Agro-Industrial Complex of the Arctic of Yakutia: Features of Development and Prospects

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Abstract. The Doctrine of Food Security of Russia determines the need for regions to ramp-up production. The ritual food of the nationalities living in the North is predominantly food of animal origin (up to 97% fat and up to 78% protein). Since senile industries are the main source and supplier of animal products in the Arctic, their development determines the food supply of the population not only in the Arctic zone, but also throughout Yakutia. The Arctic has significant natural resources, for this reason it is sometimes considered only from the perspective of obtaining economic benefits. There is another category of scientists who view it as an unspoiled and sensitive area, insisting on the need to limit industrial development in the region. Against the increasing of its geopolitical and economic importance, the underlying problem of the Arctic region development is being formed [1]. The article defines the role of Arctic agro-industrial complex senile industries in the food facility system and the economy of Yakutia. The purpose of the article is to assess the current state of the agro-industrial complex of the Arctic in Yakutia and, on its basis, to develop methodological approaches to address the problem. The relevance of the article is stemmed from the need to increase food self-production level of the region in accordance with the Doctrine of Food Security of Russia, from the position to preserve the agro-industrial complex senile industry of the Arctic in Yakutia and their development. The article novelty is to determine promising measures contributing to the development of the agro-industrial complex senile industry and to orient on increasing food self-production level.

1. Current status and the development trends of agro-industrial complex of Yakutia

The collapse of the Soviet Union determines the beginning of the transition from controlled to market-oriented economy. Owing to transitional processes, Russian agriculture experienced a decline in all sectors [2].

The economic reforms of Russia in the early 1990s have generated radical changes in the structure and volume of agricultural production [3]. Food supplies, its production, distribution and consumption are the key elements of the Russian and the world economies functioning. When assessing the prospects and options for improving food facility, it should be based on an objective assessment of the agro-industrial complex.

The socio-economic situation in the agro-industrial complex of Yakutia is multiple-valued. On the one hand, the low level of transport accessibility and material and commodity producers’ technical base limit the possibilities of their own production, and on the other hand, a reduction of producers determines the growth of food supplies from outside the region. At the same time, the level of food supply and the living standards largely depends on the sustainable operation of agro-industrial complex. In the Arctic, the development of agricultural production is the most important economical task, but also a social.
In general, the development of the Republic of Sakha (Yakutia) is inextricably linked with the agro-food sector activities, the main goal of which is to form an effective and sustainable agricultural production, providing the region’s domestic market with food supplies. Despite its small percentage in the gross regional product (GRP), the agro-industrial complex is one of the most important sectors of the republic’s economy. Establishment its own food economy in the North is the foundation of territory safety, supporting the development of new industries in the region, new jobs formation, and the local feedstuff production in a combination with the delivery of high-quality products from other regions of the country should be considered as the key factor for the development of the northern territories [4].

The climatic conditions negative impact on the health condition and the population living standards classifies the Arctic zone as territories that are uncomfortable for living. Providing good and affordable nutrition is the most important activity [5]. However, currently the agricultural sector is characterized by an unstable state. The agricultural production index clearly indicates the underperformance of financial and economic mechanisms. Over a long period, it does not reach the level of IFO GRP (fig. 1).

**Figure 1.** Indices of the physical volume of the domestic regional product and agricultural production for 2000, 2005, 2010, 2013-2018.

### 1.1. The Arctic agro-industrial complex development features and its role in the region food supply

At present, the agro-industrial complex of the Republic of Sakha (Yakutia) is unstable. This is primarily can be explained by the maladjustment of agricultural producers to market conditions.

