

Optimization of production costs of agricultural cooperatives as a factor in the formation of a stable food supply system

Optimización de los costos de producción de las cooperativas agrícolas como un factor en la formación de un sistema estable de suministro de alimentos

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ABSTRACT:

The article deals with the economic functions that can be performed within the framework of the development of cooperative forms of management that affect certain indicators of socio-economic potential of rural areas, optimization of production costs of agricultural cooperatives. The paper describes the further development of agricultural cooperation, taking into account the optimization of production costs, the impact on the identified factors that will contribute to the agricultural and economic sustainable development of rural areas and sustainable food security system.

Keywords: agricultural cooperatives, optimization of production costs, sustainable development, food security.

RESUMEN:

El artículo trata de las funciones económicas que pueden realizarse en el marco del desarrollo de formas cooperativas de gestión que afectan ciertos indicadores del potencial socioeconómico de las áreas rurales, la optimización de los costos de producción de las cooperativas agrícolas. El documento describe el desarrollo posterior de la cooperación agrícola, teniendo en cuenta la optimización de los costos de producción, el impacto sobre los factores identificados que contribuirán al desarrollo agrícola y económico sostenible de las zonas rurales y al sistema de seguridad alimentaria sostenible.

Palabras clave: cooperativas agrícolas, optimización de los costos de producción, desarrollo sostenible, seguridad alimentaria.

1. Introduction

The development of the domestic economy is now supported by the growth of the predominantly agricultural sector. In the context of modernization of the agro-industrial

complex in 2017, only agriculture demonstrates high growth rates. Further development of this promising industry is possible only if its efficiency is ensured through the optimization of production costs. Agricultural enterprises are gradually improving their overall financial situation compared to 2016, especially in livestock production, but resource prices for agricultural enterprises during 1990-2016 (Moldashev, 2016). the prices of agricultural products increased by more than 21 times (including the denomination of 1996) and the prices of agricultural products increased by more than 5 times during the corresponding period (Akimbekova, 2016-2017). This indicates a significant loss of parity prices in the agricultural sector. The profits received by farmers against the background of deterioration of price parity (i.e. absence of influence of the price factor as a source of profitability) are indirect evidence of gradual optimization of expenses and intensification of production (*Committee on statistics of the Ministry of national economy of the Republic of Kazakhstan, 2018*).

The situation which has developed in the domestic agrarian market bears threats of considerable loss of efficiency for the agricultural producer (Afanasieva, 2013). In this regard, it should be noted the decline in world prices for grain, vegetable oils, sugar, dairy products, which in turn can restrain the growth of producer prices in the domestic market. At the same time, due to the devaluation of the tenge, prices for resources of predominantly imported origin are growing rapidly. Only the intensification of production will make it possible to increase the level of profitability by reducing resource intensity and increasing the yield (productivity) (Moldashev, 2016).

The main factor in the growth of production efficiency in these conditions is cost optimization. Gunter Fandel's "Theory of production and costs" study indicates that among the factors that influence the formation of costs, scientists such as Rummel and Gutenberg allocate resources costs, employment levels, prices of spent resources, the intensity of work and, accordingly, the level of productivity of workers and machines, demand for products, the quality of resources, the organization of production and the size of the enterprise (Atyukova, Karmysova, Pavlov, Zotova, 2008).

1.1. The main problems of optimization of production costs of agricultural cooperatives and the formation of a stable food supply system

1. The small-scale nature of agricultural production:

- a high proportion of households in the total gross agricultural output (45.2 per cent), especially livestock products (74.9 per cent).%);
- high proportion of farms in the total number (94-99%) of agricultural units, especially in the southern region: 40.8% share of agricultural enterprises in the total number of agricultural enterprises, 24.9% - Almaty region (Akimbekova, 2016-2017);
- the trend of decline in agricultural land plots: 65% of agricultural land have land up to 50 hectares, the average size of land use of agricultural enterprises (JSC, LLP, PK) decreased, especially in the Eastern region by 2.8 times, Central-2.3 and southern - 6 times (*Committee on statistics of the Ministry of national economy of the Republic of Kazakhstan, 2018*);

2. Underdeveloped infrastructure in the system of purchase, storage, processing and sale of agricultural products and economic relations between producers, processors and other related sectors of agriculture:

- low purchase prices that do not cover the invested costs of agricultural producers and do not stimulate the increase in production of agricultural products and their quality;
- low share of processing of agricultural products (milk to 23.3%, meat - 27,8%, fruit and vegetables 11.3 per cent), the consequence is low utilization rate of capacities and production of competitive products in comparison with imports.

