

Mechanism of Cooperation of Private Subsidiary Plots of the Republic of Tuva in the Production of Livestock Products

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Abstract—The aim of this work is to develop a mechanism for integrating private subsidiary plots as an individual form of entrepreneurship activity with agricultural business entities for livestock production in the Republic of Tuva. The problem of studying private subsidiary plots occupies an important place in economic studies. One of the most important research topics of recent years is related to the provision of food to the population. In the Republic of Tuva, private subsidiary plots have become not only the main means of survival of the rural population in the conditions of a sharp decline in production in the 90s, but also retains the ability to solve the issue of food supply. This article is based on the analysis of the current state of production by private subsidiary plots in the Republic of Tuva and the results of the field studies conducted by the authors in districts of the republic in the summer of 2019. The source base is the results of the interviewing of farmers, individual livestock breeders, and heads of agricultural departments of district administrations. In the early 2000s, livestock products were necessary for the population of the republic for its own consumption, at present, with an increase in the number of livestock in households, it is proposed to orient livestock products to the market using the mechanism of cooperation of private subsidiary plots with business entities in the field of agricultural production

Keywords: *private subsidiary plots, population, animal husbandry, production, processing, agricultural products, cooperation, Republic of Tuva*

I. INTRODUCTION

The study of private subsidiary plots has an important place in economic science. Certainly, classics of the theory of the peasant economy are the works of A. V. Chayanov [1]; the theme of the informal economy of modern Russia, that private subsidiary plots are part of, is reflected in the works of M.A. Nikulin [2]; issues related to determining the place and role of private subsidiary plots in the Russian economy are reflected in the studies of V.I. Savkin [3], etc. Among the foreign researches, activities of households engaged in farming (family farms) are studied and reflected in the works of J. Forero-Álvarez [4], C.H. González and M.P. Fernández [5], N. Popovich [6] and others. Actualization of cooperation between private subsidiary plots and agricultural entities is considered in the studies of E.V. Ivanova, AV. Nikitin [7], as well as R.G. Yanbykh, V.A. Saraykin, and Z. Lerman [8], and also M. Altman [9].

However, at present, the range of issues related to the activation of the entrepreneurial potential of private subsidiary plots in different socio-economic conditions requires further research. In this paper, the authors consider the mechanism of cooperation between private subsidiary plots and other agricultural entities in the context of the development of territorial economic clusters.

The relevance of this problem is due to the fact that during a number of reform years of the end of the last century and the

beginning of the first decade of the current century, the agro-industrial complex of Russia has experienced difficult times which are rightly called the crisis period. During the crisis period, rural settlements lost not only production facilities (machine-tractor stations, construction shops, dairy farms, veterinary points, etc.), but also social infrastructure for the rural population: medical, consumer, transport, and other services. In the late 90s in the Republic of Tuva, the number of cattle decreased to 97 thousand and small cattle to 653 thousand. Increasing trends in the differentiation of socio-economic indicators of urban and rural areas led to significant migration of the rural population to the capital of Tuva – Kyzyl [10, 11]. However, due to the preservation of national economic characteristics by local communities – globalization – rural settlements of Tuva have been preserved, in particular, through the instruments of the informal economy. The latter, as M.A. Nikulin notes, acts "as a tool used by the local rural communities to confront the model of social and economic development imposed from above; and, on the contrary, as a tool of the embedding of local communities in a new social and economic context of modern life as painless and successful as possible" [2]. In Tuva, within the framework of historically established cultural and traditional, climatic and industrial conditions, the core of the informal economy is the breeding of domestic animals. The critical point of livestock reduction was passed in 2002. Thanks to 47 thousand private subsidiary plots of the republic, the number of cattle has reached 171 thousand heads and the number of small ruminant has reached 1311 thousand heads over the past decade. By the number of livestock, Tuva is the leader among the territories of the Siberian Federal District taking the third place in the country [12]. Households produce traditional dairy and meat products, clothing and household items.

II. RESEARCH METHODS

The methodology of the study is based on the economic principle, the principle of historicism and objectivity in the disclosure of ethnic economy, features of technologies and traditional technical means used by representatives of the ethnic group "tuvans". In the study of economic and social consequences of economic processes in the ethnical economy of the republic in the context of globalization over the past three years, a comprehensive approach was applied in which the results of historical and also economic researches and field studies were used, this revealed the resource potential of private subsidiary plots (PSP) of the population in the market system.

