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Innovative strategy of agricultural industry development of the Republic of Kazakhstan

The article deals with the formation postindustrial technological paradigm in the context of the global innovative technological space in the first half of the XXI century. The paradigm determined modern national economic policy of the Republic of Kazakhstan, which is aimed at achieving sustainable development of the country via a dynamic diversification of industries and refusal raw material model of development. Production of competitive and export-oriented goods and services in agriculture and service sector is the main goal of governmental industrial and innovation policy. Consequently, one of the main aims of providing innovative development of agriculture is to create favorable conditions for the formation of the innovation fund and development in the production process by smoothing existing differences between the results obtained in production and the potential of scientific and technological projects. This refers to both an available and affordable to consumers quantitative set of innovations and their ability to improve the productive, economic and other indicators of agricultural industry.

Keywords: agriculture, innovation and technology policies, new technologies, spin-off, commercialization, strategy, innovation strategy, agriculture, investments, R&D.

In the Message to the people of Kazakhstan named «Strategy Kazakhstan-2050» the President of the Republic of Kazakhstan N.A. Nazarbaev, noted that, in the conditions of the growing global demand for agricultural production large-scale modernization of agricultural industry is necessary. In this regard, one of important problems of the Kazakhstan economy is the problem of development of agricultural production and entry of its production into the world food market. To become the leader in the world food market of agricultural production to Kazakhstan it is necessary to increase, first of all, acreage, and also to provide considerable rise in productivity that can achieve, first of all, due to introduction of new technologies. Kazakhstan is the perspective, actively developing state which has high potential for creation of a food supply of world-class livestock production today. Therefore we need to create national competitive brands with emphasis on environmental friendliness. And, therefore, before agro-industrial complex the task - to become the global player in the field of environmentally friendly production rises Kazakhstan. Kazakhstan needs to develop measures which will allow to increase by 5 times a share of agricultural production in GDP of the country by 2050 [1].

The agricultural industry of the Republic of Kazakhstan is in great need in modernization and inflow of new modern technologies that is confirmed by rather low performance level. Especially the branch crop production seriously lags behind in the majority of the main technological directions – the greatest lag in use of fertilizers and application of irrigation systems. Also in livestock production of Kazakhstan modern technologies spheres of use of systems of maintenance of the cattle and application of feed additives are practically not used [2].

Innovation processes constitute a constant and continuous flow of conversion of specific technical or technological ideas on the basis of scientific research into new technologies, or some of its constituent parts and developing their production in order to obtain qualitatively new products. The peculiarity of these processes in agriculture is the fact that main functional areas are research, scientific and technical development, and preparation for production, actual production, storing, processing and marketing of agricultural commodity production.

Sustainable agriculture and related sectors and competitiveness of the domestic food industry are inextricably determined by the intensification of innovative processes. The innovative process gives the expected positive results, only when it is rationally organized. The experience of the world community has proved that this process becomes mostly efficient in an orientation mainly on regional innovation needs. The first priority at this stage is the development of regional science and technology policy, creation of the necessary infrastructure support, incentive mechanism of scientific and technical activities, social order and implementation of the results through market mechanisms.

The directions of development of innovative processes depend on the particularities of a region, which reflect specific natural and economic conditions, structure of production, and the level of scientific support and regional scientific and technical policy. Regional features determine the priority directions of its development, which have a special need for innovation. Thus, regional innovation processes are aimed at solving problems related to the characteristics and needs of a region.

In modern economy, government helps create viable economic structures that are able to work effectively in the domestic and international markets in stiff competition and to concentrate resources at perspective economic development. In this case, government should support workmanship and creative initiative designed to enhance the well-being of society, on the one hand, and to block the destructive tendencies and destructive behavior, on the other hand.

The key success factors of enterprises in the agricultural sector in modern conditions are applied research, updating productive forces and technology, modernization of production means, the implementation of a reserve scientific and technical potential, increase the competitiveness of domestic agricultural products, every possible improvement of industrial and social infrastructure of agriculture, development of creative potential. Innovative processes should determine the success of enterprises from the standpoint of the social significance of agriculture in the regional and national economy.