3. Financial failure of small businesses:

- weak material and technical base (lack of own agricultural machinery, financial resources for the purchase of seeds, fertilizers, feed, fuel, etc.);
- inaccessibility to the majority of small farms of Bank credits, and also the provided measures of state support in the form of the subsidy, preferential crediting, etc. in connection with discrepancy to their requirements, lack of pledge property, etc. (Kindai, 2016).
- low income, which does not allow to provide the necessary start-up capital for the development of small and medium-sized businesses in rural areas.

2. Methodology

In the process of the study were used General methods of research: methods of analysis of financial statements: horizontal, vertical, ratio, comparison, and other.

To study the optimization of production costs of agricultural cooperatives as a factor in the formation of a sustainable food supply system of Kazakhstan were used General scientific and special research methods:

- abstract-logical - in setting goals and objectives of the study;
- comparative analysis-in the analysis of data characterizing the role of cooperatives in providing employment and improving the welfare of the population of major agricultural regions;
- inductive and deductive methods-in identifying the role of optimization of production costs of agricultural cooperatives in the development of rural areas, the formation of a sustainable food supply system and relevant findings;
- mathematical-the identification of correlation between the efficiency of the cooperative and various factors.

2.1. Statistical characteristics of the situation

Thus, the formation of costs depends primarily on the availability and price of land, labor and material and technical resources. All components in value terms are presented in the cost (table. 1).

Table 1
Cost structure in agricultural enterprises
of the Republic of Kazakhstan, %

Categories	1990	2010	2017
The cost of labor	33,6	9,1	7,6
Contributions to social activities	4,2	3,2	2,8
Material costs included in the cost of production	49,4	70,0	69,6
among them			
seeds and planting material	6,8	8,1	13,0
stern	25,7	18,3	23,1
other agricultural products	2,6	2,0	1,9
mineral fertilizer	4,4	10,8	16,7

fuels and lubricants	2,5	9,9	13,4
electricity	0,7	1,6	2,2
fuel	0,3	1,1	2,0
spare parts, repair and construction materials for repair	3,0	4,8	6,6
payment for services and works performed by third parties, and other material costs	3,4	13,4	21,1
Amortization	9,8	5,3	5,5
Other operating expenses	3,0	12,4	14,5
including rent for			
land shares (shares)	-	7,0	8,9
property share	-	0,1	0,1

Source: compiled according to the statistics Committee of the Ministry of national economy (1990 – 2017).

The cost structure of economic elements makes it possible to determine the overall impact of individual elements on total costs. Since 1990, there have been dramatic changes in the cost structure. The share of labour costs has decreased significantly, which has affected the quality of the labour force. At the same time, the share of material costs increased, which was caused by high rates of growth in prices for resources (seeds, fertilizers, feed, fuel, oil products). This price increase is due both to the transition to market relations and, more recently, to an increase in the quality of resources. The share of costs for services is growing rapidly due to the greater involvement of agricultural enterprises of third-party specialized organizations for agricultural work. Also the share of payment for use of the leased land resources grows in expenses (Bondina, 2015).

Ensuring sustainable development of the agricultural sector in modern conditions depends on the efficiency of the use of available resources, including minimizing their costs per unit of output. This, in turn, requires constant innovation to improve performance (Kokoreva, Ilyasova, 2016). The level of security and the quality of material and technical resources depends on a number of factors. These, in particular, include financial and technical and technological. Financial factors that influence the formation of the level of material and technical resources are:

