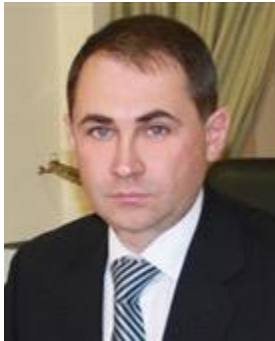


YAMAL-NENETS AUTONOMOUS DISTRICT

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Models for development of resources and territories of the Yamal-Nenets Autonomous District¹



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Abstract. Challenges and threats related to the sustainable development of the Arctic zone of the Russian Federation (AZRF) dictate the need to study the fundamental laws of evolution and current state of the structures and processes of spatial development of AZRF, the development and scientific substantiation of methodology, methods and practical approaches to the formation of alternative

(innovative) models of spatial ecological and economic development of the coastal and inland territories, including urban development, adaptation of existing methods of management. The study was conducted with use of the historical and comparative method, presupposing identification of common features in historical events in different periods of development of resources and territory of the Yamal-Nenets Autonomous District. Also, the economic models were considered which were used in different historical periods in terms of their influence on the life of the population. As a result of the study, a pattern of development of Arctic territories depending on the targets of their development is discovered, the suggestions for the formation of the basic principles of the creation of new models of the spatial development of the Arctic regions are offered, from the point of view of the invariance of the innovative way as condition for sustainable development of the Russian Arctic.

Keywords: *The Arctic, the Yamal-Nenets Autonomous District, development models, sustainable development, degradation of the spatial structure, livelihoods of the population, coastal and inland areas*

The diverse contexts of different historical periods of the development of the Russian Arctic, which sometimes have contradictory goals, methods and ways for achieving them, have formed a heterogeneous focal type of settlement and placement of productive forces, the internal disparity of the spatial matrix of the Arctic zone of the Russian Federation (AZRF).

The transformation of business conditions as a result of the change in political regimes, economic and technological structures, depletion of resources, sociocultural innovations and globalization, significantly worsened the ability of the single-commodity, mainly raw-material economy of the Russian Arctic regions, lowered profitability, and in a number of industries made further activity as economically impractical.

The economy of previously prosperous cities and villages in course of time ceased to meet the needs of society and acquired a degrading nature. These process, in turn, had a significant

¹ The study was carried out within the framework of the project of the RSSF №16-02-00741 "Life activity of the permanent population in the coastal zones of the Arctic in the current conditions of industrial development of the macroregion".

impact on the formation of alternative models of vital activity of the resident population of the Russian Arctic, which in large part begins to consider the possibility of changing places of residence to more favorable regions [1, Kibenko V.A.], and at the worst, the elimination processes begin.

The dynamics of the population size of the Arctic subjects since the 1990s demonstrates this well (Table 1). The decrease in population was typical for all regions, except for Yamal-Nenets Autonomous District. Now in some regions, stabilization and population growth has been observed (in the Krasnoyarsk Territory, the Republic of Sakha (Yakutia)), but this does not occur in the Arctic territories. At the same time in the Yamal-Nenets Autonomous District (YNAD, Yamal) the decline has begun, despite powerful development of industry and implementation of major investment projects.

Table 1

The dynamics of the population of the Arctic regions of the Russian Federation

The subject of RF	12.I. 1989	9.X. 2002	14.X. 2010	1.I. 2013	1.I. 2014	1.I. 2015	1.I. 2016	+ / - *
Murmansk region	1146.8	892.5	795.4	780.4	771.1	766.3	762.2	- 384.6
Arkhangelsk region without NAD	1515.4	1294.9	1185.5	1159.5	1148.8	1139.9	1130.2	- 385.2
Nenets Autonomous District	54.8	41.5	42.1	42.8	43.0	43.4	43.8	- 11
the Krasnoyarsk Territory	3027.6	2966.0	2828.2	2846.5	2852.8	2858.8	2866.5	-161.1
The Yamal-Nenets Autonomous District	486.2	507.0	522.9	541.6	539.7	539.9	534.1	+ 47.9
the Republic of Sakha (Yakutia)	1081.4	949.3	958.5	955.6	954.8	956.9	959.6	- 121.8
the Chukotka Autonomous District	157.5	53.8	50.5	50.8	50.5	50.5	50.2	- 107.3
Total losses: 1 123.1 thousand people								

* «+» growth, «-» decline of population in 1989 to 2016.

