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INNOVATIONS IN THE AGRO-INDUSTRIAL COMPLEX OF THE AKTOBE REGION OF THE REPUBLIC OF KAZAKHSTAN: AN EFFECTIVE MECHANISM FOR SOLVING THE FOOD ISSUE

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ АҚТӨБЕ ОБЛЫСЫНЫҢ АГРОӨНЕРКӘСІПТІК КЕШЕНІНДЕГІ ИННОВАЦИЯЛАР: АЗЫҚ-ТҮЛІК МӘСЕЛЕСІН ШЕШУДІҢ ТИІМДІ ТЕТІГІ

ИННОВАЦИИ В АГРОПРОМЫШЛЕННОМ КОМПЛЕКСЕ АКТЮБИНСКОЙ ОБЛАСТИ РЕСПУБЛИКИ КАЗАХСТАН: ЭФФЕКТИВНЫЙ МЕХАНИЗМ РЕШЕНИЯ ПРОДОВОЛЬСТВЕННОГО ВОПРОСА

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Abstract. ***Purpose*** **– the article discusses the current aspects of the development of agro-industrial complex on the example of the Aktobe region, presents recommendations that contribute to the solution of these issues. Research** ***methods*** **– abstract-logical, statistical, observation, scientific abstraction. Factor analysis, grouping method, tabular and graphical methods of data visualization were used as statistical tools.** ***Results*** **– studying the foreign practice of modernizing agricultural sector in order to ensure food security, the authors note that the main criteria should include the system of state and local self-government, legislative framework, fiscal and monetary regulation, mechanism of subsidizing and lending, investment, innovation policy. The main indi-**

cators of agricultural production in the region for 2017-2021 are analyzed. It is proved that at present it is necessary to restore this strategically important sector of economy on a qualitatively new technical and technological basis that meets modern trends. Agrarian science of Kazakhstan has developed a fairly large number of innovations, the implementation of which in the agro-industrial complex would raise it to a high level. However, the degree of use of innovations by commodity producers remains very low. One of the problems of the low activity of innovative processes is the lack of motivation in the development of innovations by agricultural producers. *Conclusions* – innovative development involves the transition to resource-saving technologies that contribute not only to increasing production volumes, but also saving resources, as well as achieving the required level of food security. This complex task requires the creation of appropriate conditions: appropriate infrastructure for innovation activity, a set of material, technical, legislative means for information, marketing, financial, and personnel services for business entities.

Аңдатпа. *Мақсаты* – мақалада Ақтөбе облысының мысалында агроөнеркәсіптік кешенді дамытудың өзекті аспектілері қарастырылады, осы мәселелерді шешуге ықпал ететін ұсыныстар ұсынылған. Зерттеу *әдістері* – абстрактілі-логикалық, статистикалық, бақылау, ғылыми абстракция. Статистикалық құрал ретінде факторлық талдау, топтастыру әдісі, кестелік және графикалық деректерді визуализациялау әдістері қолданылды. *Нәтижелері* – азық-түлік қауіпсіздігін қамтамасыз ету мақсатында аграрлық секторды жаңғыртудың шетелдік тәжірибесін зерделей отырып, авторлар негізгі критерийлерге мемлекеттік және жергілікті өзін-өзі басқару жүйесі, заңнамалық база, бюджеттік-салықтық және ақша-кредиттік реттеу, субсидиялау және кредиттеу тетігі, инвестициялық, инновациялық саясат жатқызылуы тиіс екенін атап көрсетеді. Өңірдің 2017-2021 жылдардағы ауыл шаруашылығы өндірісінің негізгі көрсеткіштері талданады. Қазіргі уақытта экономиканың осы стратегиялық маңызды саласын қазіргі тенденцияларға жауап беретін сапалы жаңа техникалық-технологиялық негізде қалпына келтіру қажет екендігі дәлелденді. Қазақстанның аграрлық ғылымы АӨК-те іске асырылуы оны жоғары деңгейге көтеруге мүмкіндік беретін көптеген инновацияларды әзірледі. Алайда, тауар өндірушілерде инновацияларды қолдану деңгейі өте төмен болып қала береді. Инновациялық процестердің әлсіз белсенділігінің проблемаларының бірі – ауыл шаруашылығы тауар өндірушілерінің инновацияларды игерудегі уәждемесінің жеткіліксіздігі. *Қортындылар* – инновациялық даму өнім көлемін ұлғайтуға ғана емес, сонымен қатар ресурстарды үнемдеуге, сондай-ақ азық-түлікпен қамтамасыз етудің қажетті деңгейіне қол жеткізуге ықпал ететін ресурстарды үнемдейтін технологияларға көшуді көздейді. Бұл кешенді міндет тиісті жағдайлар жасауды талап етеді: инновациялық қызметтің тиісті инфрақұрылымы, шаруашылық жүргізуші субъектілерге ақпараттық, маркетингтік, қаржылық, кадрлық қызмет көрсету үшін материалдық, техникалық, заңнамалық құралдар жиынтығы.