- the level of profitability of agricultural enterprises. In General, for 13 consecutive years, the agricultural sector has shown positive rates of economic development and overall fairly high profitability. However, a significant part of enterprises continues to be unprofitable. So, in 2017, the share of unprofitable enterprises accounted for 19.8% of them had obtained the maximum loss for the entire period of \$ 10.8 billion tenge (Gussenov B., 2015). A significant part of these enterprises is engaged in the production of unprofitable products, such as the cultivation of cattle, sheep and goats for meat, wool production. However, a deeper analysis shows that 43.3% of enterprises engaged in the production of grain, and 39.5% - the production of sugar beet, received losses in 2016. In addition, the risks of providing financial resources include low profitability of the key at this stage of development sub-sectors: grain, sugar beet and livestock production. In 2017, they showed a minimum profitability (1.5, 2.7 and 0.2%, respectively), which is not enough to form their own funds in order to direct them to the development of production. A significant number of enterprises working in these sub-

sectors ended 2017 with a loss (*Committee on statistics of the Ministry of national economy of the Republic of Kazakhstan, 2018*);

- volumes of current and non-current assets. Their growth indicates the intensification of production activities of enterprises. Over the last four years, accounts payable increased by 37.2%, subject to adjustment for the output deflator index (which in some way neutralizes the impact of all production prices). It is, in fact, one of the sources of attracting assets into the turnover of the enterprise and quite often acts as an important factor in stabilizing the financial condition of the enterprise (Moldashev, 2016);

- level of investments in fixed capital of agriculture. Now it is low. For example, in 2016 the investment in comparable prices of 1996 was 26.7% of the 1990 level, however, it should be noted a gradual recovery in recent years, the investment activity of enterprises.

Among the technical and technological factors of the formation of the level of material and technical resources can be identified such as:

- technical and technological backwardness of a significant number of agricultural producers. Only large highly profitable enterprises have the opportunity to update their material and technical base, introduce innovative equipment and technologies at their own expense and attract loans. Unprofitable and low-profit enterprises are not able to carry out innovative activities, intensify production processes, introduce resource-saving technologies, and thus improve the economic efficiency of production activities (Ilyasova, 2009);

- availability of opportunities for agricultural producers to temporarily increase production in an extensive way, in particular through the use of cheap labor, the attraction of unused agricultural land, excessive wear and tear of equipment, the purchase of decommissioned, cheap and outdated equipment. These processes inhibit the innovative renewal of the resource base (Kozlov, Yanina, 2016);

- the need for funds for innovative renewal of material and technical resources (Kindai, 2015);

- a significant share of agricultural production is produced in the households of the population, since this production segment is dominated by manual labor and there are no opportunities for the widespread introduction of technological and selection-genetic innovations.

In the conditions of market relations there was a rupture of the developed economic and economic relations therefore formation of deficiency of material and financial resources became. However, in the recent period there has been a positive trend of providing agricultural producers with material resources, which affects the production results. Unfortunately, while agricultural producers rely mainly on imported fertilizers and plant protection products, a significant part of updating of machine and tractor fleet is imported, in addition, imported seeds, breeding livestock, etc.

Now the main Park of agricultural machinery domestic agricultural enterprises decreased significantly compared to 1991, thus, the presence of tractors, combine harvesters now is 30% from level of 1991, Kukuruz-, potato-, beet harvesters - 14-18%, the number of installations and assemblies for milking cows has decreased by 86%.

At the same time, technological loads have doubled or tripled. At 1000 hectares of arable land in agricultural enterprises accounted for 8 tractors, while in 1991 this figure was 14 units. the Provision of grain harvesters decreased from 8 units per 1000 hectares of grain crops to 4 units. But in Poland, the provision of tractors according to the world Bank is 126 units. (due to a significant number of mini-tractors), in Germany - 84 units., France - 64, the USA - 27, Canada - 16, Argentina and Belarus - 9 units (*Committee on statistics of the Ministry of national economy of the Republic of Kazakhstan, 2018*).

For balanced use of land resources and material and technical means in crop production it is necessary to ensure application of mineral and organic fertilizers in optimum proportions. Over the past two decades, the use of fertilizers has decreased dramatically: compared with 1990, mineral fertilizers decreased by 2 times, and organic - 17.2 times (as a result of the reduction in livestock). Since 2000 in the agricultural enterprises of introduction of mineral

fertilizers on 1 hectare gradually increases (table. 2).

