

Development of Northern Rural Areas: International and Russian Experience



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Abstract: *The aim of the present work is to analyze the international experience of sustainable development of Northern rural areas. The obtained research results include proposals on diversification of agricultural production, creation of smart Northern rural settlements, legal solution of issues related to the territories of natural resource management, and achievement of food sovereignty. Domestic reindeer husbandry can become the basis for the development of rural areas in the Russian North. The authors offer the package plan on diversification of economic activity, based on a combination of traditional types of economic management with a plant growing (first of all, gardening), plantation berry and mushroom production, as well as with development of ecological and ethnographic tourism, production and sale of souvenir products. The conclusion is made that such diversification will allow attracting human capital, spark interest in young people, and thus ensure sustainable development of the Northern rural areas.*

Keywords: *the Arctic, sustainable development, food sovereignty, diversification, reindeer husbandry, indigenous peoples.*

I. INTRODUCTION

The challenge of ensuring sustainable rural development in the North and the Arctic is increasingly attracting attention in scientists and decision-makers due to climate change, increasing global food demand, and addressing food security problem.

The Northern regions of the world are characterized primarily by harsh agro-climatic conditions, increased energy consumption, very low population density, and poor development of transport infrastructure.

Sustainable development of Northern rural areas is essential for improving the quality of life and human potential, as well as capital in the North of Russia. The specificity of the problems and tasks of agricultural development and improvement of food security of indigenous peoples and local residents of the North,

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both in Russia and in other countries, is determined by the existence of two economic paradigms, namely, self-sustaining traditional and market economy, as well as by the great need of these economic paradigms in government support.

The Concept of sustainable development of rural areas defines them as the areas, which include the territory of rural settlements, and the corresponding interpopulated areas [1]. Feature of all Northern and the Arctic territories, and first of all, Russian territories, is a huge area of interpopulated territories. With the weak development of the transport infrastructure components (railways, winter roads, light aviation, maritime and river transport), social ties of people are of particular importance in the Northern rural areas. International experience, summarized in the Arctic Council monograph on the project called Adaptation Actions for a Changing Arctic of the Arctic Monitoring and Assessment Program (AMAP), testifies that the polyscale nature of social relations can be traced from the local level of rural settlements to the global level of agricultural production and food supply [2].

Problems on providing sustainability, sustainable development, and food security of indigenous and local residents of the North and the Arctic, especially in the last 15-20 years, attract the attention of many scientists, both from the countries of the Arctic Council and other countries [2-11].

At the same time, there are practically no studies on the sustainability and sustainable development of the Northern rural areas, therefore, these problems have become the objects of authors' regard [12, 13].

II. METHODS

A. General description

The authors used comparative geographical and statistical methods, as well as the method of socially oriented monitoring of the quality of life, which allowed identifying problems, tasks, and indicators for further monitoring of sustainable development of the Northern rural areas. The results of structured and semi-structured surveys, conducted in indigenous settlements in the US state of Alaska, and the Northern provinces of Canada, were also analyzed.

The most important indicator of the effective functioning of the region is the structure of its economy because there is a dependence of the regional population's income on the structure of employment and sectoral structure of production. In the entities of the Russian Federation, included in the Arctic zone,

the value of per capita income of the population is inversely proportional on the share of the population employed in agriculture and dealing with traditional activities, such as fishing, hunting, and collecting wild plants. This is primarily due to the peculiarity of the employment structure in the North and in the Arctic, as well as due to the harsh climatic conditions of the region, often hindering commercial agricultural production [14].

B. Algorithm

In the North and the Arctic, the food security of indigenous peoples has always depended primarily on the above-mentioned traditional activities.

The specificity of human nutrition in high-latitude regions is characterized by significant energy consumption. Therefore, as a result of evolution, the inhabitants here formed a polar metabolic type of organism, which is characterized by a protein-lipid diet [15, 16].

III. RESULTS

One major component of the food security of the North and the Arctic, primarily due to the low transport accessibility, is in-house agricultural production. The sharp decline in livestock and crop production after 1991 had adverse impact on the income and nutritional structure of the local population. Thus, now bread and bakery products prevail in the nutrition structure of the population of the Arkhangelsk Region, the proportion of sugar is very high, while consumption of milk, meat, fruits, vegetables, and potatoes is extremely insufficient [13].

