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DEVELOPMENT OF HORIZONTAL TYPE COOPERATION РАЗВИТИЕ

КООПЕРАЦИИ ГОРИЗОНТАЛЬНОГО ТИПА КӨЛДЕНЕҢ ТИПТІ

КООПЕРАЦИЯНЫҢ ДАМУЫ

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Abstract. The need to develop horizontal type cooperation as the basis of integration ties between enterprises of related sectors of AIC of Kazakhstan has been justified. The establishing of medium and large commodity productions and cooperative entities plays an important role. In establishing cooperatives based on the unification of small peasant farms of population, it is important to determine the optimal production structure which ensures the effective use of the resource potential and achievement of maximum profitability level. The article shows the ways of addressing this problem based on the use of economic-mathematical model. An important issue is the unification of small commodity producers and large processing enterprises into cooperatives. Correspondingly, the issues of regulation of interaction ensuring equal and mutually beneficial partnership, compliance with obligations in supply of raw materials and implementation of payments have been considered. Other issues related to the organizational and economic prerequisites for the development of cooperation in agricultural sector of the republic have also been revealed. The article contains the research results on grant financing for 2015-2017 in the budget program 217 "Scientific Development", sub-program 102 "Grant funding for research" on the project topic: No. 5467 / GF4, registration number No. 0115RK01913.

Аннотация. Обоснована необходимость развития кооперации горизонтального типа как основы интеграционных связей между предприятиями смежных отраслей АПК Казахстана. Важная роль отведена созданию средних и крупных товарных производств и кооперативных форм хозяйствования. В создании кооперативов на основе объединения мелких крестьянских хозяйств населения важно определение оптимальной структуры производства, обеспечивающей эффективное использование ресурсного потенциала и достижение максимального уровня доходности. В статье показаны способы решения этой задачи на основе использования экономико-математической модели. Важная проблема - объединение мелких товаропроизводителей и крупных перерабатывающих предприятий в кооперативы. Соответственно рассмотрены вопросы регулирования взаимоотношений, обеспечивающие равноправное и взаимовыгодное партнерство, соблюдение обязательств в поставках сырья и осуществлении расчетов. Раскрыты и другие вопросы организационных и экономических предпосылок для развития кооперации в аграрном секторе республики. В статье опубликованы результаты исследований по грантовому финансированию на 2015-2017 гг. в рамках бюджетной программы 217 «Развитие науки», подпрограмме 102 «Грантовое финансирование научных исследований» по теме проекта: №5467/ГФ4, регистрационный номер № 0115RK01913.

Аңдатпа. Қазақстанның АӨК аралас салаларының мекемелері арасындағы интеграциялық байланыс негізінде көлденең типті кооперацияны дамыту қажеттігі негізделген. Басты рөл орта және ірі тауар өндірушілерін және кооперативті негіздегі шаруашылық жүргізуді құруға берілген. Тұрғындардың ұсақ шаруа шаруашылықтарын біріктіру арқылы кооперативтер құруда ресурстық әлеуетті тиімді пайдалануды және кірістің ең жоғары деңгейіне жетуді қамтамасыз ететін өндірістің ұтымды құрылымын анықтау маңызды. Мақалада осы мәселені экономикалық-математикалық модельді пайдалану арқылы шешу әдістері көрсетілген. Маңызды мәселе – ұсақ тауар өндірушілерді және ірі қайта өндеу мекемелерін кооперативтерге қосу. Сондай-ақ, тең құқылы және өзара пайдалы әріптестікті қамтамасыз ететін қарым-қатынас мәселелері, шикізатты жеткізу және есептерді жүргізудегі міндеттерді сақтау мәселелері қарастырылған. Республиканың аграрлық секторындағы кооперацияны дамыту

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Key words: agricultural sector, cooperatives, peasant farms, taxes, integration contracts, production parameters, efficiency, market.

Ключевые слова: аграрный сектор, кооперативы, крестьянские хозяйства, налоги, интеграционные контракты, производственные параметры, эффективность, рынок.

Түйінді сөздер: аграрлық сектор, кооперативтер, шаруа шаруашылықтары, салықтар, интеграциялық келісім-шарттар, өндірістік параметрлер, тиімділік, нарық.

Agriculture is an important branch of Kazakhstan's economy. Its gross domestic product (GDP) constitutes 5% and presents the largest sector of the economy. The industry employs 24% of the country's labor resources and has rich land resources. The total area of the territory of Kazakhstan is 2742902 km², the most of them belongs to the category of agricultural land, constituting mainly by pastures. Arable lands occupy only 9% of the total land area.