Peculiarities of innovations in agriculture lie in the fact that they represent the implementation into economic practice the following: results of research and new plant varieties, breeds and species of animals and poultry, new or improved food products, new technologies in crop farming, cattle breeding and processing industries, new fertilizers and plant and animal protection products, new methods of prevention and treatment of animals and birds, new forms of organization and management of various sectors of economy, new approaches to social services that improve the efficiency of production [3].

The main characteristic feature of the new innovation control system in agriculture should be an orientation toward the long term fundamental and applied research, diversification of operations, innovative activity, and maximum use of the creative activity of people. The most important factors in achieving a high level of innovative competitiveness is the concentration of production, development of new types of products, every possible improvement of the quality of products (services) and stimulation of new needs.

The analysis of the social and economic situation in the agricultural sector of recent years shows that there are applied outdated technology, plant varieties and livestock breeds, poor methods and forms of production and management. There are no established mechanisms of innovative activity. The system of scientific and technical information does not correspond to the market economy. There is no approved effective mechanism of cooperation between scientific institutions with innovative structures. Extremely low innovation activity is also caused by the poor organizational economic mechanism of innovation development. All these result in the degradation of production branches, higher production costs and low competitiveness, as well as hinders social-economic development of rural areas, drastically reduces the quality of life in rural areas.

The innovative type of development of agrarian economy is largely determined by the scientific and technical policy in the region, the formation of regional innovative mechanism. The subjects played an important role in the implementation of anti-crisis program, using genetic selection innovation, technological, organizational, administrative and social type. The priorities for the development of innovative processes in regional agrarian sector are the following:

- Technological re-equipment of agricultural enterprises;
- Energy and resource saving technologies of production, storing and processing of agricultural products;
- Reproduction of soil fertility, prevention all kinds of degradation, development of adaptive technology of agro-ecosystems and agricultural landscapes;
- Development of organic agricultural production;
- Creation of a modern system of informational and infrastructural innovation;
- Development of innovative national and regional policies and strategies aimed at the formation of advanced technological structures;
- Formation of organizational economic mechanism of functioning of the agricultural sector based on innovation;
- Strengthening the role of governmental organizations in the promotion of innovative activities;
- Development of regional and municipal programs of innovative for development of agriculture;

– Improving the training system in order to increase the innovative activity of organizations and commercialization of research projects.

Possibilities of commercialization of domestic technologies for agricultural industry in the short term will be significantly limited to undeveloped system of institutes and innovative infrastructure, a limited stream of the new ideas for commercialization, the need for considerable volumes of risky investments, problems in the field of protection of intellectual property. Also there is no system of dissemination of knowledge which is obligatory the instrument of introduction of innovations in farms [4].

In world practice there is a numerous experience of successful modernization of branches in the absence of the developed national innovative system by means of localization of already approved foreign technologies. Therefore the transfer of the advanced foreign technologies is the most powerful instrument of economic development in developing states.

The project of innovative and technological policy of the Republic of Kazakhstan assumes strengthening of emphasis on increase in technological level of branches and the enterprises, including by means of localization of technologies as localization of the technologies which are successfully approved in the world considerably reduces risks of projects, increases «a dry release» of successful projects, reduces production terms [5].

Such instruments of creation and development of new technologies for agricultural industry as licensing, creation of spin-off, etc. will have much less considerable effect for branch in the short and medium-term period in comparison with localization, however, in process of development of innovative system their value and a contribution to technological development will increase.

Thus, strategic objectives of innovative development are: increase in technological level of agricultural industry of the Republic of Kazakhstan, creation of a basis for commercialization of national technologies, ensuring economically profitable growth.

