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## **Priority directions of innovative development of the agro-industrial complex of Kazakhstan**

### **Abstract**

**Object:** The purpose of the study is to determine the attitude and needs of agricultural producers in Kazakhstan in innovative technologies, to determine the directions of appropriate state support for these processes on the basis of a corresponding sociological survey.

**Methods:** We used the methods of pilot sociological research on topical issues of innovative development of entrepreneurs of the agro-industrial complex of Kazakhstan, including such issues as state support for innovation, financing of activities and innovative processes, long-term and short-term plans of market participants, prospects for entering the foreign market through the introduction of innovative technologies.

**Findings:** The data obtained in this pilot study are general in nature and their analysis will not make any final conclusions on the situation related to the activities of agricultural companies in the conditions of priority of innovation as one of the factors determining the overall situation of business development within the agro-industrial complex. As part of this study, we set the task to find out why the agricultural sector is not attractive to scientists and innovators, although there are specific results of the development and implementation of innovative technologies in Kazakhstan.

**Conclusions:** Development of innovations and promotion of technological modernization of the agro-industrial complex of Kazakhstan should be aimed at sustainable development of agro-industrial enterprises through:

- orientation of applied science to the tasks of agricultural modernization, creation of an effective system for generating and using innovations in the rural economy;
- formation and development of a management system for innovative and technological development, including a system of technological forecasting and planning, development and implementation of programs for innovative and technological development of the agro-industrial complex of Kazakhstan.

**Keywords:** agro-industrial complex, innovative entrepreneurship, new technologies, dissemination of innovative knowledge, innovative management.

### **Introduction**

Kazakhstan's accession to the Eurasian economic Union (EAEU) has had a certain impact on the country's agro-industrial complex. Some forms of state support for the industry have also changed, and customs barriers have been reduced and, in some cases, completely eliminated. In terms of the inevitably emerging in the EAEU market competition further improvement of the approaches to the solution of problems of innovative development of agro-industrial complex is one of the fundamental prerequisites of the modernized approach to change management of these large economic systems such as agriculture. And this remains one of the main issues.

Today, Kazakhstan's agribusiness companies increasingly have to rely on their own resources. However, many analysts and business representatives consider it impossible to maintain the profitability of existing agribusiness companies without significant state support for innovative development of the industry. Recently, there has been a certain reduction in investment in the agro-industrial complex, which, along with inflation, rising prices for all types of resources, including credit, and a decrease in the purchasing power of the population, probably negatively affects the innovative development of the agro-industrial complex.

The agro-industrial complex of Kazakhstan, in which a significant share is occupied directly by agriculture, is in urgent need of innovative high-tech technologies. This need is caused not only by low indicators of

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labor productivity in agriculture, but also by the lack of a critical mass of developed and implemented high-tech innovations of domestic scientists. This problem is also compounded by the fact that in Kazakhstan over the past two decades, a specialized scientific and innovative infrastructure has been actively formed and operates, the main task of which is to activate innovative processes in the agricultural sector of Kazakhstan. Therefore, the lack of tangible results in agricultural production in the form of mass developed and implemented scientific developments of domestic scientists leads to the search for reasons that hinder these processes not only in the innovation system of the agro-industrial complex, which includes authorized state and quasi-state organizations, industry research institutes and research universities, but also economic entities in the sector of agro-industrial entrepreneurship. It is the problems with the latter that can become the main obstacle to the activation of scientific and innovative processes in the agricultural sector of Kazakhstan. Therefore, in the framework of this study, through a survey of entrepreneurs in the agricultural sector, their attitude to the innovative infrastructure and prospects for the development of innovative processes in agricultural production will be revealed.

