Human capital of the Arctic: problems and development prospects

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Abstract. The goal of the present research is to make comparative analysis of the development of human capital of circumpolar countries as the primary factor of sustainable development of the Arctic regions. In the context of Russia's Arctic policy formation, the study of foreign countries experience in the development of human capital in the Arctic territories is seen by us particularly topical. In the course of the study, the main characteristics of the Arctic territories of the circumpolar states were identified, and their specific characteristics were determined. These include low population density, uncomfortable weather and climatic conditions, inaccessibility and farness of settlements from economic and administrative centers, the raw material orientation and non-diversified nature of the economy. The multidirectional migration processes, as well as migration influence on the characteristics of the population and, hence, on the structure and quality of human capital were determined as essential features of the territorial development of circumpolar countries. The main problems of the qualitative accumulation and effective use of human capital in the Arctic territories of the circumpolar countries, the key of which is the phenomenon of unemployment, were revealed. For the Arctic territories of Russia, poverty of the population, a high proportion of poor families with children, and low life expectancy have been defined as a threat to the degradation of human capital. The general strategic lines of circumpolar states in the development of the Arctic territories which are relevant for the Russian state regulation of the development of the Arctic territories were determined. The study was carried out within the framework of project AAAA-A18-118051590118-0 "Comprehensive interdisciplinary research and economic and mathematical modeling of the socio-economic transformation and management of regions and municipalities of the North-Arctic territories of Russia".

1. Introduction

The Arctic zone is a part of the Earth, with center in the North Pole, and its extreme border is the Arctic Circle.

The Arctic has borders with five Arctic coastal states that belong to the group of countries with direct access to the Arctic Ocean and have internal sea waters, territorial sea, continental shelf, exclusive economic zone: Russia, Canada, USA, Norway, and Denmark. Beside the above mentioned countries, the group of Arctic states includes Finland, Iceland and Sweden that have no direct access to Arctic waters but cross the zone of the Arctic Circle. These countries are members of the Arctic Council that maintains cooperation between the Arctic states in development of strategic solutions in the field of sustainable development, regulation of the legal regime of the Arctic [1] and others.
Solving of the issues of integrated natural resource management and exploitation of the Northern Sea Route, as well as the urgent need to increase military presence at the beginning of the 20th century led to a significant increase in population in the Arctic zone. Consequently, Russian Arctic territories development was of a large-scale kind primarily associated with the mineral resource production industries. In this regard, a significant number of settlements were formed in the Arctic regions in the areas of mineral resource development, causing a substantial migratory influx of the residing population and the formation of essential human capital. This is the so-called sedentary technology of development, which dominated in the USSR and post-Soviet Russia and suggested solution of a few economic and social problems, creation and maintenance of industrial, transport and social infrastructure. The peak of the population of the Arctic territories of Russia was reached in 1990s, while the functional focus of such territories leads to high percentage of their urbanization.

2. Arctic territories: composition and main characteristics
The currently inhabited areas of the Arctic include Yukon, Nunavut and Northwest Territories of Canada, Greenland (Denmark), Troms and Finnmark regions (Norway), Alaska (USA), Norbotten (Sweden), Lapland (Finland), Iceland. The Russian sector of the Arctic includes the Murmansk region, Nenets, Chukotka, Yamalo-Nenets autonomous districts, as well as Arkhangelsk, Mezensky district, Novaya Zemlya, Novodvinsk, Onega district, Primorsky district, Severodvinsk (Arkhangelsk region); Vorkuta (Komi Republic); three districts of the Republic of Karelia (Belomorsky, Loukhsky, Kemsy) and five districts (uluses) of the Republic of Sakha (Yakutia) (Allakhovsky, Anabarsky national (Dolgan-Evenkiysky), Bulunsky, Nizhnekolymsky, Ust-Yansky); Norilsk, Taimyr Dolgan-Nenets District, Turukhansky District (Krasnoyarsk Territory).