The current situation, the priorities of Russia's state policy in the Arctic² (the Arctic Strategy) determine the objective relevance and predetermine the scientific problems and the importance of research on a comprehensive scientific and theoretical analysis of the fundamental laws of evolution and the current state of structures and processes of spatial development in the Russian Arctic [2, Pavlenko V.I., Podoplekin A.O.], development and substantiation of methodology, methods and practical approaches to:

- specialization of perspective support zones of territorial development, with account of the priorities of industrial and infrastructural development of the macroregion;

² Strategy of the development of the Arctic zone of the Russian Federation and ensuring of the national security for the period up to 2020, is approved by the President of Russia V.V. Putin on February 20, 2013.

- formation of the foundations of sustainable livelihoods of the permanent population in conditions of natural, geoclimatic, ecological, economic, infrastructural, social and ethno-cultural specifics of the macroregion;
- creation of alternative (innovative) models of spatial ecological and economic development of coastal and continental territories, including urban development, adaptation of existing management methods, including the principles of integrated management of coastal territories and coastal waters.

The development of conceptual approaches to understanding the role of the Arctic and the North as a special area of national development belongs to academicians G.A. Agranat [3] and S.V. Slavin [4]. Academician A.G. Granberg [5] has become the consistent supporter of the interdisciplinary synthesis of sciences, studying the spatial patterns of regional development. The civilizational approach for the comprehensive study of the northern regions has been proposed by Academician V.V. Alekseev [6].

Considering the fundamental works, certain aspects of managing economic development based on models of rational nature management in the coastal zone of the European North of Russia were considered in the works of the researchers of the Kola Science Center [7, Matishov G.G., Denisov V.V., Jenyuk S.L.]. The works of the Arkhangelsk Scientific Center substantiate the necessity of concentrating the scientific potential of Russia as a condition for the effective implementation of the strategy for the development of the Russian Arctic and the consolidation of its geopolitical positions in the macroregion [2, Pavlenko V.I., Podoplekin A.O.]. The Scientific Center for the Study of the Arctic (Salekhard) is developing scientific and methodological approaches to the formation of principles and methodology for the design of regional innovation systems in the Russian Arctic in the context of a multilevel innovation policy using specific models of innovative development of local innovation systems [8, Detter G.F., Tukkel I.L.].

In general, at various levels of government, the measures are taken to improve the efficiency of the development of territories in relation to system-wide goals through spatial planning and the development of various concepts and strategies and spatial planning schemes.

Methods of the project RGNF № 16-02-00741 "Vital activity of the permanent population in the coastal zones of the Arctic in modern conditions of industrial development of the macroregion" include desk, field and sociological research. The research uses general scientific methods, including analysis of literature, statistical materials, documents of strategic and territorial planning of the subjects of the Russian Arctic, scientific literature, as well as a historical and comparative method that involves the identification of the common features in historical events of various periods of development of resources and territories of Yamal-Nenets

Autonomous District, as well as the economic models applied in different historical periods from the point of view of their influence on the vital activity of the population.

As a result of the formation and analysis of historical information about the origin and the economic activities of the Yamal settlements, the analysis of strategic planning documents for federal and regional authorities, as well as local government bodies at the territory of the Yamal-Nenets Autonomous District, including the territorial planning schemes, this article will show the intermediate results of the study of the economic models of the development of resources and territories of the Yamal-Nenets Autonomous District, the areas for the formation of the foundational principles of the creation of new models for the spatial development of Arctic regions are formulated, which take into account the challenges of the time.

The final result of the project¹ will be the development and justification of the scientific and methodological approaches, scientific and practical mechanisms for the implementation of innovative models of spatial ecological and economic development of coastal and continental territories, including urban development in the support zones of the long-term industrial and infrastructure development of the Russian Arctic.

