Public-private partnership as the basis for creating a cross-border cluster (Russia-Kazakhstan) for deep grain processing: the essence and specifics of the formation

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Abstract. The subject-object area of the research is organizational relations based on public-private partnership (hereinafter - PPP) between its participants to create a cross-border cluster (Russia-Kazakhstan) for deep processing of grain. There were considered the present forms, models and mechanisms of PPP and the possibility of their implementation in the formation of a cluster. The characteristic features and distinctive features of relations between PPP participants that can be used in the preparation of normative acts regulating the system of relations between partners both in the Russian Federation and in the EEU member States are identified. The author substantiates the need to solve a number of fundamental issues on the formation of an international cluster based on PPP: effective PPP cannot be considered only as attracting investment, it is necessary to take into account the interests of all participants, especially business, for which stable “rules of the game” must be defined.

1. Introduction
The creation of the Eurasian Economic Union (hereinafter referred to as the EEU) opens up new opportunities for corporate interaction between Russia and Kazakhstan as the largest grain producers. In recent years, Russia's domestic consumption of grain is 75-80 million tons, while its export potential may fluctuate in the range of 25-54 million tons, depending on the gross harvest of grain crops and the volume of changing annual reserves[21]. Kazakhstan accounts for about four percent of world grain exports. According to the International Trade Centre [8] Kazakhstan from 2001 to 2018 doubled wheat exports from 3.0 to 6.2 million tons, respectively. According to this source, Kazakhstan is dominated in the production and export of durum wheat, along with Canada, it is a world leader.

According to the Decree of the President of the Russian Federation dated May 7, 2018 "On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" [4], there was set the strategic goal to increase the export of agricultural products to 45 billion US dollars by 2024. The main legal document that provides for this task is the State Program of the
development of agriculture and regulation of markets of agricultural products, raw materials and food [10]. The Federal Project “Export of agricultural products” is an integral part of the cluster. One of the main tasks of this project is “to create a new commodity mass of agricultural products, including products with high added value through technological re-equipment of the industry”. Thus, it is planned to increase the commodity mass, increase the depth of processing of agricultural products and ensure the modernization of the industry based on innovations.

Therefore, one of the promising projects of innovation and investment activities in the EEU in the agricultural sector can be the creation of a cross-border (Russia-Kazakhstan) cluster based on PPP for deep processing of grain with high added value, the main features of which were described by us in 2017 [14]. This is due to the fact that the following subjects of the Russian Federation bordering with Kazakhstan are: Astrakhan, Volgograd, Saratov, Samara, Orenburg, Chelyabinsk, Kurgan, Tyumen, Omsk and Novosibirsk regions, as well as the Altai Territory and the Republic of Altai, in which in 2016-2018 the total location of grain production amounted to 30619 thousand tons or 24.8 percent of the national level [7]. At the same time, it should be noted that these regions are far from the grain transport infrastructure (seaports) that provides for the export of Russian grain. Therefore, the creation of a cluster, which includes a number of fundamental provisions: meeting the internal needs of the countries of the Eurasian Union in products of deep grain processing, further import substitution of scarce products of high added value (starch, gluten, glucose, glucose-fructose syrups, amino acids), intensification of the development of the livestock industry in the Union countries, effective use of the grain surplus in Russia and Kazakhstan, reducing wheat prices on world markets, entering international markets with grain processing products, increasing the income of grain producers and rural development and determined the purpose of the study.

2. Methods
The main method of the research was dialectical, according to which all events are considered in an inextricable connection between the causes of these events and their consequences. The instrumental and methodological basis of the research was provided by the combination of a systematic approach with monographic, abstract and logical methods, as well as retrospective, evolutionary and transitive approaches, which allowed us to formulate new scientific positions and constructions at the proper level of theoretical and practical justification.

3. Results
The cluster has unique competitive advantages that allow it to occupy a special niche in the market, be efficient, and produce competitive products [2,5]. Deep processing of grain consists in the isolation and effective use of grain components that have a high added value: starch, gluten, amino acids and other by-products (glucose and glucose-fructose syrups). The principal organizational structure of the declared cluster is shown in Figure 1.