### ***Literature Review***

Issues of innovative development of the agricultural sector, and in particular agriculture, have been considered in many scientific publications, among which we would like to mention the works of (Abalkin, 2009) and (Bunin, 2004), in which the need for innovative development of agriculture is put not only from the position of ensuring the competitiveness of the industry and increasing labor productivity, but also from the position of ensuring economic and food security of the national economy. Since it is the agricultural sector and its products that meet the primary needs of the population, and the development of its innovative potential depends on the possibility of sustainable development not only of the complex itself, but also of the national economy as a whole. Therefore, a number of Kazakhstani authors, such as (Sabden, 2006), (Nakipova et al., 2012a, 2012b), (Kamenova, 2017), (Aimurzina, 2019), (Taubayev, 2017) in their research, they considered various aspects of the development of the agro-industrial sector in Kazakhstan, in particular, the issues of forecasting the main trajectories of sustainable development of the industry, ensuring the competitiveness of the industry and production, and studying the impact on food security factors that are associated with the development of innovative processes in the agricultural sector. Among foreign authors, I would like to mention the research of (Elnasri, 2017) and (Fombang, 2018), which are related to the topic of our research, in terms of determining the expectations and needs of entrepreneurs from the introduction of innovative technologies in agricultural production. The latest study reveals the relationship between the efficiency of agricultural production of farms and the system of distribution of innovative technologies in the agro-industrial complex, which are widely used in developed countries. Looking ahead, it should be noted that in Kazakhstan, the need for such a system of development and dissemination of innovative knowledge and technology in the field of agriculture among entrepreneurs-farmers is very high, which should be met through the introduction of appropriate mechanisms and institutions, which will be recommended in the conclusion of the article.

In terms of the inevitably emerging in the EAEU market competition further improvement of the approaches to the solution of problems of innovative development of agro-industrial complex is one of the fundamental prerequisites of the modernized approach to change management of these large economic systems such as agriculture. Today, Kazakhstan's agribusiness companies increasingly have to rely on their own resources. However, many analysts and business representatives consider it impossible to maintain the profitability of existing agribusiness companies without significant state support for their operational and innovative activities (Mukhtarova, et al., 2017). Recently, there has been a general decline in investment potential in the agricultural sector, which, along with inflation, rising prices for all types of resources, including credit, and a decrease in the purchasing power of the population, probably negatively affected the innovative development of agricultural enterprises. In the course of the study, various aspects of the activities of Kazakhstani entrepreneurs in the field of agriculture were considered, including in the context of the situation of the development of the agricultural market within the framework of the EAEU and the WTO. The results of the study were summarized the respondents' views on topical issues of innovative development of agricultural complex of Kazakhstan, including, such as state support for innovation, financing and innovation processes, long-term and short-term plans of market participants, the prospects of entering the foreign market, through the introduction of innovative technologies.

### ***Methods***

The data obtained in this pilot study are General in nature and their analysis will not make any final conclusions on the situation related to the activities of agricultural companies in the conditions of priority of

innovation as one of the factors determining the overall situation of business development within the agro-industrial complex. The limited scope of the article does not allow us to present the results of the entire survey, and we will present the results of answers to only a part of the questions related to the development of innovative activities of entrepreneurs.

As part of this study, we set the task to find out why the agricultural sector is not attractive to scientists and innovators, although there are specific results of the development and implementation of innovative technologies in Kazakhstan. The modern Kazakhstan innovation agenda is primarily focused on the industrial sector, in particular, the manufacturing industry. Now one of the priorities is agriculture, because in Kazakhstan the productivity of agricultural production is one of the lowest – 5-10 times lower in comparison with developed countries. In Kazakhstan, there are very few scientific and innovative start-UPS working in the field of agriculture in General, including not only crop production and animal husbandry, but also subsequent areas of agricultural processing. Therefore, the purpose of this study is to determine the attitude and needs of agricultural producers in Kazakhstan in innovative technologies (Taubayev, Ulybyshev, 2015), to determine the directions of appropriate state support for these processes on the basis of a corresponding sociological survey.