III. RESULTS OF THE RESEARCH

Since ancient times the Tuvans have bred seven types of livestock (cattle, sheep, goats, horses, yaks, camels, and deer), however, the priority area of the livestock industry is sheep and goat breeding [13]. Sheep and goats of the Tuvan breed have such features as endurance, ability to travel long distances, adaptability to the local climate and poor fodder base. It is worth noting that the cultivation of grain crops is also the main economic activity for Tuva but it is subsidiary to animal husbandry. This is due to the fact that Tuvan farmers are not able to compete with the neighboring regions – Altai

Krai, Krasnoyarsk Krai, and the Republic of Khakassia – where soil and climatic conditions are favorable for crop production. In Tuva, the yield of grain and fodder crops is much lower even in irrigated fields (on average 7-11 quintals per hectare), the cost of crop production is high and this leads to unprofitability of the area. Uncompetitiveness of crop production automatically predetermines low economic efficiency of both the development of pig and poultry farming and the fattening of young cattle and small ruminants for sale. The share of crop and livestock products produced in farms of all categories in agricultural products is 15.8% and 84.2%, respectively [14]. The main grain area of Tuva is Tandy district where 78% of the total grain wedge of Tuva (more than half of the total forage crops) and about 13% of the total potato field are located.

As noted above, in recent years, 47 thousand private subsidiary plots, 86 agricultural enterprises, 416 peasant (farm) holdings and agricultural cooperatives, 47 nonprofit associations (36.2% of which are horticultural associations of citizens), and 19 individual enterprises, as well as the implementation of the national project "Development of Agriculture" and the Republican government programs have made possible not only to restore but also to increase the number of livestock that exceeded the number of livestock in the best years of the 80s of the last century. 313 peasant (farm) holdings are created at the expense of the agricultural development program "Kyshtag for a young family" (kyshtag (*tuvan*) – a livestock holding) and also 869 low-income families are provided with cows and calves at the expense of the program "A cow-breadwinner". As of January 1, 2018, in farms of all categories, the number of livestock amounted to 163.8 thousand heads (1.1 % more than in 2017) including 72.0 thousand heads of cows (an increase of 1.1 %), 1157.3 thousand heads of sheep and goats (an increase of 8.7 %), 80.8 thousand heads of horses (an increase of 1.7 %), 11.9 thousand heads of yaks, 0.271 thousand heads of camels, and 3.65 thousand heads of deer. More than 60% of all types of cattle belong to private subsidiary plots of the population. At the same time, the percentage of sales, processing, and trade of agricultural products and food commodities produced by farms of all categories of the total production of agricultural products (crop and livestock) is very low, in particular: grain, cereals, and legumes – 28.3%; potatoes – 30.4%; vegetables – 36.7%; cattle and poultry meat – 56.5%; milk – 27.6%; eggs – 41.4%. For comparison, table 1 shows the percentage of sales and processing of agricultural products produced by private subsidiary plots of the population from the total agricultural production for 2016-2017.

Based on the above data, we can say that the potential of crop and livestock production in Tuva is significant (more than 50% for each type of agricultural products). At the same time, there is a paradoxical situation of underutilization of milk processing enterprises of Tuva (table 2). As can be seen from table 2, of all the listed milk processing business entities, only three are working at full capacity: agricultural consumer cooperative "Hundu"; individual entrepreneur the Head of a peasant (farm) holding A.B. Tyulyush; individual entrepreneur the Head of a peasant (farm) holding Ch.Kh.-D. Oiun. In

general, the average underutilization of production capacities of milk processing enterprises of Tuva is 82%.

The main problems hindering the development of the dairy industry of the republic include:

- seasonal character of production, i.e. yield of milk in private subsidiary plots is made only for own consumption;
- organizational and zootechnical works are not carried out;
- low productivity in dairy cattle breeding of the republic;
- low specific weight of higher-grade dairy raw;
- lack of refrigeration on dairy farms;
- high costs in the milk processing due to the high cost of electricity and fuel and lubricants.