Historical models of development

The Mangasea period. Until the first decades of the XX century the territory of Siberia, the Arctic, including the Yamal-Nenets Autonomous District, was mainly developed as a result of trade and commercial colonization by the Russian merchants and industrialists engaged in harvesting furs, sea animals and fish, and ore prospecting expeditions. The Mangasea period begins at the end of the XVI century. At the same time, historians identify the Novgorod and the Moscow periods that preceded the Mangasea, but they are not considered in this article.



Figure 1. View of Mangasea. Reconstruction of Belov M.I.

With the movement of industrialists to the east, the Mangasea sea route had been forming, it was the first prototype of the Northern Sea Route. The city of Mangasea was founded in 1601, it received the official title "Golden-boiling land of the sovereign" (Figure 1). The favorable geographical position on the routes from Muscovia to Siberia and, most importantly, the richest fur trade became the basis of the prosperity of the city and particular attitude to it. During the period of prosperity of Mangasea the dozens of buildings appeared: churches, barns, houses. The detachments of industrialists went from here to investigate new lands in Taimyr and in the lower reaches of Yenisei, they discovered Yakutia and compiled the first map of the Lena River. Trade ties of the city went far beyond Russia: through the pomor cities, it was connected with large companies of the Western Europe. From Mangasea annually from 100 to 150 thousand of skins of soft pelt (sables, arctic foxes, foxes, beavers) was exported, which accounted up to 20% of the revenues of the state treasury. In Mangasea, for the first time, construction technologies on permafrost were developed, and foundry production was carried out. But as a result of a number of measures of the economic activity in the Arctic from the state side and irrational nature management of entrepreneurs, already in the second half of the XVII century, the trade did not bring the same incomes, the city began to empty out, the trade routes shifted to Yenisei and Lena [9].

The Obdor period. The extinction of Mangasea gave rise to the economic development of Obdorsk (established in 1595), which earlier served as a customs outpost and a transfer point. The Obdor period of the development of Yamal can be dated by the beginning of the XVIII century, when the state took control over all the meridional trade routes in the region (maritime, over-stone) [10, Mukhina E.V.]. Obdorsk started to function within the Tobolsk trade, which was oriented to the intra-Siberian market. The movement of goods was changed to a latitudinal direction along the rivers Ob, Irtysh, Tobol, Tura. The nature management was completely traditional: reindeer husbandry, fishing, fur trade. In the XIX century there was the intensification of the development of the region, its inclusion in the all-Russian modernization processes. By the beginning of XX century from Obdorsk annually up to 200 thousand poods of fish and about 50 thousand fur skins were exported to the markets.



Figure 2. The Obdorsk Fair

Trade turnover amounted to large amounts at that time — hundreds of thousands of rubles in silver and gold. Market relations increasingly penetrated and deepened in the local economy, affecting the traditional way of life of aboriginal people. The social and cultural development of the territory was going on, as well as the strengthening of the church role. The Obdorsk Fair (Figure 2) formed the merchant class, villages were developing, so this period can be considered as a period of sustainable development, which ended with the arrival of the Soviet power in the beginning of the XX century [11]. Up to the present time more than 30 villages, based in the Obdorsk period, are located in the spatial matrix, they are mainly located along the Ob highway and they are places of permanent residence of the indigenous population (Nenets, Khanty).

The Soviet period. From the first third of the XX century the industrial development began, which was connected with the Soviet modernization, it went slow until the middle of the century, with the use of special settlers, without the creation of large industrial productions. Harvesting remained one of the main activities, at the same time the industrial fishing and processing developed, the collectivization of traditional reindeer husbandry enterprises took place, and agriculture was forming [11]. Rethink of the geostrategic role of the Arctic after the Great Patriotic War predetermined the railway construction and attempts to create seaports as a transit base for the functioning of the Northern Sea Route. The strategy of the development of the Yamal-Nenets Autonomous District in the 20s–60s of the XX century was called integrated development and provided for the development of a wide range of industries and the social sphere, regardless the costs of creation (the Soviet complex period).



Figure 3. The remains of the railway Salekhard — Nadym (501 construction)

As a result of spatial development, 34 settlements were built, the main activity of the permanent population was reindeer husbandry, extraction and processing of fish, agriculture, breeding of fur-bearing animals.