Аннотация. *Цель* – в статье рассматриваются актуальные аспекты развития агропромышленного комплекса на примере Актюбинской области, представлены рекомендации, способствующие решению этих вопросов. *Методы* исследования – абстрактно-логический, статистический, наблюдения, научной абстракции. В качестве статистического инструментария использовались факторный анализ, метод группировок, табличные и графические приемы визуализации данных. *Результаты* – изучая зарубежную практику модернизации аграрного сектора в целях обеспечения продовольственной безопасности, авторы отмечают, что к основным критериям следует отнести систему государственного и местного самоуправления, законодательную базу, бюджетно-налоговое и денежно-кредитное регулирование, механизм субсидирования и кредитования, инвестиционную, инновационную политику. Анализируются основные показатели сельскохозяйственного производства региона за 2017-2021гг. Доказано, что в настоящее время необходимо восстановить данную стратегически значимую отрасль экономики на качественно новой технико-технологической основе, отвечающей современным тенденциям. Аграрная наука Казахстана разработала достаточно большое количество инноваций, реализация которых в АПК позволила бы поднять его на высокий уровень. Однако степень использования нововведений у товаропроизводителей остается очень низкой. Одна из проблем слабой активности инновационных процессов – недостаточная мотивация в освоении новшеств сельскохозяйственными товаропроизводителями. *Выводы* – инновационное развитие предполагает переход на ресурсосберегающие технологии, способствующие не только наращиванию объемов продукции, но и экономии ресурсов, а также достижению необходимого уровня продовольственной обеспеченности. Эта комплексная задача требует создания надлежащих условий: соответствующей инфраструктуры инновационной деятельности, совокупности материальных, технических, законодательных средств для информационного, маркетингового, финансового, кадрового обслуживания хозяйствующих субъектов.

Keywords: agro-industrial complex, modernization, innovative technologies, small and medium business, resource saving, infrastructure, state support, food security, competitiveness.

Түйінді сөздер: агроөнеркәсіптік кешен, жаңғырту, инновациялық технологиялар, шағын және орта кәсіпкерлік, ресурс үнемдеу, инфрақұрылым, мемлекеттік қолдау, азық-түлік қауіпсіздігі, бәсекеге қабілеттілік.

Ключевые слова: агропромышленный комплекс, модернизация, инновационные технологии, малое и среднее предпринимательство, ресурсосбережение, инфраструктура, государственная поддержка, продовольственная безопасность, конкурентоспособность.

Introduction. The agro-industrial complex plays a key role in ensuring the food independence and security of the state. It is food security that is becoming one of the most important priorities in the current conditions.

The food problem is one of the global ones, while food security is considered primarily at the national level. The following are recognized as elements of national food security: stable physical availability of the necessary food in the right quantity and quality; economic availability of food for the entire population of the country; food security of the state in relation to basic foodstuffs; development of agriculture and expanded reproduction of food [1].