Among the characteristics of the population of the Arctic territories is the predominant residence of the indigenous population: Inuits in Canada; Aleuts, Inupiks, Inuits in the USA; Saami in Finland and Sweden; Nenets, Khanty, Mansi, Saami, Chukchi, Eskimos, Selkups, Evenki, Yukagirs, Koryaks, Evens, Chuvans, Kereks, Dolgans, Kets, Nganasans, Chulyms in Russia.

The following are the specific features of the Arctic territories today.

Harsh natural climatic conditions, as well as "price raising" factors that increase the costs of life. In particular, long winter periods give rise to increased costs for food and essential goods. Special measures of state support for product import into Arctic territories (Russia) or subsidies to retailers and suppliers delivering such products by air (Canada) are implemented.

Poor accessibility and remoteness of settlements from economic centers reduce economic, investment, internal, migration attractiveness and limit the development of new sectors of the economy and business [3, 4]. Remote, poorly accessible arctic rural settlements of the Lovozersky and Tersky districts of the Murmansk region; Krasnoselkupsky, Shuryshkarsky, Priuralsky, Tazovsky and Yamalsky districts of the Yamalo-Nenets Autonomous District; Arctic territories of the Republic of Sakha (Yakutia); settlements of Turukhansky and Taimyrsky districts of the Krasnoyarsk Territory; settlements of the Chukotka Autonomous Region are notable examples in Russia. Among the factors of low level of social development of remote settlements are the subsidizing nature of local budgets and the residual approach to financing of local needs and delegated powers; lack of developed transportation networks and seasonal food dependence; high utility tariffs and prices for basic consumer goods; lack of information resources and limited communications; difficulties in providing emergency medical care.

The negative current situation in the field of social development of remote, poorly accessible arctic rural settlements is aggravated by the specific aspects of the life-sustaining activities of the indigenous peoples of the North, in particular, low competitiveness and low production volumes, high transport costs and the lack of modern technologies in conventional activities; reduction of areas of conventional natural resources use areas; limited access to the services of organizations and institutions of branches of the social sphere. Among the topical problems of social development of such areas are high mortality rates and its significant gender differentiation, high population sickness
level, migration loss and alcoholism of the population, depopulation of the indigenous population, low life expectancy for men, low paid employment and high unemployment rate.

Non-diversified, mainly resource-based economy makes town-forming economic entities dependent upon the global demand for products and price tendencies. Russia can also be cited here (for example, the Nenets Autonomous District). Due to non-diversified economy, the Arctic region is actually divided into two parts: self-sufficient (mining settlements, Naryan-Mar) and depressive (settlements with social functional basis, not involved in the mining and service industries).

In addition to their raw-material focus, the common aspects of the Arctic territories of the northern countries are relatively low population densities (0.04 in Canada, 0.49 in Alaska, 0.64 in Russia); the phenomenon of unemployment against the background of high level of population economic activity; the remuneration systems with applied coefficients used to compensate the living cost rise and the impact of uncomfortable climatic conditions on human activity in the Arctic.

Among the differences are the different patterns of migration and its influence on the characteristics of the population, the structure and quality of human capital of the Arctic territories.

3. Human capital of the Arctic territories

The modern Agenda of the northern states aims to achieve sustainable development of the Arctic territories. The main factor in its achievement is the human capital generating the productive capacity of the formed “Arctic” population. At the same time, an important condition for achieving sustainable development is the provision of productive employment at local labour markets of the Arctic territories.

The main demand of the local labour markets in the Arctic territories of Norway is skilled labour workforce in production, tourism and construction industries. For instance, more than 15% of Tromso companies are experiencing serious difficulties in staff recruiting. There is an express demand for qualified personnel in the field of health care and social services against the background of qualification disproportion, as local labour markets offer only 30% of highly qualified personnel. At the same time, the migration attitudes of “Arctic” young people with higher education are dominated by the mood of relocation and employment in other regions of Norway.

In Lapland and Norbotton, the unemployment rate fluctuates at the national average level (6% in Finland, 7.5% in Sweden). Problems with affordability of labour force are common in many professions. There is current need in medical personnel, psychologists, personnel in the field of tourism, as well as the blue collars. Like in the Arctic sector of Norway, there is an acute problem of qualification disproportion against the background of the growing need for skilled labour from Norway.