The economic relations had been maintaining in the Yamal region for four centuries (from the middle of the XVI to the middle of the XX century), these relations were generated by the trade and commercial colonization. The conditions for a new period of economic development were formed due to the change in technological methods of production, which created a demand for energy resources, as well as by technical and natural geological capabilities to meet this demand by means of the fields of Yamal.

With the arrival of geologists and the subsequent development of gas and oil fields, the first stage of industrial development of Yamal (the Soviet industrial period) begins. On September 27, 1962 from the Tazovskaya reference well, located near the remains of the ancient city of Mangasea, the first gas fountain hit. Today the promising reserves amount is up to tens trillion cubic meters of gas and more than ten billion tons of liquid hydrocarbons. The gross regional product (GRP) of the Yamal-Nenets Autonomous District in 2015 reached 1.8 trillion rubles, the revenues of the consolidated budget of the Yamal-Nenets Autonomous District are about 140 billion rubles.

During the mass development of oil and gas fields in Western Siberia, first attempts of the scientific substantiation of the methods of integrated development of the Arctic territories were made for the first time [12]. The discussion was centered around traditional and mobile methods. The traditional one provided the construction of settlements within 40–50 km from the fields, the mobile meant the need for expedition-shift work.

As a result, it was found expedient to create different categories of cities: large, medium and small, depending on the specific conditions and the development zone. In total, from 1960 to

1990, 6 cities and 14 settlements were set up, focused on the search, extraction, service and transportation of hydrocarbon raw materials, where currently about 400 thousand people live, 75% of the total population of Yamal (Figures 4, 5). If to consider the population growth in a number of settlements formed in previous periods (Salekhard, Tarko-Sale, etc.), also oriented to servicing the oil and gas complex, the population of the region, depending on the extraction of hydrocarbon raw materials will be 95%.

In the process of gradual expansion of zone of development to the North and increase in the costs of creating cities, it was suggested to focus on the periodic replacement of the newcomers. As a result, in the 80's more than 30% of all works were performed by the mobile method, the number of shift workers reached 130 thousand people.



Figure 4. The Yamal-Nenets Autonomous District in XXI century

Despite the wide scope, the mobile method of development has not been unambiguously assessed in the scientific world: it led to the lack of development of the territory of the North; sociologists gave a negative assessment for this method; medical research has shown that intraregional method is preferable. Over time, the conviction that the mobile method is possible only with sufficient development of the base cities, with creating in them a full-fledged social infrastructure. Therefore, a method of combining the traditional and shift work was proposed as the further method for developing the oil and gas provinces. The settlement system included base and base cities and shift camps.

Market period. The second period of industrial development of resources and territories of the YNAD began in the 1990s and it was associated with a change in the political regime and the emergence of the market economy.



Figure 5. The city of Novy Urengoy

It is generally accepted that the model of regional development, that was formed in the Yamal-Nenets Autonomous District in the 1990s, embodied the most successful example of the social and economic transformation of the mining region in the conditions of transition to the market, allowing for comprehensive regional development on a mature economic and cultural basis [13, Brekhuntzov A., Kulakhmetov N.Kh.]. Indeed, thanks to the creation of the developed fuel and energy complex (FEC) in Yamal during the first period of industrial development, the economic growth in Yamal-Nenets Autonomous District surpassed all other regions of the Russian Arctic (Diagram 1).