Currently, the organizational system of governance in the agriculture is considerably weakened by a number of factors. Those include, but are not limited to the following: the shortage of and poor quality of the park of machines, the lack of effective engineering infrastructure, the lack of innovative and intellectual reconstruction of agricultural production, negative phenomena in the material and technical support of producers of agricultural goods, the fragmentation of the system participants and their lack of legal regulation.

The important factors that affect the modernization of the agro-industrial complex are of regional character. They are closely related to macro and microeconomic levels of economic impact.

Regional factors influencing the creation and optimization of the agro-industrial complex in individual regions can be divided into six important groups: technical and technological; soil-climatic; economic; social; information and environmental.

In recent years, the agro-industrial complex has been considered as one of the main priorities of the economic policy of the Republic of Kazakhstan. However, the situation with the innovative activity of agriculture is lower compared to the producers of agricultural products.

Material and methods of research. The foreign and domestic scientists devoted to the study of the problems of modernization of the agrarian sector.

Nevertheless, the problems of modernization of the agro-industrial complex, the impact of modern challenges and the development of strategic prospects for the agro-industrial complex has been and remains to be relevant for the governance of Kazakhstan. The scholarly and practical significance of these issues necessitated their further scientific research.

The theoretical and methodological basis of the research is the works of domestic and foreign reserachers on the modernization of agriculture. The research is based on dialectical, statistical, inductive and deductive methods used in the fields of the agroindustrial complex. To solve these problems, special methods of comparative analysis, grouping of data, indexes, analysis and synthesis, modeling and methods of short-term and long-term forecasting were used.

The key problems of the development of the agro-industrial complex of Kazakhstan are low technical equipment of the branch with agricultural machinery and technology, inefficient use of natural resources, in particular land, water, the presence of a large number of small non-commodity farms, low level of processing of agricultural products, a lot of intermediaries between the production and sale of grown products, poor implementation of the results of scientific research and development of agricultural scientists, low level of storage, transportation and sale of agricultural products.

Results and their discussion. To achieve the United Nations Sustainable Development Goal “A World without Hunger by 2030”, it is necessary to develop more productive, efficient, sustainable, inclusive, transparent and sustainable food systems, and to change the current agro-food system.

The agricultural sector of the world economy must provide the necessary amount of food to the growing population of the planet.

According to the The United Nations's forecast, the world's population will grow to 8.6 billion people in 2030 and to 9.8 billion by 2050. Due to the growth of the world's population, there is a decrease in the availability of arable land.

Kazakhstan has managed to maintain relative stability of food security, but has also risen by 16 positions in the Economist Intelligence Unit Global Food Security Index at the end of 2022.

The main directions of innovative development in agriculture in the near future should be the formationof effective production and economic structures; use of innovative technologies in planning, organizing and managing production; development of information and advisory services; creation of highly productive varities, hybrids of crops and animal breeds adapted to stressful situations and regional characteristics; as well as the development and implementation of zonal innovative environmentally friendly technologies. In the foreground should be the problem of improving the efficiency of innovation management [2].

Improvement for the organization of innovative activity in agriculture should be carried out by modernizing organizational and legal structure: the formation of cooperative ties between the components of the organizational structure; creation of innovative infrastructure; improving the legal framework for innovative activities in the agricultural sector; improvement of the insurance system; creation of a system for stimulating innovation activity.

The formation of a mechanism for stimulating the innovative modernization of agriculture in the country and the region involves the solution of the following tasks:

- creation of a competitive research and development sector and conditions for its resource reproduction;
- creation of the effective system that would enable the innovative modernization of agriculture in the region;
- development of institutions for commercialization and protection of research and development results;
- innovative modernization of the agricultural management system.

At the level of each region, a clear organizationally managed innovation system should be formed, where each element would be characterized by specific functions, internal and external relations, and should carry out its activities in accordance with the overall strategy and objectives of the entire system.