At the heart of this strategy – 5 basic principles which will provide achievement of stated purposes:

– work in the most attractive segments from the point of view of the volume of potential demand and complexity of development in these segments: seed farming, processing of production of crop production and livestock production, biotechnology, irrigation, compound feeds, engineering services, breeding livestock production;

– use of optimum instruments of transfer of technologies taking into account the existing situation in the RK innovative system: localization of foreign technologies, licensing, creation of the new innovative companies (spin-off) and contract researches;

– focus on priority tools for each chosen technological direction;

– stage-by-stage development of the chosen directions taking into account the flowing and planned level of development of innovative system;

– the effective organization allowing to set responsibility for realization of strategic objectives and the chosen directions of development.

Effect of realization of innovative strategy by 2020: creation in addition 14 billion tenges of GDP and more than 3000 new jobs at the innovative enterprises, payment of 1,7 billion tenges of taxes. Despite rather long return on investment the business model has positive NPV. Long payback is partly connected with existence of activities which have negative financial results, but significant effect for economy (first of all, creation of the new innovative companies – spin-off).

In crop production the greatest gain of production in 2015-2020 is expected in segments of grain and oil-bearing crops. Due to replacement of import raw materials for production of sugar (raw sugar) it is possible to increase production of sugar beet to 1,2 million tons by 2020 and to 2,06 by 2030. Production of potatoes will not change till 2020. Production of vegetables and melon can be increased by 5 % to 2,4 million tons by 2020 due to growth of internal consumption and reduction of a share of import. Due to import substitution and an expansion in consumption it is possible to increase production of fruit by 88 % to 0,33 million tons by 2020. Due to import substitution, an expansion in consumption, and also development of export it is possible to double production of vegetable oil and oil-bearing crops to 1,16 million tons by 2020. Oil-bearing crops can become large article of export of Kazakhstan to China; potential of other products of crop production is significantly limited. Due to strengthening of export, development of production of forages for livestock production and increase in production of flour at export it is possible to increase production of grain by 55 % to 24,1 million tons by 2030. Production of cotton raw can increase to 540 thousand tons by 2020 due to productivity growth.

In processing of production of agricultural industry the greatest gain of release in 2015–2020 is expected in production of flour, cheese and cottage cheese, and also processing of meat. Production of sausages can grow by 2,5 times to 102 thousand tons by 2020 at the expense of an expansion in consumption and reduction of import. Production of cheeses and cottage cheese can grow to 66 thousand tons by 2020 at the expense of an expansion in consumption and import substitution. Production of compound feeds can grow to 632 thousand tons by 2020 due to growth of a livestock of the cattle. Production of pasta can grow to 161 thousand tons by 2020 due to export growth and import substitution. Production of flour can grow to 4,04 million tons by 2020 due to increase in export. Consumption of the prepared and tinned fish in Kazakhstan can increase to 80 thousand tons by 2020 due to growth of internal consumption and reduction of a share of import. Production of mineral waters can grow to 710 million liters by 2020 at the expense of an expansion in consumption. Production of juice can grow twice to 273 million liters by 2020 due to increase in internal consumption, reduction of a share of import and increase in export. Production of the processed and tinned vegetables can grow three times to 55 thousand tons by 2020 [5].

The agro-industrial complex of Kazakhstan is characterized by low labor productivity and small depth of processing of agricultural production. As the low level of the used technologies in livestock production leads to serious lag of Kazakhstan on the main indicators of efficiency. Though production of seed wheat can grow to 2,6 million tons to 2020 due to increase in acreage and import substitution. Production of seed potatoes can grow by 80 % to 196 thousand tons by 2020 due to growth of a share of the CX enterprises and farms. The market of seed sugar beet – by nine times to 0,9 billion tenges by 2020 due to increase in acreage will grow most quicker. The market of means of protection of plants can grow to 46 billion tenges by 2020 due to transition to more intensive use of chemical means. In plans for development of a segment of mineral fertilizers – repeated increase in production, first of all, phosphoric and nitrogen fertilizers which production will lean on own resource base. As a result, production of mineral fertilizers in Kazakhstan can grow by 12,5 times to 137 billion tenges to 2020 at the expense of satisfaction of domestic demand and export growth to India, China and the European countries. The market of biological fertilizers can grow by 18 times to 13,9 billion tenges by 2020. The market of breeding livestock production can grow to 29 billion tenges by 2020 due to increase in a share of breeding herd. The market of veterinary medicines can grow to 13,5 billion tenges by 2020 due to growth of a livestock of the cattle and increase in costs of veterinary service. Production of the hinged agricultural equipment can grow to 20 billion tenges by 2020 due to import substitution [6].