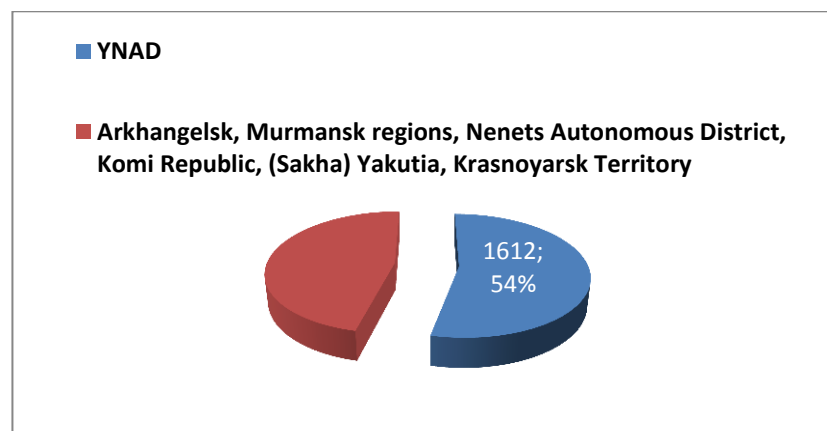


Diagram 1. GRP of the Russian Arctic in 2014 in billion rubles and in %

At the same time, the implementation of the principles of the market economy (equality, openness, freedom of choice, limited state intervention) has got mixed consequences for the economy of Yamal-Nenets Autonomous District and its residents. On the one hand, the efficiency of resource development has improved, the profitability of oil and gas enterprises has grown. The region has received economic independence and its own tax base. On the other hand, the processes of optimization of financial and economic activity of enterprises have begun: the withdrawal and sale of non-core (service) assets; transfer of social infrastructure to the balance of municipalities; reduction of number of workers, the transition to the interregional method of

work. These processes have alienated the economy of the fuel and energy sector from other sectors of the regional economy. External positive effects from the presence of large business in the region have decreased, the differentiation in income distribution has grown, social stratification has increased.

The adjustment policy of regulating the economic activity in the central and peripheral regions has naturally begun to draw the resources to the center, including intellectual and financial, weakening the periphery. With this approach, the only economically viable type of entrepreneurial activity in the Arctic was the extraction of resources and related service functions, but service functions were transferred to companies from other regions in order to maximize profit.

During the market period, the trend to use the mobile method of development was increased, new cities and settlements were no longer built. At the same time, large shift camps were created: Sabetta, Bovanenkovo, Kharasavey, Yamburg. The statistics does not separately consider those working in shifts, but according to some estimates, their number in Yamal varies from 70 to 100 thousand people in different seasons.

The consequences of the transition to the market regulation of economic processes in the Arctic regions, as well as the current achievements in scientific and technological progress, the factors of globalization, the decline in production in old fields have significantly influenced on public relations in the region. Therefore, despite the strong economic position of the Yamal-Nenets Autonomous District in relation to other Arctic territories, the social and economic model used in the region has ceased to meet the demands of the society and provoked a massive outflow of the population (Diagram 2).

The main factors that reduce the effectiveness of the market model, reduce real incomes of the population, quality and attractiveness of life in the region:

- in the Yamal-Nenets Autonomous District, the fourth technological structure remains dominant, it is focused on the extraction and transportation of hydrocarbon raw materials. New high-tech activities are not developing; traditional activities are unprofitable;
- conjuncture, technological and climatic risks [14, Detter G.F., Kozlov A.V., Malyshev E.A.], degradation of infrastructure facilities;
- gradual exclusion of local business and population from the financial flows of the oil and gas complex, a shift in favor of using interregional method of work;
- stabilization of budget revenues, insufficiency of budget investments in human development and conservation of ecosystems.



Diagram 2. The impact of economic policy on the population of Yamal-Nenets Autonomous District. While gross regional product becomes bigger, population diminishes, and real incomes of populations become smaller.

The conducted historical analysis of social and economic development of Yamal-Nenets Autonomous District for the past four centuries has revealed five-time periods for the development of Yamal, differing in goal-setting, spatial development, technological methods of production and social and economic productivity of development, namely, the Mangazeya, the Obdor, the Soviet complex and Soviet industrial; market periods. The spatial structure actively developed in three periods: during the Obdor and both Soviet periods, it was related to the goal of development aimed at the arrangement and sustainable development of the Arctic territories. The modern spatial structure of the Yamal-Nenets Autonomous District was formed mainly during the Soviet periods. The state and business got the largest volumes of production and incomes during the Mangazeya and the market periods, which, however, led to the degradation of the spatial structure and the decrease in the population in the territory. The emergence of new technological methods of production was the main factor in the changing lifestyles of the population of the region and the industrialization of the economy.

