

OPTIMIZATION OF PUBLIC-PRIVATE PARTNERSHIP PROJECT MANAGEMENT: CHALLENGES AND SOLUTIONS

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Abstract

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The relevance of the study is related to the increasing importance of public-private partnership (PPP) for solving socially significant tasks and implementing large projects in conditions of a limited budget and lack of private investment. The aim of the work is to optimize the management of PPP projects by analyzing the current state, identifying key problems, and developing practical solutions. The research methodology includes the analysis of scientific literature and empirical observations. During the work, it was found that, despite Kazakhstan's significant achievements in the development of PPP, such systemic problems as bureaucratic obstacles, financial risks, and insufficient readiness of facilities for transfer to private management remain. The main conclusions of the article emphasize the need to increase the competence of PPP participants, improve legislation, and apply new financial instruments (Stepanov et al., 2023). It is expected that the proposed measures will increase the volume of financing of PPP projects from 3,112 million tenge in 2023 to 4,697 million tenge in 2028. The paper highlights the importance of a systematic approach to PPP project management for the sustainable economic development of Kazakhstan (Stepanov & Legostayeva, 2022b).

Keywords: Project Management, Public-Private Partnership, Mechanism, Projects, State Management, Structural-Logistic Model, Challenges, Partnership

Authors' individual contribution: Conceptualization — M.S., A.L., H.F., B.J., and S.Y.; Methodology — H.F. and S.Y.; Formal Analysis — M.S.; Writing — Original Draft — M.S., A.L., H.F., B.J., and S.Y.; Writing — Review & Editing — M.S., A.L., H.F., B.J., and S.Y.; Supervision — H.F.; Project Administration — A.L.

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1. INTRODUCTION

Public-private partnership (PPP) is becoming an increasingly important tool for achieving public

goals and implementing major projects in various fields such as infrastructure, education, healthcare, and technological development (Hodge & Greve, 2007). In the context of public administration and

regulation, these projects require special attention to management and coordination between public authorities and private companies (Wang & Ma, 2020).

There are significant gaps in the literature on PPPs that need to be addressed in order to better understand and effectively use this model of cooperation. First, despite the many studies on PPPs, little attention is paid to the specific problems specific to countries with economies in transition, such as Kazakhstan. For example, the impact of administrative barriers and bureaucratic procedures on the effectiveness of PPP implementation remains insufficiently studied (Ibrahim & Jantan, 2024).

Secondly, the aspects of adapting international PPP models to national conditions are not sufficiently covered. Although successful examples of PPP projects in developed countries are widely discussed in the literature, little research has been devoted to how these approaches can be adapted to the legislative, economic, and social realities of Kazakhstan.

In addition, the literature often focuses on the technical and financial aspects of PPP projects, ignoring the problems of interaction between the participants in the process (Wang et al., 2017). For example, the mechanisms for increasing trust between public and private partners, as well as the role of transparency and accountability in the successful implementation of projects, remain poorly understood (Cui et al., 2018).

Finally, there is a limited amount of research on the long-term sustainability of PPP projects, including their social and economic impacts (Iazzolino et al., 2018). In particular, there are no systematic studies analyzing how PPP projects affect local development, social justice, and accessibility of services to the population. Thus, further research is needed to address these gaps and develop recommendations that take into account the national characteristics of Kazakhstan and the specific challenges associated with the implementation of PPP projects (Ma et al., 2020).

The PPP project implementation system in Kazakhstan faces a number of significant problems that limit its effectiveness. One of the key problems is high administrative barriers, expressed in long project review periods, complex procedures for concluding agreements, and insufficient readiness of facilities for transfer to private partners. Often, the transferred objects do not meet the requirements of regulatory authorities, which creates additional difficulties for private investors. Financial risks, including inefficient tariffs and low attractiveness of projects for private capital, also remain a serious obstacle. The interaction of public and private partners is often complicated by the lack of consistency in providing compensation for operating costs, as well as the insufficient readiness of the engineering infrastructure for the transfer of land plots within the framework of PPP. These systemic shortcomings reduce the interest of the private sector in participating in such projects and require significant efforts to eliminate them.

The aim of the study is to eliminate these gaps by analyzing the current state of PPP management, identifying key problems, and offering practical solutions.

