

INNOVATIVE ACTIVITY IN AGRICULTURAL SECTOR  
OF THE REPUBLIC OF KAZAKHSTAN

ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ АГРАРЛЫҚ СЕКТОРЫНДАҒЫ  
ИННОВАЦИЯЛЫҚ ҚЫЗМЕТ

ИННОВАЦИОННАЯ ДЕЯТЕЛЬНОСТЬ В АГРАРНОМ СЕКТОРЕ  
РЕСПУБЛИКИ КАЗАХСТАН

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**Abstract.** The innovation process is considered as a single and continuous stream of transformation of specific ideas based on scientific developments into innovative technologies. The experience of industrialized countries continuing to successfully modernize the economy with the introduction of technological innovations based on automation, computerization, digital platforms is presented. It has been shown that in many countries the transition from informatization to digitalization of processes in agriculture and related industries is being carried out through the use of digital models that can increase the efficiency of agricultural sector, reduce its costs and achieve a high level of cooperation among business entities. As part of the development of a national spatial data infrastructure, it is planned to organize its own Kazakhstan geodetics network and geoportal for the provision of public services, with the expansion of the conditions for involving businesses in IT technologies, including precision farming methods and Smart farms. AgroBiz.kz - a multi-functional agricultural Internet portal, operating for two and a half years, made it possible to create a single base for farmers, agricultural enterprises, rural districts, scientists, facilitate communication with government agencies and financial institutions. In Kazakhstan, enterprises are introducing precision farming elements, using electronic maps and online monitoring, monitoring sowing and harvesting operations with reduction in overhead and time, which contributes to a significant increase in labor productivity.

**Аңдатпа.** Инновациялық процесс ғылыми әзірлемелер негізінде инновациялық технологияларға нақты идеяларды қайта құрудың бірыңғай және үздіксіз ағыны ретінде қарастырылған. Автоматтандыруға, компьютерлендіруге, цифрлық платформаларға негізделген технологиялық жаңалықтарды енгізе отырып, экономиканы табысты жаңғыртуды жалғастыратын индустриялық дамыған елдердің тәжірибесі ұсынылған. Көптеген мемлекеттерде аграрлық сектордың тиімділігін арттыруға, оның шығындарын төмендетуге және шаруашылық жүргізуші субъектілер кооперациясының жоғары деңгейіне қол жеткізуге мүмкіндік беретін сандық үлгілерді пайдалану есебінен ауыл шаруашылығындағы және аралас салалардағы процестерді цифрландыруға ақпараттандырудан көшу жүзеге асырылғандығы көрсетілген. Кеңістіктік деректердің ұлттық инфрақұрылымын құру шеңберінде IT-технологиясына, оның ішінде нақты егіншілік және Smart-фермалар әдістеріне бизнесті тарту үшін

Аннотация. Рассмотрен инновационный процесс как единый и непрерывный поток преобразования конкретных идей на основе научных разработок в инновационные технологии. Представлен опыт индустриально развитых стран, продолжающих успешно модернизировать экономику с внедрением технологических нововведений, базирующихся на автоматизации, компьютеризации, цифровых платформах. Показано, что во многих государствах осуществляется переход от информатизации к цифровизации процессов в сельском хозяйстве и смежных отраслях за счет использования цифровых моделей, позволяющих повысить эффективность аграрного сектора, снизить его издержки и достигнуть высокого уровня кооперации хозяйствующих субъектов. В рамках создания национальной инфраструктуры пространственных данных планируется организация собственной казахстанской геодезической сети и геопортала для оказания государственных услуг, с расширением условий для вовлечения бизнеса в ИТ-технологии, в том числе методы точного земледелия и Smart-фермы. AgroBiz.kz – многофункциональный аграрный интернет-портал, действующий два с половиной года, дал возможность создать единую базу для фермеров, сельхозпредприятий, сельских округов, ученых, облегчить связь с госорганами и финансовыми институтами. В Казахстане предприятия внедряют элементы точного земледелия, используют электронные карты и онлайн-мониторинг, осуществляют контроль посевных и уборочных работ с сокращением непроизводительных затрат и сроков, что способствует значительному росту производительности труда.