Aktobe region has a convenient geographical location and has the potencial for full food supply of Western Kazakhstan population. As a result of its convenient geographical location, the region has a well-development transport infrastructure. There are 11,415.2 thousand hectares of agricultural land, of which 10,177.6 thousand hectares of pastures, 133.1 thousand hectares of hayfields, 702.3 thousand hectares of arable land, and 256.3 thousand hectares of lands with valuable underground resources. Two thirds of agricultural products produced in the region are accounted for by private subsidiary farms (table 1).

Table 1- Main indicators of agricultural production in Aktobe region in 2017-2021, million tenge

Indicators	2017	2018	2019	2020	2021
Gross output of products and sevices from agriculture, forestry and fisheries at current prices, million tenge	201 352,1	234 989,0	272 393,7	326 346,7	375 313,9
Gross crop production	78 033,9	85 290,6	96 433,8	123 040,1	132 604,6
Gross livestock production	122 411,0	148 838,2	174 866,2	202 120,1	242 635,7
Agricultural services	186,4	207,7	261,8	66,0	73,5
Volume of products and services in hunting sector	20,9	18,5	23,0	22,6	23,0
Volume of products and services in forestry	524,6	494,6	628,8	937,7	1011,2
Volume of products and services in fisheries	175,3	139,5	180,2	160,2	165,3
Index of physical volume of gross output (including services) of rural forestry and fisheries, as a percentage of the previous year	104,4	106,3	103,8	106,7	115,0
Note: https://stat.gov.kz/region/248875/statistical_information/publication					

In the region on the November 1, 2020 were registared 4,966 agricultural formations, of which 4,522 were peasant farms and 444 legal entities. The main activity meat and dairy direction of animal husbandry, processing of agricultural products [3].

In general, the development and productivity of agriculture in the Aktobe region of the region shows upward trends.

The long-term development plan has a number of measures for the effective development of pasture lands, as well as aims at an increase in the number of cattle up to 1.2 million heads, horses up to 230 thouthand heads, and small cattle up to 2.6 million heads by 2025. In 2022, it is planned to allocate more than 25 billion tenge to subsidize agriculture in the Aktobe region, which is higher than the sums that had come from state budget last year. In 2021, 22.6 billion tenge was allocated from the repulican and local budgets to subsidize the agro-industrial complex of the region. To further increase the share of ensuring the food security of the region in the next 3 years, it is planned to implement 75 projects in the agro-industrial complex in the amount of 315 billion tenge.

The contribution of agriculture to the Gross Regional Output of the region remains low despite the 12.3% share of the total number of entrepreneurs. Thus, the region's agriculture in 2021 provided only 5.3% of the region's economy. Two thirds of the agricultural production produced in the region comes from personal farms. In terms of pasture land area, Aktobe region ranks second in the republic. But today, only 9.3 million hectares or 36.8% of the available 25.3 million hectares of pastures are assigned to farms. Obligatory requirements for correct crop raising are unlikely to be upheld in many areas of crop, as well as outdated equipments are very common. Such problems are relevant for all branches of agriculture.

Despite the positive indicators of the development of the agricultural sector of the economy in the Aktobe region, there are problems with ensuring the food security of the population. In particular, there are problems with raising local products (garlic, potatoes, tomatoes, etc.), which are not enough on local markets to meet the needs of the population. At the same time, more than 90% of investments in fixed capital in the industry are directed spacifically to the cultivation of seasonal crops (58.3%) and animal husbandry (32.4%). As a result, the state annually loses 1.5 billion dollars. In addition, in the republic, in particular, in the Aktobe region, there are problems with the storage and marketing of agricultural products, which directly affects the level of competitiveness of agriculture.

As a result of the effective development of agriculture, Aktobe region provides itself with 24 out of 32 types of basic foodstuffs. Including flour, bakery products, dairy, meat products, eggs and vegetables.

To further increase the share of ensuring food security in the next 3 years, 75 projects worth 315 billion tenge are planned to be implemented in the agricultural sector.