The main research question is:

RQ: How can the management of PPP projects in Kazakhstan be optimized in order to overcome existing barriers and increase the efficiency of interaction between the public and private sectors?

The principles of project management and the theory of public administration, which are integrated with practical observations of the implementation of PPP in Kazakhstan, are used as the theoretical basis of the study. The study also examines the legislative, financial, and organizational factors affecting the effectiveness of the project (Stepanov & Legostayeva, 2022b).

The relevance of the work is due to the importance of PPP for sustainable economic development, especially in conditions of limited budgetary resources and the need to attract private investment. Eliminating systemic deficiencies in PPP management can significantly increase their effectiveness, which makes the study significant for both the scientific community and practitioners.

The research methodology includes the analysis of scientific literature, the study of specific cases, and empirical observations, which allows us to get a holistic view of the PPP situation in Kazakhstan. The results show that, despite the progress made, problems such as bureaucratic delays, financial instability, and insufficient readiness of facilities for transfer to the private sector remain. The document proposes measures aimed at improving the competence of PPP participants, improving legislation, and introducing innovative financial instruments (Stepanov & Legostayeva, 2022b).

The contribution of the research is to combine theoretical knowledge and practical solutions, providing a roadmap for optimizing the management of PPP projects in Kazakhstan. The proposed solutions are expected to increase the number and scale of financing for PPP projects, highlighting the importance of research for policymakers, investors, and the scientific community.

The structure of this work includes the following elements. Section 1 describes the relevance of the research and shows the purpose, problems, and significance. Section 2 is devoted to the analysis of existing research gaps and the importance of PPPs at both global and regional levels. Section 3 describes the methods used in the study, such as the analysis of scientific literature, the study of specific cases, and empirical observations, which allow for a comprehensive understanding of the current state of PPP in Kazakhstan. Section 4 pays special attention to the key issues and progress achieved in the implementation of PPP projects in Kazakhstan. Section 5 displays the data obtained, as well as provides recommendations for improving the efficiency of PPP project management. Section 6 presents the main conclusions and describes expected results from the implementation of the proposed solutions and directions for further research are presented.

2. LITERATURE REVIEW

In the new global economic landscape, where limited governmental budgets and insufficient private investment challenge development, PPPs emerge as a favorable collaborative model (Gafurova, 2013). Tang et al. (2023) posit that public administration is pivotal in laying the legal and economic groundwork for PPPs and in the effective operation of their management systems (Tang et al., 2023). Shah and Haq (2022) highlight the critical role of public administration in defining strategic objectives and priorities for government projects, with the state delineating areas for development and fostering conditions for private sector engagement based on

national and societal needs (Shah & Haq, 2022). Spahiu and Durguti (2023) emphasize the importance of interdepartmental coordination and interaction to maximize the efficiency and effectiveness of project execution (Spahiu & Durguti, 2023).

According to the World Bank (2017) definition, a PPP is a long-term contract between a private party and a public institution for the provision of public assets or services, in which the private party bears significant risks and responsibility for management, and remuneration depends on the results. In this context, PPP is perceived as a targeted mechanism that includes financing, resource sharing, and cooperation in the field of competencies (Hartman et al., 2020). Through the active involvement of various stakeholders, PPP contributes to the development of public infrastructure and services, which is especially effective in times of crises or disasters when public resources are limited (Murphy et al., 2021).

PPP contributes to the development of public infrastructure and the provision of services by involving a wide range of stakeholders, which makes this model especially useful in crisis or emergency situations when public resources are limited (Casady & Baxter, 2020). Unlike the standard supplier-buyer relationship, PPP is based on a significant level of equality and trust between participants, which is critical for the successful implementation of each project or event (Hartman et al., 2020).

The literature describes various problems and obstacles encountered in the implementation of PPP projects. Some studies highlight issues related to individual and organizational levels, such as human resources, financial and administrative difficulties, technical aspects, knowledge, and research development (Pan et al., 2020; Biygautane et al., 2021). Other studies analyze issues at the inter-organizational level. These issues include commitment to goals, shared responsibility, vision formation, legal accountability, and sustainable development.

In addition, research shows that problems and barriers can arise due to various aspects of interaction, which leads to negative consequences. Numerous approaches to solving problems and overcoming barriers inherent in PPPs have also been proposed in the literature. They cover higher levels of the organization, including political leadership and management, and involve employees with appropriate authority (Lam & Young, 2020). Thus, various optimal solutions have been developed to solve PPP problems at different levels of organizations, as well as to identify critical success factors.

