

**PUBLIC-PRIVATE PARTNERSHIP IN AGRICULTURE:
TRANSFER OF INNOVATIONS AND TECHNOLOGIES**

**АУЫЛ ШАРУАШЫЛЫҒЫНДАҒЫ МЕМЛЕКЕТТІК-ЖЕКЕ МЕНШІК ӘРІПТЕСТІК:
ИННОВАЦИЯЛАР МЕН ТЕХНОЛОГИЯЛАРДЫҢ ТРАНСФЕРІ**

**ГОСУДАРСТВЕННО-ЧАСТНОЕ ПАРТНЕРСТВО В СЕЛЬСКОМ ХОЗЯЙСТВЕ:
ТРАНСФЕР ИННОВАЦИЙ И ТЕХНОЛОГИЙ**

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Abstract. The features of public-private partnership (PPP) in agriculture are shown, an overview of partnerships in the field of technology transfer and innovation is presented. The significance of PPP in this industry is examined in view of the mechanism of joint interaction of the public and the private sector in terms of resources, market, techniques, and technology. The typologies for public-private partnership in agriculture are summarized. International experience shows that the transition to innovative development is based on the effective interaction between public and private structures in the field of science and innovations. Lessons learned from various types of partnerships require a clear division of responsibilities, establishing accountability, sharing resources and experience between public and private organizations to achieve high performance. Recommendations that should be taken into account by stakeholders to extend the potential benefits of PPP in agricultural production are given. In order to make a decision on its application in agriculture, it is necessary to clearly understand that partnership with private business creates more advantages than those that are due to the alternative methods of public procurement or private investment.

Аңдатпа. Ауыл шаруашылығындағы мемлекеттік-жеке меншік әріптестік (МЖӘ) ерекшеліктері көрсетілген, технологиялар мен инновациялар трансферті саласындағы серіктестіктерге шолу ұсынылды. Осы саладағы МЖӘ маңыздылығы мемлекет пен жеке сектордың ресурстарға, нарыққа, техникаға, технологияларға қатысты бірлескен өзара іс-қимыл механизмі тұрғысынан

Аннотация. Показаны особенности государственно-частного партнерства (ГЧП) в сельском хозяйстве, представлен обзор партнерств в области трансфера технологий и инноваций. Значимость ГЧП в данной отрасли исследуется с точки зрения механизма совместного взаимодействия государства и частного сектора в отношении ресурсов, рынка, техники, технологий. Обобщены типологии для государственно-частного партнерства в сельском хозяйстве. Международный опыт свидетельствует, что переход к инновационному развитию основан на эффективной взаимосвязи государственных и частных структур в области науки и инноваций. Уроки, извлеченные из различных видов партнерств, требуют четкого распределения обязанностей, установления отчетности, обмена ресурсами и опытом между государственными и частными организациями для достижения высокой результативности. Даны рекомендации, которые должны быть учтены заинтересованными сторонами для расширения потенциальных преимуществ ГЧП в сельскохозяйственном производстве. Для принятия решения о его применении в сельском хозяйстве необходимо четко понимать, что партнерство с частным бизнесом создает больше преимуществ, чем за счет альтернативных способов государственных закупок или частных инвестиций.

Түйінді сөздер: аграрлық сектор, ауыл шаруашылығы өнімдері, мемлекеттік-жеке меншік әріптестік, инновациялар, технологиялар, ресурстар, инвестициялар, әлеуетті артықшылықтар, мемлекеттік сатып алулар.

Ключевые слова: аграрный сектор, сельскохозяйственная продукция, государственно-частное партнерство, инновации, технологии, ресурсы, инвестиции, потенциальные преимущества, государственные закупки.

In general, the concept of PPPs means a contract between public institutions and private partners where the private sector entity provides a public service or project and assumes substantial financial, technical and operational risk in the project with specified roles and responsibilities. This approach supplements scarce public resources, build a more competitive environment and helps to increase efficiencies and reduce costs.

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sector, improve cost-effectiveness, as well as expand storage capacity and transportation [2].

Material and methods of research. Kazakhstan's accession to the World Trade Organization requires the development of new mechanisms for supporting the agriculture producers. Firstly, it refers to measures aimed at developing the infrastructure of agricultural business, which is considered to be the base for new innovative projects needed for providing the sustainable socio-economic development and food security of the economy. Moving towards innovational development significantly strengthens the role of the state as a conductor of a national idea and a development strategy in the creation effective mechanisms for its implementation and regulation the technological progress. At the same time, the reality is that the specific sectors in agriculture are not able to provide themselves with new technologies and recent researches, which are mainly owned and distributed by the private sector [3]. Thus, active collaboration between public and private sector entities in which partners jointly plan and perform to accomplish agreed-upon objectives while sharing the costs, risks, and benefits incurred in the process can be an interesting and quite effective solution.