Average annual costs of investments into irrigation systems in 2016-2020 will make 33-54 billion tenges. Annual investments into construction of livestock complexes can average 4 billion tenges a year by 2020. Annual investments into acquisition of the equipment for transportation and construction of logistic complexes for livestock production can average 1,2 billion tenges by 2020. Investments into acquisition of the equipment and construction of logistic complexes for crop production can average 1,2 billion tenges by 2020. The market of engineering services can make 21,6 billion tenges by 2020. The main gain by 2020 have to be in productions: mineral fertilizer, seed farming, biotechnologies, hinged equipment, combines and irrigation systems [7].

For development of production of means of protection of plants it is necessary to be focused on involvement of large foreign producers to Kazakhstan. For development of production of means of mineral fertilizers it is necessary to be focused on involvement of large foreign producers to Kazakhstan and modernizations of the existing production base. For development of biotechnologies it is necessary to invest in creation of the new technological companies. In machine-building production it is necessary will concentrate on localization of foreign technologies. For development of production of seeds it is necessary to be focused on creation of modern seed farms on the basis of domestic and foreign technologies. For development of breeding herd it is necessary to create own breeding farms, at the first stage foreign partners are necessary for import of animals. For development of a segment of maintenance of the cattle it is necessary to be focused on localization of the advanced world technologies of maintenance of the cattle. In a segment of processing of production of livestock production it is necessary to be focused on localization of the advanced world technologies. In a segment of processing of production of crop production it is necessary to be focused on localization of the advanced world technologies.

There is a successful experience of functioning of models of adaptation of the technologies approved in the world: Korea Technology Transfer Center (KTTC) together with the state successfully supports a technological condition of the Korean industry at world level, the Agro-union – an example of the successful model

«distributor of technologies», the company managed to adapt hi-tech foreign technologies for the domestic market and to earn on sale of technological production [8].

Use of the adapted foreign technologies would allow to create an available and effective innovative product for the market of the CIS. Localization of the technologies which are successfully approved in the world in the republic considerably reduces risks of projects, increases «a dry release» of successful projects, reduces realization terms in comparison with creation of spin-off: The centers of commercialization give advisory support during all cycle, financing usually happens only on pre seed-stage. Because of absence in the republic of necessary financial infrastructure, support of businesses at later stages is necessary for effective functioning. Expansion of financing up to a stage of industrial start will demand significant increase in financial means. Depending on opportunities on the basis of the Centers it is possible to develop in parallel some other the directions on the basis of national researches and developments which will have the postponed effect: contract researches for the industry, licensing and creation of spin-off [9].

In world practice the Centers render the whole range of services and have two essentially different categories of clients: the research establishments wishing to earn on knowledge and opening and the companies wishing to order research and development. The Business model basis of «service of the industry» - granting scientific infrastructure maternal research establishments, for carrying out the applied research and development necessary for the industry, and consulting support. The successful model of work of the center of a transfer of technologies on the industry, is realized in Germany, however Kazakhstan in the next years has no possibility of introduction of such model [10].

Also the «licensing and sale of technologies» model successfully works in the countries with the developed innovative infrastructure and great demand on technologies from the industry. Creation and support of backs-off of the companies – one of the most widespread tools of the center of a transfer of technologies, especially at early stages of existence of the centers.

