Agroindustrial Complex Modernization Of Kazakhstan On The Basis Of Innovation

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Abstract – The research is devoted to the problems of modernization of the agroindustrial complex on the basis of innovation, which has the actual value for the development of the AIC and its structural components. It reveals the essence and purpose of the innovation activity and its results. Special attention is paid to the increase in innovation activity, which is necessary for the acceleration of the agroindustrial modernization and the transition to the highly technological level. The innovation activity which contributes to creation of a new product and technical improvements on the basis of scientific research and developments. To maintain the innovation activity and increase production responsiveness to innovations a consistent system of management and acceleration of the innovative process in the AIC has been created. This method takes into account the whole economic system, including state support for tax privileges, subsidies and guarantees on innovation investments, etc.

Keywords – Innovation, innovation process, technology, modernization, agriculture.

1. INTRODUCTION

Economic development of Kazakhstan after the disintegration of the former Soviet Union started with large scale changes on the basis of new forms of property and organisation, increase of investment and business activity, use of innovations to modernize the production and its growth. Market changes in socio-economic development of the country, caused by its transition to market relations, became the subject of scientific research of Kazakh scientists who published a lot of studies, as well as monographs.
Among these scientific studies, a special attention should be paid to the monograph of the academicians Orazal Sabden “Innovation economics”, which was published in 2008; it investigates the source of innovation in more details, as well as conditions for the formation of industrial and innovative sphere, which covers almost all economy sectors and infrastructure elements contributing to its development [8]. The collective monograph, published in 2005, “The analysis of scientific support for the development of economy sectors and innovation activity” gives the analysis of the economy development of the country on the basis of innovation taking into account the mechanism of innovation implementation in all its spheres [9]. The scientific research devoted to the agriculture development regards the economic problems of structural and technological modernization, as well as possibilities for cluster creation in AIC and creation of agrimarkets [10, 11, 12]. But these works don’t give sufficient details on creation and implementation of innovations with regard to the specifics of agricultural production in order to ensure its intensive development on the innovation basis. The innovation process in AIC is connected with the use of innovation, presented in the form of new plants, animal breeds, equipment and machines, created with regard to climate conditions of the country and its regions. At the same time, innovations must cover all three AIC spheres, which are interconnected. The efficient performance of their enterprises is possible only if there are conditions for their interrelated development [13, 14, 15].

Therefore, in our research, we are trying to improve the situation by paying more attention to the issues related to the development and management of the innovative process in the AIC.

The essence and classification of innovations. The concept of "innovation" first appeared in scientific studies of culture experts in the XIX century and meant the introduction of some elements of one culture into another. Usually it was about infiltration of European customs and ways of organization in traditional Asian and African societies. And it was only at the beginning of the 20th century that the laws of technical innovation started to be studied [20]. The founder of the theory of innovation is J. Schumpeter. In his work The Theory of Economic Development, published in 1912, he considered innovation (new combinations) as a means of entrepreneurship to get a profit. The author called the entrepreneurs "economic entities whose function is just the implementation of new combinations and which act as its active element" [21]. Later, in the thirties, J. Schumpeter distinguished five typical changes in economic development: the use of new technology, new technological processes or new market collateral of production (buying and selling); introduction of products with new properties; use of new raw materials; changes in the organization of production and its material and technical support; the emergence of new markets. A significant contribution to the study of innovation was made by N.D. Kondratiev, who substantiated the theory of large cycles lasting 50-60 years and developed models of conjuncture cycles. He proved that the transition to a new cycle is connected with the expansion of capital goods, which create the conditions for mass introduction of accumulated inventions. N.D. Kondratiev linked the transition to a new cycle with the technological progress: "Before the upward trend of each large cycle, and sometimes at its very beginning," he wrote, "there are significant changes in the conditions of the economic life of the society. These changes are usually expressed in some combinations,
in significant technical inventions and discoveries, in profound changes in the techniques of production and exchange." [22]. The main role in the economic changes of the society Kondratiev assigned to scientific and technical innovations. In the world economic literature, "innovation" is interpreted as the transformation of potential scientific and technical progress into a real progress, embodied in new products and technologies [23].