In the period from 15.08.19 to 30.08.19, a sociological study was conducted to study the business and innovation activity of entrepreneurs in the agricultural sector. The study examined various aspects of the activities of agricultural companies, including in the context of the situation of the development of the agricultural market within the EAEU. Taking into account the practical goals and objectives of the study, as well as the possibility to use statistical data on respondents, the target sample model was applied. This type of sampling does not assume that the percentage of quotas in the General and sample populations corresponds to each other. It is allowed to distort the ratio proportions in order to get a legitimate number of respondents in the specified target groups. The criteria for determining the target groups were: the type of production within the agro-industrial complex and the size (volume) of production. The sample consisted of 163 respondents, representatives of agricultural enterprises of the Karaganda region.

The limited scope of the article does not allow us to provide answers to all the questions of the survey, and in the framework of our research, we would like to focus on certain groups of questions of the survey that directly relate to the innovative development of the industry.

### Results

The first group of questions concerned the existing production and innovation potential of entrepreneurs for the survey period (Table 1). As we can see from the responses, among the surveyed entrepreneurs, the majority are focused on medium and small consumers, which immediately gives them a reference point mainly to the domestic market, in which they note very high competition (64%). They rate the existing innovation potential as low (51%) and sufficient (41%), although they rate competitors relatively higher than themselves, which is an additional factor of innovative development in the industry. However, when we survey the main forms and types of innovation that are being implemented, we see that the bulk of innovations in agribusiness enterprises are focused on expanding the product range (32.4%), organizational (30.2%) and marketing (24.5%) innovations, while much-needed technological innovations occupy only 21.6%. The high percentage of non – innovators-24.5% - is also alarming.

Table 1. Assessment of the production and innovation potential of entrepreneurs

Questions	Distribution of answers to a question
1	2
Basically, You work in the calculation of the...	a) large consumers – 10%; b) average consumers – 41%; c) small consumers – 49%.
Assess the level of competition in the domestic market	a) high-64%; b) average-30%; c) low-6%.
Evaluate the innovative potential of your organization	a) high – 8%; b) average (sufficient) - 41%; c) low-51%.
Evaluate the innovative potential of your competitors	a) high – 14%; b) average-52%; c) low – 44%.

1	2
What are the main forms and types of innovation you use in your business? (1-3 selections)	a) grocery (expanding the range of products...) – 32.4%; b) technological (new equipment, changes in technological processes...) – 21.6%; c) organizational (changes in the business model, new structural divisions, personnel...) - 30.2%; d) marketing (change of name, packaging, promotions...) – 24.5%; e) I can't answer-12.1%. f) not implemented in the last 3 years – 24.5%.
Evaluate your prospects for active implementation of innovative technologies	a) high – 18%. b) average – 27%. c) low – 41%. d) no prospects – 6%; e) the other 8%.
What changes in the market do you expect in 2020? (1-2 choices)	a) competition growth – 77.8%; b) decrease in demand for agricultural products – 23.8%; c) increase in demand for agricultural products-14.3%. d) weakening of competition – 7.9%; e) I can't answer-15.9%.
In your opinion, what are the prospects for your company's development in 2020-2022? (1-3 selections)	a) growth, expansion of production-9,5%; b) acquisition of competing companies – 6.3%; c) expansion of specialization-31.7%; d) expansion of coverage, access to other regions-47.6%; e) survival – 19.0%; f) franchising (conclusion of agreements on the lease of a trademark or commercial designation with foreign producers of agricultural products) – 3.2%; g) no prospects-0 h) difficult to answer-22.2%.
<i>Note - Compiled by the author</i>	

Only 18%, 27% on average, and 41% on average rate their prospects for further innovative development in the direction of introducing innovations highly, which generally indicates low prospects for innovative development of the industry. Although the respondents see the further development of the market for agricultural products with an increase in competition (77.8%) and a relative decrease in demand for agricultural products (23.8%), which generally acts as a factor in stimulating innovation processes in the industry. As for the directions of their development, the majority of entrepreneur's plan to go to other regions (47.6%) and expand their specialization (31.7%), which will also require innovative approaches.

The second group of questions is devoted to assessing the resources of innovative development and the impact of the Eurasian economic Union on the innovation potential of the surveyed entrepreneurs (Table 2). As we can see from the responses, only 18% of entrepreneurs plan to significantly increase production volumes, in particular by expanding production volumes, and to a greater extent by improving production efficiency (14.3%). To implement these measures, entrepreneurs rely on bank loans (11.1%) and on their own funds (14.3%).

