

## Abstract

**Thesis for the degree of Doctor of Philosophy (PhD) in the specialty -  
6D051700 “Innovation Management”**

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**Title “The management of the process of transferring technology in the  
agriculture sector of Kazakhstan”**

**The topic of the dissertation research.** The transition to new technologies as a development priority for Kazakhstan, voiced by the Head of State in the Address "New Development Opportunities in the Fourth Industrial Revolution", is an important direction in improving the competitiveness of agriculture. President of Kazakhstan K.K. Tokayev in his address to the people of Kazakhstan "The unity of the people and systematic reforms - a solid foundation for the prosperity of the country" especially noted that problematic issues in agriculture have increased due to adverse weather conditions in the country. But new technological opportunities are used in world practice in order to solve such issues. In particular, digitalization of processes, data collection and their automation affect the systematic functioning of agriculture. In these areas, the concept of development of the agro-industrial complex of the Republic of Kazakhstan for 2021-2025 is currently in effect. Thus, innovative development, technology transfer and commercialization of innovative activities of organizations are one of the most actual problems in the modern economy. In this regard, the issues of management of new technologies transfer to the agricultural sector of the country are relevant. **The purpose of this dissertation research** is to develop scientific and practical recommendations based on the study of theoretical and methodological aspects of technology transfer process management for the development of agricultural sector of Kazakhstan.

**Research objectives.** In accordance with the study objectives following **tasks** were set and solved in the thesis:

- 1) a comprehensive research of the theoretical and methodological foundations of technology transfer process management;
- 2) consideration of the possibility of applying technologies in the country basing on the analysis of the best foreign practices of technology transfer in agricultural sector;
- 3) identification of factors affecting the process of technology transfer basing on the analysis of current state of agricultural sector in Kazakhstan;
- 4) development of management models for technology transfer in agricultural sector basing on the questionnaire collected in the innovative agricultural companies of the country;

- 5) offering scientific and practical recommendations to agricultural sector of the Republic of Kazakhstan on promising directions of technology transfer.

**Research methods.** Abstraction, economic and mathematical, graphic, monographic, bibliometric, logical methods, methods of quantitative and qualitative analysis, comparison and synthesis were used in the dissertation research. Qualitative analysis was performed using questionnaires when actual data was obtained and analyzed, whereas quantitative data was analyzed using economic and mathematical means of correlation between factors. Modern statistical methods were used for data processing, including Smart PLS, Atlas TI, and SPSS software packages.

**The scientific novelty of the research results.** Following conclusions that determine the scientific novelty of the dissertation were obtained in the course of the study:

- basing on an in-depth study of the theoretical concepts of classical and neoclassical schools representatives author's definition was given to concept of "technology transfer in agriculture" and "technology transfer management";
- factors and ways of activating innovative progress in agriculture and the process of technology transfer to this sector has been developed in accordance with new prevailing economic environment;
- basing on a survey conducted in innovative farms a model for managing the process of technology transfer to the agricultural sector of the country is proposed;
- the quadruple helix of technology transfer to agricultural sector of the country is presented;
- planned strategic directions taking into account the influence of modern internal and external factors of the technology transfer process in the agricultural sector of Kazakhstan are proposed.

**Main provisions submitted for defense:**

- basing on study of foreign and domestic scientific works author's definition was given to concept of "technology transfer in agriculture" and "technology transfer management";
- process of technology transfer in agriculture of the country as well as factors and ways to enhance the innovation progress in agriculture in accordance with new prevailing economic situation were developed;
- factors affecting the process of technology transfer have been identified basing on the analysis of current status in agricultural sector of Kazakhstan;
- basing on a survey conducted in innovative farms a model for managing the process of technology transfer to the agricultural sector of the country is proposed;

- priority directions of process development of technology transfer to the agricultural sector of Kazakhstan are proposed.

**Practical significance of the research results.** The dissertation research of A.K. Boranbayeva shows that recommendations for managing the process of technology transfer in domestic agriculture make a significant contribution to development of sustainable agriculture of country. The research conducted by the respondent has a high degree of scientific novelty and practical significance. The results of dissertation research provide several recommendations for the formation of country's future strategic plans in the direction of innovative and technological fitting out of agricultural sector. Also, the technology transfer process management model resulting from the study was used in systematic activities of the domestic KazMyaso LLP for the purposes of productivity increase. Main strategic directions of technology transfer in agricultural sector reflected in the dissertation work, are included in the plan of innovative development of Kegen district agriculture.

Main theoretical provisions considered in the dissertation generally allow to form a new direction for improving management of the technology transfer process. The scientifically based proposals developed in the dissertation make it possible to ensure the technological equipment of the agricultural sector of Kazakhstan and effectively manage the process of technology transfer in the agricultural sector. Conclusions resulting from the study and developed methodological recommendations can be used in the educational process in higher educational institutions, in particular in educational process for the courses "Innovation Management", "Strategic Planning", "Innovations in the System of State and Local Government", "Strategies and systems for the commercialization of innovations", "Innovations and venture business", "Innovative project management methodology" and "Strategic development of an innovative company". The scientifically based proposals developed in the dissertation allow to ensure the technological equipment of the agricultural sector of Kazakhstan and effectively manage the process of technology transfer in the agricultural sector. At the same time, the results of the study can become the basis for innovative and technological development of the agricultural sector of Kazakhstan.