TABLE I. MARKETABILITY OF AGRICULTURAL PRODUCTION IN PRIVATE SUBSIDIARY PLOTS (SOLD AS A PERCENTAGE OF TOTAL PRODUCTION) [14]

Agricultural products	2016	2017
Grain, cereals and legumes	19,8	18,0
Potato	24,6	24,3
Vegetables	26,1	26,0
Cattle and poultry meat	49,6	51,4
Milk	17,6	18,7
Eggs	10,5	11,6

Analysis of the production volumes of 11 meat processing enterprises shows that all of them are working at full capacity. The volume of production of meat products in natural terms for 2017 is presented in table 3. As can be seen from table 3, meat processing enterprises operating in 7 districts of the republic and one – in the urban district: Kyzyl city, Dzun-Khem (Chadan town), Kyzyl (Sukpak village), Piy-khem (Uyuk village), Tandy (Bai-Khaak village), Tes-Khem, Ulug-Khem (Khairakan village), Chedi-Khol (Ak-Tal village), and Erzlin (Bai-Dag village) districts – increased production in 2017. All of them were established in 2011. In terms of production capacity, the largest are: Tuvan meat processing company Agricultural consumer cooperative "Zarya", Agricultural consumer cooperative Breeding Farm «Bai-Khol»; individual entrepreneur U.D. Oorzhak. The last two have not yet reached their design capacity. The reason for this, in our opinion, lies in the following circumstances. For the Agricultural consumer cooperative Breeding Farm "Bai-Khol", a meat processing enterprise with a large production capacity, in terms of zoning the territory of Tuva taking into account transport accessibility, the wrong choice of location was made. For the South-Eastern part of Tuva, the most optimal place for such a productive capacity is the village of Samagaltay (Tes-Khem district). In this case, such basic conditions as transport accessibility of delivery of raw and sale of finished products for a large number of consumers will be met. The problems of the meat processing plant established by individual entrepreneur U.D. Oorzhak in the town of Chadan, in our opinion, are the following: first, when designing a meat

processing plant, a mistake was made in the technological sequence of production; second, with the right choice of location, supply and sale of finished products was not organized; third, personnel with professional education are not prepared or selected. The latter is typical not only for this enterprise, but also for the Bai-Dag.

Consider the results of the survey of the enterprises producing and processing milk and meat, farmers and households of rural settlements that are engaged in private subsidiary plot conducted by us in July of 2019. Thus, the following problematic issues were identified:

- the determination of the purchase price of milk and meat acceptable to both suppliers and producers. According to the owners of farms and private subsidiary plots, the current purchase price is underestimated almost twice. According to them, in this price range, revenues do not cover the costs of grazing and feeding cattle, sheep, goats, and other livestock. Taking into account the above it is necessary to determine the fair pricing;
- the lack of development of a strict schedule of delivery of raw materials in which penalties should be provided for every hour of delay in the delivery of milk or meat, as well as for the provision of low-quality raw;
- storage of raw and the lack of special equipment;
- the lack of qualified specialists in the field of management, finance, and law who are engaged in the procedure of concluding contracts between producers and suppliers of raw materials (owners of farms and private subsidiary plots);
- organization and control of work in accordance with the technological sequence of production and logistics of transport.

The solution of the above-mentioned problems requires setting tasks in social, infrastructural, and financial aspects. The first means the training of highly qualified specialists and employees of the required professions according to the relevant staff lists of agricultural enterprises. To do this, the heads of processing enterprises should conclude contracts with universities and technical schools for the targeted training or requalification of the required specialists and workers from among the youth living in these municipal areas. Infrastructure issues are solved by the construction of production facilities, the acquisition of additional equipment for storage of raw materials for the smooth operation of processing enterprises, and the creation of receiving points of milk and meat in rural settlements, as well as the acquisition of special equipment for the delivery of raw materials. The issue of financing infrastructure and social facilities can be solved through various types of concessional lending, grants, and budget subsidies. For funding, organizations must participate in the tender. In practice, this is more difficult to do. Firstly, the size of the subsidy may differ in different regions of the country as well as within the same region in its different areas. Secondly, the process of obtaining concessional funds is complex. Third, each of the processing enterprises mentioned in tables 2 and 3

The study was carried out with the financial support of the RFBR grant 19-010-00831\19 A and the grant of the Government of the Republic of Tuva 18-410-170002/19 r_a.

TABLE II. USE OF PRODUCTION CAPACITIES OF SHOPS FOR THE PRODUCTION OF WHOLE MILK PRODUCTS IN THE REPUBLIC OF TUVA FOR 2019 [15]