In the studies of domestic economists, the term "innovation" has been widely used after the transition to market relations. Prior to this, in the domestic economic literature, the problems of innovations were widely covered in the framework of research on scientific and technical progress, the development of science and technology.

The modern development stage of AIC is associated with the need to transfer it to the innovative development path that involves the intensive use of scientific and technical achievements to update the range of agricultural output, improve its quality and competitiveness. Today for the agroindustrial complex and its three spheres this way of development is the main motive for turning them into drivers of Kazakhstan's economic growth. For this, the agroindustrial complex has sufficient resource potential.

The large-scale transformations carried out in the agroindustrial complex in accordance with the guidelines of the above-mentioned state programs were aimed at activating innovative processes for the creation and introduction of new high-tech industries in the agrarian sphere.

In the framework of the Agribusiness-2020 program, over 16 billion dollars will be invested in the agro-food sector. With the development of the program agricultural production by 2020 will have got almost all the signs and attributes of the innovative type. And the agriculture, providing the second sphere of the agro-industrial complex as a base for an efficient, diversified and export-oriented processing sector, will join highly technological branches and produce competitive agricultural products.

Over the last five years, less than 1% of the annual foreign investments attracted by the state for the implementation of the Strategy: Kazakhstan-2050 was allocated to its development each year. And there are some reasons to expect a fuller use of natural potential through the optimization of land use technologies, growth and development based on quality and timing of agrotechnical measures with the use of borrowed foreign technologies and materials.

We express our gratitude to the leadership of the Department of Science and Technology of the Ministry of Agriculture of the Republic of Kazakhstan and JSC National Holding “KazAgro” for supporting this research by providing the necessary information.

2. METHODS

The complexity of the agroindustrial production and its specifics determine the unique nature of approaches and methods of innovation management, the combination of different innovation types, the strengthening of the state role in stimulating innovation. It should be emphasized that the agricultural production is characterized by the high level of innovation risks. The risk of financing scientific and production results, the risk of a temporary gap between costs and results, the uncertainty of the demand for innovative products do not attract private investors.

Four main areas of innovation can be identified in the agroindustrial complex: selection and genetic, production and
technological, organizational and management, economic and socioecological.

Selection and genetic. New varieties and hybrids of agricultural plants. New breeds, animal types and bird crosses. Creation of plants and animals resistant to diseases and pests, adverse environmental factors.


Economic and socioecological. Formation of a system of scientific and technical personnel of the agroindustrial complex. Improvement of working conditions, solving of public health problems, education and culture problems of rural workers. Improvement of the environment situation. Ensuring favorable ecological conditions for the life, work and leisure of the population.

We see that at least two directions from the set of agricultural innovation directions are related to the biological sciences. Innovative processes in the agroindustrial complex have their own specifics. They differ in the variety of regional, branch, functional, technological and organizational features. One of the agriculture characteristics is that along with the industrial production means, living organisms - animals and plants are active participants of the production process. Their development is subject to the natural laws and depends on such natural factors as climate, weather, heat, moisture, light and food. Extended reproduction in agriculture takes place in the interaction of economic and natural-biological processes. Therefore, when managing innovations, it is necessary to take into account the requirements of not only economic, but also biological laws.

The complex nature of innovations in the agroindustrial complex poses specific requirements on the innovative mechanism.

The complexity of agricultural production and its specifics predetermine the unique nature of approaches and methods of managing the innovation process, the combination of different innovation types, the strengthening of the state role in stimulating innovation. It should be noted that the complexity and specifics of agricultural production are characterized by the high level of risks of innovation processes. The risk of financing scientific and production results, the risk of a temporary gap between costs and results, the uncertainty of the demand for innovative products do not attract investors. Analysis of the conditions and factors affecting the innovative development of the agroindustrial complex made it possible to subdivide them into negative (constraining innovative development) and positive (contributing to the acceleration of innovation processes).