Table 2
Use of fertilizers in agricultural enterprises

Indicator	1990	2000	2005	2010	2015	2016	2017, to 1990, %
Made of organic fertilizers per 1 ha of cultivated area, tons of	8,6	1,3	0,8	0,5	0,5	0,5	5,8
It is introduced into the soil of mineral fertilizers in nutrients on 1 hectare of the sown area, kg	141	13	32	58	72	79	51,1
among them:							
nitrogen	59	10	22	43	50	55	84,7
potassium	39	1	4	8	10	11	25,6
phosphoric	43	2	6	7	12	13	27,9

Source: compiled according to the statistics Committee of the Ministry of national economy.

The situation that has developed with the provision of agricultural production with material and technical resources against the background of their natural disposal (depreciation) leads to a sharp decrease in the level of mechanization of labor - intensive processes in agricultural production and the efficiency of the use of available resources, as well as the impact of the main means of production-land (Vinnichek, 2011).

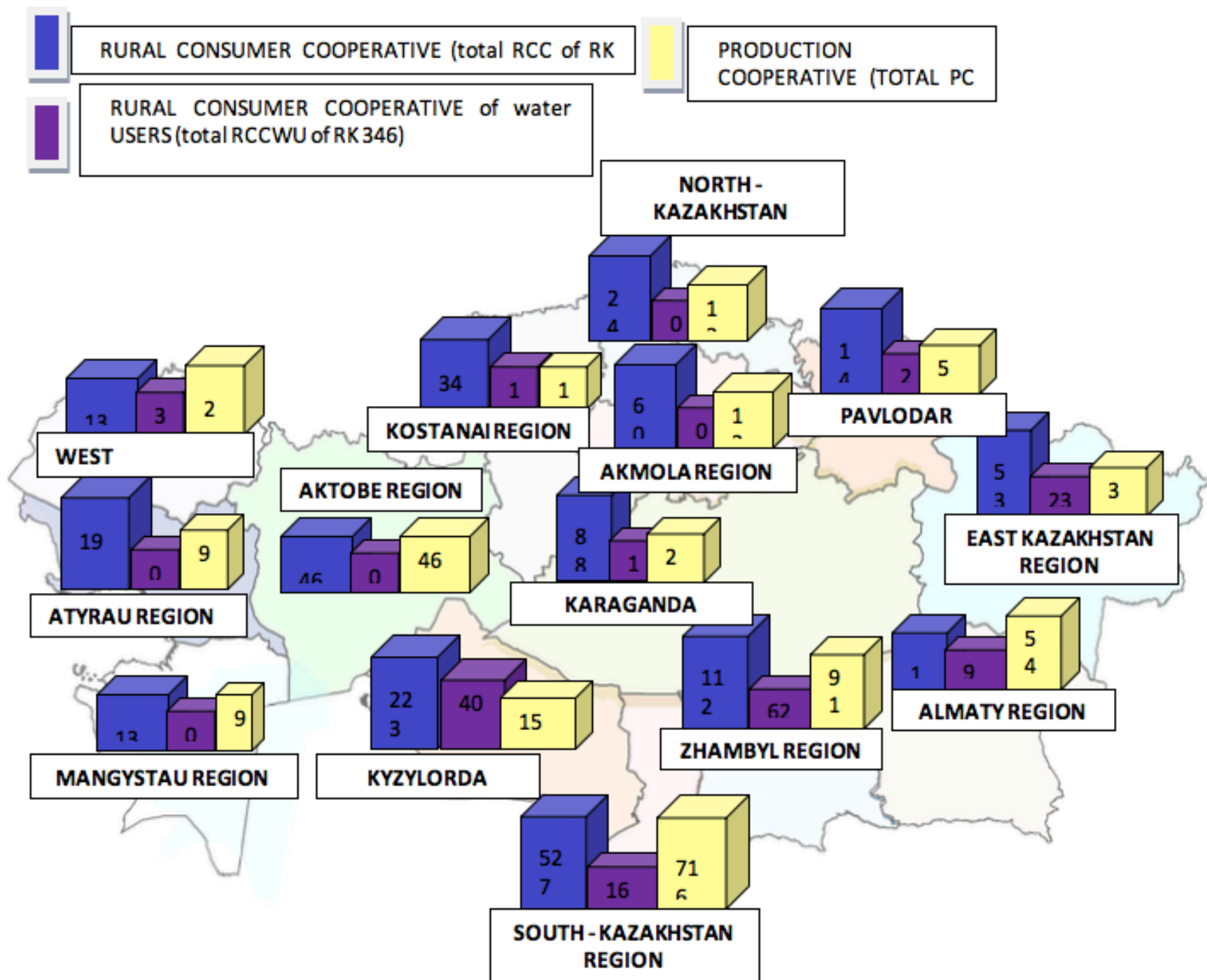
Over the past few years, the high level of profitability of agriculture in Kazakhstan has come into conflict with high energy and labor intensity, low wages and capital equipment, technological decline. Now there is a gradual restoration of the resource support of the agricultural sector, however, there is a threat of exhaustion of resource potential, especially land resources, due to their predominantly extensive use and the gradual fall in the level of income of agricultural producers (Gussenov B., 2015).