Understanding the multitude of problems and barriers associated with PPPs highlights the need to find effective solutions at all levels of the organization. These aspects will be considered further in the course of the study.

In Kazakhstan, the first PPP endeavors, such as the Sharym — Ust-Kamenogorsk railway and the North Kazakhstan — Aktobe region power transmission line, began in 2005 under pilot concession agreements established by the Civil Code. Following these, the Law on Concessions was enacted in 2006, creating a structured framework for PPPs. This legislation was further refined in 2008 and 2010, drawing from early experiences with concession projects (Stepanov & Legostaeva, 2022a; Stepanov et al., 2023).

In 2015, Kazakhstan formalized its approach to PPPs by enacting the Law on Public-Private Partnership, which introduced various state support measures for entrepreneurs and investors (Parliament of the Republic of Kazakhstan, 2015). However, the evolution of the PPP project management system in Kazakhstan still encounters significant challenges, notably reconciling public and private sector interests and selecting the most effective relationship and development models for the PPP framework.

The necessity for effective private-public sector interaction mechanisms is clear, alongside a robust and functional PPP governance system that draws on successful international practices.

The current situation in the Republic of Kazakhstan requires a comprehensive review in order to improve legislative aspects and bring it closer to the PPP forms common in Western countries. The head of state Kassym-Jomart Tokayev has repeatedly drawn attention to the fact that the very idea of PPP is discredited and more than 90% of the cost of PPP projects are state obligations. And at a meeting with the largest representatives of the business community in January 2022, he said that “another direction for attracting investment to the country should be the restart of PPPs.

The main advantages of PPPs include the distribution of risks and responsibilities between the state and the private sector, the use of innovations, and efficient resource management, as well as receiving financial and technical support from private partners.

Thus, within the framework of this topic, it is necessary to pay attention to the basic principles and advantages of using a project management system within the framework of a PPP.

The subject of further research is the project management system of PPP, which is an important and relevant topic. PPP is becoming an increasingly common mechanism for implementing investment projects, especially in the field of infrastructure. Research in this area will provide a better understanding of how to manage PPP projects taking into account the specifics and requirements of this type of partnership between the state and the private sector. Analysis of the PPP project management system can identify successful strategies and methods, as well as help in developing recommendations for improving the effectiveness of such projects. It is important to study this topic taking into account various aspects, such as performance evaluation methods, financing models, risk analysis, and stakeholder management.

This research focuses on improving the project management system for PPPs in Kazakhstan by creating a detailed structural-logical model of the PPP mechanism. The goal of this model is to enhance the coordination and efficiency between the public and private sectors, thereby ensuring more effective planning, execution, and monitoring of PPP projects.

3. RESEARCH METHODOLOGY

The research is based on the use of a mixed approach combining quantitative and qualitative methods of analysis. This approach allowed us to get a complete picture of the state of PPP project management in Kazakhstan. At the initial stage,

a thorough analysis of the scientific literature, including theoretical and empirical works, was carried out. This provided a deep understanding of the existing concepts, approaches, and methodological foundations that could be applied to the topic under study. At the same time, specific cases were investigated, such as the project of the Big Almaty Ring Road (BAKAD). This stage helped to identify key successes and shortcomings in the implementation of PPP projects.

To collect empirical data, materials on 1085 PPP contracts were studied, including their financial parameters, types of projects, and stages of implementation.

The Pearson correlation coefficient was used to study the relationships between variables such as the *amount of funding*, the *number of contracts*, *changes in legislation*, and *types of projects*. The formula of the correlation coefficient:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{(\sum(x_i - \bar{x})^2)(\sum(y_i - \bar{y})^2)}} \quad (1)$$

where,

- x_i, y_i — are the values of the variables;
- \bar{x}, \bar{y} — are the average values of the variables;
- r — is the correlation coefficient, which takes values from -1 to 1.

The r values were interpreted as follows:

- $r > 0.7$ — strong positive correlation;
- $0.3 \leq r \leq 0.7$ — moderate positive correlation;
- $r < 0.3$ — weak correlation or lack thereof.