3. RESULTS AND DISCUSSION

The result of our research was the identification of the problems and the
formation of integrated approaches to their solution. So, nowadays the most important issue of the AIC development is the creation of the conditions for its sustainable development and increase of agrarian production competitiveness. To solve this problem, we have to ensure stable agrarian development and improve its quality characteristics through innovation activity in AIC activity on creation and implementation of new innovations, representing the latest science and technology achievements.

Analysis of the state and assessment of innovative activities in the agroindustrial complex show that this process is characterized by the low activity level with considerable scientific potential. The adaptation of innovations is observed mainly at processing enterprises of the agroindustrial complex and in industrial agricultural organizations (at poultry farms and greenhouse complexes). The share of agroindustrial enterprises, which are the most dynamic consumers of innovations, is 8-10%. Primitive methods and technologies dominate in most agrarian enterprises and economies; obsolete varieties of agricultural crops and cattle breeds, imperfect organization and management forms are applied. At the same time, there are some exceptions: the production of durum wheat: in this sector, investments in certified seeds, the efforts of domestic scientists in zoning and selection, hybridization of the best world varieties and their adaptation to local conditions have led to good results – the production of a product with a high export potential. Leading scientific research institutes and agricultural experimental stations of Kazakhstan have united their efforts to increase the yield of cereals and other crops. Among them there are the Karaganda Research Institute of Plant Growing and Selection, the Pavlodar Research Institute of Agriculture, the North Kazakhstan Research Institute of Agriculture, the North Kazakhstan Institute of Animal Husbandry Livestock and Plant Growing, the Kostana Institute of Agriculture, the Karabalyk Agricultural experimental station, the North Kazakhstan Agricultural experimental station, the Aktub Agricultural experimental station, the Ural Agricultural experimental station and East Kazakhstan Scientific Research Agricultural Station. The Scientific Production Center of the grain economy named after A. A. Baraev will coordinate this work.

Taking into account the above mentioned information, the purpose of the research is to ensure the innovation development of AIC on the basis of scientific and technological achievements in its three spheres, where innovation activities on modernizing agrarian production and technology are implemented. For the implementation of this goal, the following tasks are set: to give a comprehensive analysis of the current state of the agroindustrial complex of the country as a source of its innovative development; to determine the function of innovation in the modernization of agricultural production in order to ensure stable and balanced AIC development; to develop proposals for the improvement of innovation process management in the AIC and the stimulation of the innovative activity through strengthening their responsiveness to innovations, especially at the beginning of the innovation process adaptation.

The necessity of solving these tasks derives from the growing role of AIC as one of the main production and social economy sectors of the country, which determines the living conditions of the population through satisfying their needs in nutrition and clothing.