3. Results

In connection with the measures taken in the country for import substitution and the implementation of the Doctrine of food security, it is advisable to pay more attention in the agricultural sphere to the mobilization of domestic reserves and the search for incentives for domestic producers on the basis of cooperative principles of economic activity.

The cooperative form of management is designed to contribute to increasing the income of the rural population, ensuring food security, the development of rural areas. The system of agricultural cooperation is divided into agricultural consumer and industrial cooperation, as well as consumer societies. Agricultural production cooperatives (APC), unlike other organizational and legal forms, represent the most democratic, labor form of organization of agricultural production, when a member of the cooperative can be a citizen who works in it. Members of the production cooperative are not only employees, executors, but also owners of its property; everyone has the right to vote at the General meeting of the collective. All these provisions allow an ordinary member of the APC to exercise its right to participate in the economic activities of the cooperative and to make managerial decisions on its operation (Ilyasova, 2016).

Figure 1
Placement of agricultural cooperatives in
the Republic of Kazakhstan on 01.01.2018



3.1. The main results of the research

Table 3
Resource and performance indicators of the Socio-entrepreneurial
Corporation "Zhetysu"*, ths. tenge.

Indicators	2015y.	2016y.	2017y.
Fixed assets	13359	13893	10997
Stocks of current assets	38865	37243	38738
Receivables	1214	584	486
Creditor indebtedness	5410	1501	3133
Authorized capital	4340	4340	4340
Additional capital	21330	21113	20897

Reserve capital	651	651	651
Revenue	30339	35347	22187
Cost of sales	28140	34316	22833
Profit on sales	2199	1031	-646
Other income	1396	8	2079
Other expenses	121	179	690
Net profit	3474	860	743

*The Corporation is taken as an example of research, as it is one of the largest in Kazakhstan

In General, the presented results testify to the expediency of further development and support of agricultural production cooperation in rural areas, which will contribute to the improvement of food supply in the regions with domestically produced products, increase of labor employment, profitability and living standards of rural population (*The main indicators of activity of social and entrepreneurial Corporation "Zhetysu", 2018*).

Table 4
SWOT analysis of the agricultural sector

Strength	Weaknesses
<p>Kazakhstan ranks ninth in the world in terms of territory; Kazakhstan ranks second in the world in terms of arable land per capita; Kazakhstan is among the largest exporters of grain and flour; large rural population (43% of the total population), high employment rate (18% of the employed population); high potential demand for food products in the CIS and Central Asia sales markets; constant growth of gross product of agriculture; high potential of organic production and export.</p>	<p>low share in GDP (4.8%); the lack of development of trade, including export; low level of implementation of research and development works; insufficient level of veterinary and food safety; high capital intensity; a long payback period; dependence on climatic conditions; low productivity; the low level of profitability of agricultural producers.</p>
Opportunities	Threats
<p>the possibility of increasing the volume of all types of agricultural products due to the growing number and changing the structure of nutrition of the population; formation of effective state support of agricultural cooperatives and AGRICULTURAL cooperatives; expansion of geography of deliveries and the volume of exports in advanced industries.</p>	<p>adverse changes in climatic conditions, instability of weather conditions; spread of animal and plant diseases and environmental pollution; increased competition in international markets for selected products in connection with WTO accession; risk of inefficient state regulation of the industry.</p>

4. Conclusions

1. Agricultural cooperation for the sale and processing of products

The conceptual approach, which includes the optimization of production costs, is the large-scale development of cooperation to use the potential of smallholder farmers and smallholders as an objective factor in the growth of production and living standards in rural areas (Moldashev, 2016).