The revealed strong positive correlation between the *number of contracts* and the volume of their financing confirms the importance of financial resources for the successful implementation of projects. At the same time, a moderate correlation between *changes in legislation* and the *number of contracts* shows that frequent legal amendments affect the process of project implementation, but not in such a decisive way. Linear regression was used to predict the amount of funding and the number of projects. The regression model revealed a trend: an increase in the *number of contracts* was accompanied by an increase in funding, which underlines the importance of quantitative growth for the implementation of large-scale initiatives.

$$Y = a + bX + \varepsilon \quad (2)$$

where,

- Y — dependent variable (*amount of funding*);
- X — is an independent variable (*number of contracts*);
- a — is a constant (intersection with the Y axis);
- b — is a regression coefficient showing how much Y will change when X changes by one;
- ε — model error.

However, the weak relationship between actual and predicted data indicates the need to develop more complex models that take into account additional factors.

The principal component analysis (PCA) method was used to identify the main factors influencing the success of projects. This tool made it possible to identify the key areas that have the greatest impact on data variability. For example, the first main component was related to the *number*

of contracts and *types of projects*, while the second revealed the significance of *changes in legislation*. This highlights the importance of both legislative stability and active project management in areas such as education and healthcare.

$$Z = XW \quad (3)$$

where,

- Z — is the matrix of transformed data;
- X — is the original data matrix;
- W — is a matrix of eigenvectors (vectors of principal components).

Within the framework of the study, the combination of correlation analysis, regression, and PCA methods allowed not only to identify quantitative patterns but also to study in depth the qualitative relationships between key variables. This integrated approach provided a comprehensive data analysis, which was especially important for achieving the goals set.

The use of alternative methods, such as econometric modeling or strengths, weaknesses, opportunities, and threats (SWOT) analysis, could significantly enrich the study. However, the use of these tools was limited by the availability of data and the time frame of the project. In particular, econometric modeling requires an extensive set of macroeconomic data, and SWOT analysis involves deeper strategic study, which may take longer.

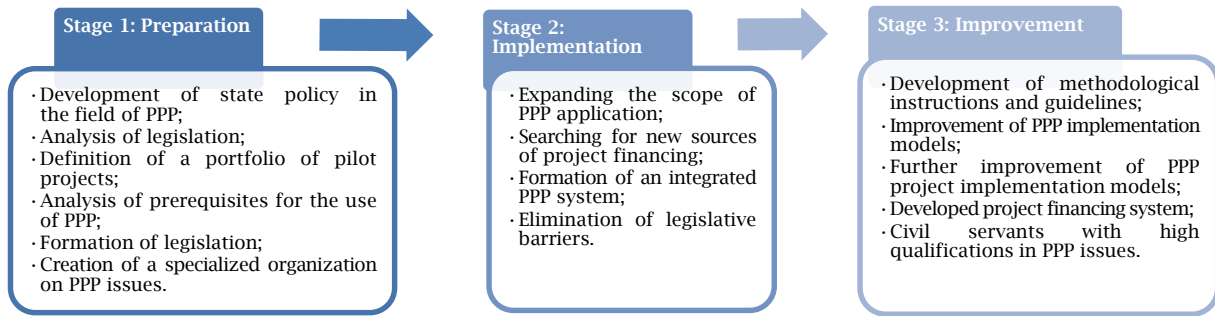
Thus, the selected methods provided a sufficient and reliable basis for assessing the current state of PPP in Kazakhstan and developing practical recommendations. Alternative approaches could be complementary in subsequent studies to further deepen the analysis.

4. RESULTS

Kazakhstan has made significant progress in the area of PPPs, but only one project, the construction of the BAKAD, is considered a long-term PPP project that has been internationally bid and successfully completed financial close with the participation of foreign banks. As a result, in 2019, Kazakhstan was assigned a "low" rating on the Infrascope Index, which measures PPP maturity. Although the country ranks among the leaders in terms of political will in PPP, the low maturity level indicates a gap between stated intentions and their implementation, as well as possible systemic barriers that limit private sector interest in infrastructure PPP projects. The country is implementing PPP projects that are not as large-scale as BAKAD, but no less significant. As of May 1, 2023, 1,085 contracts have been concluded for a total of 2.1 trillion tenge. There are another 152 projects worth 450 billion tenge at the planning stage. But given the needs of the state, as well as the goals and objectives, dozens of times more investment is required. Statistics on concluded contracts show that 90% of them, in quantitative terms, fall into three main sectors: 1) education, 2) healthcare, 3) energy, housing and communal services¹. However, if you look at the value, 40% falls on transport and energy. Figure 1 shows the stages of PPP development in Kazakhstan.