**Түйінді сөздер:** агроөнеркәсіптік кешен, инновациялық қызмет, нақты егіншілік, инфрақұрылым, цифрландыру, электрондық карталар, еңбек өнімділігі, мемлекеттік қолдау, бәсекеге қабілеттілік.

**Ключевые слова:** агропромышленный комплекс, инновационная деятельность, точное земледелие, инфраструктура, цифровизация, электронные карты, производительность труда, государственная поддержка, конкурентоспособность.

technological achievements in agriculture, contributes to the economic development of rural areas due to their specificity [1].

The Digital platform in the field of agriculture should unite the producer, the consumer, transport workers, warehouses, laboratories processors, trade enterprises, scientific organizations and authorized bodies in the field of agriculture, veterinary and phytosanitary control and many others. It should implement the processes of electronic certification and part of the processes of tracing goods, aggregation of data on prices for agricultural products, information on issued veterinary and phytosanitary certificates, permits for the import (export, transit) of goods controlled by the veterinary service, the introduction of temporary phytosanitary measures, plans for the development of production.

Digitalization will become a key tool for the development of four areas of state regulation of agribusiness: the availability of financing for agribusiness entities; market accessibility and export development; the effective-

The Eurasian economic commission called out the Eurasian economic Union countries to move from informatization to digitalization of processes in agriculture and connected industries due to the transition to digital models of activity, end-to-end digital processes and the use of digital platforms can significantly improve the efficiency of agriculture of the EAEU countries, reduce its costs and increase the level of cooperation [5].

A third of food is lost or thrown out before consumption, agriculture consumes most of the available fresh water and up to 15% of the consumed energy, and these parameters can be improved through the use of digital processes and modern technologies, animal identification systems, and traceability of veterinary controlled goods. It is possible to trace all "biography" of an animal, automatically to define need of issue of subsidies, to keep veterinary account, supervision and control of the imported and exported production of live animals, raw materials of an animal origin, forages, feed additives and veterinary preparations, to issue acts of veterinary and sanitary control.

The experience of leading countries with a developed agricultural sector shows that all of them have passed a kind of "technological revolution". For example, the classical extensive agriculture is replaced by accurate (precision), widely used geo-information technologies, multi-operational energy-saving agricultural units, selection of high-yielding varieties of plants and breeding of highly productive breeds of animals [6]. According to the data of the research Agency Roland Berger, annually in Asia 20% of potential growth is accounted for by innovative technologies in the field of agriculture.

Australia has implemented a system of identification and traceability of farm animals and products which is a complete package of software modules, with full tracking of animals during their lives and identification of all animals and objects with whom they have been in contact during their life cycle which allows a quick and effective reply to various diseases when they occur; this reduces the cost associated with the spread of diseases, industry support and closure of operations in the market [7].

The transition to digitalization is a tool for steady agricultural production. According to FAO UN and OECD, the world population will reach 9.7 billion people by 2050. In order to meet the needs of the population, it will be necessary to increase agricultural production by 60-70% compared with 2000-s, the digitalization of the agricultural sector can provide the volume of production [8].

Moreover digital technologies allow to train farmers located in different countries, best practices, and to follow common production standards. For instance, the company Nestle (Switzerland) has trained 10 thousand farmers in West Africa modern technology of agriculture and storage of products. As a result of what the company got raw materials of guaranteed quality, and farmers – access to the global market and marketing of products at high prices.

The following data indicate an increase in interest in digitalization on the part of business structures. If in 2010 there were no more than 20 high-tech companies working in the field of agriculture, the venture capital market amounted to 400 thousand dollars, and the growth of venture capital has begun since 2013.

