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PREMISES TO CREATING OF INNOVATION ECOSYSTEM, INFLUENCE ON AGRICULTURAL SECTOR

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Ensuring food security is one of the most significant and determinants of sustainable development of the economy of any country. Kazakhstan is no exception. Moreover, the huge potential of the republic in food production is an additional stimulus. At the same time, the accelerated development of the agricultural sectors and the growth of export potential are unthinkable without the introduction of innovations in the agro-industrial complex of Kazakhstan. President of the Republic of Kazakhstan N.Nazarbayev in his address to the nation (January 17 2014), said that “we need to ensure that our agriculture takes the path of innovations. This is our traditional industry. The global demand for food will increase. This sector will attract more investment. This will enable farmers to look beyond short-term-weather-related achievements to the long-term growth of production. Competition in the global agro-production will intensify. Agricultural lands should be used by those who introduce new technologies, continuously improve productivity, and perform on the basis of the bestinternational standards”[1] It should be reminded that in his Address the President "Third Modernization of Kazakhstan: global competitiveness," focused on innovation support, rapid deployment into production, the development of research and innovation potential on the basis of higher education institutions. [2]

The agro-industrial complex of Kazakhstan is characterized by low labor productivity and small volumes of processing of agricultural products. Labor productivity in agriculture by different estimates does not exceed 600 thousand tenge per employee per year. The main reasons for this are:

Use of outdated technologies;

-Low innovative activity, access to information on advanced scientific achievements;

-Outdated and inefficient forms of management, etc .;

Agriculture is one of the keysectors of the Kazakh economy. Kazakhstan is the 9th largest country by land mass. More than 74 % of the country’s territory is suitable for agricultural production, representing 5.5 % of GDP and employing over 20% of the labor force, with 43% of the population living in rural areas. The rich soil and climate provide ideal conditions for growing wheat, barley, rice, corn, millet and buckwheat. In 2015, the total crop area reached 21.2 million ha. Corn

and beans will be sown on 16.5million ha while oilseed will occupy 1.7 million ha. Food production increased by 2.9% at the end of 2015 and for the first time was more than 1 trillion tenge. Imports amounted to 2.9 billion US dollars, export were 1.1 billion US Dollars [3]. Agriculture plays an important role in the economy of Kazakhstan, with over one-quarter of the labour force depending on the sector for income and employment. Despite its importance, however, agricultural production remains highly fragmented and labour productivity is significantly lower than in OECD countries: value added per worker in Kazakhstan's agricultural sector was USD 3 533 in 2012, compared with the OECD average of USD 15 700 (World Bank, 2014b). Small-scale producers account for the majority of agricultural output in virtually all regions of Kazakhstan, yet they often face difficulties overcoming market failures and connecting with local supply chains

The main problem is out of centralization of the processes of modernization of methods of recycling, our companies (agricultural co-operatives) haven't enough resourses to sinply become worldwide. Presently Kazakhstan is commodity exporter in this sphere, for near-by countries. The problem of recycling have many different sides and aspects : lack of subsidies (for example for Flour Milling Enterprises), logistic problems (expensive supply) , competitive (CIS countries in majority have a commodity orientation) and others. And technologies is not on a worst level , but all technologies from economical strategy to machines is trans.

Public support for agricultural education, R&D and extension services is limited, and not sufficient to meet the needs of small-scale producers. There are 10 higher education institutes and 168 vocational education and training (VET) schools for agriculture in Kazakhstan. KazAgro Innovations was responsible for agricultural R&D, provided through 23 research institutes and a network of regional branches, experimental stations and innovation centres. Despite sustained increases in funding in recent years, public expenditure on agricultural R&D amounted to just USD 22 million in 2016. This is equivalent to 0.5% of gross agricultural output, compared with over 1% in most OECD countries; over 2% in Denmark andAustralia; over 3% in Japan, Iceland and Ireland; and over 4% in the United States (OECD, 2011). KazAgro Innovations established an extension system in 2009, with ten offices operating in eight regions across Kazakhstan. Its extension centres provide a number of services to farmers, including education on the practical application of new technologies, remote consultations by telephone and direct consultations through farm visits. In addition, KazAgro Marketing operates a network of 160 rural information and consultation centres in all regions of Kazakhstan. The main tasks undertaken include monitoring of food prices and the provision of advice, training and business assistance to farmers. Each year, KazAgro Marketing provides targeted information and advice to approximately 60 000 entities, or 2.5% of all farmers in Kazakhstan . This suggests that the dissemination of knowledge and new technologies in rural areas is limited in scale, with low levels of outreach to households and individual farms.