The need for state support of the agroindustrial complex can be eplained by a number of features of agriculture as a branch of the economy. The production of agricultural products depends on climatic conditions, the degree of human participation in the activities of agricultural enterprises and the natural development process of living organisms, which are the main means of production. Land is also the main means of production, its rational usage requires significant financial investments. The return of capital and profit in this field are associated with significant risks due to the distribution of agricultural land in large areas located in different climatic zones, the seasonal nature of production process that affect the material, labor and financial resources of enterprises [4].

The level of agricultural production development has a significant impact on food security of the country. In terms of the development of productive forces, agriculture is a relatively static industry, and it adapts slower to rapidly changing economic and technological conditions of the market environment.

State regulation of the agricultural sector is one of the main components of the state regulation system. The state regulation of the agroindustrial complex usually implements it by economic methods and includes the protection of the domestic food market from imports.

Without developed agriculture and a progressive agroindustrial complex, positive development of the economy and improvement of society's well-being is impossible. In addition, in recent years, especially in the context of the globalization of the economy, special attention has been paid to the agricultural sector in order to ensure the economic security of the country [5].

Development and modernization of adriculture is impossible without state regulation and support. A modern approach is based on a combination of market self-regulation mechanisms and the active influence of government bodies. Agriculture requires state sup-

port for issues such as regulation of alternative exchange, price policy, regulation of export-import operations, formation of infrastructure of agro-industrial complex.

There were positive changes in indicators such as the availability of food for the population, the quality and safety of food products, as well as the availability of food products, agricultural infrastructure, scientific research in the agro-industrial complex [6].

It is necessary to note the following problems in the field of food security in Kazakhstan:

* the level of food price inflation, which potentially ihcreases the share of food costs in total household income for the wider population in the context of a decline in real average income;

* reduction in the level of consumption of vegetables and diary products per capita, which may affect other categories of agricultural products.

The main problems of food security in the Republic of Kazakhstan are: reduction of production capacity in the agricultural sector of the economy; insufficient level of stock, insurance and logistics of food supply. The threat of agflation (agrarian inflation) causes a disproportionate increase in prices for food products and industrial crops. An important problem is the low standard of living of the population, most of the income of low-income people are spent on food purchases. There is an inefficient system of pricing and distribution of food products. In the Republic of Kazakhstan in order to solve these problems, it is planned to create a stable network of wholesale distribution centers from among small agricultural producers and personal subsidiary farms [7].

Modernization of the agrarian sector of the economy in Kazakhstan and foreign countries has similar goals:

- satisfaction the needs of the population for affordable food products in terms of price, quality and assortment;
- improvement of the structure of the agro-industrial complex;
- implementation of monetary and credit, budgetary and tax regulation of the agricultural enterprices' activities;
- social support of the able-bodied population and ensuring its employment;
- increase the competetiveness of the country;
- participation in foreign trade operations;
- management of innovative and investment development of agriculture;
- solution of environmental problems.

Kazakhstan's agriculture, being one of the priority areas of economic development, has great potential and huge reserves. 42% of the population of Kazakhstan lives in rural areas, which is about 7.7 million people. Today, the agro-industrial complex of Kazakhstan employs 14% of the total number of employed people. Agriculture in Kazakhstan accounts for 5% of Gross Domestic Product (GDP) [8].

State support of the modernization of the agro-industrial complex is mainly carried out in the following ways:

✓ budget lending;

✓ subsiding in the context of economic efficiency of the subsidy so as to increase the quality and competitiveness of the manufactured product.

Despite the positive momentum of growth in recent years, the agricultural sector remains among the low-profitability sectors of the domestic economy, where many negative trends have not been overcome. If in 1991 the agro-industrial complex of Kazakhstan provided one third of the GDP (29.5%), today the agro-industrial complex produces about 5% of the Gross Domestic Product.

According to expert assessments, the main problem in Kazakhstan is the imperfection of the state regulation system of the agrarian sector.