Agricultural production in the country is growing, thus trade is expanding. The total volume of trade in agricultural food products has grown significantly since the early 2000s, primarily due to increased grain exports, increased income and demand for imported food products.

In recent years, the import volume of agricultural products in the country exceeds exports ones and the country became a net importer of agricultural products since 2009.

To decrease the country's dependence on food imports and food security became the strategic objectives of economic policy. In this regard, significant attention is paid on the creation of medium and large commodity productions including the development of cooperatives [1].

As it is well known, after the economic transformations, the structure of agriculture has been changed, there were formed three categories of agricultural producers: agricultural enterprises, represented mainly by large farms; peasant farms, as a rule, small and medium-sized private enterprises; households occupying small-scale plots used by families for subsistence farming, which radically changed the distribution of the shares of large and small farms in total production, making peasant and households the leading producers of agricultural products in Kazakhstan Republic [2].

The total area of agricultural land in the use of small producers increased from 364,000 hectares in 1991 up to 50.1 million hectares in 2016. In this period there was a significant shift in livestock. The majority of the livestock belongs to households. Currently, the small agricultural producers provide the main share of agricultural production. They produce 76% of the gross agricultural output in Kazakhstan Republic where 66% of crop production and 89% of livestock ones. This situation is holding up the rapid development of the industry and large-scale innovations implementation.

It is necessary to unite small commodity producers and create cooperatives to successfully fulfill the tasks set in the economic policy, to ensure food security and to increase the export potential of the industry and other important problems. There are favorable conditions for their development in the republic.

The results of the research showed that the main part of agricultural production accounts for peasant and households: meat - 83%, vegetables - 93%, potatoes - 95%, cotton - 97%, wool - 95% and oilseeds - 51%.

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The radical changes are needed to create an economic environment that stimulates the development of agricultural cooperatives for accelerating the cooperation of small commodity producers. Thus, the tax system is represented as important tool. On the one hand, the taxes should equalize the starting conditions of market entities located on lands of different natural fertility and location, secondly, they should stimulate market structures to effectively use land resources, and thirdly, they must corres-pond to the conditions for the formation of a macroeconomic environment favorable for the innovative development of entrepreneurship in the rural areas [3].

Subsidies and long-term concessional loans for strengthening the material and technical base provided to cooperatives are another, not less important instrument for stimulating the development of cooperation.

The existing structure of market actors in rural areas, the predominance of the share of small farms and the households implies the need of organization of production cooperatives related to horizontal type. Small farms should be grouped together for collective agriculture [see 3].

Productive cooperative is a voluntary association of citizens on the basis of membership for joint entrepreneurial activity, based on their personal labor participation and joint of property contributions by its members. The founders of the productive cooperative combine the functions of the manufacturer, the owner and the manager in the role of one person, being attractive for agricultural producers and more suits their nature.

This cooperatives feature makes them very attractive and promotes their wide use in agriculture. Such combination in the name of one organizational legal form is more useful for certain production volumes, since in large-scale industries, it becomes necessary to separate these functions because their further combination becomes inefficient.

Thus, cooperatives are necessary to organize in optimal sizes. At such sizes it is rationally to join the functions of the owner, producer and manager in one. Each founder of a cooperative, regardless of its share in the property of the enterprise, has only one vote. The main issues of the life of the cooperative are decided at the general meeting of its members by a majority votes. This feature of the cooperative suits more to the mentality of rural areas.

Along with this, there are moments which reduce the attractiveness of cooperatives for agricultural producers. The founders have invested a lot of money on the creation of cooperatives are in the same position as other members whose contribution is less, that stimulates an increase in investment and savings. Therefore it is necessary to provide measures for their elimination.

The order of income distribution should be determined by the founders of the cooperative, which does not infringe their interests, on the contrary, provides them with confidence in the profitability of membership in the cooperative. The degree of benefit depends on the size of the cooperative, so there will be need to justify its best size. This should take into account what the production will be organized on an industrial basis with the use of innovative technologies.

The task of optimizing the parameters of the cooperative is to determine, with the available resources and production means, the volumes of production, the number of animals for growing, the area of crops, taking into account the need for fodder for the full provision of animals, the need for fixed assets, how much to additionally lease land and attract hired labor, how much and what products will be produced in physical and value terms, the size of production costs, that is, to determine the production parameters of the cooperative, where his will get the greatest income.

