in the Arctic
regions), share of the Arctic population with permanent access to the drinking water supply that meets sanitary and epidemiological standards.

The analysis of such indicators demonstrates positive changes in the social development of the Russian Arctic between 2008 and 2017. In particular, the period in question saw reduced rates of natural population decline.

A natural increase of the population is recorded in the Nenets and Chukotka Autonomous Districts and in the Republic of Sakha (Yakutia).

Social stratification of the population decreased dramatically: by 1.5 times in the Nenets Autonomous District and by 1.4 times the Komi Republic. Accommodation quality level increased.

However, we suppose that such indicators do not give the big picture of the social development of the Russian Arctic. So, for example, the study of the social development of the Russian Arctic as regards the social stratification of the population based on income earned requires a more detailed analysis of quality of life indicators since there is income differentiation in rich oil and gas production regions driven by disproportions in the sectoral structure of regional economies.

First, objective reasons for such disproportions are attributable to differences in the gross regional product level per capita and production profile, especially in the relative share of resource-based industries.

The second factor is the existence of less competitive processing industries, as well as low-paid government-financed sectors.

For instance, the average monthly wage of employees at mining companies in the Yamalo-Nenets Autonomous District is 2.2 times higher than that of people employed in the educational sector. The headcount of such sectors is 19.7% and 7.2% of the total headcount, respectively.

Furthermore, we find the ratio of household income and living wage, level of unemployment and poverty to be key indicators that testify to the success of the government policy pertaining to the social development of the Russian Arctic.

The analysis of such indicators demonstrates low efficiency of the national policy of the social development of the Russian Arctic. The standard of living of the population in the regions in question (except for the Chukotka Autonomous District, Arkhangelsk Oblast and Murmansk Oblast) declined between 2008 and 2017. So, the ratio of average cash income per capita and the living wage of employable population decreased from 3.42 times to 3.11 times for the Russian Arctic regions on the whole: 1.4 times in the Nenets Autonomous District, 1.3 times in the Yamalo-Nenets Autonomous District and 1.2 times in the Komi Republic. This indicator did not exceed the Russian average value of 3.65 times in 2017 nowhere except for the autonomous districts in the Russian Arctic.

Poverty in the Russian Arctic is above the average rate nationwide: 14.9% in 2008 and 13.4% in 2017 vs 16.4% and 11.2%, respectively. The share of the population with average cash income per capita doubled in the Nenets Autonomous District. 1/5 of the population of the Republic of Sakha (Yakutia) lives below the poverty line.

The situation with the standard of living is aggravated by unemployment with its level also being above the average level across Russia. In 2017, the level of unemployment was 8.6% in the Republic of Karelia, 8% in the Nenets Autonomous District, 7.8% in the Komi Republic, 7.1% in Republic of Sakha (Yakutia) and 7% in the Murmansk Oblast against the Russian average level of 5.2%. On the whole, in 2017, the unemployment level in the regions in question was 6.4%.

3. Conclusions

Such diverse threats to the steady development of the Russian Arctic are produced by destructive economic, social and government administration processes. Admittedly, we urgently need new approaches to the research and practical agenda for Arctic development and scientific research methodology to transform the government control system for Arctic development. The focus of the transformation of an Arctic government control system is to identify system dynamics and quantitatively assess losses and achievements in the social space of the Russian Arctic.
The analysis of the social development of the Russian Arctic regions between 1950 and 2018 shows that transformations in the long-term consistent dynamics of the social space in the Russian Arctic are determined by the intensity of its industrial development, the scale of government support, and long-term interests of the national economy.

The first stage of the long-term dynamics of the social space in the Russian Arctic is related to an increase in the economic significance of the Arctic for the Soviet economy. Permanent population of the Arctic in that period was formed through a migration inflow where legislation on northern guarantees and compensations played a significant role in the purposefulness of migration. The demographic situation at that time was, in particular, characterised by the mortality rate in the Arctic below the average one nationwide and higher than the average natural increase of the population. Industry-focused development preconditioned prevailing urban population in the Arctic regions. The exploration of the Arctic areas in that period was accompanied by the active development of social industries. The number of urban settlements reached its maximum.

The second stage of the long-term dynamics of the social space in the Russian Arctic started with a crisis caused by the transition of the Soviet centrally planned economy to the market-based one which resulted in a sharp decrease in the economic activity so that the issue of a declining population size in the Arctic regions emerged full blown. That period was marked by a trend towards a reduction in the population size through a large-scale migration outflow with a considerable increase in mortality and emerging natural population decline. New challenges included unemployment and poverty. There was an emerging trend towards growing crime rate.

The third stage of the long-term dynamics of the social space in the Russian Arctic was related to the need to form internal factors for its economic development to achieve sustainable development of the Arctic. The key interrelated goals of Russia’s national policy in the Arctic between 2000 and 2008 included creation of conditions for the self-development of Arctic territories based on resumed activity of local backbone enterprises and streamlining of the employment structure and population size driven by government impact on migration. However, these goals were not achieved, and the Arctic regions did not attain stable rates of social and economic development, while population reduction and a decline in the standard of living continued.

The Russian Arctic still faces such challenges as poverty and unemployment which implies that the national policy of the social development of the Russian Arctic regions is quite ineffective. The standard of living continued to decline in the Russian Arctic between 2008 and 2017 with unemployment remaining an immediate problem. The latter as a phenomenon for the Arctic labour markets is due to the functional specifics of regional businesses and destructive processes attributable to the national and global recession.

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