At the same time, it has been revealed that Northern crop production, grown in the open ground (not in a greenhouse), contains much more biologically active substances than that produced in more southern areas, because in extreme conditions of the North and the Arctic, plants are natural concentrators of vitamins [15, 17].

An important direction in providing the sustainable development of the Northern rural areas and food security is a combination of traditional economy management of indigenous people of the North (reindeer breeding, fishing, gathering, etc.) with crop husbandry (including vegetable gardening, rapidly developing at the present time in the villages of indigenous peoples), as well as animal husbandry, whose distribution can significantly move North due to the global climate changes and use of new agricultural technologies. Northern crop and livestock productions are associated with high energy consumption, though this indicator alone cannot be used to judge the competitiveness of Northern agricultural production. Thus, the natural and ecological advantages of Northern agricultural production primarily include long daylight hours during the growing season, high soil moisture, as well as the availability of significant areas of river floodplains with fertile alluvial soils, free from the permanent and seasonal frozen ground [6, 15].

Multipurpose natural resource management in many regions of the North of Russia is limited by a shortage of labor resources and underfunding of agricultural production. First of all, this concerns the main commodity branch, which is reindeer husbandry [12].

Thus, the level of state support for the reindeer herding industry in the Russian North is on average 3-4 times lower

than that in the Nordic countries. In the North of Finland, in Lapland, the state, in addition to direct support, undertakes the organization of slaughter of deer, the construction of fences and pens, hay harvesting, and the supply of feed for feeding animals in winter. The main component of the reindeer products cost is transportation expenses, therefore, the state takes part in these expenses [18]. In addition, reindeer husbandry is managed in the Nordic countries using the advanced means of communication and other innovations [19].

The importance and uniqueness of the Russian Northern reindeer breeding are determined by two reasons: firstly, Russia has a huge area of reindeer pastures exceeding 320 mln ha. For comparison, this figure in Finland equals to 11.4 mln ha, in Norway – 14.0 mln ha, in Sweden – 16.0 mln ha (as of 2000). Secondly, the production cost of dietary gourmet reindeer meat in Russia is very low (on average twice lower than the cost of pork production). In addition, unlike Finland, Sweden, and Norway, reindeer husbandry in Russia is based on natural pastures, while in the Nordic countries reindeer are fed with hay and compound animal feedstuff that reduces the quality of venison as a particularly valuable product, and increases its cost [12, 18].

It is important that both in Russia and in the Nordic countries only indigenous minorities are engaged in reindeer herding: in the Nordic countries, these are Saami, while in Russia – 18 indigenous minorities of the North [18].

Reindeer husbandry is not only a significant branch of agricultural production but also the way of life of indigenous minorities. The condition of this industry sector essentially influences well-being, food security, and overall quality of people's life. For the Arctic rural areas from the Kola Peninsula to Chukotka, reindeer husbandry remains the main field of activity of a large part of the local indigenous population and can become the basis for sustainable development. The monitoring of the world population of both domestic and wild reindeer carried out from 1970 to 2010 has shown that the maximum reindeer livestock population was reached in the period from 1988 to 1997, with a peak of 5.5 mln heads that was followed by a decline. In the Russian North, from 1970 to 1992, the number of domestic deer did not fall below 2 mln heads. Global climate change is considered to be the main reason for the decline in wild deer, although there are other equally important reasons, such as industrial and infrastructural development [5].

The decline in domestic reindeer livestock from 1997 to 2010 (more recent data are not available) was observed in all Arctic countries, but in Finland and Norway – to less degree than in other countries (13 and 21%, respectively [20]). Under favorable economic conditions for the sale of reindeer products (this especially concerns high prices) in the domestic market, the livestock decreased due to the reduction of pasture area caused by infrastructure development, as well as losses from predators. Adverse factors affecting the development of reindeer husbandry in Finland and Sweden include the fact that these countries have not ratified Convention No.169 of the International Labor Organization (ILO) about indigenous peoples and tribal peoples.

In Sweden, another adverse factor for the industry was the decline in the participation of Saami families in reindeer husbandry due to the curtailment of their rights [20].

In 2007, Norway adopted rules limiting the size of the Saami reindeer herds, as the Saami reindeer herders were not owners but users of the land. As a result, reindeer husbandry became unprofitable for many Saami. The state regulation of Norway's pasture systems by the Saami was called "welfare colonialism" [21].