The distinctive current trend of demographic development in Sweden, Finland, and Norway is the growth of the population over employable age. This trend along with the migration outflow of young people from the Arctic territories leads to shortage of labour in the territorial labour markets, especially shortage of highly qualified personnel.

The main negative factors of formation and use of human capital in the Arctic territories of Canada are low life expectancy and high unemployment (more than 8% in the Northwest Territories, and more than 14% in Nunavut). In Nunavut, this situation is aggravated by a significant ethnic component of the population (most of the human capital here is represented by Inuits), in the Northwest Territories - by the functional specifics of the Arctic settlements (the basis of human capital here are shift workers, and the major part of population is represented by Inuit Eskimos).

The specific aspects of Alaska's labour markets have shaped the human capital. The employment is mainly seasonal there: in the summer, the demand for labour increases by an average of 15% (for example, in construction - double-fold, in fisheries by 75%, in hydrocarbon production by almost 30%). The basis of human capital is the population migrating to work locations from other regions of the country. Another negative factor is the social tension in local labour markets in view of fluctuation of the world oil prices and reduction of investments in the oil industry, due to the reduction in the number of jobs in this industry and service sector of the economy and its significant territorial
differentiation (in some areas of the state) unemployment reaches 20% with an average of 7% in Alaska, and 5% in the USA).

In the Arctic territories of Russia [5, 6], the main problems with regard to the issues of high-quality accumulation and efficient use of human capital are also related to unemployment. A distinctive feature is the household unattractiveness of the Arctic territories, which determines the migration outflow of the population and the “desertion” of the Arctic settlements [7].

The problems of the Arctic labour markets in Russia constitute a high level of territorial differentiation of unemployment and a high level of hidden unemployment in rural and remote settlements. Due to lack of the required competencies and the tightness of labour application areas in the Arctic territories of Russia, the employment opportunities of the local population are limited. Social strain in local labour markets is caused by a significant level of wages differentiation in industrial areas (Chukotka, Yamalo-Nenets, Nenets Autonomous Districts, Murmansk region, Vorkuta) and low-paid employment in agricultural and woodworking settlements (Arctic territories of the Arkhangelsk and Murmansk regions, Republic of Karelia).

The narrowness of labour application, rural specifics of economic activity types (traditional reindeer herding and fishing), lack of professional skills and competencies required by employers from the local population aggravate social strain in labour markets of the Nenets Autonomous District. This causes stagnation of unemployment phenomenon and high level of its territorial differentiation. Problems in the labour markets produce a negative situation in the living standards of the population. These are income lowering, expansions of poverty centres localization [8], growth of social apathy, socially significant diseases distribution, alcoholism and drug addiction.

The heterogeneity of the quality and capacity of local social infrastructure, lack of a unified transport system (bus and train communication) aggravate the situation in the territorial labour market of the Yamalo-Nenets Autonomous District and adversely affect the quality of human capital in the region. For example, almost 70% of the population of the Priuralsky municipal district lives in settlements that do not have a regular bus (railway) connection to the administrative centre of the Yamalo-Nenets Autonomous District.

In the Arctic territories of the Arkhangelsk region, the main problem in the accumulation of human capital is low-paid employment, which causes migratory loss of young people (in migration flows a significant part is represented by citizens aged 15-34 years old and rural youth) and limiting the possibilities of attracting highly qualified specialists and skilled personnel.

The gap in the human capital of the Arctic territories of Murmansk region is also obvious: the territorial remoteness and underdevelopment of the transport infrastructure of distant rural settlements, their functional peculiarities and subsidized budgets, critical condition of housing facilities, information and communication unavailability are the main factors of high levels of unemployment and poverty and, as a result, potential degradation of human capital. Focal population and harsh climatic conditions in winter periods lead to a blockade of transport links of such settlements with regional and district centers, including the blockade of supplies of essential goods, medicines and medical products, and fuel.

