Scientific aspects of economic mechanisms of grain production development based on innovations

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Abstract: The article provides a conceptual analysis of the concept of "mechanism", considers the scientific aspects of economic mechanisms that stimulate the grain production development with the use of innovations. The development of grain production in the country needs strengthening the organizational and economic processes that are in constant improvement of scientific and technological base of grain farming, taking into account advances in science, technology and best practices. In this regard, the author gives a range of measures and recommendations for improving the grain production on the example of agricultural sector of the Republic of Kazakhstan.
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Introduction

Currently, the economic relations development in the world, of course, leads to transformation and radical changes in all spheres of the economy, including in the agricultural production system. The formation of economic relations was paralleled by the changes in the economic mechanism of management, as well as in system and functions of mixed agrarian sector management.

The relevance of the study lies in the fact that agricultural sector is now an urgent need to optimize the mechanisms of interaction of the parties involved in increasingly competitive domestic and foreign markets. The theoretical solution of this mechanism suggests new institutional theory based on innovations in agriculture and directly in grain production.

The purpose of the study is to examine the scientific aspects of economic mechanisms of grain production development on the basis of innovations. To achieve this goal it is necessary to consider the theory of complete contracts where efficiency requirements imply the need to use this information if there is some leeway for optimal mechanisms to achieve economic goals in allocation of resources.

Conceptual framework and review of literature on economic mechanisms and innovations

Economic mechanism, based on the theory of economic mechanism, is its main core, and many scientists draw the clear line between these two concepts.

The concept of «mechanism» was introduced by American scientist Leo Hurwicz. He also set out the main principles of the theory of economic mechanisms in 1959-1960 [1]. The focus of attention in solving this problem was the limited resources in the desire of people to meet their needs. L. Hurwicz developed the theory of optimal mechanisms that contributed to business and public sector to increase the individual rationality and decisions accuracy to their desire to increase social welfare.

Over time, Eric Maskin began to develop a so-called "implementation theory". That is the actual design of mechanisms: how to make such a protocol that has the desired properties [2-4]. An important element of the theory became the principle of detection strategies within the align incentives mechanism developed by Roger Myerson. He subsequently applied all these to auctions and finally designed the field of action [5-8].

In 2007, the scientist was awarded the Nobel Prize for "fundamental contributions to the theory of economic mechanisms" [9]. For the study of economic mechanisms and the organization of coordinated resource allocation mechanism, it was necessary to take into account the positions of the parties and to choose the right strategy in the framework of the align incentives mechanism.

A.B. Nagoyev notes the increasing role of the economic mechanism as a factor that enhances the sustainability of the agricultural sector [10]. E.V. Fakhrutdinova notes that not any formed economic mechanism can be effective. Its effectiveness is based on a combination of government regulation and market self-regulation [11]. In their articles, G.M. Semyashkin and S.N. Silvestrov raise the question of the proper choice of instruments and leverage of the economic mechanism on the economic system [12-13].

As noted by L.I. Abalkin "the goals ... of policy, their social attitudes quite substantially affect the whole mechanism, their methods and tools, the choice of evaluation criteria of the economic activity and so on". Thus, many scientists are similar to agree that each socio-economic formation is inherent in its mechanism, that is caused by changes in the level and nature of the productive forces and production relations [14].

Considering these aspects of economic mechanisms and applying the scientific theories in modern conditions for the grain production development, it is necessary, first of all, to use the legal framework, the laws on land, as well as innovations in technology terms, and production mechanism. Agriculture, climatic conditions, availability of resources and the price mechanism will affect it as well.

Having analyzed the concept of "economic mechanism" we can note that in the categorical sense, the definition among diverse terminology formulations gives us grounds to prefer the concept of "economic mechanism" as a category that reflects the set of tools and techniques that affects the economic process in any socio-economic formation.

The economic literature is largely dominated by publications devoted to the notion of "economic mechanism". At the same time, there are a number of publications examining the issue of innovations and considering separate mechanisms aimed at enhancing innovations in the agricultural sector.

In summary it can be noted that despite the variety of concepts of scientific study in agricultural sector, the question of its innovative component in the complex formulation of the problem has not been investigated fully. There is no scientific formulation of the question on the system of mechanisms allowing to implement this innovative component. The structure of the elements of the system is not defined as well.

Economic mechanisms of grain production development on the basis of innovations

In the context of globalization and the formation of a single world market of grain and grain products to develop innovative systems has become a central character of the economic process. This means that the dominant of economic growth in grain farming subcomplex becomes a system of scientific knowledge, new technology, innovative processes, products, and services.