On the basis of the successful implementation of the new state program "Agribusiness - 2020", in the framework of
which 16 billion dollars will be invested in
the AIC, this complex will become one of
the largest world manufacturers of the
agrarian export products in the nearest
future. As a result, the AIC will become a
new economy driver of the country [1-6].
The Kazakhstan agrarian sector has a big
potential for the AIC development. But this
potential is not being fully used now. In
2016 the agrarian enterprises put production
out for the sum of 3.6 trillion tenges; the
growth was 5.5%. But in 2017 the
production growth was 2.5%. Today the
share of agrarian production in the GNP of
the country is approximately 7%, compared
to the indicator of developed countries,
where it is twice higher. Moreover, the main
part of the final product of the agroindustrial
complex in these countries is created in its
third sphere, where non-waste technology of
processing agricultural raw materials is used
and the obtained products are constantly
provided with innovation in the packing
process, the conditions of their storage and
delivery to the place of supply. In
Kazakhstan, the largest part of the final
agroindustrial complex product belongs to
the second sphere, which is represented by
agriculture. And the share of the first and
third spheres of the agroindustrial complex
has a relatively small part of its agricultural
output due to the low development level of
these spheres, especially agricultural
machinery. Currently, the domestic
agricultural machinery and equipment
market of the country is almost filled with
imported products, although their volume
does not fully cover the existing demand for
them, which hampers the development of
agriculture and industrial agricultural
products processing. This indicates that there
are serious problems in the development of
the AIC and its three spheres, maintaining
them in a certain ratio.
Ensuring the optimal balance of the three
AIC spheres largely depends on the
development level of the first sphere, which
produces production means for the rest two
spheres, that is for the agriculture and
industrial processing of the agricultural raw
materials. The first sphere is connected with
the industrialization of the agrarian
production on the innovation basis, which
involves modernization and technical re-
equipment for dynamic development of AIC
and ensuring safety and quality of the
agrarian products in accordance with the
international standards, which is an
important condition for increasing their
competitiveness.
In the last decade, especially in the first five-
year period (2010-2014) of the industrial and
innovative development of the country the
AIC has significantly strengthened its
potential for modernization in order to solve
the agroindustrial production problems. But
despite the positive trends, there are still
some problems to be solved through the
modernization of the complex and use of
new technology by creating and
implementing innovations.
These problems are the backwardness of
agricultural technologies, physical and moral
deterioration of the main production
facilities, small-scale agricultural production,
low share of agricultural products in the
domestic food market and a low level of
investment attractiveness of the agricultural
economy sector. In connection with this, the
modern agroindustrial complex is still in a
difficult financial and economic situation.
Here, unprofitable agroindustrial enterprises
are still operating along with financially
stable organizations, whose share is from
35 % to 40% of the total number of
operating enterprises. The production cost
remains high, credit debt is not decreased,
there are not enough current assets.
Moreover, there are no necessary re-
equipment methods; business management
mechanisms with the use of progressive
production technologies are not effective.
Under these conditions the need for innovation development of AIC and the expectations connected with it allow us to rely on the innovation processes implemented here, which are characterized by a large scale and a good pace of innovation implementation in the agriculture. That is why, modernization, caused by the need for innovation implementation and increase of its effect, must be primarily connected with the production and application of new kinds of equipment and machines. It is based on the following principles:

- **System approach to the development and production of machines and equipment**, which ensures the possibility of complete equipment supply for finished technological cycles in agricultural production and the industrial processing of agricultural products.
- **Rational range restriction of technical means**, reduction of metal and energy intensity through creation of optimal standard series, aggregate unification, modular construction technique and universalization of machines and other mechanic equipment of production processes in the second and third spheres of the AIC.
- **Technological and management process automatization**, first of all, automation of stationary processes with the use of automatic machines, industrial robots, information technologies and remotely operated machines;
- **Maintenance of the necessary level of operational capacity of machines and equipment**, while in operation, forming and using the technological base of the AIC through putting machine-tractor stations into operation again.
- **Computer production technologies** for the use of the intellectual work and science-technological achievements in order to create an integral system for information storing, processing and transmitting it to the relevant authorities, including digital management of the production.

The agrarian production modernization, based on such an approach to re-equipment with new machines and technology, meeting the above-mentioned principles, with provide the best machines and equipment that have the same technical and operational characteristics, design, reliability and durability as their foreign analogues.

Nowadays in Kazakhstan there are more than 100 tractor and agricultural enterprises, the number of which account for about 70% in the total number of machine-building enterprises. There are a lot of large companies, such as JSC "Agromashholding", LLP "Astana-Agropromtechnika", JSC "Kazakhstan tractor", JSC "Kazakhshelmash", "CemAZ", JSC "Uralagrommash". But along with these large enterprises there are some small and badly mechanized enterprises with a small number of workers (from 200 to 500 people), which produce machine parts and details of the final product of machine-building industry and fix non-functioning equipment with the help of old methods due to the low organizational and technological level.

