ANNOTATION
to the dissertation for the degree of Doctor of Philosophy (PhD)
in EP 8D04101 – Economy by Aigerim Abayevna Rakhmetulina
"Development of Logistics Infrastructure and Supply Chains
of Agri-Food Products in the Republic of Kazakhstan"

General Characteristics of the Work. The dissertation research is devoted to the development of logistics infrastructure and supply chains of agri-food products, as well as their role in increasing the competitiveness of the economy of Kazakhstan and ensuring sustainable growth.

Relevance of the Research Topic. The development of the agro-food sector occupies a key place in the economic policy of the Republic of Kazakhstan, which is due to its contribution to GDP, significant export potential and strategic role in ensuring food security. However, the effective functioning of this sector is impossible without the development of modern logistics infrastructure and the construction of sustainable supply chains for agro-food products. Currently, issues related to logistical support for agricultural enterprises remain highly relevant, but a comprehensive solution has not yet been achieved.

President of the Republic of Kazakhstan K.-J. Tokayev has set the task of accelerating the creation of modern storage and distribution infrastructure for agricultural products. In particular, he emphasized supporting businesses in constructing vegetable storage facilities, wholesale distribution centers, and rural service and distribution cooperatives.

At the same time, systemic issues persist in the logistics infrastructure and supply chains of agri-food products in Kazakhstan. These include regional and structural imbalances, weak coordination between supply chain participants, and insufficient access to quality logistics services. Collectively, these factors have a significant negative impact on the country's economic development, complicating efforts to achieve import substitution and build a competitive agro-industrial sector.

The formation of agri-food supply chains requires a highly efficient network of interconnections and economic relationships that enhance supply chain efficiency by developing new models and mechanisms that account for local characteristics, the level of logistics infrastructure development, and consumer mentality. Solving these issues will improve the efficiency and sustainability of logistics infrastructure and agri-food supply chains.

The Government of the Republic of Kazakhstan emphasizes the importance of developing logistics distribution centers to support sustainable regional economic growth. However, there is still a lack of clarity regarding the functioning mechanism and performance indicators of these centers. The fragmented nature of existing research, inadequate organizational and methodological support, and the absence of a systematic approach to designing logistics infrastructure, agri-food supply chains, and wholesale distribution centers highlight the significance of this dissertation study.

The purpose of the dissertation research is to develop recommendations and an organizational and economic mechanism for the development of logistics infrastructure

and sustainable supply chains of agri-food products to increase the competitiveness of the economy of Kazakhstan in the domestic and international markets.

The implementation of this goal necessitated the need to solve the following problems:

1. Conduct a theoretical analysis of the formation of logistics infrastructure, examining its role and the specific features of the functioning of agri-food supply chains.

2. Analyze international experience in the formation and development of agri-food supply chains and their logistics infrastructure, and develop a methodology for their study.

3. Assess the current state of logistics infrastructure and established supply chains for perishable products, identifying factors that influence their development.

4. To develop recommendations for the development of logistics infrastructure facilities in the regions and to propose effective supply chains for agricultural products to increase the country's competitiveness and reduce transportation costs;

5. Justify a prospective model and organizational-economic mechanism for the functioning of logistics infrastructure and supply chains, using logistics wholesale distribution centers as an example, develop a model of the LWDC of agro-food products based on the mechanism of public-private partnership;

6. To propose methodological solutions for the formation of logistics wholesale distribution centers for agricultural products and to conduct an assessment of the economic efficiency of their operation

The object of the study is the logistics infrastructure and supply chain of agri-food products.

The subject of the study is the organizational and economic relations that arise during the formation and functioning of logistics infrastructure facilities and supply chains of agri-food products.

The theoretical and methodological foundations of this research draw upon the works of both international and domestic scholars examining the development of logistics infrastructure at the regional level and supply chain management in the agri-food sector.

The dissertation employs a variety of general scientific methods (comparative, systematic, and statistical analyses) and applied techniques (indicator standardization, cluster analysis, regression analysis, factor analysis, center-of-gravity methods, regional ranking, and forecasting).

The empirical basis of the study comprises legislative and regulatory documents of the Republic of Kazakhstan, statistical data from the Bureau of National Statistics under the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, materials from the Ministry of National Economy of the Republic of Kazakhstan, as well as information from periodical publications, and research conducted by the author personally.

Main provisions submitted for defense. In the course of the study, new provisions, conclusions and recommendations were formulated, the most significant of which are the following:

1. Systematization and clarification of the elements and structure of logistics infrastructure, leading to the development of a structural model of transport and logistics infrastructure and a classification of logistics infrastructure in the context of building effective and sustainable supply chains.

2. A methodological approach to the formation and development of logistics infrastructure and agri-food supply chains.

3. Scientifically substantiated proposals for prioritizing the development of logistics infrastructure and agri-food supply chains, along with measures for their implementation.

4. A model and organizational-economic mechanism for the functioning of logistics infrastructure for agri-food products.

Scientific Novelty of the Key Provisions of the Dissertation Research:

1. Based on the study of the formation and development processes of logistics infrastructure, distinctions in the concepts of logistics infrastructure and its core characteristics were identified.

2. Methodological approaches to the formation and development of logistics infrastructure and agri-food supply chains were developed based on the analysis of international experience.