Based on the results of 8 months 2019, the volume of capital investments in agriculture reached 175.7 billion tenge - this is 8.2% more than a year earlier (and +5.3% in comparable prices). More than half of all investments were in three regions of Kazakhstan: North Kazakhstan (25.7%), Kostanay region (13.9%) and Akmola region (11.2%).

Intellectual digital solutions should help the agriculture of Kazakhstan to cope with the problems of increasing productivity and steady development.

The aim of digitalization of AIC is to increase productivity and efficiency through the introduction of digital technologies and business involvement in the development of IT solutions for agriculture. Digitalization in AIC will reduce risks, adapt to climate change, increase crop yields and animal productivity, plan field work in time.

In 2017 electronic filing of loan and leasing applications was realized, control of consideration of the application in time (25 days) was provided. In the future this service will be realized for the instruments of guarantee and purchase of agricultural products. In 2018 full automation was realized in 10 areas of subsidization, in 2019 - in the remaining areas. This will reduce the processing time of applications by an average of 2.5 times (from 18 to 7 days) and reduce corruption risks.

Digitalization allows to create a new financial instrument to attract investments in the industry: after the adoption of the relevant legislative act, electronic agricultural (commodity and financial) receipts are introduced from 2019.

Within the frame of the development of the system in 2018 in order to improve security, the introduction of block chain technology, online ordering of grain carriers, online trading that allow foreign buyers to take part in the purchase of grain was carried out.

Besides, the system of traceability of agricultural products "from field to table" has been implemented since 2019, the introduction of e-Commerce in full format is planned for 2020. Preparation works are being carried out: a detailed logistics Map of AIC, it will determine existing and terminals, depots, warehouses, wholesale distribution centers which are necessary for construction.

Within the frame of the creation of the national spatial data infrastructure it is planned

to create Kazakhstan's own geodetic network and geo-portal for providing public services. Based on the technological re-equipment conditions for business involvement will be created in the use of IT technologies, including precision farming technologies and Smart farms [9].

Individual enterprises are introducing elements of precision agriculture, so JSC "Atameken Agro" in the North Kazakhstan region has introduced electronic maps and carries out online monitoring, control of sowing and harvesting operations which led to a reduction in unproductive costs and terms of work and increased productivity. For instance, fuel sensors allow you to save from one unit of equipment about one million tenge per season by reducing losses and theft of FLM.

Digitalization will increase competitiveness and productivity, provide food safety and attract investment in the industry. Totally, the economic effect until 2025 will be about 40 billion tenge. By 2021, it is planned to build 19,970 thousand km of fiber-optic communication lines and provide high-speed Internet to more than 1,249 rural settlements.

JSC "Holding" KazAgro " automated the process of receiving applications from agribusiness entities for loans and leasing, will be automated all types of services supplied by the group of companies of the holding. A Single digital platform will be created which units all measures of state support of agribusiness entities on the principle of "one window", internal business processes will be automated.

This year 100% digitization of pastures will be provided in agriculture of Zhambyl region. A situation center for control and distribution of water resources along the Talas river was opened in the region, smart technologies were introduced in 4 farms. In the future, it is planned to digitize 20 farms, 316 - to introduce elements of digitalization on the basis of knowledge distribution centers.

In rural areas of the region there are "digital offices", where the specialists of the Centers help residents to obtain e-government certificates, by the end of the year, thanks to the integration of information databases, they will be able to advise on obtaining services under all state programs. 32 offices are functioning and 34 more will be activated by the end of the year, in 2019 - the opening of 209 additional offices. In Zhambyl region, it is planned to launch the TarazHub project, which was created by analogy with the International Technopark of IT startups Astana Hub.

98 public services have been optimized and approved by the Interdepartmental Commission for the selection of public services. In

the near future it is planned to optimize the remaining 3, until 2022 – all public services. In accordance with the state program of agriculture due to the measures planned GDP growth of more than 3 trillion tenge, in which the expected effect of digitalization of agriculture will be 30%, or about 1 trillion tenge.