**Description of the doctoral student contribution to the preparation of each publication.** 10 scientific papers of the doctoral student have been published on the topic of dissertation, 2 of them in the journal with the quartile Q2, included in the Scopus database, 4 in the journal approved by the Committee for Control in the area of education and science of the Ministry of Education and Science of the Republic of Kazakhstan, 3 in collections of materials of international foreign scientific conferences, 1 in the MDP Project journal.

"The interplay of access to organisational resources, firm innovativeness, and cooperative norms in technology transfer: testing a moderated mediation model"

- a survey among more than one hundred and fifty managers of Kazakhstan agricultural sector that carry out the transfer of foreign technologies is conducted in the article, as a result of survey a model for managing the technology transfer process is proposed. This article was published in the journal "Technology Analysis and Strategic Management", which is part of the Q2 quartile included in the Taylor and Francis database.

«Management of successful technology transfer in agriculture: the case of Kazakhstan». The purpose of this article research is to identify strategic directions for effective technologies transfer in developing countries agriculture on the example of Kazakhstan. A SWOT analysis was carried out using the matrices "assessment of internal factors", "assessment of external factors", "assessment of strategic positions and actions" and "quantitative Strategic planning" as analytical methods based on initial data obtained during interviews and secondary data from reports. As a result, external and internal factors affecting the agricultural sector of the country during technology transfer are identified and strategic directions for the development of technology transfer to the agricultural sector of the country are proposed.

In the article "Қазақстан мемлекетіне тартылған тікелей шетелдік инвестициялардың ағымдағы үрдістерін талдау" the authors tried to study the process of attracting inflows of foreign direct investment (FDI) to Kazakhstan because foreign direct investment is the main channel of technology transfer. Analytical data of the Committee on Statistics of the Republic of Kazakhstan and the UN Committee on Trade and Development were used in the research work. In addition, the article considers the issue of attracting FDI in the CIS space. Based on thorough data analysis author succeeded to identify priority sectors of Kazakhstan economy to be of interest to the foreign investors, as well as projects that contribute to the growth of FDI in the republic. The practical significance of the analysis is to ensure a favorable investment climate and to identify ways for improvement of the investment flows regulation in Kazakhstan.

In the article "Theoretical aspects of technology transfer research for the innovative development of the national economy", the authors consider the processes of development of the innovation-oriented economy through technology transfer. Ways of socio-economic efficiency maximization were identified by author through increasing the efficiency of intellectual potential usage. Ways of improving technology transfer and innovation infrastructure as a source of improving innovation processes were also proposed.

In the article "Эффективное развитие и улучшение технологической оснащенности агротехнологий Казахстана путем применения мирового опыта" development of innovative activities and the usage of new technologies for the growth of agricultural production in Kazakhstan is considered based on foreign experience. Conducted analysis will allow to trace the trends of agricultural technologies development in advanced countries, as well as to identify problems and to develop practical recommendations for improving the

implementation of agricultural technologies in Kazakhstan. This study allowed for the conclusions and recommendations for application in strategies and concepts of agriculture development in Kazakhstan.

The article "Қазақстан экономикасының инновациялық даму көрсеткіштері мен инвестициялары арасындағы байланысты талдау" examines the main sources and channels of technology transfer that ensure rapid economic growth increasing the living standard in Kazakhstan, as well as examines the relationship between investments and patents based on statistical data. As a result, low relationships between technology transfer channels and performance indicators were revealed.

The article "Sustainable Agriculture: Developing a Conceptual Model for Technology Transfer" shows the importance of agriculture in the world economy, its importance for the population. But based on changes in natural resources and the environment, it was indicated that current state of agriculture is unstable. The essence of stability concept is explained in accordance with this. To be stable agriculture must maintain the environment and improve the social situation of the population by increasing productivity. And the importance of technology transfer as a source of access to sustainable agriculture was particularly considered. As a result, a conceptual model of technology transfer has been developed for usage in agricultural sector with consideration of the prospects for sustainable development.

In the article "Экономиканың инновациялық бағытта дамуына тікелей шетелдік инвестициялардың рөлі" a study and analysis of the main reasons for innovative development of the Republic of Kazakhstan was conducted. Moreover, the impact of foreign direct investment on the development of Kazakhstan's economy in an innovative direction is envisaged. The links between global innovation indices and investments are analyzed, the disadvantages and advantages of the country's innovative development are indicated.

The article "Технологияны трансферлеуде технология мүмкіндіктерін бағалаудың маңызы" reflected real data that at the present stage of the world economy development technology transfer is one of the sources of economic development. Each enterprise considering its technological capabilities transfers technologies in accordance with its approaches to the organization of production and innovation policy. It is confirmed that technological capabilities contribute to the development of the organization in a short period of time.

The article "Technology transfer in agriculture" was published in the journal MDP Project of the Kazakh National University. Using the methods of literature analysis the importance of technology transfer in sustainable agriculture is indicated.