Such a big number of small enterprises hampers the development of production and technological potential of domestic agricultural machine-building and Kazakh final products, produced by large enterprises operating in the first AIC sphere. That is why it is important to create integrated formations to extend the production with the aim of serial issue of new samples, domestic machines and equipment, developed by the scientific organizations of AIC to improve the technological structure of innovation processes in agriculture. In the country over the last decade there have been created in recommended for the introduction 43 new machinery and equipment types, 12 technological processes for the aggregate, part and detail restoration of tractors and
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combines, 23 samples of repair technological equipment, 14 items of technological equipment for grain processing, technologies and machines for complex mechanization of plant and livestock production. For the innovative development of the agriculture these inventions and discoveries have a significant importance as an indicator of increased and modernized production of agricultural products with the minimization of production costs. If these changes are adopted as innovations, they become a result of the innovative process in the AIC, which is a complex of consecutive measures on creation of a new and modernized product and organization of its production on the basis of scientific research and developments. Consequently, the innovation development of AIC should be regarded as its quality transformation due to the production capacity growth and the improvement of organizational and economic mechanism of agriculture and its related branches, as well as of the whole AIC. It is ensured by the constantly expanding use of more advanced production and processing technologies of the agricultural products, improved varieties of plants and animal breeds, new machines, progressive organizational and economic models, modern information technologies and other innovations.

Within the innovation process in AIC a special place is taken by the innovation activity in the agriculture, which is aimed at its qualitative transformation as a basic branch of the complex, whose level determines the state and perspective development of the agrarian economy sphere. The innovation development in agriculture gives a multiplying effect, which stimulates a range of activities on qualitative transformation of technical production in AIC as a whole, as well as in its two spheres. It is mainly done through the introduction of new domestic equipment and more reliable foreign agricultural machinery.

Innovation activity as an agricultural process is characterized by the variety of created and implemented innovations, connected with the functional peculiarities of reproduction in this sphere, where economic and natural biological laws closely interact. Therefore, creation and introduction of innovations in the agricultural production is characterized by the wide range and scope of directions. In the last decade scientific organizations of the AIC have created a number of innovations and improved a range of scientific and technological products, which have been recommended for the introduction into the production process. Among them there have been 623 new varieties and hybrids of plants, including 254 varieties and hybrids of crops, pulse and grain-fodder, 60 – vegetables and gourds, 92 – fruit, 11 – grapes, 39 – potato, 34 – oil-plants, 17 – cereal crops, 86 – feed crops, 10 – cotton plants, 20 varieties of forestry and industrial crops, medical plants, 30% of which can be used.

In the period of 2015-2016 82 scientifically substantiated technologies were introduced in agriculture production: technologies for grain, pulse and oil crops growing – 35, rice – 2, vegetables, fruit – 3, breeding: dairy breeds – 1, camels – 6, sheep – 5, poultry – 1; 6 technologies were aimed at satisfying people’s needs and 15 at technological processes. Unique technologies on production of elite virus-free potatoes were introduced and put into practice [6, 7].

As technological modernization of agricultural production is closely connected with the use of innovations, the production of a new product or a well-known agricultural product in other artificially created conditions can be regarded as an innovation, for instance vegetables and gourds grown in greenhouses. In Kazakhstan for the purpose of year-round supply of the population with fruit and vegetables, state
programs realize a number of investment projects, which cover not only greenhouse construction, but also other facilities, in which scientific and technical ideas are transformed into a new or improved product as a part of agricultural production and processing.

During the first five-year period of the innovation industrial period of the country in connection with the AIC development program only in terms of “KazAgriFinance” 82 innovation projects were presented. Due to these projects 48 technologies for cultivation of main types of crops and 44 – for processing and storing agricultural products were developed and improved. Thirty-nine animal breeds were developed and 23 more efficient technologies of keeping and feeding livestock, poultry and fish were introduced. For the period of 2007-2016, despite a rather difficult economic situation, caused by two global crises, the innovation processes in the AIC of Kazakhstan began to intensify. This is evidenced by the mastered innovations, although not to the full extent, but they are used selectively in all AIC spheres, especially in agriculture. The innovations proposed for introduction into the agrarian production show that every AIC sphere is characterized by a certain set of innovations connected with its functional specifics. Creation and rational implementation of innovation with regard to the agrarian production need play an important role in ensuring stable AIC development. The optimal balance in AIC can be found if the producers use the innovation functions, namely the reproduction and stimulating ones. Reproduction function of the innovation should be regarded as an important source of extended production financing. Because the money received from the sale of innovations on the market is the source of financial resources and at the same time the measure of the innovation process efficiency, which is conducted to increase production output and get additional profit to cover production costs. Stimulating function of innovation is a good opportunity for the producer to get profit. It serves as an incentive for the producer to use innovations, study market demand and organize marketing activity in order to constantly modernize production and increase its efficiency [16-19].