In the state program "Digital Kazakhstan" it is noted that the level of digitalization of the economy in the ranking made by the Boston Consulting Group, Kazakhstan ranks 50th out of 85 countries. According to preliminary estimates the direct effect of the digitalization of the economy by 2025 will create an added value of 1.7–2.2 trillion tenge.

The state provides full support to producers of agricultural products. However, rural producers need additional financial resources to accelerate digitalization. It is advisable to create a fund for digitalization of AIC which will attract investment in the country's agriculture and be attractive for making investment.

Kazakhstan faces an important task of performance of the international requirements and norms of the EAEU, to provide the control of food safety products coming to Kazakhstan from third countries and exported from the country to other EAEU States.

Performance of the requirements will allow to realize its export potential in the field of agriculture which will change not only the volume of production but also increase the technological development of the state agriculture.

Now digitalization is a strategic development priority in many countries. According to the forecasts of the world's leading experts, by 2020 a quarter of the world economy will be digital, and the introduction of technologies for digitalization of the economy, allowing the state, business and society to interact effectively is becoming an increasingly large-scale and dynamic process. More than 15 countries are realizing national digitalization programs: Denmark, Norway, UK, Canada, Germany, Saudi Arabia, India, Russia, China, South Korea, Malaysia, Singapore, Australia, New Zealand and Kazakhstan. China's Internet plus program integrates digital industries with traditional ones. Singapore forms a "Smart economy", Canada creates an ICT-hub in Toronto, South Korea in the program "Creative economy focuses on the development of human capital, entrepreneurship and dissemination of ICT achievements. Denmark focuses on the digitalization of the public sector.

The experience of countries such as the United States, Canada and Australia shows that the informatization of production, operation, management and services in agriculture with the introduction of digital technol-

ologies in this area transforms the model of turnover of agricultural products, stimulates the development of industrial parks and electronic trade in agricultural products, accelerates the demonstration and dissemination of digital technological achievements in agriculture, contributes to the economic development of rural areas due to their specificity.

#### **Concluions**

1. The main priority of Kazakhstan is the development of a new economy based on innovations and new technologies. High-tech industries are of strategic interest for the regions of Kazakhstan.

2. Digitalization will be a key tool for the development of four areas of state regulation of agriculture: the availability of financing for agribusiness entities; the availability of markets and export development; the effectiveness of state control and supervision.

3. In many countries, digitalization is a strategic priority for regional development and according to the forecasts of leading world experts, a quarter of the world economy will be digital, and the introduction of technologies for digitalization of the economy is becoming a dynamic process.

4. The state provides full support to rural producers. However, to accelerate digitalization, rural producers need additional financial resources. It is advisable to create a Fund for digitalization of agriculture, which will attract investment in agriculture of the country, and be attractive for investment.

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**ҚАЗАҚСТАННЫҢ АГРОӨНЕРКӘСІПТІК ӨНДІРІСІН ДАМУҒА АРНАЛҒАН  
АРНАЙЫ ЭКОНОМИКАЛЫҚ АЙМАҚТАР**

**СПЕЦИАЛЬНЫЕ ЭКОНОМИЧЕСКИЕ ЗОНЫ ДЛЯ РАЗВИТИЯ  
АГРОПРОМЫШЛЕННОГО ПРОИЗВОДСТВА КАЗАХСТАНА**

**SPECIAL ECONOMIC ZONES FOR THE DEVELOPMENT  
OF AGRICULTURAL PRODUCTION IN KAZAKHSTAN**

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Аңдатпа. Экономиканы басқару әдісі – арнайы экономикалық аймақтар (АЭА) құру талданған. Оларға тән ерекшеліктері мен негізгі белгілері анықталған. Өңірді жедел дамыту, республиканың АӨК-нің әлемдік шаруашылық байланыстар жүйесіне кіруін жандандыру, тиімділігі жоғары құрылымдар құру, тауарлардың жаңа түрлерін өндіруді игеру, олардың сапасын жақсарту және ассортиментін ұлғайту, инвестициялар тарту мақсатында осы