The implementation of many special programs for the development of agricultural production did not have a significant impact on the improvement of the situation in this sector.

The main goal of almost all programs is to increase the competitiveness of agro-industrial complex. At the same time, during these years, the priority directions of the development of agricultural production were often changed, the system of state support, principles of subsidies, directions of support for the export of local agricultural products were revised. Allocating substantial budget funds to the agricultural sector did not bring concrete positive results that could be evaluated for the effectiveness of investments [9].

Raw materials form the basis of the potential of the agrarian sector in Kazakhstan. Almost 80% of agricultural products produced in Kazakhstan are processed as raw materials, and the competitiveness of finished products is weak, mainly due to the technological backwardness of processing enterprises. Despite the increase in state aid, the share of agricultural product processing remains low.

One of the important problems of the industry is high dependence on imports for a

number of products. Kazakhstan mainly exports raw materials.

Ready-made food products form the basis of imports. The main export product of Kazakhstan's agro-industrial complex remains cereals, which take 42% of the total volume of exports of agro products.

Production growth in the domestic agrarian sector can be achieved not by increasing the livestock, arable lands, or effective technologies, but due to attracting a large number of workers, increasing productivity, using modern equipment and achievements in the field of science and technology. This is evidence of the extensive development and technological backwardness of Kazakhstan's agricultural sector [10].

Since state support for agricultural producers in Kazakhstan is much lower than in economically developed countries, recommendations for its improvement should be aimed at preventing reduction of the current level of support and qualitative expansion of the tools used. Improving the forms and mechanisms of state support and increasing its scope is intended to create regionally integrated companies in the form of large agrarian food corporations (holdings) with the participation of state and private capital, unification of farmers and business structures for production and sale of final products.

The creation of such corporations can also be achieved by the development of promising directions of the state policy in the agro-industrial complex, increasing the profitability and investment attractiveness of agricultural industries, their technical modernization, increasing the availability of credit resources, increasing the volume of stock exchange trading, improving the training and attraction of highly qualified personnel, developing innovative infrastructure and personnel potencial of innovative activities. It is also necessary to increase the standard of living of the population working in the agricultural sector of Kazakhstan [11].

The state should bear a part of expenses for creating and maintaining the growth potential of seed farming, livestock breeding, soil fertility, which require significant investments, particularly in the areas where it is usually difficult to attract investors. It is also important to finance research programs, train personnel, provide informational and marketing support to agro-industrial complex, create insurance funds, financial and material means in case of unexpected emergency situations [12].

The methods and means of state regulation of the innovative process include growing economy, increasing employment, improving the competitive position of the country, improving the environmental situation, etc. which are aimed to solve tasks. In developed countries, support for agriculture is carried out systematically and regularly [13].

It is noticeable the capacity of each organization to innovate, in fact, either it is capable to produce a promising product or enter new business areas or others. It can provide considerable competitiveness in domestic and international markets[14].

Scientific and technical success in agriculture is connected with the influence of natural and biological factors. Each of the biological components of reproduction in agriculture (land, plants, animals) is the basis for independent directions of scientific research and technological development[15].

Conclusion

To modernize the agro-industrial complex in ensuring the food security of the region, it is necessary to:

1. Create and develop dairy and meat animal husbandry in all regions.

2. Invest in the formation of production capacities for processing agricultural raw materials, as well as to develop the production, marketing, transport systems in the agricultural sector.

3. Introduce a motivation system for high-performance agricultural labor to create effective organizational forms of agricultural production.

4. Update the fleet of machines in agriculture to perform the entire cycle of agricultural work both in crop production and in animal husbandry on a high-quality technical and technological basis.

5. Improve seasonal agricultural risk insurance mechanisms.

6. Finance and strengthen the state's activities to create a modern scientific, industrial, social, cultural and recreational infrastructure in the agricultural sector of the economy.

Taking into account the specifics of the industry,geographical, economic and social characteristics, every country in the world develops its own methods and programs to raise its agricultural business[15].

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