Name of the shops and products	Unit	Production capacity of shops	Production		Capacity utilization in 2018, %
			2017	2018	
Whole milk products	tons	12568	3979	2655	21
<i>Mongun-Taiga district</i>					
1. Limited Liability Company «Saizyrab», Kyzyl-Khaya village	tons	24	8	8	33
<i>Dzun-Khemchik district</i>					
2. Agricultural consumer cooperative «Hundu», Saryg-Alaak-Oi village	tons	140	244	308	220
<i>Chaa-Khol district</i>					
3. Individual entrepreneur the Head of a peasant (farm) holding O. B. Balchy, Chaa-Khol village	tons	140	60	48	34
<i>Chedi-Khol district</i>					
4. Agricultural consumer cooperative «Ogzham», Ak-Tal village	tons	280	138	141	50
<i>Ulug-Khem district</i>					
5. Agricultural consumer cooperative «Ulug-Khem», Shagonar town	tons	280	37	11	4
<i>Kyzyl district</i>					
6. Agricultural consumer cooperative «Sayan-Daa», Tselinnoe village	tons	280	208	238	85
<i>Piy-Khem district</i>					
7. Agricultural consumer cooperative «Arzhaan», Arzhaan village	tons	280	170	183	65
8. Individual entrepreneur the Head of a peasant (farm) holding A.B. Tyulyush, Uyuk village	tons	280	259	335	119
<i>Tandy district</i>					
9. Individual entrepreneur the Head of a peasant (farm) holding Yu. Sh. Loigu, Aryg-Bazhy village	tons	24	18	19	79
10. Individual entrepreneur the Head of a peasant (farm) holding Ch. Kh.-D. Oyun, Balgazyn village	tons	560	770	961	171
<i>Kyzyl city</i>					
11. Limited Liability Company «Tyvamoloko»	tons	10000	1779	143	1,4
12. Agricultural consumer processing cooperative «Turanskoe»	tons	280	288	260	93

received subsidies from the Republican budget at the time of their establishment. Fourth, as domestic and international experience shows, facilities tend to preserve the situation without solving the problem itself. Fifth, comprehensive government support to be provided according to the Federal law “On the private subsidiary plots”, in practice, does not often give the guarantees for the development of the private subsidiary plots of population [16].

In this situation, the cooperation of private subsidiary plots with economic entities of the agro-industrial complex allows to multiply the potential and resources, as well as to solve tasks by collective forces. To date, cooperation and integration have become the most progressive forms of interaction between different participants in the chain of production, processing, and sale of products [17, 18, 19]. As the domestic experience, namely the experience of the kolhoz, shows that the integration of personal subsidiary plots into agricultural consumer cooperatives contributes to the development of technological types of agricultural products which in turn contributes to the development of regional and national markets.

IV. DISCUSSION

The basic algorithm for the formation of a model of interaction between private subsidiary plots and anchor agricultural cooperatives is presented in figures 1 and 2.

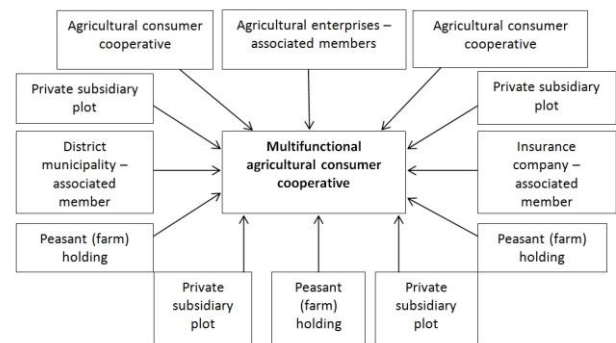


Fig. 1. Organizational model of the creation of multifunctional agricultural production cooperative

The motive for the interaction for private subsidiary plots with a multifunctional agricultural consumer cooperative is the

TABLE III. PRODUCTION OF MEAT PRODUCTS OF ENTERPRISES OF FOOD AND PROCESSING INDUSTRY OF THE REPUBLIC FOR 2017 (IN NATURAL TERMS)