The key industry of agro-industrial complex of Yakutia is livestock husbandry, which in the Arctic is represented by reindeer breeding, droving horse-breeding and cattle breeding. The specialization of 15 Arctic and northern districts corresponds to the complex character of the tradition-bound farming development. So, in Allaikhovsky, Anabarsky, Bulunsky, Zhigansky, Nizhekolymsky, Oleneksky and Ust-Yansky districts historically specialized in reindeer husbandry and fisheries; in Verkhoyansk, Momsky, Oymyakonsky, Tomponsky, Eveno-Bytantaysky districts were mainly engaged in reindeer, horse, and cattle breeding; Abyisky, Verkhnekolymsky, and Srednekolymsky districts were engaged in cattle and horse breeding, and fishing [6].
At present, the Arctic zone of Yakutia includes 13 municipalities with almost similar natural and climatic conditions. In addition, they are characterized by a low population density, and, despite their own agricultural production, they mostly depend on the supply of goods to northern Russia (fig. 2).

The results of the agro-industrial complex development over the past decades indicate low efficiency, but there is still continuing instability of the livestock inventory (fig. 3), and deteriorating the level of quality indicators.

Due to the lack of farm business financial means, they use obsolete technologies, which leads to an annual decrease in production indicators and a reduction in livestock population.

In reindeer husbandry and droving horse-breeding, quality indicators deteriorate, actual accretion of animal yield is reduced, and the death rate of agricultural animals is growing (fig. 4).
Because of the senile industries crisis, there are growing social problems. So, in recent years, the population employment and the living standard have been sharply reduced. The spontaneous development of the Arctic by production facilities with the purpose of maximum profit extraction has led to urgent decisions [7].

Nevertheless, the northern territories food market particularity, despite the agriculture, is a food shortages, which is caused by low food self-sufficiency, geographic distance and inaccessibility.

1.2. Factors and causes adversely affecting the development of agribusiness in the Arctic of Yakutia

In agriculture, there are a number of problems that contribute to its underdevelopment. This is primarily economic. State funding, according to global experts, is several times less to compare with European countries. Second problem is the human factor or low level of managers competence [8, 9]. To date, a system of measures to retain young specialists, including with the obligatory interaction of all participants in the training process for agriculture, starting from the management bodies of the agro-industrial complex, agricultural organizations, agricultural universities and their graduates, and to improve the activities of the agricultural management bodies at all levels, unfortunately, it is not implemented [10].

In addition, the financial instability of agricultural enterprises and the low rate of renewal of fixed assets remain among the factors negatively affecting and inhibiting the development of the agro-industrial complex. Hence the problem of lack of investment in agriculture. The low level of profitability of agricultural enterprises does not attract investors [11]. The main causes of the crisis state of agriculture are also such as shortcomings in the work of zootechnical and veterinary services, a low level of mechanization, and strong physical and moral depreciation of fixed assets [12, 13].

As for reindeer husbandry, as the main branch of traditional farming, its situation is becoming more and more alarming every year. The main reason for the crisis is an increase in the contradictions between the actual social status of society in the 21st century and the technology of reindeer husbandry, which remained at the level of the 17-18th centuries. The reindeer herder does not want to live in the conditions of two to three hundred years ago, and the industry as a whole cannot work profitably in the conditions of the modern market [14].

Reindeer husbandry is also negatively affected by industrial development, which leads to a reduction in reindeer pastures, unauthorized industrial dumps and a number of other negative consequences, including the death of domestic deer [15].

Herd horse breeding is another livestock industry in the Arctic. However, despite state support, both reindeer and horse-breeding farms are in a difficult economic and financial situation. Their situation may worsen due to large-scale plans for the industrial development of the Arctic zone of Yakutia.

The exploration areas of the Arctic of Yakutia include the territories of the largest territorial-production complexes and industrial units that produce natural resources. The development of resources in the places of residence and economic activity of the indigenous population is already negatively affecting their habitat and undermining the natural base of traditional industries. This leads to a decrease in production volumes [16].

2. Directions of agricultural development in the Arctic of Yakutia

The agro-industrial complex prospective development is because the need to provide adequate nutrition for the population living in this territory, as well as to solve employment problems and increase the level of food self-production.

Analyzing present and future state of food self-production in the Arctic, first of all, we should proceed from the natural and resource potential. Here, compared to Russia as a whole and directly to the North, the possibility of providing biological resources, with the exception of deer head per capita, is much lower [17].