The production of the Arctic food should be included among the factors ensuring sustainable development of Northern rural areas. Venison, game meat, fish and wild plants, in today's highly polluted land resources in many more southern regions of the world are increasingly recognized as a valuable and functional food product that attracts tourists. In addition, Arctic food produced in ecologically certified natural conditions of the North and the Arctic meets high international quality standards for agricultural products and is in high demand on the world market. Therefore, the Arctic food are becoming increasingly important for the sustainable development of rural areas of the North [8].

The collection of wild cloudberries, fen-berries, cranberries, and blueberries in Sweden and Finland is more negative than positive in terms of international experience in Arctic food production. Nordic berry industry employs cheap labor from Southeast Asia and Eastern Europe. The largest international companies process wild berries, i.e. a type of the Arctic food harvested in the North, in China, and in Japan, and receive high added value. This industry in Sweden and Finland is recognized as economically efficient, but it should be recognized as an obstacle to the sustainable development of Northern rural areas because indigenous northerners are deprived of access to traditional food [22, 23].

Sweden's experience in growing Japanese shiitake mushrooms in exhausted iron ore mines near the city of Kiruna can be useful for the Russian North (in particular, the Murmansk Region). Shiitake mushrooms, which have antioxidant properties, are produced in significant quantities. It is even planned to export these valuable delicacy products. Mushroom production is subsidized directly from Kiruna city budget [12].

In the Russian North, agricultural production could also be diversified through the organization of plantations of particularly valuable species of berries, mushrooms, and medicinal plants. Note that the collection of medicinal plants in the Soviet period was carried out unflinchingly.

The experience of creating a cluster in Lapland (Northern Finland) on smart management of rural settlements is very challenging. The main development objectives of the Lappish rural villages in the cluster named "Circular (nonwaste) economy – the future of rural life in 2025" are: a) local nonwaste production of all the necessary natural products; b) use of all funds only for the needs of local communities; c) the production of all required energy on the spot; g) the cessation of emigration from local rural communities; and d) the transformation of villages into the hubs of various entrepreneurship [24].

Production of necessary energy on the spot is one of the most important points for sustainable development of the Northern rural settlements, because of its high cost, increased

energy consumption, and high transportation expenses. Attempts to implement alternative energy have previously been made in Russia as well, in particular in the Murmansk Region, in the village of Lovozero, but these attempts failed due to lack of funding [15].

The problem of emigration from the Northern rural settlements (point (g) of the Finnish cluster) is very acute in all Northern and Arctic countries. Thus, in rural settlements in Northern Canada, emigration from 2016 to 2025 is projected to be more than 19%. At that, among emigrants, 49% or 10 thousand people are younger than 24 years. The main reason for this process is the inability and low attractiveness to carry out traditional economic activities for indigenous northerners, especially young people.

In most cases, global climate change is the cause. For example, in Alaska, young Inuit hunters are now unable to hunt for sea animals due to the lack of ice by which they could reach these animals.

To prevent the outflow of young people from Canadian Northern rural settlements, it is proposed to involve young indigenous northerners in nontraditional activities, namely, to create youth correspondent networks, develop training programs for leadership, training photo and film journalists, as well as journalists in other mass media [9].

For the indigenous peoples of the North and the Arctic, as shown by studies in Canada, food security is primarily concerned with food self-sufficiency based on traditional environmental management and economy [6].

The food sovereignty indicator is very important for the Northern rural areas. In accordance with the Food and Agricultural Organization (FAO), food sovereignty is broader concept than food security, since it includes human rights to food, access to natural resources and the protection of smaller, more labor-intensive, sustainable and diversified agriculture. Food sovereignty is directly related to the concept of self-sufficiency, and is possible, when people manage the food system and agriculture themselves, taking into account traditional modes of production [25].

The concept of food sovereignty is based on the fact that decisions on food systems, production patterns, food culture, and ways to ensure environmental food safety must be made by the population itself.

Respect for food sovereignty is particularly important to provide life necessities of the indigenous peoples of the North, based on traditional knowledge and skills, which are grounded in seasonal traditional food practices [15].

Ensuring the food sovereignty of the indigenous people of the North over the past 10-20 years has been complicated by the loss of channels for the transfer of traditional knowledge and skills to younger generations. In the Canadian North, therefore, much attention has been given to knowledge transfer channels: traditional knowledge centers, networks, programs, community centers, Northern research centers, as well as organizations capable of integrating traditional and contemporary scientific knowledge in food security and sovereignty [13, 25].

Strategies to ensure food security and sovereignty of the Northern rural settlements, first of all, must be diverse.