This structure provides for close cooperation between government authorities, businesses, producers of commercial grain in Russia and Kazakhstan, complexes of its deep processing, producers of livestock products based on PPP mechanisms.
Figure 1. Principal organizational structure of the cross-border agro-industrial cluster for deep grain processing "Russia-Kazakhstan" based on PPP Source: compiled by the authors based on materials [14].

According to the state research Institute of genetics and selection of industrial microorganisms of the national research center "Kurchatov Institute" (hereinafter-Gosniigenetika), potential products of deep processing of grain and stages of processing depth are shown in Figure 2.

Figure 2. Potential products of deep processing of grain according to Gosniigenetika data. Source: compiled by the authors based on data from Gosniigenetika.

We propose to create the cluster (at the initial stage) with a second degree of deep processing of grain and an appropriate amount of investment. As for the first stage of grain processing, calculations
made in 2017 showed that at this depth of processing, the value added of processed grain is close in its values to the options to its use in the pig production for slaughter or in feed production and feed preparation in poultry. Therefore, the formation of a second-generation cluster with a developed scientific and innovative component based on PPP will be of great practical importance for the sustainable development of the agricultural sector of the EAEU member States.

4. Discussion
As the world experience evidences, the models and structure of PPPs can be diverse, but there are some characteristic features that make it possible to distinguish a partnership into an independent economic category. According to M. Deryabina [6], it arises as a formalized cooperation of public and private structures and is based on the relevant agreements of the parties, in this case, the Russian Federation and the Republic of Kazakhstan under the patronage of the Eurasian Economic Commission.

The project on deep grain processing (Russia-Kazakhstan) on the basis of PPP, discussed above, encourages attracting investment, both from participating countries and international direct investment in accordance with the provisions of the OECD [P. 11. 22]. PPP is particularly important for the economy of stakeholders, where it is used to develop local markets for capital, goods and services [11].

At the same time, each partner (country, state and business) makes a certain contribution to this project. Thus, the business provides financial resources, professional experience, effective management, flexibility and efficiency in decision-making [16]. The country (state) and the recommendation of the Eurasian Economic Commission can be expected to provide tax incentives, guarantees, as well as material and financial resources. In PPP, these structures carry out the monitoring functions, they are focused on regulation of production processes and observance of state interests (to allow the grain supply in those or other volumes). At the same time, unavoidable business risks (for example, grain crop failure due to drought) [1] are usually redistributed to the business side. The public significance of PPP in this case lies in the fact that in the end, not only agricultural producers, but also society as a whole, benefit. According to the provisions (reasons) for the need to create an international cluster listed above, a PPP can develop according to the types (models) shown in figure 3.

![Figure 3. Models of public-private partnership.](image)

Source: compiled by the authors based on materials [18,20].

As follows from the data in figure 4, the most appropriate PPP model for creating an interstate cluster should be considered as a combination of them. Thus, according to the organizational model, it is necessary to allocate unused lands to a concession for the construction of a plant, silo facilities and
logistics terminals. According to the financing model, the cross-country investment of the project from the Eurasian Fund for stabilization and development, established in 2006, as well as financial resources from the real sector of the economy are possible. As for the model of cooperation, the joint efforts of PPP partners will be aimed at the construction and operation of complex infrastructure facilities [9], which have strategic and social significance.

When implementing PPP projects, various mechanisms of cooperation between state structures and organizations in the real sector of the economy are used. The mechanism (Mechane in Greek) is a system that determines the order of some type of activity[3]. The mechanisms are differentiated depending on the amount of ownership rights transferred to the private partner, the investment obligations of the parties, the principles of risk sharing between partners, and the responsibility for carrying out various types of works [12].