The main R&D problem is in deficiency in connections between science, business and government. Creating of Innovation eco-system is the perspective solution.

An innovation ecosystem models the economic rather than the energy dynamics of the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation. In this context, the actors would include the material resources (funds, equipment, facilities, etc.) and the human capital (students, faculty, staff, industry researchers, industry representatives, etc.) that make up the institutional entities participating in the ecosystem (e.g. the universities, colleges of engineering, business schools, business firms, venture capitalists (VC), industry-university research institutes, federal or industrial supported Centers of Excellence, and state and/or local economic development and business assistance organizations, funding agencies, policy makers, etc.). The innovation ecosystem comprises two distinct, but largely separated economies, the research economy, which is driven by fundamental research, and the commercial economy, which is driven by the marketplace. By design, the two economies are weakly coupled because the resources invested in the research economy must be from the commercial sector. This definition includes government research and development (R&D) investments which ultimately derive from tax revenues. In order to foster the serendipitous investigations that are essential to innovative discovery, it is also important that the incentives driving the research economy be decoupled from the financial incentives driving the commercial economy.

Commercialization and transferring of technologies the main trend worldwide. Every country provides new tech-innovative reforms, role of government , in this process, to make it perspective to both other sides universities and business, as a link.

A general definition of productivity is the ability of production factors to produce output (Latruffe, 2010). This can be measured through a ratio between output and input. However, a wide body of literature has treated productivity measures in agriculture addressing both conceptual and practical issues in implementing this concept. The literature includes simple measures of partial productivity (e.g. relating output to individual inputs as well as measures accounting for more than one input (e.g. multiple factor productivity). A more comprehensive measure of productivity is Total Factor Productivity(TFP), which is a ratio of the (monetary) aggregation of all outputs and the aggregation of all inputs. This concept often follows a time series approach to account for productivity improvements based on changes in TFP (Coelli, 2005; Latruffe, 2010). Fuglie (2015) shows that TFP has a major role in accounting for the growth of agricultural production overtime, though with a differing weight in different time periods and in different regions. Productivity indexes have been discussed and extended to account for a number of issues, including the growing variety of inputs and outputs related to environmental and resources concerns. Several multi-output, resource-saving, or dynamic specifications are now attempting to tackle these issues. This has led, among others, to proposing extensions such as environmentally adjusted TFP or even green TFP (e.g. Chen and Galley, 2014).

Besides measuring productivity, the economic literature has attempted to investigate the factors affecting productivity and its changes. This has been done largely through econometric models using productivity measures as dependent variables and various influencing factors as explanatory variables. Among such factors, research and innovation have a prominent role. In particular, the research to date has focused on seeking to make a connection between research expenditure and productivity (Alston et al., 2010,2011; Wang et al., 2013). Research and innovation are indeed potentially key explanatory variables of changes in productivity over time. Through the provision of new knowledge (increasing the knowledge stock), embedding this knowledge in new technologies (enlarging the technology set) and the diffusion of innovation in the economic system, researches expected to directly affect the relationship between input and output and hence improve productivity. In this way, the role of research and innovation can be seen as a way of escaping (or at least modifying) trade-offs among goods, given limited resource availability, by enhancing technical possibilities. Yet as research is costly, this implies a trade-off between present consumption and investment in technology development. [4]

An innovative ecosystem is the formation of a set of conditions for the successful implementation of innovations. Such a complex of conditions is necessary for the agricultural sector of the economy of Kazakhstan, for the modernization of the existing mechanism for the distribution of technological potential. At the initial stage, it is necessary to prepare an "intellectual foundation" and the interrelations of the state, universities and «business players». At the initial stage, it is possible to create small structural divisions on the basis of universities, commercializationand technology transfer centers and. Based on KAZATU, this unit successfully operates and interacts with other scientific participants of the innovation ecosystem.

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