This includes short-term strategies, such as the establishment of food banks and child nutrition programs, programs for human development and skills (such as the organization of community vegetable gardens and purchasing cooperatives), and long-term strategies, involving the development of policy decisions, or programs focused on legal issues [13].

Since none of the programs can solve the food security and sovereignty problems, a set of interrelated measures is needed. For example, education programs on rational nutrition cannot compensate for poor food availability [25].

As a result of monitoring of one of the most important problems of the indigenous people of the North, namely, a reduction in their diet of traditional food, and an increase in the proportion of purchased store-brought foodstuff, a close relationship was revealed between food security and sovereignty, on the one hand, and the health of indigenous peoples, on the other hand [6, 13].

It is the change in diet by reducing the consumption of traditional aboriginal food and increase in their diet of store-bought food that is considered to be the main reason for the increased risk of chronic diseases in the Northern aboriginal villages [13, 25]. In addition, food insecurity leads to reduced learning capacity, depressions, and feelings of social insecurity [6].

Seven following strategies have been proposed to ensure food security and food sovereignty in the Canadian North:

1. Improving accessibility to food (socio-economic and transport accessibility).
2. Raising the level of education in the issues concerning the provision of quality food.
3. Increasing the well-being of aboriginal people and transferring traditional knowledge from the older generation to the younger.
4. Maintaining the necessary volumes of traditional food production, and ensuring sustainable management of natural ecosystems.
5. Eradicating poverty, and ensuring economic development of aboriginal settlements.
6. Implementing information innovations and developing local food production.
7. Involving youth in providing food security and sovereignty [13, 25].

A combination of various measures listed below can serve the basis for diversification of economic activities in the territories of traditional nature management of the North of Russia to ensure sustainable development:

1. developing crop (on the open ground and in greenhouses) and livestock production, primarily reindeer herding;
2. developing vegetable gardening;
3. collecting medicinal plants and wild plants, which was necessarily carried out in Soviet times;
4. organizing plantations for the cultivation of valuable species of mushrooms, berries, and medicinal plants;
5. processing products of traditional crafts (creating small enterprises for fish, berries, nuts, and mushrooms processing), as well as organizing sales of finished products;
6. organizing crafts based on traditional agriculture (producing birch bark crafts and important household items, the ornamentation of household items, beadwork, including

that for gift business);

7. organizing ecological and ethnographic reserves and wildlife sanctuaries to implement the priority of the indigenous population on their land and economy.

8. organizing controlled ecological and ethnographic tourism [12].

A feature of providing food security and sovereignty in the Northern villages is often the existence of horizontal social ties, where one hunter can provide traditional food to his neighbors [2].

IV. DISCUSSION

The sustainable development of the Northern rural territories is impossible without the solution of legal issues, among which the main one is the issue of the rights on territories of traditional nature management (TTNM) of the Northern indigenous minorities, which include also specially protected nature conservation areas, created to conduct traditional nature management and traditional way of life of indigenous peoples of the North [26]. Attribution of specially protected nature conservation areas to the TTNM is disputed by the indigenous peoples themselves since it prevents them from full-fledged management of their lands.

In authors' opinion, the TTNM in the North and the Arctic should be considered as rural areas, because they perform all the most important functions of rural areas, and primarily, social functions (employment of indigenous people), economic (development of reindeer husbandry, hunting, fishing, and harvesting of wild plants), environmental (nature protection at the level of ecosystems and commercial species), as well as ethnocultural functions (creation of conditions for the preservation of the native language and traditional culture) [4].

Analyzing the experience of the Nordic and the Arctic countries in terms of indigenous peoples' rights for the TTNM, it should be noted that when specifying property rights in relation to the settlement of indigenous land claims, the main issues are the subject and object of ownership, as well as the method of vesting property [26].

In Alaska, according to the Alaska Native Claims Settlement Act (ANCSA) of 1971, native residents were granted land rights in the area of their settlements, as well as monetary compensation in exchange for cessation the legitimate territorial claims. Subsoil resources began to be owned by regional corporations, while the surface resources were given to the ownership of the township corporations of indigenous peoples [3].

In Canada, the 1982 constitutional act recognized aboriginal rights in all matters "relevant to the good governance and well-being of aboriginal peoples in their territory" [27]. Agreements on the territorial claims of indigenous people of Canada identified three categories of land:

- (a) lands with exclusive ownership of all resources by indigenous peoples;
- (b) lands, on which subsoil rights were limited by the right to receive part of the income from mining, to conclude agreements with mining companies on social, economic, and other benefits;

(c) public lands, on which indigenous peoples were entitled to wildlife resources along with other users [28].