To maintain the balanced AIC development, it is necessary to ensure the development of its interrelated spheres. It should be kept in mind that in the AIC the most important innovations are new or modernized production technologies in agriculture, which act as an AIC forming system; new types and hybrids of crops and new animal breeds and poultry crosses take the second and third positions respectively. Further, there must go a deep processing of products and the introduction of machinery and equipment produced by the machine-building industry of AIC. This innovation classification defines the features of each innovation group and makes it possible to determine the priority directions of state innovative and investment policy, which is implemented in the agrarian economy sector in order to ensure its sustainable development through the regulation of innovation process which goes along with the use of information technologies. In this regard, in relation to the formation and development of the AIC processing sphere in recent decades a big amount of work has been done by the state agrarian holding “KazAgro”. The result of the work was the creation of hundreds of processing enterprises in the country. According to the “KazAgro” report the total amount of AIC financing in the period of 2007-2016 amounted to 2.3 billion tenges. Due to this livestock feeding complexes, commercial dairy farms, meat-processing plants, greenhouse facilities, elevators with mill
complexes and feed factories, advanced grain processing plants, pasta factories, poultry farms, vegetable storehouses, processing plants of vegetable and fruit, sunflower and other oil-crops. So that innovation and balanced development of the AIC spheres serves its purpose and meets the expectations, a full and comprehensive support is required to increase agricultural production capacity of all AIC spheres of AIC.

When developing innovations for AIC industries, especially for agriculture, a special attention should be paid to the use of information agricultural technologies in scientific research, which gives the necessary information on the influence of gravitation and space radiation on the bioresonance activation of plant seeds and the growth of animal productivity. This technology has a high potential of adaptive response to climate change and other conditions that lead to the imbalance in nature. Agrotechnology is an integral part of information technology, which according to the definition suggested by UNESCO is a complex of interrelated scientific, technological and engineering disciplines studying methods of effective organization of work of people engaged in processing and storing information; computing tools and methods of work organization and interaction of people and equipment, as well as their practical use in solving social, economic and cultural issues. The purpose of any information technology is to obtain necessary information of the required quality on a given medium.

To coordinate scientific and technological work carried out in information agrotechnologies JSC “National holding KazAgro”, “KazAgroFinance”, “KazAgroInnovation” and others have been founded in the country. These structural formations are aimed at integration of the newest nano- and biophysical information adaptive technologies and their practical implementation in agriculture. Due to such an integration, the above-mentioned innovations, which were developed and used in agriculture, were created taking into account the effect of magneto-electrical biofield on biological processes, that is plant and biological bodies, the environment through choosing optimal conditions, regimes and means of this influence implementation.