Investments into ready foreign technologies - the most powerful instrument of economic development in the developing and technologically lagging behind countries. Process of localization of technology does not demand the developed scientific base and can be introduced with assistance of the state. Many major technological directions in the republic cannot be realized on the basis of domestic scientific developments, but at the same time can be borrowed from abroad. Localization of the technologies which are successfully approved in the world in our republic considerably reduces risks of projects, increases «a dry release» of successful projects, reduces production conclusion terms [11].

For advance of localization of technologies, the Centers have to work closely with the companies of the industry and foreign suppliers of technologies. Advance of backs-off of the companies requires development of enterprise activity and full support of small enterprises. For successful licensing at the first stage it is required to increase the level of the legislative base and to carry out assessment of opportunities of domestic science. In 2015 the stream of new technologies has to become sufficient for licensing development as priority direction and will demand active expansion of client base. For successful start of contract researches it is necessary to create requirements to the conducted researches and create demand for contract researches from outside the agricultural companies. For sustainable development of contract researches, continued support of applied researches and close cooperation with customers of an innovative product is necessary.

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Қазақстан Республикасының ауыл шаруашылығын дамытудың инновациялық стратегиясы

Мақалада ХХІ ғасырдың бірінші жартысындағы жаһандық инновациялық-технологиялық кеңістік жағдайындағы постиндустрияланған технологиялық құрылыс пайда болды. Бұл елдің тұрақты динамикалық дамуға, экономика салалардың әртараптандыру жолымен және шікізаттық тәуелділіктен ауытқуға бағытталған Қазақстан Республикасының заманауи мемлекеттік экономикалық саясатын анықтады. Ауыл шаруашылығында және қызмет саладағы экспортқа бағдарланған және бәсекеге қабілетті тауарларды, жұмыстарды, қызметтерді өндіру – мемлекеттік индустриалды-инновациялық саясаттың негізгі қызметі. Сондықтан ауыл шаруашылығында инновациялық дамуды қамтамасыз етуші ең негізгі міндеттерінің бірі — инновациялық қорды қалыптастыру және оларды өндірісте игеруді, өндірістегі айырмашылықтары бар ғылыми-техникалық өңдеулердің әлеуеті мен нәтижелерімен тегістеу арқылы қолайлы жағдай жасау. Мұндағы тұтынушыларға сандық инновациялар жиынтығының бар және қолжетімді болуы, сондай-ақ агроөнеркәсіптік қызметінің олардың мүмкіншіліктерін өндірістік, экономикалық және басқа да көрсеткіштерін жақсартуы жатады.

Кілт сөздер: ауыл шаруашылығы, инновациялық-техникалық саясат, жаңа технологиялар, коммерциализациялау, инновациялық стратегиялар, агроөнеркәсіптік кешен, инвестиция, ҒЗТҚЖ.

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Инновационная стратегия развития сельского хозяйства Республики Казахстан

В статье рассматривается становление в первой половине ХХІ в. постиндустриального технологического уклада в условиях формирования глобального инновационно-технологического пространства, которые и определили современную государственную экономическую политику Республики Казахстан, нацеленную на достижение устойчивого динамического развития страны путем диверсификации отраслей экономики и отхода от сырьевой направленности развития. Отмечено, что производство конкурентоспособных и экспортноориентированных товаров, работ и услуг в сельском хозяйстве и сфере услуг является главным предметом государственной индустриально-инновационной политики. Следовательно, одной из основных задач, обеспечивающих инновационное развитие сельского хозяйства, является создание благоприятных условий для формирования фонда инноваций и освоения их в производстве при сглаживании существующих различий между получаемыми в производстве результатами и потенциалом научно-технических разработок. Подчеркнуто, что имеются в виду как имеющийся в наличии и доступный потребителям количественный набор нововведений, так и их возможности улучшать производственные, экономические и другие показатели агропромышленной деятельности.

Ключевые слова: сельское хозяйство, инновационно-технологическая политика, новые технологии, spin-off, коммерциализация, инновационные стратегии, агропромышленный комплекс, инвестиции, НИОКР.

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