The most common partnership mechanisms are shown in figure 4.

| MAIN MECHANISMS OF PPP |
|-----------------------|
| BOOT (Build, Own, Operate, Transfer) - building-ownership-operation/ management-transfer |
| BOT (Build, Operate, Transfer) – building-operation/ management-transfer |
| BTO (Build, Transfer, Operate) – building-transfer-operation/ management |
| BOO (Build, Own, Operate) – building-ownership-operation/ management |
| BO MT (Build, Operate, Maintain, Transfer) - building-operation/ management-operation-transfer |
| DBOOT (Design, Build, Own, Operate, Transfer) – designing, ownership, building, operation/management-transfer |
| DBFO (Design, Build, Finance, Operate) – designing, building, financing, management |

Figure 4. The most common PPP mechanisms.

Source: compiled by the authors based on materials [6,13].

We have listed an extensive list of mechanisms for the implementation of PPP projects that can be used in the formation of an interstate cluster (Russia-Kazakhstan) for deep grain processing. At the same time, according to data [6] in a number of Eastern European countries in the late 1990s and early 2000s, PPP methods were actively used in transport infrastructure sectors. Moreover, according to her, the specific experience was ambiguous: along with successful solutions, there were also cases of problematic, not always prosperous solutions. For agricultural sector, a survey of 139 farms in the Lujiang plain in the Nu river valley (upper Salween), Southwestern China [23] found that the operation of PPPs to improve agricultural adaptation to drought did not bring the desired result. This is due to limited government funding for projects, as well as the distrust of farmers. All of these leads to a reduction in private investment in partnerships with farmers in warming climate. This is indicated by [16].

In the Russian Federation, the risks of miscalculations by both the state and private business in PPP projects are very high. Currently, there is a trend towards a strong increase in the cost of projects compared to their original cost. According to some sources [6,11], the problem of rise in price can reach up to 20% per year. The reasons for this are not only banal mistakes and miscalculations at the initial stage, but also quite objective circumstances: a constant increase in prices for services, raw materials, and some subjective factors. World experience shows that the only way out of this situation is to attract private capital, often direct investment, which means creating more attractive conditions for it than usual commercial activities [15,19].
The most important aspect of the PPP to create an interstate cluster (Russia-Kazakhstan) is the practical division of risks between its participants. Thus, Eurostat officially identifies the following main risks taken into account, which are an important element of partnership agreements [18]:

1. Risk of late delivery of equipment or non-compliance with accepted standards - construction risk. As a rule, most of these risks are assumed by the state.
2. The risk of non-payment of claims, which is vested with the private partner.
3. The risk of failure or fluctuations of the market demand that the private partner almost can not affect. This risk is usually also borne by the state.

5. Summary
The States of the Eurasian economic Union have a large-scale potential for implementing many forms of PPP listed above. However, for the practical implementation of the cross-border cluster (Russia-Kazakhstan) for deep processing of grain, a number of fundamental issues need to be resolved.

First, all parties of the partnership should realize that an effective PPP cannot be considered narrowly, only as attracting investment in such a capital-intensive project as a plant for deep processing of grain, which is the main part of the cluster being created. The real interests of all parties, especially private investors, must be taken into account.

Secondly, significant progress is needed in understanding the public legal functions of member States. Especially in the country, where a plant for deep grain processing with a system of silo and logistics infrastructure will be built. For example, in the Russian Federation, legislation does not distinguish the public legal functions of the state and does not establish a link between it and public property. The legal reality is that public legal functions are implemented either administratively or through civil law. Unfortunately, it is quite problematic to organize the distribution of powers between the partnership countries on this basis without the appropriate support of the Eurasian Economic Commission. International practice shows that the higher the economic and legal level of development of a country, the more effective the interaction between the state and the real sector of the economy.