Another factor is the raw material specialization of settlements in the Murmansk region. It could be seen at the example of Pechengsky municipal district, where the town-forming enterprise Kola Mining and Metallurgical Company operates. In particular, in settlements - areas of presence of a joint stock company, indicators of living standards (for example, the ratio of wages to the subsistence minimum of the working-age population) are significantly (almost 1.5 times) higher than in other settlements, and the unemployment rate exceeds the average regional level. The third type of settlements in the Murmansk region is closed administrative-territorial formations, which functioning is limited by their military industrial focus. The current problem of effective human capital use in the region is the discrepancy between the qualifications of the local population and the needs of major employers, as well as the system of specialized professional education that does not meet the modern requirements of the regional economy.
In Chukotka Autonomous Region, a low level of unemployment is registered, but it is characterized by a high level of territorial differentiation escalated by a low level of qualification of the unemployed persons, limited opportunities and a low degree of intensity of labour mobility, and poorly developed transport network.

As shown above, the situation in the sphere of human capital in the Arctic territories of Russia is aggravated by domestic territorial unattractiveness and rather low quality of life.

The most acute problems of the territorial socio-economic development of the Russian sector of the Arctic, in contrast to the foreign northern countries, are the shortage of public catering enterprises, significant proportion of substandard and dilapidated housing and the high cost of housing and utility services; poor quality of drinking water and sewage treatment facilities, lack of sustainable radio and television broadcasting and access to information and communication technologies in remote settlements, poor state of material and technical base of social sector institutions, high rates for air transport and electricity, difficulties in providing emergency medical care.

Threats to the degradation of human capital in the Arctic territories of Russia are such problems pertaining to life quality as poverty of the population and a high proportion of poor families with children (in the Murmansk region, about 80% of poor families are families with children under the age of 16); low life expectancy (especially among men against the background of their high mortality rate at working age). Specific factors include high levels of infant mortality, mortality due to external causes (in particular, the alcoholism of the indigenous population and suicides).

4. Prospects for the development of human capital of the Arctic territories
Today, each “Arctic” country has its own Arctic strategies that set out the goals, objectives and tools for achieving sustainable development of the Arctic territories. In addition, there has been accumulated sufficient experience in the development of Arctic municipalities in accordance with the state development priorities pronounced in the statutory instruments. The common strategic lines in the Arctic development [9] are diversification of territorial economies and fostering entrepreneurship and tourism, taking into account the impact of natural climatic factors and the research and development advantages of the Arctic territories; governmental regulation and stimulation of development of the Arctic territories; human capital.

Review of the Arctic strategies indicates the need to update the Arctic policy of Russia in relation to the human capital of the Arctic territories taking into account the best foreign practices [10]. In particular, it is necessary to pay attention to the fact that achieving sustainable balanced development of foreign Arctic territories involves, in the first place, solving employment and unemployment problems by ensuring maximum employment of the “Arctic” population based on the constant improvement of interaction of the major employers with local schools and vocational educational institutions and widespread social licensing activities of mining corporations in terms of increasing their responsibility for the socio-economic development of the territories of their presence (creation of a comfortable urban environment, modernization of the social infrastructure, development of health care and education systems).

Foreign northern countries apply comprehensive measures of state influence on the development of human capital of the Arctic territories. One of the topical examples for Russia is the proactive youth policy of Canada and Norway. For instance, the possibility of combining the desired level of education with labour activity is secured at federal level in Canada (by scholarships, grants, internships for young professionals without work experience). National interests in attracting foreign youth In Norway are secured by provision of possibilities of free higher education. Kirkenes branch of Arctic University of Tromso specializing in the study of Arctic is interested in attracting not only foreign students, but also foreign specialists.