In this paper key features of PPPs in agriculture sector and review of partnerships in innovation and technology transfer are presented. The scope of typologies for PPP in agriculture was identified and summarized. Moreover, the article provides some recommended strategies and lessons for Kazakhstan regarding its opportunities for developing PPPs in agriculture.

Results and their discussion. PPP approach is adopted in different aspects of the agricultural sector such as research and development, transfer of technologies, quality enhancement, market and infrastructure development, extension, marketing, etc. Functional and operational factors of the PPP linkage tend to differ from field to field based on the capability of partners, budget and time frame [4].

According to the definition of Food and Agriculture Organization of the United Nations [1], an agri-PPP or a PPP for agribusiness development is a formalized partnership between public institutions and private partners designed to address sustainable agricultural development objectives, where the public benefits anticipated from the partnership are clearly defined, investment contributions and risks are shared, and active roles exist for all

partners at various stages throughout the PPP project lifestyle.

The scope of typologies for PPP in agriculture can be identified and summarized as follows:

- partnerships that aim to develop agricultural value chains are designed to develop specific value chains to provide access to domestic or foreign markets, often with a focus on achieving quality certification within the chain, such as good agricultural practice, organic and fair trade certification;
- partnerships for joint agricultural research, innovation, and technology transfer are designed to commercialize innovative technology to improve productivity and/or market access and deliver specialized extension services such as sustainable integrated farming techniques and training in the development of high-technology agricultural enterprises;
- partnerships for building and upgrading market infrastructure focus on the development of market trading centers, commodity storage facilities, transport or logistics systems for agricultural products, and agrifood parks;
- partnerships for the delivery of business development services include those for the development of market information systems; management training for agro dealers; matching grants for farmers' access to services to support value addition on the farm or for small groups; and subsidized services for small and medium agro-enterprises (SMAEs).

PPPs for agricultural innovation have received attention from a number of scholars, raising important issues with respect to relative benefits of such partnerships. Commercial interests of business create expectations that investments in innovation should pay back in the form of cost reduction, an increase in overall sales or higher profit margins. In addition, companies usually cannot afford to wait for economic returns in a long time which puts a certain time pressure on the innovation process. Moreover, when products appear difficult to promote or when financial benefits don't appear on the balance sheet, a company may decide to withdraw from partnership [5].

Few studies on PPPs in the case of agricultural innovation contain a conceptualization of technology which is primarily seen as an input, referring to specific products and packages of products and guidelines. The main aim of such findings is to evaluate the impact of PPP for innovation on its positive effect on market inclusion in general and development further perspectives for farmers.

However, for exactly those reasons the question what kind of knowledge the innovation process is supposed to develop and what kind of technologies that leads to, are questions worth asking. Members of the Consultative Group on International Agricultural Research (CGIAR) mention that few PPPs in the CGIAR are specifically designed to facilitate joint innovation processes with the private sector or diversify the directions through which centers can collaborate with the private sector. These findings suggest that they are not addressing many of the wider systemic constraints associated with knowledge exchanges [Ik.3]. In other words, technology or, in the more abstract form, knowledge, is not neutral towards the organizational arrangements in which it is produced and implemented.

In practice, agri-PPPs may involve either formal (contractual) or informal (collaborative) arrangements and tend to choose simpler, less complete contract modalities, such as a memorandum of understanding, comparing to traditional partnerships in infrastructure. The main documents formalizing partnership consider typically a series of bilateral agreements among the parties. These include contract farming agreements between the company and farmers; confidentiality agreements; agreements related to ownership of intellectual property rights/licensing agreements; and financial service contracts.

Partnerships in innovation and technology transfer. Innovative partnerships that bring together business, government and civil society actors are increasingly being promoted as a mechanism for improving productivity and driving growth in agriculture and food sectors around the world.

In general, there is little doubt that if developing economies are to achieve their objectives related to sustainable agricultural development, improvements should be made to the existing agricultural innovation system and approaches to technology transfer in many countries. Achieving the targets for agricultural growth present in national socio-economic development documents requires progress in agricultural productivity, labor efficiency and value added. None of these goals would probably be met in the absence of innovative applied research solutions that address complex problems such as pest and disease management, climate change impacts, post-harvest losses, poor product quality and food safety, and low-value addition. The question of how to ensure that appropriate technologies are available to the people who need

them most is also a major issue that needs to be challenged.