Table 2. Assessment of the resources and impact of the EAEU on the innovative development of entrepreneurs

Questions	Distribution of answers to a question
1	2
Do you plan to significantly increase production at Your company in 2020-2022?	a) Yes-18%; b) No-60%; c) I can't answer-22%.
What resources do you plan to use to increase production at your company? (the number of selections is unlimited)	a) expansion (purchase of land, livestock, machinery, etc.) - 9.5%. b) modernization of production is 7.9%; c) acquisition of new companies/mergers – 3.2%; d) increase in production efficiency from existing assets-14.3%; e) other – 3.2%.

1	2
What financial resources do you plan to attract to expand production? (The number of selections is unlimited)	f) Bank loan – 11.1 V%; g) investors ' money – 3.2%; h) own funds-14.3%; i) funding under state programs – 6.3%.
Assess the impact of the sanctions policy against Russia on your business?	a) decreased competition in the market of agricultural products was 25.4%; b) increased demand for agricultural products-9.5%; c) difficulties in marketing products-65.1%; d) the opportunity to enter the foreign market-14.3%; e) profit growth-3.2%; f) no impact - 6.3%; g) other – 6.3%.
How do you assess the impact of the Eurasian economic Union on the innovative development of your business? (one choice)	a) positive – 23.8%; b) negative-17.5%; c) on average, there are both pros and cons – 38.1%; d) I find it difficult to answer – 20.6%.
What are the consequences of Kazakhstan's accession to the Eurasian economic Union on the innovative development of your business? (the number of selections is unlimited)	a) increased opportunities for export – 60,3%; b) decreased tax burden – 55,6%; c) decreased the cost of purchasing raw materials and equipment, transportation costs – 34,9%; d) having problems with sales of goods, due to their lack of competitiveness quality (lower quality products) – 11,1%; e) increased tax burden – 0; f) having problems with sales of goods, due to their price competitiveness (higher prices) – 61,9%; g) increased the chances and prospects of access to foreign markets – 23,8%; h) the other is 14.3%.
<i>Note - Compiled by the author</i>	

A separate block included issues related to Russia and the EEU, and 65.1% of respondents believe that the introduction of sanctions against Russia has led to difficulties in marketing products, and 25.4% believe that competition in the agricultural market has decreased. 23.8% and 38.1%, respectively, have a positive and average attitude to the EAEU, while only 17.5% have a negative attitude. In General, the work within the framework of the Eurasian economic Union as a positive factor of innovative development is noted by the majority of entrepreneurs, indicating that the opportunities for exporting products have increased (60.3%), the tax burden has decreased (55.6%), as well as the cost of purchasing raw materials and equipment, transport costs (34.9%), but there are also those who note that there are problems with the sale of goods due to their price non-competitiveness (61.9%). That is, in General, there is not a clear opinion about the EAEU among the respondents in terms of business functioning and innovative development (Taubayev et al., 2019).

The third group of questions is related to the assessment of problems that hinder innovative development, as well as forms and tools of state support for innovative development of entrepreneurs (Table 3). As can be seen from the responses, 71.4% of respondents point to high lending rates, weak legislative framework, 38.1% and weak state support for 25.4% of respondents as the main problems of innovative development of their business. 12.7% of entrepreneurs note that there are no problems with innovative development (Ulybyshev, Kenzhebekov, 2017). Among the respondents, 89% said that they need state support.