Economic growth of grain production depends on the level of scientific and technical potential, the use of intellectual property, investment and innovations.

The development of grain farming industry requires ensuring four factors of scientific and technological progress: *technological, technical, biological, organizational, and economic*. The main problem of the innovation sphere in grain farming is the contradiction between the increasing role and the need for innovations as a factor of development and current organizational and economic relations that impede the commercialization of research and development.

Technological backwardness enhances the lack of receptivity of industry to scientific and technical achievements and best practices. Measures taken in the agricultural sector should be aimed at stimulating innovative proposals rather than innovations demand. The state is able to persuade grain farmers to raise demand for energy-saving equipment and technology, offering them incentives due to the changes in the structure of taxation, depreciation policy. Created on the basis of the need of economic entities of all forms of ownership creates demand for innovation and the beginning of the formation of innovation development market.

The basis of economic ties between the scientific work with grain farming should be considered as the need for the knowledge implementation in the product: "production scientific work - a product of material production". In modern conditions, it operates differently: "research - information, report". Scientific work, involved in the grain industry, is embodied in a specific product and seen as a kind of productive labor. The cost is embodied in grain, its products, in the creation of which the science is involved and the share of scientific work is materialized. These provisions and approaches are considered in the economic relations improvement between science and production. Economic mechanism of science and grain production interaction must be constructed so as to achieve the results, adequate to scientific and technical development, productivity growth. Productive research work and its material conditions consumed in the production of grain, it is necessary to restore and reproduce through its implementation. Practice shows that the economic interest of scientific organizations met by unjustified reduction of time and actually for the development of innovations turns losses. Putting science into the position only of trading partner of grain production, selling it research results with the expected effect and not involved in its implementation is not rational, since before development, the elaboration is tested. We believe that the best way to adapt science to production is the recognition of elaboration not only as complete goods, but also as embedded one passed the stage of technical, economic development in the industry. Payment is subject to the work of all actors involved in research activities, in the product implementation or in the new technological process development.

Innovation process in the grain industry has its own characteristics: the multiplicity of types of grain and its products; significant differentiation zones due to production conditions, and the difference in the duration of the period of grain and products of its processing production; the lack of scientifically grounded organizational and economic mechanism of

transfer of science to agricultural producers; lagging of sector in the innovations development in production. Organizational and economic essence of innovation processes is associated with the goals and objectives of their development, which are in constant organizational and economic, technical and technological renewal of grain farming, aimed at its improvement, taking into account advances in science, technology, and best practices. Organizational-economic mechanism of innovations development involves a contractual relationship of grain producers with its creators and information consulting service of AIC.

We distinguish *two main ways* of bridging the gap between science and grain production. The first is related to the integration processes between research organizations and producers focused on grain production, having effective demand in the market. Positive role in the development of scientific and technological advances has been played by scientific production system.

The second direction of organizational links between science and grain production is focused on the innovative market infrastructure formation: innovation centers, small innovative ventures , information and consultancy services and others. The experience of agro-industrial consulting services proves that information and consulting services in conjunction with other methods of state regulation of the grain complex is intended to play a catalytic role in enhancing the product's synergies, sustainability, and competitiveness.

Direct impact on the management and production processes needs changing to the consulting and regulatory function. Such approach would create a flexible coordinated system of information flows, that will contribute to the price monitoring organization and standardization of grain and products of its processing with high added value. To increase efficiency in grain farming consulting we propose to develop the concept of transition from research problems and management of scientific and technical progress to problem-oriented management.

Implications

Mentioned by the author above problem of innovation sphere in grain farming directly affects agro-industrial complex of the Republic of Kazakhstan, that under the conditions of market mechanisms does not meet modern requirements. Innovative basis of grain production is to create innovation centers based on agrouniversity with technological park formation, "incubators" of small firms in terms of creating a techno-polis, using resource saving, information and other technologies, including nanotechnology, biotechnology, creation of innovations, venture capital and traditional business development infrastructure, and grain livestock and fodder industries development. Industry needs new high-yield Kazakhstan, resistant to adverse conditions, varieties and hybrids, the ecologically pure biological preparations for pest management.

