

# The concept of formation of agricultural food systems in the border regions on the principles of network-centric structures

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**Abstract.** The theoretical and practical approaches to the organization of the territorial economy in agricultural regions on network-centric principles are considered in this paper. Their effectiveness has been proven within the sinter theory in the conditions of market economy and planned economy. The effectiveness of horizontal linkages in clusters of commercial complex provides the opportunity to conduct economic activities, mutually beneficial, efficient use of resources usage cross-border territories. Exploring the resource potential of Large regions of Altai enabled us to identify opportunities to significantly increase the production of the ecologically clean certified meat and dairy livestock products with special properties and contains useful microelements, vitamins, competitive not only in the domestic but also in global markets. This is due to the problem of ensuring healthy nutrition as well as recruiting in world popularity, slow food movement, based on the principle of ecological compatibility of natural products consumed. Thus, the eco-production is able to become a “growth pole” for the rural territories.

## 1. Introduction

One of the areas of agricultural policy aimed at ensuring the sustainability of ecological agriculture (including livestock) is the development of cooperative forms to increase production volumes of livestock products, providing the people of the region and other territories with environmentally-friendly food products. However, the development of Rural Studies show that the production, supply, and marketing cooperatives and its other forms are not sufficient in themselves to modern conditions. There is therefore a need for cooperation and integration, providing a positive impact on the development of the territories.

## 2. Materials and Methods

The resource potential of the studied cross-border territories, including Altai Krai, Altai Republic, and Mongolia, in the production of ecologically pure meat and meat products, on the basis of historical economic ties these regions [9] is enormous. Additionally, there are many natural objects included in the UNESCO list of world natural heritage [1]. These products are uniquely characterized by the world community as environmentally friendly.

Taken into account the fact that the territories of Altai Krai and Altai Republic, as well as in Mongolia, authentic homemade breeds adapted to local conditions. Their presence is the proof of careful attitude to the local genetic resources, the success of breeding and selection work. The largest research specialist in the preservation of the pets' gene pool Y. Stolpovskogo states that the availability of local breeds is the most important objective condition for the production of

environmentally friendly and traditional foods. In the transboundary region, 14 species new species have been genetically bred [4]. In turn, as a result of many years of breeding work, there are the genetically bred sheep in Mongolia (“Uzjemchin” and “Bayaz”) [4]. These local breeds are different with their exclusive endurance and pure genes. It is clear that the natural pets’ elite gene pool acquires special significance in the context of increasing diseases in cattle fed industrially. According to the results of biochemical research, the beef from the mountains of Altai Krai, Altai Republic, and Western Mongolia is environmentally friendly. Only natural feeds are used in that region, without elements of agricultural chemistry and pesticides. Mongolia currently contains 50 million only cattle, a quarter of which is consumed by China due to its high quality [5].

Our studies on the basis of the Main Central Scientific-Industrial Veterinary Radiological Laboratory were focused on the justification of ecological purity and nutritional value of meat grown in farms of the Altai Republic, Altai Krai, and Zavhanskogo aimak and demonstrated high ecological safety and high content of useful micro and macro elements, vitamin, and acid preparations.

### 3. Results and Discussion

We have three samples of meat: (1) the first sample (beef, frozen in quarters) is collected in the Altai Krai (Petropavlovsky District); (2) the second sample (beef, frozen in quarters) is from the Altai Republic (Ongudaysky region, IP “Sajdanov, A. B.”); (3) the third sample (beef stew) is from Ulaanbaatar, Armos, Mongolia. In the future, it is necessary to conduct research and laboratory complex studies on the qualities of the Mongolian and Russian meat livestock. Special significance is given in the research on content in meat of cattle, yaks, sheep vitamins and minerals, positively affect the human body. It is important to conduct experiments on the therapeutic effect of the high-mountainous Altai meat. It is planned to develop research in cooperation with scientists from Medical University on the appropriateness of this meat to supply patients undergoing heavy operations. There is every reason to believe that we get here very important scientific results of great social and economic importance for the development of recreational areas, tourism in Altai. Some positive results have been achieved in the medical and therapeutic practice in the Altai region.

It is worth mentioning that the processes of cooperation and integration in the development of livestock production and processing of cross-border territories of Altai and Western Mongolia have long historical roots. In Soviet times, meat from Western Mongolia were almost entirely processed in the Altai Krai and the East Kazakhstan region (at the Semipalatinsk and Bijskom meat-processing plants). In the 90s years, customs and veterinary barriers of the Russian-Mongolia actually blocked the possibility of exporting Mongolian meat on territory of the Altai region and Republic of Altai.

In turn, this has led to substantial investments of 15-20 years restructuring the Mongolian herds and exacerbated the problems in animal husbandry. At the end of the 90s and in the early years of the twenty-first century, the production of high-quality is done in the cities of Kobdo and Bayan-Ulgii by the entrepreneurs from Gorno-Altai. Lack of effective marketing, logistics, and purely technologic reasons do not allow make their businesses profitable.