6. References
[1] Alam A S A F, Begum H, Masud M M, Al-Amin A Q, Filho W L 2020 Agriculture insurance for disaster risk reduction: A case study of Malaysia (International Journal of Disaster Risk Reduction) 47
[2] Alimov A, Adilchaev R, Oteev U, Adilchaev B and Temirkhanov A 2020 Innovative approach to clustering in tourism (in example EU countries) (Journal of Critical Reviews) 7 (2) 781-786
[3] Large economic dictionary 2004 Under ed. A.N.Azriiyan. 6th added and processed M: Institute of new economics 1576
[4] Decree of the President of the Russian Federation dated May 7, 2018 No. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024" https://www.garant.ru/products/ipo/prime/doc/71837200/
[5] Demishkevich G, Petrov A and Botasheva L 2018 Activation of investment attraction in the dairy sub-complex of the agro-industrial complex on the basis of public-private partnership (International Scientific Conference "Investment, Construction, Real Estate: New Technologies and Special-Purpose Development Priorities", Irkutsk, Russian Federation) 26-27 April 2018 https://doi.org/10.1051/matecconf/201821208023
[6] Deryabina M 2008 State-private partnership: theory and practice (Problems of Economics) 8 61-77 https://doi.org/10.32609/0042-8736-2008-8-61-77
[7] Export of Russian AIC products: tendencies and development 2020 Collective monograph M: Ltd Company «Sampoligrafist» 256 https://www.elibrary.ru/item.asp?id=42531100
[8] International trade statistics 2001-2020 https://www.intracen.org/ite/market-info-tools/trade-statistics/
[9] Fakhrutdinova L R, Chumaria G R, Eidelman B M and Bunakov O A 2019 Cluster approach for development of tourism infrastructure based on the supply chain management in the region (International Journal of Supply Chain Management) 8 (3) 522-525

[10] Decree of the Government of the Russian Federation of July 14, 2012 N 717 "On the State program for the development of agriculture and regulation of markets for agricultural products, raw materials and food" https://base.garant.ru/70210644/

[11] Khairova S M, Karpov V V, Kovalev V A and Khairov B G 2019 The influence of the integration level of the production and logistics cluster participants on its efficiency upon implementing import substitution program (Espacios) 40 (24) 11

[12] Liang L, Shen L, Cui Y and Liu H. 2018 Private partner selection of PPP model for rural infrastructure based on grey cluster theory (International Journal of Circuits, Systems and Signal Processing) 12 514-519

[13] Nesmyslenov A P, Novikova S M and Serdobintsev D V 2019 The Mechanism of Public-Private Partnerships as an Important Element of the Development of Irrigated Agriculture (IOP Conference Series: Earth and Environmental Science) 459 (6)

[14] Nechaev V I, Mikhailushkin P V, Slepneva T N 2017 New approaches to the deep grain processing on the basis of interstate cluster formation (Russian-Kazakhstan) (Economics of agricultural and processing enterprises) (9) 52-55

[15] Parker D, Castillo F and Zilberman D 2001 Public-private sector linkages in research and development: The case of U.S. agriculture (American Journal of Agricultural Economics) 83 (3) 736-741

[16] Poulton C, Macartney J. 2012 Can Public-Private Partnerships Leverage Private Investment in Agricultural Value Chains in Africa? A Preliminary Review (World Development) 40 (1) 96-109

[17] Pray C E 2001 Public-private sector linkages in research and development: Biotechnology and the seed industry in Brazil, China and India (American Journal of Agricultural Economics) 83 (3) 742-747

[18] Public Private Partnership: Ein Leitfaden fur offentliche Verwaltung und Unternehmer (Dokumentation) 2003. Bundesministerium fur Wirtschaft und Arbeit, S.10

[19] Spielman D J, von Grebmer K 2006 Public-private partnerships in international agricultural research: An analysis of constraints (Journal of Technology Transfer) 31 (2) 291-300

[20] Stadler T and Chauvet J-M 2018 New innovative ecosystems in France to develop the Bioeconomy (New Biotechnology) 40 113-118

[21] Trukhin A 2018 Russia still has a strong grain export potential (Nivy Rossii) 9 (164) http://svetich.info/publikacii/analitika/u-rossii-sohranjaetsja-moschnyi-zernovoi.html

[22] Reference definition of OECD for direct foreign investment. 4th edition Final edition. April. 2008 OECD, 277 https://www.oecd.org/daf/inv/investmentstatisticsandanalysis/46229224.pdf

[23] Zhang L, Hu J and Li Y and Pradhan N S 2018 Public-private partnership in enhancing farmers’ adaptation to drought: Insights from the Lujiang Flatland in the Nu River (Upper Salween) valley, China Land Use Policy 71 138-145