¹ Based on data from the official database of PPP projects in the Republic of Kazakhstan: 1) <https://kzppp.kz/ru/ppp-development-in-kazakhstan/>, 2) <https://kzppp.kz/en/infographics/en/>

Figure 1. Stages of public-private partnership development in Kazakhstan

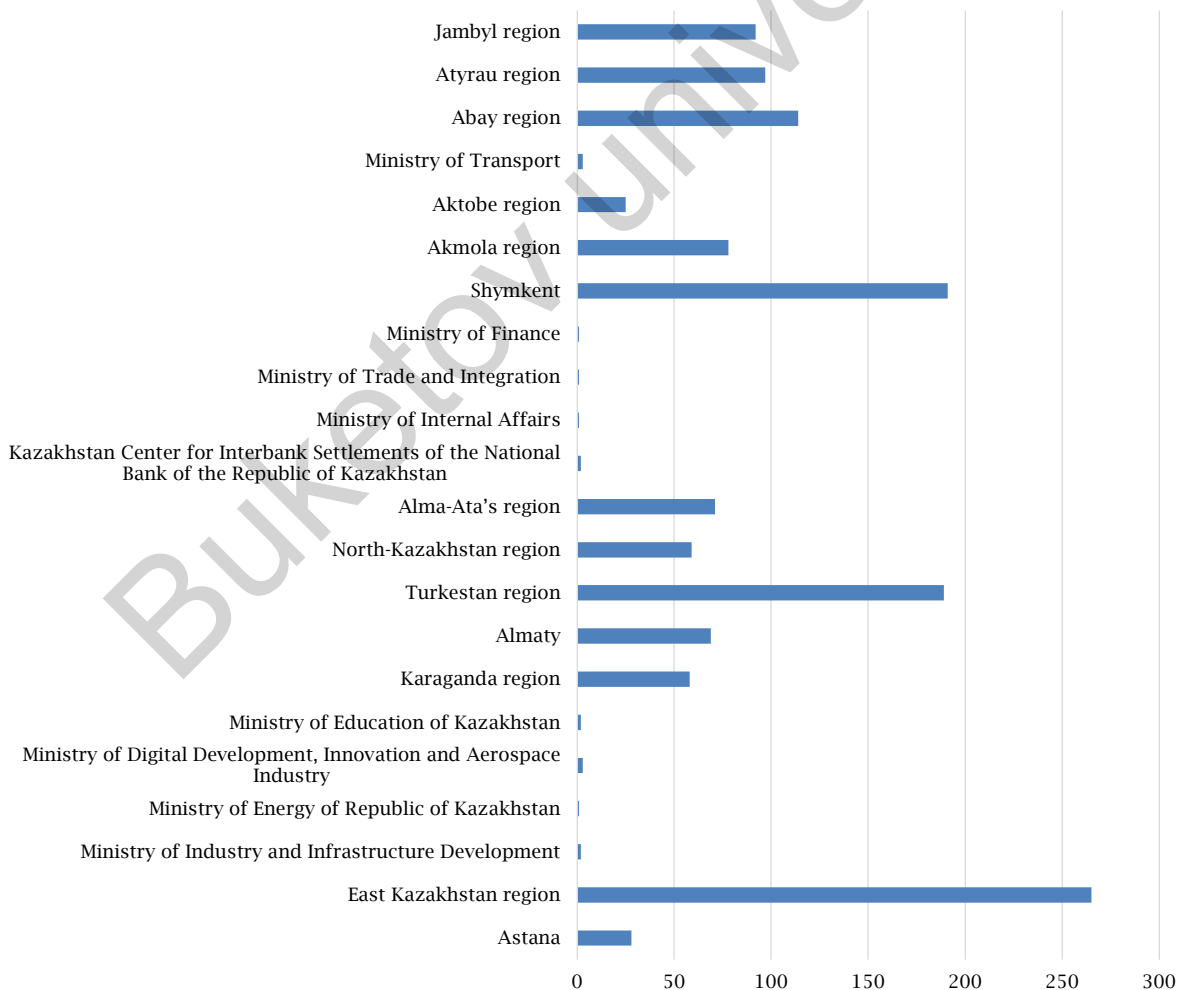


The largest number of PPP projects are implemented in the fields of education — 58% and healthcare — 17% (<https://shorturl.at/IQJEB>). This may be due to several factors. In the education sector, there is likely to be a high demand for modernization and expansion of infrastructure caused by an increase in the number of students. In addition, public institutions in this area face limited funding, which encourages the search for private investment to improve services and learning conditions.