Settlements formed during the Obdor and the Soviet complex periods, due to their belonging to the 2nd and 3rd technological modes, are currently most vulnerable to degradation, primarily to intellectual. The income from traditional nature management is not sufficient to ensure the livelihoods of the population, so the preservation of settlements and the way of life is due to subsidies from the regional budget as a result of the support for the traditional economy on non-market fundamentals that were formed in previous economic periods. Maintaining of the traditional institutions does not provide an opportunity for the development of new industries. The physical infrastructure of the settlements is supported by the regional budget, but it does not

meet modern requirements for comfortable living, with the possible exception of settlements that have received the status of an administrative center.

Crisis events in the economy, which began in 2008, revealed the problems of social and economic development of cities and settlements of Yamal, formed during the Soviet industrial development, including: a mono-profile economic structure; changes in the social policy of city-forming enterprises (development of interregional watch); end of the period of active development and technological modernization of production, leading to the release of workers; lack of strategic vision of the parameters of future development in institutions of power. Certainly, it is important to solve the issues of economic specialization of the single-industry towns of Yamal, search for new sources to ensure their livelihoods [15, Larchenko L.V., Kolesnikov R.A.] for the elimination of the Mangazeya scenario.

The history of the settlement of the Yamal-Nenets Autonomous District as a territory for temporary residence created an interlayer of the mobile population that does not link its future with the region, thus creating informal restrictions for sustainable development. The natural process of formation of the settlement structure, which has an economic base and is developing on the basis of market relations and rational nature management, was interrupted at the beginning of the 20th century and was entrenched by subsequent political and economic events which created a rigid colonial structure in which the resources of the region serve the public idea, the state or private treasury, the interests of the population and entrepreneurship are of secondary importance.

Considering the historical and economic analysis of the various periods of development of YaNAO:

- the regularity of the results of the development of the Arctic territories from the goal-setting of the state is revealed. If the main purpose of development is to fill the state treasury and maximize the profits of transnational companies, the result will be ecosystem degradation, social stratification and elimination. If the goal-setting is based on the inclusion of regions in the economic mechanism as equal elements of the state, accompanied by the development of human capital, sustainable development of the territories should be expected;
- the relevance and practical significance of the formation of a new paradigm for the spatial and urban development of the Arctic regions, based on modern achievements in science and technology, including the solution of the issues of locating productive forces and resettlement, considering the foundations of the life of the permanent population and the ecological capacity of landscapes, is confirmed.

Strategic models of development

In the last decade, the study of the specific features of the spatial development of the Arctic regions was associated with mass development and approval of strategies for social and economic development of regions and settlements, territorial planning schemes, as well as with crisis trends in the economy of individual regions. In the YaNAO the studies were also carried out aimed at determining the trajectories of social and economic development, in connection with the comprehensive development of the Yamal peninsula by enterprises of the fuel and energy complex [13].

Strategies for the development of coastal municipal areas have enshrined their mission, the short nature of which is to ensure the development of natural resources (Table 2). Thus, the new strategic planning documents remain dependent on the trajectory of the previous development, which is the subordination of the interests of the region to the interests of the center.

Table 2

Strategies for the social and economic development of the coastal regions of the YaNAO

Indicator	Nadym district	Yamal district	Tazovsky district
The title of the document	Strategy of social and economic development of the Nadym district until 2020	Strategy of social and economic development of the municipal entity Yamal district for the period until 2020	Strategy of social and economic development of the municipality Tazovsky district until 2025
Strategic mission	The development of oil and gas production complex, based on the effective use of the resource potential, advanced development of the transport and energy infrastructure	Yamal district is a territory of harmonious combination of development of industrial and traditional ways, where comfortable living conditions for all population are provided	Tazovsky district is the territory of active development, the area of effective nature management, promising base of the gas producing industry of Yamal.
Main strategic objective	Raising the level and quality of life of the population based on the effective use of the aggregate potential of the Nadym region	Raising the level of well-being and quality of life of the population on the basis of a harmonious combination and effective development of the traditional and industrial structures of the regional economy	Ensuring a high level and quality of life of the population of the Tazovsky district on the basis of effective development of natural resources

The main objective of these strategies is to ensure a high level and quality of life of the population on the basis of effective development of natural resources. Accordingly, the implementation of social and economic policy is tied to the volume of extraction and export of natural resources, revenues from the sale of which are planned to be used to increase the level of infrastructure development, to create a comfortable living environment for the population.