N	Name of shops and products	Year of foundation / project capacity	Volume of production, tons		Change, %
			2016	2017	
1.	Chilled and frozen sheep meat		196	294,8	150
1.1.	Agricultural consumer cooperative Breeding Farm «Bai-Khol», Bai-Dag village, Erzin district	2015 / 240	129	106	82,2
1.2.	Tuvan meat processing company Agricultural consumer cooperative «Zarya», Sukpak village, Kyzyl district	2016 / 420	67	188,8	2,8 times
1.3.	Individual entrepreneur U.D. Oorzhak, Chadan town, Dzun-Khem district	2016 / 240	-	-	-
2.	Frozen beef		420	359	85
2.1.	Tuvan meat processing company Agricultural consumer cooperative «Zarya», Sukpak village, Kyzyl district	2016 / 420	420	359	85
3.	Edible offal of slaughter animals		41,3	25,0	61
4.	Sausage goods		215,7	237,5	110
4.1.	Individual entrepreneur A.Ya. Nanetashvili, Kyzyl city	2002 / 2,0	168	168,4	100,2
4.2.	The Head of a peasant (farm) holding V.D. Soyan, Bai-Khaak village, Tandy district	2014 / 1,0	0,8	0,5	62,5
4.3.	The Head of a peasant (farm) holding V.D. Serenmaa, Ak-Tal village, Chedi-Khol District	2015 / 0,1 per shift	0,5	0,5	100
4.4.	Tuvan meat processing company Agricultural consumer cooperative «Zarya», Sukpak village, Kyzyl district	2016 / -	44,9	65,8	146,5
4.5.	Individual entrepreneur U.D. Oorzhak, Chadan town, Dzun-Khem district	2016 / 240	1,5	2,3	153,3
5.	Meat semi-finished products		158,9	171,1	107
5.1.	Individual entrepreneur A.Ya. Nanetashvili, Kyzyl city	2002 / 2,0	35	35	100
5.2.	The Head of a peasant (farm) holding O.K. Shirin, Sukpak village, Kyzyl district	2011 / 1,0	90	90	100
5.3.	The Head of a peasant (farm) holding V.D. Soyan, Bai-Khaak village, Tandy district	2014 / 1,0	3,4	3,5	102,9
5.4.	The Head of a peasant (farm) holding A.B. Tyulyush, Uyuk village, Piy-Khem district	2011 / 1,0	26	35,2	135,4
5.5.	Individual entrepreneur U. D. Oorzhak, Chadan town, Dzun-Khem district	2016 / 240	2,0	5,4	2,7 times
5.6.	The Head of a peasant (farm) holding M.B. Tumat, Khairakan village, Ulug-Khem district	2014 / 0,1 per shift	1,0	1,0	100
5.7.	Individual entrepreneur M.B. Shokar, Tes-Khem district	-	1,5	1,0	66,7
6.	Poultry meat		0	82,8	
6.1.	Limited Liability Company «Zarya» Poultry farm, Khaa-Khem urban village, Kyzyl district	2017 / -	0	82,8	-

replacement manual labor with mechanization, infrastructure support, reducing the dependence on the cost of selling livestock products, reducing the risks of keeping livestock, and increasing the income from business activities.

Generalization and systematization of normative documents devoted to forms of cooperation [20] and theoretical foundations of the business economy (individual, collective and corporate forms of entrepreneurship in agriculture), existing in the scientific literature [21], allowed to build a fundamental structure of an agricultural consumer cooperative taking into account the peculiarities of production and processing of agricultural products in Tuva (Fig. 2).

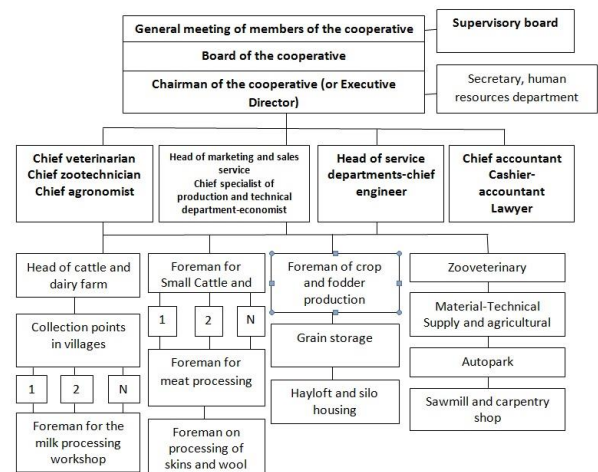


Fig. 2. Structure of multifunctional agricultural consumer cooperative

From the point of view of the reduction of logistics and transport costs, the identification of the locations of anchor agricultural production cooperatives is important in the creation of collective business structures. In this regard, we