The use of adaptive agrotechnologies contributes to the achievement of the dual goal. That is high productivity of crops, livestock and poultry, stable production performance, soil fertility and ecologically clean products. For example, one of the directions of this technology is the technology which uses magneto-electric fields, including solar radiation, which significantly increases crop yield and improves their biochemical composition. This technology provides 24-hour energy supply through the use of solar and wind energy, i.d. renewable energy. It provides fruit and berries, vegetables, fish, meat and dairy products, fuel without air, water and soil pollution. Due to the use of such technologies the agrarian complexes which are constructed in northern and southern parts of the country produce more food from 1 hectare compared to the use of traditional seasonal agricultural technologies. On the basis of these technologies biological and technological processes, electrophysical facilities for processing, recycling and storing of biological products are developed and introduced into production activities of the agricultural complex. This provides sufficient energy potential for yield maximization, obtaining ecologically clean product and cost reduction. Thus, innovation process in AIC, which involves information adaptive technologies, determines the efficiency of innovation activity in all its spheres, where innovation production is forming.
It is important to improve the innovation process management, the organizational basis of which is the Department of science and technological progress with the coordination committee on information and advisory activity. The efficiency of agrarian innovation science and the successful performance of information and advisory service of AIC depend on the work of the department. To ensure the coordinated work of the innovation management bodies in the AIC, it is necessary to distinguish functions and competences both at the national and local levels, as well as to ensure timely and sufficient fund allocation on the development of agrarian science quality innovations. Special attention should be paid to strengthening the activities of the AIC information and advisory service on innovation dissemination and systematic informing of economic entities about innovations in agricultural production technologies. These entities must learn about innovations not from their neighbors’ production experience, but from the information and advisory service at the stage of their creation. The service must use all forms of interaction with producers, maintaining a close relationship with scientific and educational organizations. This will make it possible to inform the entities about the latest results of adaptive technologies application for their further development through the establishment of scientifically sound agricultural and scientific organizations, differentiated by natural and economic characteristics, taking into account the achievements of interrelated sciences – biophysics, biochemistry, biomagnetic cybernetics and information technologies. Consequently, it is necessary to expand the scope of activities of the information and advisory service with the improvement of its organizational structure to enhance its role in establishing and strengthening the relationship between science-dissemination-production. It gives a certain impetus to the innovation development in the AIC through the modernization of its management system. From each position it can be proved that the AIC entities should have a comprehensive approach to innovation, its contents and quality so that in the process of its use it is possible to ensure the efficiency of production through labour productivity growth.

Moreover, special measures aimed at stimulation of AIC innovation processes are also required. It was established that radical changes are required in the context of common activities in the AIC, which create favorable conditions for its functioning through the application of tax incentives, subsidies, specific standards for accelerated amortization and mechanism for innovation stimulating.

4. CONCLUSIONS
1. Nowadays there are large-scale changes on the basis of innovation processes on creation and introduction of new high-tech production for ensuring sustainable growth of agrarian products and increase of their competitiveness.
2. Innovation process in AIC is closely connected with the creation and implementation of innovation represented in the form of new varieties of plants, animal breeds, machinery and equipment, technology in its three spheres, on the basis of which AIC should become the driver of economy growth of the country.
3. While creating innovation for the first AIC sphere, a systematic approach to the development of its types, which provide full-scale supply of technical means for finished technological cycles in the production of agricultural products and their industrial processing, is required.
4. The use of information agrotechnologies in scientific research while creating
innovation for agriculture, taking into account its functional specifics, will provide us with the necessary information on the effect of gravitation and space radiation on the bioresonance activation of plant seeds and the growth of animal productivity.

5. The unity of biological and technological processes is ensured by the application of adaptive biological and technological processes, which are accompanied by electrophysical methods of processing, recycling and storing of products of biological origin. This provides sufficient energy potential for yield maximization, obtaining ecologically clean product and significant cost reduction.

References


Schumpeter, J., Mileikovskii, A. G., Bomkin, V. I. The Theory of Economic Development: (The study of entrepreneurial profit, capital, credit, interest and the conjuncture cycle):
Figure 1. Economic mechanism of innovation activity
Figure 2. Conditions and factors of innovation development of AIC
Durum wheat export

Export destinations, kt

- Russia: 190,721
- Italy: 156,691
- Turkey: 156,927
- Sweden: 156,463
- Poland: 57,436
- Azerbaijan: 21,705
- Afganistan: 21,705
- Germany: 57,436
- Iran: 21,705
- Tajikistan: 21,705
- Tunisia: 21,705

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<td>Total</td>
<td>171,617</td>
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Comments:

- Sustainable key destination for export remain Russia based on fact of Eurasian Union (no limitation, no export import duties)
- Last years significant export growth to Italy
- Turkey remains in top 3 export directions for last 3 years
- Top 3 countries of export direction are delivering 80-87% of total durum export
- Tunisia is new country of top 8 direction in 2016 with good potential for growth
- Total export of durum wheat is increasing significantly last years. More than twice during last 3 years