Bearing in mind the constraints associated with the conjuncture in world hydrocarbon markets, it is already clear that only partial implementation of these strategies is possible. In

addition, the time period for achieving the goals or adjusting them is increasing, while the region's ecology continues to suffer from particular damage, which cannot be completely compensated by declining budget revenues.

It is interesting that all development strategies of the Yamal-Nenets Autonomous District and its municipalities envisaged the increase in the population. So, by 2020 the population of Yamal should be 600 thousand people³. It is clear that this will not happen. It is also obvious that the methods of forecasting which were used previously are unsuitable. The weak side of these strategies is that they do not consider the development opportunities associated with the formation of new technological structures, the implementation of the concept of the innovative social-oriented economy, do not use local human capital in development mechanisms, and do not envisage measures to improve its level and quality.

The formation of an innovative socially oriented economy is envisaged by the Concept of long-term social and economic development of the Russian Federation for the period till 2020 (the Concept)⁴. The concept selectively approaches the innovative development of Russian regions, as follows: the development of scientific, technical and educational potential is envisaged only in large urban agglomerations with high quality of habitat and human potential, dynamic innovative and educational infrastructure; the formation of clusters is planned in urbanized regions, in poorly developed territories, clusters are oriented to deep processing of raw materials and energy production using modern technologies; zones of advanced economic growth are planned to be developed in the largest agglomerations and large cities — the centers of the regions with the most dynamic economic growth, the high level of human capital development and the potential for the development of the innovation economy, which provides an inflow of population and investments that concentrate service functions and industrial productions. The concept does not foresee the development of any innovative formations, zones or systems in order to enhance the development of the Russian Arctic sector, although there are problems of development of oil and gas fields, low exploration of the Arctic continental shelf, the need to adapt infrastructure to the projected climate change, the development of information and communication technologies and means of communication.

Thus, the policy of innovative socially-oriented type of development in the Concept is shifted in favor of large cities and agglomerations located in the middle and low latitudes of the

³ the Concept of long-term social and economic development of the Russian Federation for the period till 2020, is approved by the Resolution of the Legislative Assembly of the Yamal-Nenets Autonomous District dated December 14, 2011 N 839.

⁴ On the Concept of long-term social and economic development of the Russian Federation for the Period till 2020, Order of the Government of the RF, dated November 17, 2008 N 1662-p.

country, on the basis of which the scientific, educational, innovative and industrial centers will be formed. In the northern regions, raw material specialization is fixed with individual elements of raw material processing.

The proposed sectoral and functional division of the territories does not create favorable conditions for the development of the Arctic regions. The consequences of such a division are the outflow of qualified personnel, the reduction of intellectual and human capital — the basic capital of the innovation economy, the increase in economic, technological and social dependence of the regions, which contradicts the principle of balanced spatial development claimed by the Concept. And in fact, it is a continuation of the colonial policy of developing the Arctic, does not correspond to the principle of sustainable development, in which the exploitation of natural resources considers the interests of the current and future potential and generations.

The most important strategic planning document in the Arctic is the Arctic Strategy², which, describing the risks and threats to the current social and economic state of the Arctic, notes "a shortage of technical means and technological capabilities for exploring, developing and using Arctic spaces and resources," as well as a lack of willingness to move to the innovative way of development of the Russian Arctic, that is why, among the priority directions of the development of the Russian Arctic is the development of science and technology.

At the second stage of the implementation of the Arctic Strategy starting from 2015, the transition of the Russian Arctic to a sustainable, innovative social and economic development is envisaged. Thus, the Arctic Strategy, indicating the problems of the social and economic development of the Russian Arctic, points to the need to choose the innovative way of development, the search and introduction of new technologies, and provides the responsibility of the authorities for achieving the established indicators. These provisions are justified, proceeding from the fact that the application of standard approaches and technologies in specific Arctic conditions will be ineffective and even impossible. At the same time, it should be noted that the implementation of the Arctic Strategy in terms of innovative development of the regions is delayed: there are no documents on innovative development of the Russian Arctic, indicators are not established.