This is a general statement of the problem. It is suitable for any cooperative, but in each specific case, the possibilities and adaptations for certain conditions must be specified. This formulation reflects the conceptual approach to the problem of optimizing production parameters and serves as a starting point for the development of specific tasks.

The formulation of the problem and the economic-mathematical model for optimizing the structure of production cooperatives are specific. The economic essence of the optimization problem is to compile an alternative list of required methods and volume of production of crops and livestock, and then from these indicators to identify the best ones what would be used for defining the terms and restrictions of production, meeting the needs of the market focused on these products and would provide the greatest economic efficiency with the available limited resources as land areas and the possibility of their transformation, labor, fixed assets and other material and financial resources.

In such a qualitative formulation, this problem is an optimization problem, which in mathematical form can be formulated as a linear programming problem with the help of the corresponding economic-mathematical model.

In accordance with the above economic formulation, it is advisable to use three indicators as an objective function:

- the amount of production costs in crop production and livestock;

- the amount of profit received as a difference in the amount of commodity output and the amount of production costs in crop and livestock productions;

- the amount of gross income received as a difference in the amount of gross output in monetary terms and the amount of production costs in crop production and livestock.

Therefore, as a criterion of optimality of plans, it should be used the following:

♦ a minimum of production costs performing the most important technological conditions and restrictions on the use of limited production resources and on obtaining the volumes of the most important types of marketable products;

♦ a maximum amount of profit on the cooperative with the same economic and technological limitations;

♦ a maximum gross income in monetary terms under the same restrictions as in the previous criterion.

In this linear programming model one should choose one of the listed criteria and the corresponding objective function and clearly define a constraint system in the form of a system of linear inequalities and equations.

The aim of the solution of the problem is to choose from all possible plans, the best one that suits the chosen criterion. Because of the complexity of solving real economic problems, it is not correct to select only the one criterion of optimality. It is expedient to solve this problem separately with each of the three criteria of optimality and choose the most acceptable option.

Structural economic-mathematical model of optimization of the structure of production in a cooperative, based on the conditions of the tasks, has the following form.

Notation:

j - variable index;

i - restriction index;

x_j - variable indicating the size of the j-th industry or purchases of the j-th type of feed;

x_i - variable indicating the total amount of the i-th value of the indicator;

a_{ij} – the cost of a unit of i-th type of resource based on the accepted unit of measurement for j-th industry, j-th type of feed purchased;

v_{ij} - output of nutrients of the i-th types in terms of the accepted unit of measurement of the industry or the j-th purchased feed;

p_{ij} - demand of j-th species of livestock in nutrition elements of the i-th types;

q_{ij} – the minimum requirement of the j-th types the i-th group feed;

d_{ij} - output of commodity output of the i-th types in terms of the accepted unit of measurement of the j-th industry;

c_j - cost of commodity output per unit of measurement;

w_{ij} - coefficient of proportionality;

B_i - the amount of resources of i-th types;

Q_i - guaranteed volume of production of commodity products of i-th types;

N - set, that includes the numbers of variables by types of industries;

N' – subset, which includes variables by type of crop;

N''' – subset that includes variables for the types of livestock industries;

N''' – subset that includes variables for the types of purchased feed;

M1 - set, that includes restrictions on the use of production resources;

M2 – set that includes restrictions on the total amount of production of nutrients;

M3 – set that includes restrictions on the balances of individual groups of feed;

M4 – set that includes restrictions on the ratio of individual groups of feed;

M5 – set that includes the numbers of restrictions on the structure of crops;

M6 – set that includes the numbers of restrictions on the guaranteed production of commercial products;

M7 - number is limited by sum of materially monetary costs;

M8 - number limited in sum of marketable products.

The aim of the task is to detfine the production structure of the cooperative, that would ensure the maximum profit:

$$Z = x_i - x_i, (i?M8, i?M7); \qquad (1)$$

by performing the restrictions:

on production resources

$$\sum a_{ij} \cdot x_j \le B_i, (j?N, i?M_1); \qquad (2)$$

on ensuring livestock with nutrients

$$\sum v_{ij} \cdot x_{ij} \ge \sum p_{ij} \cdot x_j, (j?N', N''', j?N'', i?M_2); \quad (3)$$

on ensuring the livestock in separate groups of food:

$$\sum v_{ij} \cdot x_{ij} \ge \sum q_{ij} \cdot x_j, (j?N', N''', j?N'', i?M_3); \qquad (4)$$

on the ratio of individual groups of food:

$$\ge$$

$$\sum v_{ij} \cdot x_{ij} = \sum w_{ij} \cdot v_{ij} \cdot x_j, (j?N', N''', j?N''', i?M_4); \quad (5)$$