3. Factors influencing the formation of effective logistics infrastructure and agri-food supply chains were identified, and the efficiency of their functioning was evaluated.

4. Scientific-practical recommendations and organizational-economic measures were developed in order to form logistics infrastructure and sustainable supply chains connecting small-scale agricultural producers to major regional consumers. This was achieved through an analysis of the agri-food market, organizational-economic issues in the development of logistics infrastructure, and the logistics services provided.

5. An organizational and economic mechanism for the functioning of the logistics infrastructure and efficient supply chains for products and a model for the formation of the LWDC based on the mechanism of public-private partnership, combining into one chain all logistics, production and technological processes, as well as the marketing and sale of agricultural products, have been developed.

6. Methodological solutions were proposed and tested for the formation of logistics wholesale distribution centers for the storage, distribution, and trade of agri-food products. Unlike existing centers, these solutions are based on the calculation of an integral indicator, determination of optimal placement, service zones, and the number of centers required in the regions, thereby justifying their locations, increasing the efficiency of production and sales of products. Based on economic efficiency indicators, including the discounted payback period (DPP), the built-in rate of return and the profitability ratio, an assessment of the project for the creation of the wholesale distribution center was carried out. The economic efficiency from the creation of the wholesale distribution center will be expressed in a decrease in losses and expenses in the distribution system, an increase in the efficiency of the supply system, an increase in tax revenues, an increase in the income of producers and an expansion of consumer choice.

Theoretical and practical relevance of the research. The results obtained by the author and the developed methodological approaches have the potential for further development of theoretical and applied research in the current field and the development of industrial employment and the supply chain of agro-food products. They have scientific and practical value for government agencies and research organizations involved in the development of the agro-industrial complex.

The proposed methodological support allows us to put in order the mechanisms of the LWDC. This will ensure the optimization of supply chains, a reduction in the scale of costs and product losses, which plays a key role in increasing the competitiveness of the agro-food sector.

The practical innovativeness of the dissertation is determined by the fact that the measures developed within the framework of the study allow us to increase the efficiency of alternative employment and create sustainable supply chains of agro-food products. The proposed methodological solutions for the formation of the LWDC of agro-food products can be used in the activities of government bodies in developing strategies for the economic development of agriculture, regulating agro-food markets, implementing import substitution policies; as well as in economic and production activities, agricultural agriculture, food industry, wholesale trade, in order to ensure a good system of marketing of agricultural products and increase the efficiency of their effectiveness.

A number of provisions and conclusions developed within the framework of dissertations can be used in the educational process of higher educational institutions in economic educational programs.

Testing and implementation of research results. The results of the dissertation research were covered at international conferences, including: The IIER International Conference on Social Science and Economics (London, 2024), International scientific and practical conference "New reality: economics, management, social communications" (Novosibirsk, Novosibirsk State Pedagogical University, 2023), X ISPC "Current innovation and investment mechanisms for the development of the national economy in the minds of European integration" (Poltava Polytechnic named after Yuri Kondratyuk, 2023).

In addition, the results of the study were reported at international scientific and practical conferences, in particular: VIII RSPC "Integration of education-science-business: problems and prospects" (Ust-Kamenogorsk, S.Amanzholov East Kazakhstan State University, 2022), ISPC "Uvaliyev Readings: Actual Problems of Science and Education in the Context of Modern Challenges" (Ust-Kamenogorsk, S.Amanzholov East Kazakhstan State University, 2022), IX ISPC "Integration of education-science-business: problems and prospects" (Ust-Kamenogorsk, S.Amanzholov East Kazakhstan State University, 2023), XVIII ISPC "Ǵylym jáne bilim" (Astana, L.N. Gumilyov Eurasian National University, 2023), ISPC "Development of digitalization and formation of the institutional environment of e-commerce: trends, problems and solutions" (Astana, L.N. Gumilyov Eurasian National University, 2024).

The materials of the electronic book "Scientific project "Development of the transport and logistics system of Kazakhstan" were used in the educational process at

the Sarsen Amanzholov East Kazakhstan State University, Kokshetau University named after Sh. Ualikhanov. Individual recommendations of the applicant were used in the activities of LLP “New Silk Road” and LLP “SMART Trade Solutions”, which is confirmed by the relevant acts on the implementation of scientific research results.

The results of the dissertation research were reflected in the applied research in priority areas for the state, in the project within the framework of grant funding from the Ministry of Higher Education of the Republic of Kazakhstan “AP19677634 Development of logistics infrastructure and sustainable supply chains of perishable food products in Kazakhstan (2023 - 2025)”.

Publications. The results of the scientific research have been published in 4 articles in journals indexed in the Scopus database, including 3 articles in the Web of Science Core Collection database, 5 articles in journals recommended by the Committee for Control in Education and Science of the Republic of Kazakhstan, and 8 articles presented at international conferences. Additionally, 1 copyright certificate from the Ministry of Justice of the Republic of Kazakhstan was obtained, registered in the State Register of Rights to Copyright-Protected Objects under № 42478 dated January 30, 2024.

Structure of the work. The dissertation contains an introduction, three sections, a conclusion, as well as a list of references, including 20 tables, 28 figures, 7 appendices.