propose to create basic agricultural consumer cooperatives in certain territorial zones of Tuva. It is proposed to use the territorial zoning model for ethnical clusters (ethnoclusters) of entrepreneurial activity in the Republic of Tuva optimized for the transport factor developed by B.A. Dongak [22], with the addition of the zone VI, as the initial base for the placement of basic agricultural consumer cooperatives (Fig. 3). To the five optimized territorial zones, we add a sixth zone with the center in the village of Solchur, Ovr district (circled in black) (Fig. 3), which includes two South-Western border areas: Mongun-Taiga and the Western part of Ovr district. The need to allocate an additional sixth territorial zone is related to the following circumstances. These regions are connected with other regions of Tuva by only one road – the Federal road P267 which passes through zone III (Dzun-Khemchik district); zones III and VI are separated by the high mountain range Tannu-Ola. The reason of addition zone VI of the ethnocluster of entrepreneurial activity is connected not only with the transport connectivity of these areas, but also with the similarity of the bred cattle. In particular, in these areas more yaks are bred in comparison with other regions of the republic. Ovr district is the leader in the number of small cattle in Tuva, and together with Mongun-Taiga district it can produce meat and dairy products in optimal quantities. It should also be noted that in accordance with the development Strategy of the Republic of Tuva until 2030 [23] and the Individual plan of socio-economic development of Tuva for the period 2020-2025 [24], the development of transport corridors is envisaged in these border areas. In particular, in the Individual development plan of Tuva, it is planned to change the status of the automobile checkpoint across the Russian-Mongolian state border "Khandagaity" to a multilateral one under a temporary scheme before the measures for its reconstruction begin; and on the territory of Mongun-Taiga district it is planned to build an interregional highway Kyzyl-Khaya (Republic of Tuva) – Kosh-Agach (Republic of Altai) with access to the Chui tract. These international and interregional transport corridors will allow ethnoclusters to increase trade and economic relations with Mongolia and the Altai Republic in the future. Taking into account the above, we present the optimized territorial zones of B.A. Dongak supplemented by the sixth zone:

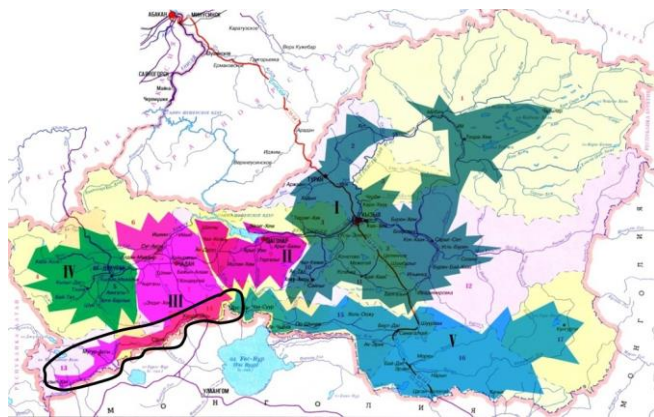


Fig. 3. Territorial zone for the organization of business activities ethnoclusters optimized for the transport factor

- zone I with the center in the Kyzyl city which includes Kaa-Khem, Kyzyl, Piy-Khem, Tandy, Todzha, and Chedi-Khol districts. Recommended places of organization of agricultural consumer cooperatives – Saryg-Sep village, Sukpak village, Turan town, Sosnovka village, Elegend village;
- zone II with the center in the Shagonar town: Ulug-khem and Chaa-Khol districts. Recommended places of organization of agricultural consumer cooperatives – Haiyakan village and Ak-Turug village;
- zone III with the center in the Chadan town: Dzun-Khemchik and Sut-Khol districts. Recommended places of organization of agricultural consumer cooperatives – Haiyakan village and Kirov village;
- zone IV with the center in Kyzyl-Mazhalyk village: Bai-Taiga and Barun-Khemchik districts. Recommended places of organization of agricultural consumer cooperatives – Kyzyl-Mazhalyk village and Teeli village;
- zone V with the center in the Samagalday village: Tes-Khem, Tere-Khol, Erzin, and Eastern part of Ovr districts. Recommended places of organization of agricultural consumer cooperatives – Samagaltay village and Erzin village;
- zone VI with the center the Solchur village: Ovr (Western part) and Mongun-Taiga districts. Recommended places of organization of agricultural consumer cooperatives – Solchur village and Mugur-Aksy village.

V. CONCLUSION

First of all, integration of private subsidiary plots into collective forms of entrepreneurship will reduce transaction costs associated with the sale of products using an effective management model. Secondly, with the help of the multifunctional agricultural consumer cooperative, production and business structures will be created in the respective territorial zones of the ethnoclusters and this will stimulate the development of rural areas of the republic. Thirdly, in the conditions of increasing competition, high-tech production of agricultural products will be stimulated. At the same time with the established agricultural business structures in rural areas, service infrastructure for medical, educational, cultural, leisure needs of villagers will be developed.

ACKNOWLEDGMENTS

The study was carried out with the financial support of the RFBR grant 19-010-00831\19 A and the grant of the Government of the Republic of Tuva 18-410-170002/19 r_a.

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