In the Nordic countries, according to the 1971 act, and the Saami Parliament Act of 1987, land rights of Saami are only related to reindeer husbandry, and reserved only for Saami citizens. At that, the basic rights of the Saami to land are still not recognized [8, 28].

In the USA and Canada, a mechanism for involving indigenous peoples in the management of natural resources has been developed, called joint management (co-management), which is a component of public policy aimed at sharing responsibility for special resources, as well as benefits from their use [26].

International experience in the development of agricultural production and traditional economic activities in the North shows, first of all, an increase in diversification. The combination of traditional farming with crop production (mainly horticulture) and livestock contributes to the sustainable development of the Northern rural areas [12, 15].

Talking about the traditional types of management of indigenous and local residents of the Russian North and the Arctic, the most promising economic activity may be domestic reindeer herding, primarily due to the availability of natural reindeer pastures, exceeding the area of deer pastures in Finland, Sweden, and Norway by 20-28 times. This requires the development of regional development plans of the industry while maintaining and increasing direct state support [12, 15].

Recognition of the Arctic food as a particularly valuable, functional products occurred only 8-10 years ago. Produced and certified in ecologically clean conditions of the North, these products meet high international standards, are in high demand on the global market, and are becoming increasingly important for the sustainable development of the Northern rural areas [8, 12].

Environmental management in the Northern regions of the world is very often faced with conflicts of interest between traditional economic activities and agricultural production, on the one hand, and with the activities of industrial and infrastructure companies, on the other hand. One example is laying of a railway from Finnish Rovaniemi to Norwegian Kirkenes through Sami reindeer pastures planned on 2019, or tree planting in Finnish Lapland that will also result in the loss of significant areas of winter and summer reindeer pastures [21].

Solving these problems requires methods of socially oriented monitoring of the quality of life of the Nordic and Arctic population, as well as solutions to conflict problems of traditional nature management, developed by the authors.

According to the proposed approach, conflict problems should be tracked within the framework of complex socio-ecological systems in various types of environmental management [27-29]. In addition to the application of legislative measures, in these situations, it is necessary to look for opportunities to develop mutually beneficial solutions among all actors, as it was demonstrated in Evenkia by successful resolving the conflict in land use between the indigenous community and a large wood cutting company [29].

V. CONCLUSION

The fact that reindeer husbandry should become the driver of agricultural production development in the Russian North is determined mainly by the availability of a huge area of natural reindeer pastures. The objectives of all reindeer husbandry development programs in the North and in the Arctic, both federal and regional, should consist in the following:

- supporting reindeer husbandry and other traditional agricultural industries, cropping and crafts;
- developing the product processing in these industries; establishing trading stations, and developing trade and commodity turnover with indigenous communities;
- developing local energy base;
- developing market and ensuring rehabilitation of social infrastructure, providing health care and services.

Due to the fact that transportation expenses are the main component of the reindeer products cost, while the cost of energy in the Russian North is growing faster than in the more southern regions of the country, it is necessary to implement alternative energy sources, as well as to restore and improve the transport system.

To ensure the sustainable development of the Northern rural areas, it is necessary to diversify economic activities, which would include not only the development of reindeer herding, fishing, collecting wild plants, traditional to this reindeer region, but also crop plantation, production of valuable types of berries, mushrooms, and medicinal plants, as well as the processing of local traditional products, development of handicrafts for souvenir business, the creation of ecological and ethnographic reserves and sanctuaries, and organization of controlled environmental and ethnographic tourism.

The creation of smart Northern rural settlements is of great importance for the sustainable development of rural interpopulated areas in the Russian North, with the employment of young indigenous people playing a crucial role.

The priority task of the state should be providing the comprehensive development of the economic structure in the Northern rural areas, the reconstruction of the traditional way of life of indigenous peoples, the restoration of biological resources and the preservation of ecological balance to ensure sustainable development of rural areas. It is necessary to support and develop traditional economic sectors, their resource and production base.

In order to ensure food security and food sovereignty in the TTNM, it is necessary to provide a legislative framework for the rights of indigenous people. The solution of conflicts in land use in the North and the Arctic is possible only with the involvement of all actors and using the method of socially oriented monitoring of the population's quality of life.

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