The development of PPPs in R&D as well as in innovation and technology transfer is not new and its presence in both developed and developing countries is predicated on the following reasons [Ik.3], [6]:

- according to innovation theory collaboration between institutions leads to the establishment of interdependencies which foster innovation. PPPs provide a framework for coordinating the financial, R&D and governance activities of innovation systems by organizing researchers, service providers and agricultural producers into networks that strengthen the demand-driven nature of research solutions and contribute to more efficient technology to agricultural producers;

- despite the positive trend in global public spending for agricultural research the public sector no longer has the necessary funding to take all responsibility for developing and disseminating improved cultivars and production techniques for agricultural producers, nor does it necessarily have the advanced technical and management skills required. Many developing countries face lack of human resources. Common challenges include an aging staff of research scientists, little succession-planning and high staff turnover because of low salaries and limited training opportunities for entry- and mid-level professionals.;

- global private spending on agricultural R&D (excluding R&D by food industries) increased of more than three-fold, from 5.1 bn US dollars in 1990 to 15.6 bn US dollars by 2014 [7]. Moreover, private agricultural R&D spending was rising faster in developing countries than in developed countries;

- these increases in both public and private research spending highlights the growing demand for value-added food products, driven by newly emerging market opportunities. The reduction in productivity requires research and technology solutions that extend beyond the traditional public or private R&D investment models for agricultural inputs into other demand-driven research areas.

Overall, a partnership with the private sector often provides an opportunity for the public sector to leverage investment and gain access to cutting-edge technology, research methods, and management skills to develop the products of research from the conceptual stage through to commercialization and adoption at different phases of the value chain. Such partnerships may also provide opportunities to earn much needed additional income from licensing of new varieties and royalties,

which can be channeled back into applied research to bridge the gaps in public funding. For private partners, PPPs provide an opportunity to reduce the risk associated with entering new and developing markets by sharing investment costs, drawing on local technical skills, securing a level of protection over intellectual property rights, and tapping into extensive public-sector rural networks that can be used to support product distribution and adoption [Ik.1].

Different forms of PPPs in agriculture are adapted in practice of the developing countries. PPP is developed in India through the strengthening of R&D collaboration between industries and universities. The development of PPP models in agriculture starts from the mechanisms such as consulting, provision of contractual services, commercialization of products and processes placed through the Indian Council of Agricultural Research, which includes the Central University of Agriculture and 40 state agrarian universities. Thus, knowledge de-fines the rapid development of the innovative economy.

The government of Australia issues competitive grants and provides tax benefits to promote and facilitate the mechanisms of agri-PPPs, increase the share of research and improve the interaction between the different actors of the innovation system. Thus, innovations become a sustainable factor in the development of effective cooperation and the translation of research results into economic, social and environmental benefits [8].

Brazil has taken a relatively liberal policy toward multinational participation in their domestic agricultural input markets, allowing foreign companies to operate wholly owned subsidiaries in the country and acquire domestic companies. Brazil also established intellectual property rights for new crop varieties and regulatory protocols for approving the use of GM crop varieties. Brazil is one of the fastest growing markets for agricultural inputs, and several multinational companies have established agricultural research stations in the country. Agricultural R&D spending by private companies increased from 50 mln US dollars in 1996 to 377 mln US dollars in 2012, almost all of which was by foreign companies. This amounts to about 20% of total public and private agricultural R&D spending in Brazil in 2012 (public agricultural R&D in Brazil 1560 mln US dollars that year) [Ik. 7].

International experience in the PPP development allows determining promising areas and mechanisms of sustainable development of the agricultural sector in Kazakhstan

while promoting the kinds of agricultural products for which there are competitive advantages.

Being the ninth largest country in the world Kazakhstan has great opportunities for the development of agricultural sector. The country is among the top ten largest grain exporters in the world. Annually up to 6 million tons are exported to the countries of Central Asia, up to 2 million tons of grain to the European Union. Within the framework of the diversification program of the agricultural sector in recent years, sown areas under grain have been reduced in favor of expanding areas for oilseeds, forage, vegetable crops and sugar beet.

The experience of Brazil can serve as an example of intensive agriculture in Kazakhstan. Until the mid-1960s, Brazil received food as a humanitarian aid, and until the mid-1980s, it was an importer of agricultural products from other countries. As from the late 1980s, the government had adopted policies aimed at the intensification of agriculture and the technology transfer, which in turn allowed Brazil to become a leader in the production of agricultural products.

The huge potential of land, water and labor resources give opportunities for Kazakhstan in becoming one of the largest producers of agricultural products, particularly in the area of ecologically clean and based on the development of bioorganic agriculture [9].

International experience shows that moving towards innovative development is based on the effective interaction between the state and private entities in science and innovation. One of the mechanisms for this collaboration is the development of various forms of PPPs throughout the innovation cycle, from conducting research and commercialization phase to the production of high-tech products. Thus, the potential of PPPs contributes to the formation of agricultural innovation systems and is achieved through market-oriented policies.

Successful replication of PPP models across different production hubs for key commodities can change the agriculture from inefficient, supply-driven, low-value business scenario to an organized, high-tech, demand-led and high-value orientation and essential to incorporate learning of previous PPP experience [10]. Ongoing development of methods, tools, principles, models, and mechanisms of PPP in the innovation and investment performance in the agricultural sector will improve the efficiency of production and the competitiveness of domestic agribusiness.

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