Issues of stable purchase and sale of agricultural products with further direction to the processing enterprises will be solved through agricultural cooperatives.

Providing cooperatives with technological equipment is carried out by "KazAgro" holding. Also, support will be provided through subsidizing the costs of cooperatives to provide personal - subsidiary farms with veterinary, agrochemical, financial, marketing and other services.

Optimization of production costs:

- * will involve more than 500 thousand small producers in commodity production
- * provide processing enterprises with raw materials and increase the level of their loading by 1.3 times
- * will provide additional annual income of rural residents in the amount of 300 billion tenge
- * reduce trade margins by 15-20% by reducing unnecessary intermediary links.

2. Targeted export policies

Promotion of food products to foreign markets is carried out by the agribusiness Export center on the basis of JSC "Prodcorporation" through:

- * market analysis, search for export niches and target work with importers
- * forward purchase of food products and creation of export channels for agricultural producers
- * creation of umbrella brands of food products, including organic products
- * issuing guarantees for the execution of export contracts.

Kazakhstan borders with China, Russia and Central Asian countries, whose markets have a great potential demand for food products. Global demand for food is constantly growing, forming one of the largest consumer markets with annual sales of more than \$ 7 trillion.

3. Change mechanisms are subsidies and loans of "KazAgro»

The formation of a stable system of food security through the optimization of production costs will expand the coverage of grantees by 7 times, borrowers on concessional lending "KazAgro" and members of credit unions – 1.4 times with the priority of supporting small and medium-sized businesses (World Development Indicators, 2018).

The return of 1 tenge of subsidies will increase by almost 2 times, from 7.5 tenge to 13 tenge of products covering 50% of the total production.

The main condition for concessional lending will be to ensure the loading of processing enterprises, and due to investment subsidies for low-cost agricultural machinery, the pace of renewal of the technical Park will be increased by 1.5-2 times.

4. Improving the efficiency of livestock and crop production

To improve the efficiency of livestock production by 40% will be provided forage base, increased the proportion of breeding animals and expanded area of irrigated pastures:

- * increased production of dairy products, meat and fish
- * increase in meat exports
- * decrease in imports of poultry meat, meat products, dairy products.

Diversification of areas, increase in fertilizer application, the use of high-quality seeds, as well as increasing the rate of renewal of agricultural machinery in crop production will

replace wheat crops with other, more profitable and popular crops, increasing production efficiency by 30%:

- * increase in the production of feed, barley, sugar beet, oilseeds, vegetable oil, maize, oats and sugar
- * increase in exports of oilseeds
- * reduction in imports of vegetable oil, fruits and sugar.

5. Improvement of state regulation of agroindustrial complex

State regulation in the field of agriculture provides:

- * solving issues of rational use and irrigation of agricultural land
- * ensuring a safe epizootic and phytosanitary situation
- * providing incentives for the integration of science, education and production
- * formation of the regulatory and technical basis for the development of organic production.

As a result of the adoption of measures of state regulation, the cadastral value of land will be updated and involved in the turnover of more than 600 thousand hectares of irrigated land, which will have a positive impact on the efficiency of agricultural production (Ilimzhanova, Burnasheva, Gussenov, 2018)

4.1. Brief description

As a result of the proposed policy measures to develop a sustainable food system, the following results can be achieved:

- * increase in gross output of agricultural products by 30%, or 1 trillion tenge
- the growth of labor productivity by 50%
- * growth in exports and decline in imports by 17%
- * expansion of irrigated area by 40% - up to 2 million hectares
- * expansion of coverage of agricultural producers by state support measures by 7 times
- * involvement of more than 500 thousand private-subsidiary farms in the sales system through cooperatives
- * increase in the share of agricultural products processing and loading of processing enterprises by 1.3 times
- * the growth of private investment in the industry more than 3 times – up to 427 billion tenge.

In addition, effective implementation of the programme from the point of view of commodity sector development requires:

- creation of legally fixed organizational and economic conditions in the system of production, sale and processing of agricultural products;
- ensuring efficiency of state regulation of processes of formation of the market of food products and resources for their production; mobilization of resource potential of system of food providing in the sphere of economic relations and its effective use;
- stimulation of introduction of resource-saving and economically clean technologies adapted on zones of production of receiving food products.

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