In healthcare, there is also an increased demand for the modernization of medical institutions and the renewal of medical equipment. Private partners may be interested in participating in such projects in order to gain access to the healthcare market and the introduction of innovative technologies or treatment methods.

Figure 2 shows the number of projects in the region, central government agency.

Figure 2. Number of projects by region, central government agency



According to Figure 2, it is observed that the largest number of projects were implemented from 2015 to 2023 in the East Kazakhstan

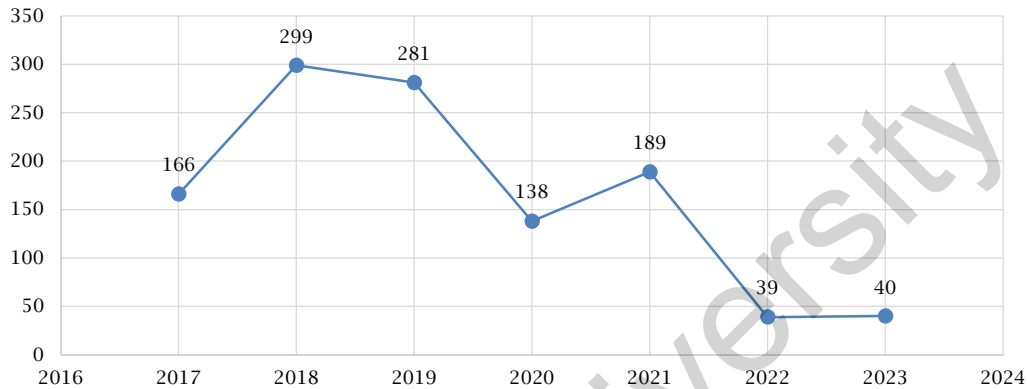
region — 265 projects, in the Turkestan region — 189 projects, in Astana — 28, in Shymkent — 191 and in the Abay region — 114.

It should also be noted that 98% of projects are implemented at the local level and only 2% at the national level (<https://shorturl.at/SSrxK>).

Of the total number of projects for the period 2015–2023, 4% are planned, and 56% are implemented, which indicates that only a small number of new projects were planned during this time. Completed projects account for 56% of the total number. This indicates that most of the projects planned for the specified period have been successfully implemented or are in the process of implementation. Completed projects

account for 7%. This means that some projects have been interrupted or canceled for some reason. Projects whose deadlines have expired account for 24%. This indicates that a significant part of the projects are at the stage when the deadlines for their implementation have already expired. The share of projects at the tender stage is 9%. This indicates that some projects are still in the process of evaluation and selection for implementation (<https://shorturl.at/SSrxK>). Figure 3 shows the number of contracts concluded between 2015 and 2023.

Figure 3. Number of concluded contracts from 2015–2023



As can be seen from the graph, the largest number of contracts concluded was in 2018, and the smallest number was observed from 2022–2023. During the study, it was revealed that the minimum amount for the analyzed period was — 300.20 in 2018, it should be noted that the maximum amount was also recorded in 2018 and amounted to — 510,967,322.00 (<https://shorturl.at/SSrxK>).

Until 2023, the Republic of Kazakhstan used the private financial initiative (PFI) mechanism, which allows private companies to initiate projects related to their property or intellectual property in the context of PPP. However, this method of project implementation was criticized by the public, the expert community, and even the president, which led to its radical revision. This revision was due to the high level of corruption risks and the frequent discrepancy between the initiated projects and the goals of state development, as well as insufficient socio-economic efficiency for all stakeholders and potential project participants.