$$\le$$

on the structure of agricultural crops:

$$\sum a_{ij} \cdot x_j \le B_i, (j?N, i?M_1); \qquad (6)$$

$$\ge$$

$$\sum x_{ij} = \sum w_{ij} \cdot x_{ij}, (j?N'), (i?M_5); \qquad (7)$$

$$\le$$

on guaranteed products:

$$\sum d_{ij} \cdot x_j \le Q_i, (j?N', N'', i?M_6); \qquad (8)$$

on the sum of production costs:

$$\sum a_{ij} \cdot x_j = x_i, (j?N, i?M_7); \qquad (9)$$

on the sum of commercial produc

$$\sum c_{ij} \cdot x_j = x_i, (j?N, N'', i?M_8); \qquad (10)$$

To form a mathematical model, it is necessary to determine the list of initial parameters or variables, and then determine the system of constraints and the objective function.

To determine the list of variables for crops and livestock should be allocated to the acreage of forage crops by types of their use to feed animals.

X1 - area of winter wheat, ha;

X2 - area of spring barley for grain, ha;

X3 - area of spring barley forage, ha;

X7 - area of potatoes on tubers, ha;

X9 - area of vegetables, ha;

X10 - area of corn for silage, ha;

X11 - area of annual grass for green fodder, ha;

X12 - area of perennial grasses for hay, ha;

X13 - area of natural pastures, ha;

X14 - a livestock of cows, the head;

X15 - a livestock of young cattle, the head;

X16 - the number of horses, the head;

X17 - production costs, total, thousand tenge KZT.

X18 - the cost of commodity output, total thousand tenge KZT.

The model must reflect the following main groups of constraints.

1. The use of agricultural land: arable land, hayfields, pastures.

2. Use of labor resources.

3. Conditions for ensuring guaranteed volumes of production of marketable crop and livestock products aimed for sale [4].

The experience of developed countries presents that in agriculture and the socio-economic development of the agro-industrial complex is successfully achieved in cooperation with other structures that have significant productive potential, financial resources and opportunities to attract loans. They are usually large processing enterprises [5].

Currently, their capacities are used only by 25-30% due to lack of raw materials – milk, vegetables, production of which is greatly reduced due to lack of funds of agricultural enterprises. Processing enterprises can parti-cipate in the investment to create and expand its own resource base. Investments may invest in productive cooperatives, which are experiencing financial difficulties. The processing enterprises make long-term contracts with suppliers as suppliers of raw materials, which specify the da-tes of supply and machinery quantities, equip-ment, seeds, fertilizers, plant protection pro-ducts, the conditions for reimbursement of their costs, organize the maintenance and training of specialists, and control in accordance with technology production and use of machinery.

The following preferential terms should be provided to return the investments: payment of equipment during two years after its purchase, payment for the supply of seeds, fuel, fertilizers and herbicides after receive of the products in the purchase.

Agricultural cooperative for investments in production are estimated by the supply of raw materials. They have a reasonable plan of income and credit calculations [6].

In the organization of the development of agricultural production, it can be used U.S. experience in organizational and legal forms of contractual relations that have arisen as a result of development of the integration process. Parties in the integration contract, as a rule, act as a customer trading or processing company and as performer – agricultural producer.

The subject of integration of contracts is the growing by contractor of crops or livestock products by a specific customer's technology by the contactor from materials (seeds, young animals) provided by the customer. Feature of this contract type is that the right of ownership on growing of farmer's agricultural products belongs to the customer.

The content of integration contracts depends on a number of factors: firstly, from the industry sector grown under contract production; secondly, the type of cultivated products; third, from the subsequent target use products. All the conditions of integration contracts can be grouped into three main groups: conditions governing the allocation of rights and responsibilities between the customer and the contractor; the conditions governing the distribution of rights and obligations between the customer and the contractor; the conditions determining the method and procedure of calculation and payment of remuneration (compensation) to the contractor for the work performed; the conditions encompassing responsibility for the nonperformance or improper performance of obligations.

As example, can be provided the conditions of contracts concluded for the production of broilers, turkeys and pork. As a customer according to the contract acts the company that usually owns the plant for the production of feed, slaughter and processing enterprises. The executor acts as the farmer who owns certain land and manufacturing facilities, by breeding of animals. The duties of the customer are the supply of young animals for breeding; providing them with feed and medicines; payment of veterinary services; transportation of feed and animals to the farm and from the farm. Duties of the executor are the breeding of animals to a certain contract weight by using particular technology contract; repair and maintenance of production facilities; provision of electricity and water; cleaning the place; if its required the use of hired labor. Such expenditures as the fuel and lubricants costs and bedding can belong both to the farmer and the company, and can be distributed between the two sides. As mentioned above, the owner of the product is the company, so she decides on the volume of production and turnover of the herd in each specific sector where he makes the contracts. The company typically enters into contracts with several farmers at the same time.