Table 3. Assessment of problems and tools of state support for innovative development of entrepreneurs

Questions	Distribution of answers to a question
1	2
What are the main problems that hinder the innovative development of Your business?	a) weak legislative base – 38.1%; b) high lending rates-71.4%; c) financial difficulties – 19.0%; d) high competition in the domestic market-47.6%; e) high competition in the foreign market-6.3%; f) low production efficiency-4.8%;

1	2
	g) low qualification of employees-9.5%; h) non-competitive products – 1.6%; i) no obstacles to business development-12.7%; j) weak state support-25.4%; k) I can't answer-6.3%; l) other-1.6%.
Do you need government support to activate innovation processes in Your organization?	a) Yes-46%; b) No-8%; c) Yes, partial – 43%; d) The other 3%.
What forms and tools of state support for innovation in the agricultural sector are acceptable to You?	a) innovation grants – 21.4%; b) soft loans-34.4%; c) budget subsidies and grants – 51.4%; d) professional development of employees-14.3%; e) grants for commercialization of innovations – 12.1%; f) centers of competence and dissemination of innovations-32.1%; g) promotion of cooperation with universities-21.4%; h) cooperation with development Institutions-21.4%; i) internships abroad-19.7%; j) I can't answer-3.6%; k) other – 1.3%.
<i>Note - Compiled by the author</i>	

Among the main state instruments, entrepreneurs allocate budget subsidies and grants-51.4% and soft loans-34.4%, while only 21.4% of respondents apply for innovation grants. This is due to the fact that, in General, entrepreneurs are used to relying either on irrevocable budget subsidies, or on clear bank loans, rather than on innovative grants, for which many do not even have knowledge about them. The share of specialized centers of competence and innovation dissemination is also relatively low (32.1%), although in world practice they are the coordinating organization of state support for innovative development of agribusiness.

### **Discussion**

In general, the results of this sociological study indicate that there are significant problems in providing resources for innovative plans of entrepreneurs in the agricultural sector of Kazakhstan. In solving these problems, the entrepreneurs we interviewed focus primarily on credit resources and rely on state support. However, the existing national innovation system of Kazakhstan, the formation and development of which is devoted to a lot of research, considers the innovative infrastructure of the agro-industrial complex as an integral element of the development of agricultural science and the introduction of innovative high-tech technologies of domestic scientists.

### **Conclusion**

Development of innovations and promotion of technological modernization of the agro-industrial complex of Kazakhstan should be aimed at sustainable development of agro-industrial enterprises through:

- orientation of applied science to the tasks of agricultural modernization, creation of an effective system for generating and using innovations in the rural economy;
- formation and development of a management system for innovative and technological development, including a system of technological forecasting and planning, development and implementation of programs for innovative and technological development of the agro-industrial complex of Kazakhstan;
- development of the system of assistance to technological modernization of agriculture of the Republic of Kazakhstan, including: technological audit, transfer of foreign technologies, promotion of the introduction and dissemination of technologies, commercialization of technologies;
- as part of spreading innovative knowledge among farms, a network of high-tech demonstration sites, model educational farms, joint ventures, and start-ups should be created together with national and large foreign companies.

Thus, critical to the development of innovative activity in agrarian sector of Kazakhstan's economy should be the establishment and effective functioning of highly organized large-scale regional systems of

innovation, focused on implementing new technologies and best practices. The role of such systems of consulting support for farmers is very important in the implementation of feedback from production with science – the formation of proposals for further improvement of innovations, areas and subjects of research, etc.

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**А.С. Кернебаев, А.А. Таубаев, Б.М. Жукенов, Е.И. Борисова, Ю.М. Сайфуллина**

### **Қазақстанның агроөнеркәсіптік кешенінің инновациялық дамуының басым бағыттары**

#### **Аңдатпа**

**Мақсаты:** Зерттеу мақсаты Қазақстанның ауыл шаруашылығы өндірушілерінің инновациялық технологияларға қатынасы мен қажеттілігін айқындау, тиісті әлеуметтік сауалнама негізінде осы үрдістерде тиісті мемлекеттік қолдау бағыттарын белгілеу.

**Әдістері:** Қазақстанның агроөнеркәсіптік кешені кәсіпкерлерінің инновациялық дамуының өзекті мәселелері бойынша, оның ішінде инновацияны мемлекеттік қолдау, қызмет пен инновациялық процестерді қаржыландыру, нарыққа қатысушылардың ұзақ мерзімді және қысқа мерзімді жоспарлары, инновациялық

технологияларды енгізу арқылы сыртқы нарыққа шығу перспективалары сияқты мәселелер бойынша пилотаждық әлеуметтік зерттеу әдістері пайдаланылды.