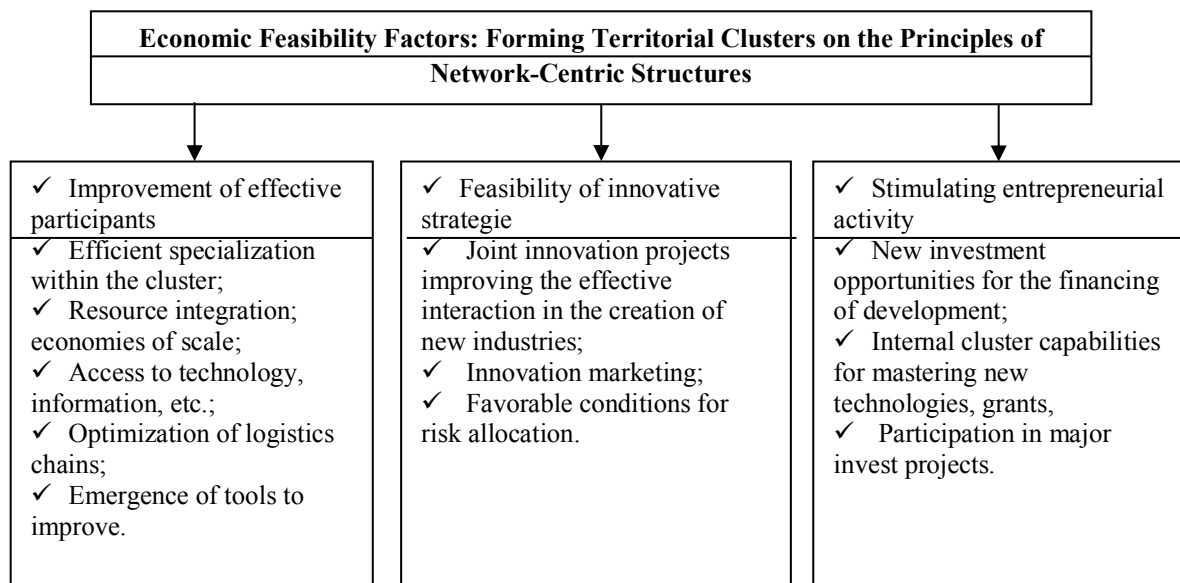
For the gradual resumption and development of the high-value production based on their food and curative properties of meat and products of its processing in modern conditions, it is necessary to form agri-food systems based on the principles of cross-border regions and network-centric structures in the form of territorial innovation economic clusters. In particular, the formation of cross-border territories cluster meat will solve the complex laws and customs problems associated with Mongolian meat import conditions on the Russian territory. Also, it is necessary to look for transferring the processing equipment and agricultural machinery on the territory of Mongolia. In particular, it is highly advisable to use the veterinary expertise and technology developed in Russia to improve the organization of sanitary-epidemiological and veterinary control in Mongolia.

Forming a cluster would accelerate solving the problems of innovative development, transport, production, and social infrastructure. A large role in these processes is assigned. There should be a successful co-op experience in Sweden and Finland, where major amounts of meat and dairy products produce just cooperatives. Given the predominantly family nature of Mongolian livestock, its

cooperation in reconstruction of traditional Russian markets could provide a significant economic multiplier effect. The establishment of procurement, consumption and, possibly, credit cooperatives in the Western Mongolia will require a qualitative economic advice. To solve this problem, all interested parties should quite seek assistance from the capable economists-Altai agrarians, in our opinion. It is helpful to organize a Cooperative Advisory Centre, which would coordinate economic cooperation in the cross-border regions. The large meat processing enterprises of the Altai region and Republic of Altai become the core of such a cross-border cluster.

Within our project, we have developed a number of theoretical and practical approaches to the territorial economy of border regions on the network-centric principles. Their effectiveness has been proven in the conditions of market economy and planned economy. The effectiveness of horizontal linkages in clusters of commercial complex provides the opportunity to conduct economic activities, even in cases where they, in terms of classical investment analysis, appear to be completely unprofitable. A formation of cluster agglomeration, possibly in the form of a formalization of economic partnership structure prevailing at that time in a specific territory. In a cluster structure, in addition to agricultural producers, processors, infrastructure organizations will include scientific organizations: Altai State Agrarian University, Gorno-Altaysk Research Institute of Agriculture, Research Institute of Water and Ecological Problems of the Russian Academy of Science, Altai Regional Institute of Ecology, and others.

Clustering economy enables a comprehensive look at public policies for regional development, increase productivity, efficiency and competitiveness, cluster members. Additional opportunities for innovative development, in general, increased the levels of employment and quality of life [3]. In addition, we justified factors of the feasibility of forming of territorial economic clusters based on principles of network-centric agri-food structures (fig. 1).



**Figure 1.** Factors of economic feasibility.

#### 4. Conclusion

Our research clearly shows that the economic feasibility of developing the territorial economic clusters based on the principles of network-centric structures evolves could have other expansion opportunities, adapting to specific situations. It is a systematic interaction in the integrated entities induces additional effect.

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