Another best practice for Russia is the proactive participation of state in shaping the relevant infrastructure (social, transport) and the accessibility of services provided by enterprises and organizations, which, in turn, helps reducing social tension in local labour markets [11] and significant development of small and medium-sized businesses (and, accordingly, increasing the efficiency of the
processes of using human capital in the Arctic territories). One of these aspects is the development of Arctic tourism, a priority in raising the level of socio-economic development of the Arctic territories, the main way to diversify the Arctic economies, also in terms of revenues for municipal budgets. In particular, in Finland, Arctic tourism is the basis for the development of the Arctic territories, since it primarily offers the solution of the infrastructure problems of these territories. Another example is Greenland and Spitsbergen - the leaders of the Arctic tourism offering a wide range of tourist programs.

Arctic territory marketing has become widespread in the Arctic foreign countries. In particular, in order to develop tourism industry, a marketing approach is widely used here to improve the image and promote the Arctic territories. In this aspect, the “winter city strategy” in Canada is of interest, whereas it focuses on the advantages of Arctic settlements, for example, its widespread use of wind energy, snow and ice settlements, and ski resorts. In Russian practice, we can take an example the city of Kirovsk in Murmansk region, famous for its mountain skiing potential and annually organized snow village, the backbone of the tourist cluster of the Murmansk region - Khibiny.

Great interest in terms of the human capital development of the Arctic territories is aroused by Norway’s experience in business development in such areas as marine biotechnology, energy, seabed mining, sea shipping and tourism, satellite positioning navigation, etc. In terms of Russian reality, we can cite as an example the plans of the Arctic Kirovsk to create in the near future a centre of diving in the Arctic water.

Due to the fundamental contradictions between the significance of the Arctic territories and the priorities of the state policy of Russia, the transfer approach to the development of the Arctic territories is of particular importance. In the first place, it is the experience of Canada, Denmark and the United States, where regional authorities are vested with extensive powers in carrying out their own tax, budget and lending policies. In particular, the main financial means for achieving sustainable balanced development of the Arctic territories in such countries are intergovernmental transfers aimed at implementing specific regional programs in the development of social sectors and the communications and information sectors. Another tool is tax preferences for investors and businessmen aimed to attract financial resources for the implementation of industrial and infrastructure projects. As an example of implementation of this type of tool, we can take again the Murmansk region, specifically the city of Kirovsk, having been granted in 2016 the status of TASED - the territory of advanced socio-economic development. The purpose of this status is to establish a special legal regime for business activities in order to create favorable conditions for increasing investment activity, ensuring accelerated territorial socio-economic development and creating conditions for accumulation and effective use of human capital.

Another example of the best practice of managing the Arctic territories in terms of the development of their human capital (in the opinion of the authors) are preferential tariffs for contributions to state social insurance and for electricity consumption (which is especially important for uncomfortable Arctic territories), reduced income tax rates, the possibility of obtaining preferential educational loans.

Undoubtedly, it is worthwhile to touch upon such a sensitive topic for the Russian sector of the Arctic as raising the age limit for the purpose of retirement. For example, in Norway, Sweden and Finland, the increase in the proportion of elderly citizens is by no means interpreted as the problem of the population aging. The growth in the number of elderly citizens in these countries is primarily a result of the state social policy which encourages the retirees to continue working.

5. Conclusions
The strategic importance of the Arctic territories brings to the fore the issue of their sustainable development and the effective use of the resource base for the realization of the national interests of the Arctic countries. The driving force for this development and, accordingly, the realization of national Arctic interests, is human capital.

The processes of accumulation and the degree of efficiency of using the human capital in the Arctic territories have their own peculiarities affected by natural-climatic and economic-geographical
territorial features. Among the common features of human capital in the Arctic territories of the circumpolar countries are the phenomenon of unemployment, aging of the population, the vulnerable position of the indigenous population, the mono-profile nature of the territorial economies.

The significant experience of foreign northern countries in sustainable development is relevant for Russia, especially in terms of the formation of a competent policy regarding the prospects for the development of human capital. Foreign experience in managing the Arctic territories shows that the primary governmental task is to use incentives for the development of human capital - development of health care and education systems, improvement of transport infrastructure, functioning of the system of benefits, preferences, guarantees and compensations for the population and economic entities of the Arctic territories.

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