Particular interest in the contract represents the scheme of calculations, which is a mechanism for stimulating the production of high-quality products. Possible schemes of calculation remuneration for work performed for the contractor as two partial compensation or a fixed quality standard. If there are two partial compensations in the contract, then its size is

determined depending on two factors: the base fixed rate for the unit of livestock produced in live weight (the same for all farmers with whom the company has contracted) and the variable allowance, which depends on the quality of performance contract by each farmer. Varying the allowance is determined by comparing the quality of execution of each farmer contract with an average contract in the group of farmers that is concluded with integration. The quality of the performance of the contract is determined by the number of feeds used to produce a certain amount of live weight of meat. Usually, another measure is used to measure contract performance (agreed costs). It differs from the first besides the feed cost for the calculation takes into account other types of costs, such as purchase costs of young animals, medicines, etc., which are added to the cost of feed, and then divided by the total weight produced meat. If the feed conversion rate is below the average, the farmer receives a positive variable allowance in addition to the basic fixed rate. If the rate of feed conversion is above average (contract performance compared to other farmers), the farmer will be fined. In the process of calculating the average performance of a contract for a group of farmers, data are taken into consideration for farmers, in which the production and delivery of meat to the company took place at the same time.

If the contract as a settlement scheme provides a fixed quality standard, the compensation is determined in the following. As in the above scheme, the amount of compensation is determined in the following. As in the above scheme, the amount of compensation is determined depending on two indicators - a basic fixed payment and a variable surcharge. The quality of contract performance by the farmer in this case is compared not with the actual average for the group of farmers as in the previous case, but with the indicators of technological standards.

The use of a scheme in a contract depends on the industry, the size of the company and its position on the market. The contract that draws up such a complex property relationship is always written in with detailed regulation of each element of the relationship between the parties. The type of contract considered is not directly stipulated by US contract law, but it does not contradict their current legislation. An integration contract is a kind of a mixed contract, the terms of which do not contradict the general spirit of the law. The terms of integration contracts are formed by the requirements of the market economy and the peculiarities of the functioning of the agribusiness system. Parties without state intervention formulate the terms of contracts in such a way that they most accurately reflect the property relations that arise between them and contribute to the equal distribution of rights and obligations and the fair determination of remuneration, the size of which is formed under the influence of supply and demand in the market of the relevant works and services [7].

Rural residents of the country have traditionally been engaged in household. Therefore, in order to solve the food problem, it is expedient to use the opportunities of small producers to increase the production of agricultural products most fully.

Experience shows that if small-scale farms do not cooperate with each other or with agricultural enterprises, they cannot transform into commodity farms, moreover, to develop innovative technology.

Small-scale production in agriculture requires special flexibility in economic development. For its successful development it is necessary to solve a large range of issues related to the consideration of all factors of production: social, economic, natural and technical. The solution of these issues is possible through cooperation. According to A.V Chayanova's definition, the cooperative is primarily a union of farms and the farms that are part of such an alliance are not destroyed from this, but still remain small. The most promising is the dissemination of such forms of cooperatives, under which the peasant farms and personal farm, on the basis of the agreement transmit the livestock of young animals for further cultivation and fattening. The cooperative is transferred to small farms for the joint maintenance of livestock with the allocation of natural forage lands.

Delivery of livestock to the place of fattening, the delivery of the breeded livestock to the final destinations is carried out by the cooperative. From the proceeds for the grown and fattened, the family reimburses the cost of the cooperative, the cost of the spent fodder. The income of the family is the remaining sources.

The agreement provides that the purchase of feed accounted for in the price of acquisitions, including the cost of shipping. In conditions of limited land, material resources and the small size of farms and personal farms their successful functioning involves the establishment of cooperative relations with agricultural enterprises. Such relationships are an important instrument to enable small agricultural producers to market relations and creation of a competitive private sector agricultural economy.

By itself, the cooperation will not solve all the economic problems in agriculture. However, world practice presents, it can become an important lever to develop the market relations, to promote the release agro-industrial sector from the crisis and stabilize agricultural production due to the concentration of financial and material resources.

195

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