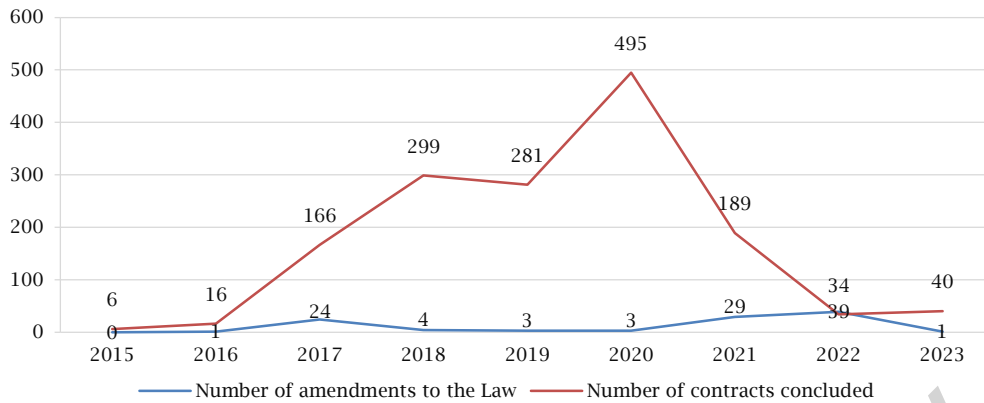
When implementing PPP projects, the following problems arise that require solutions: 1) limited government obligations; 2) the presence of administrative barriers at the local level; 3) a long time for reviewing projects and concluding PPP agreements; 4) unpreparedness of facilities for transfer to private partners; 5) non-compliance of transferred objects with the requirements of regulatory authorities; 6) low attractiveness and ineffective tariffs; 7) inconsistency of state partners in providing compensation for operating expenses;

and 8) insufficient readiness of engineering infrastructure for the transfer of land plots within the framework of PPP.

The following methods of implementation are typical for PPP projects in Kazakhstan: 1) concessions; 2) trust management of state property; 3) property rental (lease) of state property; 4) leasing; 5) contracts concluded for the development of technology, production of a prototype, pilot testing, and small-scale production; life cycle contract; 6) service contract; and 7) other contracts corresponding to the characteristics of a PPP.

In Kazakhstan, the PPP model is characterized by legislative strengthening in the relevant industry legislation. It is presented in the legislation as a tool for interaction between the state and the private sector, and the key role in coordination and methodological guidance on PPP belongs to the Ministry of National Economy. The Ministry of National Economy acts as a center for intersectoral coordination and methodological guidance in the field of PPP. At the same time, the Center for Development of Public-Private Partnerships operates, which analyzes the practice of project implementation, takes into account the proposals of the expert community, and formulates methodological recommendations for the development of this mechanism. This structure and approach ensure a systematic and coordinated approach to the implementation of PPP projects, allowing for the effective identification, analysis, and management of potential opportunities and problems in this area (see Figure 4).

Figure 4. Number of amendments by year to the Law of the Republic of Kazakhstan dated October 31, 2015, on Public-Private Partnership and the number of concluded agreements in the analyzed period



During the period of validity of the Law of the Republic of Kazakhstan dated October 31, 2015, focused on PPP, 100 amendments were made. An analysis of changes, additions, and exceptions showed that the largest number of amendments to the document were made in 2017, 2021, and 2022. The largest number of additions to the law was recorded in 2022.

5. DISCUSSION

The inverse correlation between the number of amendments to the law and the number of contracts concluded indicates that changes in legislation can influence decisions on concluding contracts. An increase in the number of amendments can cause uncertainty or difficulties in the legal sphere, which, in turn, can slow down the process of concluding contracts due to the need to adapt to new rules or due to expectations of the enshrining of new regulatory requirements.

The survey identified the main trends and problems accompanying the implementation of PPP projects. The main types of projects include social and infrastructure projects aimed at social security and stimulating innovation. The main challenges faced by PPP projects are related to financial constraints and legal aspects. To improve the effectiveness of such projects, it is recommended to provide additional funding, simplify legal procedures, and train personnel, which contributes to their successful implementation.

In order to maximize the potential of PPP projects, several key aspects need to be considered:

1. The need for additional financial resources for the successful implementation of projects was noted by a significant number of respondents.

2. Improving the professional skills and qualifications of personnel can improve the efficiency of PPP project management and ensure higher quality and more effective execution of tasks.

3. Simplifying legal procedures and reducing the time for resolving legal issues.

4. Cooperation with international partners can provide access to additional resources, expertise, and experience, which contributes to the successful implementation of projects and their compliance with international standards and practices.