2.1. State policy regarding agribusiness in the Arctic of Yakutia

Overcoming the agrarian crisis and the transition of the Arctic agro-industrial complex of Yakutia to dynamic development determines the need to improve the agrarian policy.
The state agrarian policy should ensure a regulated socially-oriented market system and create conditions for population labor activity and live, which must meet living standards in extreme conditions given the country socio-economic condition [18]. At the same time, to maintain the agricultural entrepreneurship social function in areas with unfavorable conditions will require much less public funds than new job formation for the local population in other sectors.

In the Arctic zone, it is necessary to form an agri-food system, taking into account innovative directions and forms of its improvement, corresponding to strategic plans for the development of the entire Russian Arctic, as well as tasks aimed at providing food in the region, respective to the Russian Food Security Doctrine. One of the ways to increase the agro-industrial complex efficiency and traditional industries is to change management methods. The functioning and comprehensive development of agricultural sectors should be based on the scientific, technical and managerial advanced achievements that are relevant at present, which implies the project management principles implementation. Project management or team management, can lead to a unique result. Project management is a methodology for managing important and ambitious tasks that have a specific goal, deadlines and limited resource allocation. The development and implementation of new technologies and products providing competitive position in the market, the introduction of modern management technologies at all levels of management, as well as reducing the costs of maintaining a huge managerial staff, are only part of the positive consequences of the project management introduction in the Arctic agricultural sector.

In addition, it should use foreign countries experience in creating at research institutions and regional centers in universities for studying the issues of agro-industrial complex development and crisis rural areas [19] to develop innovative solutions for increasing its effectiveness.

2.2 Prospective directions of the Arctic agro-industrial complex development

The key factor of the agro-industrial complex development is the public financial support that regulates pricing and provides the industry with investment attractiveness.

Traditional subsistence is the cornerstone of the livelihoods of indigenous people and it serves as a guarantee of the preservation of their culture and traditions. This circumstance determines not only the need to preserve traditional activities, but also to promote their development. Considering this circumstance as a strategic task, it is necessary to take into account the traditional subsistence’s weaknesses and strengths, as well as the economic and social environment constantly changing conditions.

Local agricultural production, due to unfavorable conditions of development, is not able to fully provide the population by food supply. Despite the fact that the self-sufficiency principle is unacceptable in the Arctic, the agro-industrial complex’s major priority should solve the issues of the production modernization and new production creation within the existing economic complexes. The territories infrastructure development, living standards improvement of the indigenous population, given the traditional types economy characteristics of indigenous peoples, is also a priority line in the North productive forces development [20]. The innovative sphere has a number of difficulties for development and application in the agro-industrial complex, such as the low level of scientific and educational complex that can provide the industry with highly qualified personnel. Meanwhile, some actions in this direction are already being taken, which require financial investments. The modern agro-industrial complex needs new working methods, including chipization, marking of animals and agricultural products, RFID technologies, test systems for agricultural animals early diagnostics, improvement of breeding work, and genetic researches.

Increasing the level and food consumption structure in the region can be achieved by a set of measures aimed at increasing food production. The innovative processing technologies development, especially senile industries’ livestock raw materials, construction and establishment of mini-processes will ensure the economic efficiency increase of the production itself.

At the same time, it is necessary to preserve agricultural entrepreneurship, but also to ensure its development, since its social function will require much less public expenses in areas with unfavorable conditions than the creation of new jobs for the local population in other industries.
When implementing regional strategic measures aimed at improving food supply, it is necessary to take into account the growing population in connection with the development of natural resources. Industrial development of the Arctic territories should ensure the harmony of interests with traditional sectors of the agro-industrial complex, ensuring their preservation and development. This means the social responsibility of companies to ensure the socio-economic development of the Arctic zone of Yakutia and, of course, directly to traditional industries.

3. Conclusion
The agro-industrial complex performance improvement in the Arctic of Yakutia should be implemented through the integrated formation of public regulation optimal structure, i.e. through the application of an effective state policy and the organizational and economic mechanism of Arctic agriculture state management, focused on innovative development and the latest technologies application, as well as with the observance of the social, economic and environmental interests of all interested parties in the territories of traditional nature management.

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