*Нәтижелері:* Осы пилотаждық зерттеу шеңберінде алынған деректер жалпы сипатқа ие және оларды талдау кезінде агроөнеркәсіптік кешен шеңберінде кәсіпкерлікті дамытудың жалпы жағдайын айқындайтын факторлардың бірі ретінде инновациялық қызметтің басымдығы жағдайында АӨК компанияларының қызметіне байланысты жағдай бойынша қандай да бір түпкілікті қорытынды жасалмайды. Осы зерттеу аясында біз Қазақстанда инновациялық технологияларды әзірлеу мен енгізудің нақты нәтижелері бар болғанымен, ауыл шаруашылығы саласының ғалымдар мен инноваторлар үшін неге тартымды еместігін анықтау міндетін қойдық.

*Қорытынды:* Инновацияларды дамыту және Қазақстанның АӨК-сін технологиялық жаңғыртуға жәрдемдесу агроөнеркәсіптік кәсіпорындарды орнықты дамытуға келесідей бағытталуы тиіс:

– қолданбалы ғылымды ауыл шаруашылығын жаңғырту міндеттеріне бағдарлау, ауыл экономикасында инновацияларды генерациялау мен пайдаланудың тиімді жүйесін құру;

– Қазақстанның АӨК инновациялық-технологиялық дамыту бағдарламаларын әзірлеу және іске асыруды, технологиялық болжау және жоспарлау жүйесін қамтитын инновациялық-технологиялық дамытуды басқару жүйесін қалыптастыру және дамыту;

*Кілт сөздер:* агроөнеркәсіптік кешен, инновациялық кәсіпкерлік, жаңа технологиялар, инновациялық білімді тарату, инновациялық менеджмент.

**А.С.Кернебаев, А.А. Таубаев, Б.М. Жукенов, Е.И. Борисова, Ю.М. Сайфуллина**

### **Приоритетные направления инновационного развития агропромышленного комплекса Казахстана**

#### *Аннотация*

*Цель:* Цель исследования — определить отношение и потребности сельхозпроизводителей Казахстана в инновационных технологиях, установить направления соответствующей государственной поддержки этих процессов на основе соответствующего социологического опроса.

*Методы:* Используются методы пилотажного социологического исследования по актуальным вопросам инновационного развития предпринимателей агропромышленного комплекса Казахстана, в том числе по таким вопросам, как государственная поддержка инноваций, финансирование деятельности и инновационных процессов, долгосрочные и краткосрочные планы участников рынка, перспективы выхода на внешний рынок через внедрение инновационных технологий.

*Результаты:* Полученные в рамках данного пилотажного исследования данные носят общий характер и при их анализе не будут сделаны какие-либо окончательные выводы по ситуации, связанной с деятельностью компаний АПК в условиях приоритета инновационной деятельности как одного из факторов, определяющих общую ситуацию развития предпринимательства в рамках агропромышленного комплекса. В данном исследовании нами была поставлена задача — выяснить, почему отрасль сельского хозяйства не привлекательна для ученых и инноваторов, хотя точечные результаты разработки и внедрения инновационных технологий в Казахстане имеются.

*Выводы:* Развитие инноваций и содействие технологической модернизации АПК Казахстана должны быть нацелены на устойчивое развитие агропромышленных предприятий через:

– ориентирование прикладной науки на задачи модернизации сельского хозяйства, создание эффективной системы генерации и использование инноваций в сельской экономике;

– формирование и развитие системы управления инновационно-технологическим развитием, включающей систему технологического прогнозирования и планирования, разработку и реализацию программ инновационно-технологического развития АПК Казахстана.

*Ключевые слова:* агропромышленный комплекс, инновационное предпринимательство, новые технологии, распространение инновационных знаний, инновационный менеджмент.

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