Kazakhstan's grain farms need specialists who perceive the logic of technological change, system organizers, scientific, technical and organizational solutions integrators, mastered energy saving technologies in the industry and in the processing of raw materials. In modern innovation infrastructure development of educational technology allows us to show the best practices and explain their application in the classroom, laboratory, field, and farm. Agribusiness of the country should put tasks to educational establishments and participate in the training system, including distance education and targeted training. To solve the problem we need to create an infrastructure and legal framework to ensure a mutually beneficial interaction between science, agribusiness and production, as well as the creation of a new type of agrocities. This will solve the problem of primary processing, storage, marketing of grain and its products, and it will also support small businesses. Grain farming is relatively weakly affected by fluctuations in economic cycles because of the low elasticity of demand for its products. One of the advantages of agrocities is solving the problem of grain sales at fair prices, that under present conditions cannot be established due to the lack of appropriate institutions. Fair price of the products, in this case, is determined by the grain exchange, that is created simultaneously with agrocities.

One of the areas to promote innovations in the Republic of Kazakhstan is the technology parks development in the state. Their advantage is the possibility of the initiators of the new technologies to conduct their own research and project development and to promote grain production through commercialization and transfer.

One of the factors of grain farming unreceptiveness to innovations is the state of market environment. Developing grain market tends to natural patterns of a mediator. Such monopolization of the market depresses the consumer with unreasonably high prices for food of grain processing, grain livestock industries. This reduces the possibility of agricultural producers to invest in technological innovations. One of the directions of the transition to innovative economic development of the industry, we believe, is the creation of highly competitive institutional environment, including through the formation and development of

competitive markets and demonopolization of Kazakhstan's AIC economy.

It is also advisable to form a centralized fund for science and technology development at the expense of budget funds, deductions from profits of enterprises, sales of elite seeds and planting material. This will allow the funds to engage in prospective studies. Removal of science from the allocation of the resulting effect reduces the material interest of research in achieving outcomes, and does not improve the performance of scientific work.

The creation of innovation infrastructure, providing high efficiency of the innovative projects implementation is a major challenge for social and economic systems that require rapid solutions.

The innovation infrastructure development in Kazakhstan is possible with the organization and implementation of the following measures:

- *Creation of innovative-industrial complexes producing multi-operational agricultural machinery and implements, a fifth-generation technology* - the organizations uniting small innovative businesses with large-scale production. All branches of the system are combined with each other on the basis of economic interests, and it minimizes the transition from basic research to the development of high-tech competitive products.
- *Creation of grain cluster* - a set of enterprises and organizations of various forms of ownership, united by a common technological chain of production, processing and marketing of grain in order to increase the competitiveness of enterprises and grain production cluster.
- *Organization for innovations advancement, such as innovation and technology centers or business incubators*. Functions of these organizations are: to stimulate innovation and technology commercialization; to assist introduction of innovations in agricultural production cycles; to select and analyse the effectiveness and appropriateness of using the advanced innovative products and their implementation in specific agricultural organizations and businesses with public and private investment.
- *Creation of research centers (techno-polis, science cities).* Techno-polis (research centre) is research and production complex with advanced scientific and industrial infrastructure, covering the territory of a single large city or dispersed throughout the country. It is composed of academic institutions and a major university (or an academy) having modern large groundwork in the field of research and the results of advances in science; the latest experimental facilities; agro-industrial organizations (enterprises); agro-industrial parks.
- *Organization of agro-industrial parks* - an integration mechanism of higher education institutions, research centers, farms, businesses, financial institutions, and government aimed at addressing socio-economic and technological development of the country's problems through innovations, small innovative businesses. That is, in industrial parks mechanisms of research results transformation, inventions and know-how into commercial technologies, materials, products and services are established.

On the development of the innovation process in grain production, *the state* has a large impact and this effect should be strengthened. This task is solved by the implementation of two major measures. The measure is to establish special financial instruments of *state support of innovations*, that is implemented on the basis of: the integrated targeted programs development, oriented to the creation of breeding achievements, resource-saving technologies, agricultural machinery, creation of special funds. Their use should be increased.

Taking into account that updating the technical base of the innovation process in grain production is not possible without the state participation, it is necessary to expand the measures of updating the mechanisms and technical base of the innovation process.

This study suggests that the current state of the grain market in the Republic of Kazakhstan is determined by a complex institutional, socio-economic, ecological, organizational and technological problems. In order to solve them, there is an objective need of state's influence on the grain market. In the long term, the grain market in Kazakhstan from spontaneously developing system must become a system that optimally combines the mechanisms of market self-regulation and state influence on the basis of innovations.

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