With this in mind, we can conclude that the state innovation policy of the Russian Federation, fixed in the documents of strategic planning, does not have a clearly expressed concept of regional development, which is confirmed in other studies [16]. On the one hand, the need for an innovative socially-oriented way of development of the country and regions is declared, on the other, reservations are made in favor of developed regions, the plans are not

being fulfilled. In modern conditions, this leads to the increase in the attraction of developed economic centers and weakens remote regions, delaying the most creative specialists and investment resources. Considering the demographic and migration processes in the Russian Arctic, caused by economic and environmental factors leading to decrease in the number of the permanent population and the replacement of temporary and often low-skilled personnel from southern regions and countries, the Russian Arctic is de-intellectualizing, the technological gap is growing, and the level of cultural identity of the population is deteriorating.

The absence of clear state policy for the territorial development of the Arctic regions reduces their economic potential, does not contribute to sustainable development and efficient use of natural resources in the vast territories of the Russian Arctic, does not contribute to the emergence of the innovative, socially-oriented economy. Continuation of trends towards an outflow and a qualitative replacement of the population in the Russian Arctic, the decrease in the intellectual potential of the region, which will not allow the full realization of the tasks of social and economic development and development of the Arctic riches, lowers competitiveness in the struggle for resources and territories.

It can be confidently predicted that failure to take measures aimed at the sustainable development of Yamal leads to the repetition of the Mangazeya scenario and will, over time, involve the depletion of gas and oil reserves, with irreparable damage to nature.

Conclusion

The study of historical and operational models for the development of the Yamal-Nenets Autonomous District has shown their specific features, advantages and disadvantages, revealed the pattern of development of the Arctic territories depending on the purposes of their development, confirmed the hypothesis set for the purpose of the study, namely, the need to search for new basic principles and provisions for the formation of a modern model of social and economic Development of the Arctic region, capable of counteracting emerging challenges and threats. As a result of the research the following provisions are formulated:

1. It is necessary to change the approaches to the formulation of strategic goals for the social and economic development of the Arctic regions, which must consider not only the desired result of functioning — the quantity of products and the standard of living, but the factors necessary to achieve these goals, i.e. the ability of the region to develop independently, to support innovation, to meet the challenges of the time.

The goal of the region's development in modern conditions should be the desire to accumulate human capital, maintain and develop intellectual and technological capabilities, the

ability to create and introduce new technologies that increase the sustainability of development and create higher opportunities to meet the needs of the population. Thus, the high level and quality of life of the population should not be the end purpose, but a consequence of the innovative development of society in complex and dynamic conditions.

2. The economic policy of the Arctic regions should be established in the invariance of the innovative way for the formation of the trajectory of sustainable social and economic development. Distances and climate make most economic activities in the Arctic economically impractical, therefore only knowledge, technology and new equipment can open up the Arctic expanses, create conditions for economic development, safe and comfortable living.

3. The strategy for implementing of sustainable development policies should become proactive, i.e. not to be limited to solving current issues and problems, but to strive forward, to focus on future challenges and opportunities, which will require extensive involvement of scientific organizations, the development of new social humanitarian technologies for forecasting and management.

4. Creation of the adequate system for the management of the Arctic territories, which provides for measures of state regulation (regulatory, tariff, tax, etc.) of economic activity in the Arctic territories, and mechanisms for increasing the effectiveness of institutions of power.

5. The maximum inclusion of the potential of the local population and business in the production and technological and financial-commodity chains of large enterprises and the Arctic megaprojects, which will allow more fully use the opportunities for industrial and infrastructure development of the Arctic in the interests of the region, will expand the economic basis of development.

6. Reorientation of commodity flows from the meridian (east to west) to latitudinal (north-south), the formation of the intra-Siberian territorial industrial complex, including within the framework of the project concept Ural Polar — Ural Industrial.

In the future it is proposed to expand the basic principles that form the sustainable development of the Arctic regions and their meaningful disclosure.

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