The overall picture shows that PPP projects have the potential to stimulate economic growth, improve infrastructure, create jobs, and encourage innovation, but to achieve their full potential, it is necessary to pay attention to the above aspects and ensure a balanced approach to their implementation.

The overall picture shows that PPP projects have the potential to stimulate economic growth, improve infrastructure, create jobs, and encourage innovation, but to achieve their full potential, it is necessary to pay attention to the above aspects and ensure a balanced approach to their implementation.

It is necessary to consider the possibility of further development of this model, introducing new options. For example, Kazakhstan has already introduced such attractive instruments as direct agreement, success fees and compensation for currency risks, which cannot be fully implemented within the framework of the existing PPP model. Therefore, it is worth paying attention to the modernization of the existing model, with an emphasis on financial support instruments. Table 1 shows the correlation analysis of the variables of the PPP project.

Table 1. Correlation analysis of public-private partnership project variables

Variables	Year	Number of contracts concluded	Type of projects (education and healthcare)	Changes in legislation	The amount of financing (thousand tenge)
Year	1.00	0.02	0.27	0.42	0.27
Number of contracts concluded	0.02	1.00	0.95	0.39	0.61
Type of projects (education and healthcare)	0.27	0.95	1.00	0.43	0.63
Changes in legislation	0.42	0.39	0.43	1.00	0.25
The amount of financing (thousand tenge)	0.27	0.61	0.63	0.25	1.00

Source: Authors' elaboration.

The number of contracts and the type of projects (education and health) show a strong positive correlation, indicating a significant

relationship between these variables. In addition, funding shows a moderate correlation with the number of projects in the education and health

sectors, which highlights the crucial role of financial resources in supporting the development of these areas.

Further, Table 2 shows the correlation analysis between the actual and projected indicators.

Table 2. Correlation analysis between actual and projected indicators

Indicators	The actual number of contracts	Projected number of contracts	The actual amount of financing (thousand tenge)	Projected amount of financing (thousand tenge)
The actual number of contracts	1.00	0.02	0.61	0.02
Projected number of contracts	0.02	1.00	0.27	1.00
The actual amount of financing (thousand tenge)	0.61	0.27	1.00	0.27
Projected amount of financing (thousand tenge)	0.02	1.00	0.27	1.00

Source: Authors' elaboration.

Thus, the correlation coefficient between the actual and projected number of contracts concluded is 0.02, which indicates an extremely weak relationship. This indicates that the regression model does not fully reflect the real dynamics of the number of contracts, which is probably due to the influence of unpredictable factors affecting the process of concluding contracts.

The correlation between the actual and projected amount of funding is 0.27, which indicates a weak positive relationship. This means that the trend of the projected amount of financing partially coincides with the actual one, but does not reflect all fluctuations and changes in financing.

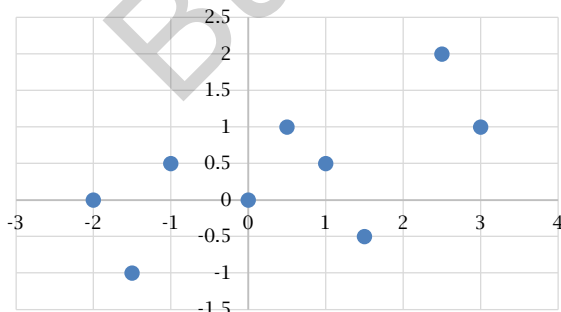
The actual number of contracts and the actual amount of funding have a correlation coefficient of 0.61, which indicates a moderate positive relationship. This indicates that a larger number of contracts is usually accompanied by an increase in funding, which is logical since new projects require more funding.

The projected number of contracts and the projected amount of financing have a strong correlation of 1.00, which reflects that both values follow the same trend line in the model. This is the expected result since the model uses the same linear trend for both indicators.

The correlation analysis shows a moderate relationship between the number of contracts and financing, which confirms that an increase in the number of contracts is associated with an increase in funding.

Next, we will conduct a PCA to identify the main factors influencing the success of PPP projects (see Figure 5).

Figure 5. Principal component analysis



Source: Authors' elaboration.

The points on the graph represent data projected onto two main components. These components represent the most significant directions of variability in the data, reducing the initial variables.

Principal Component 1 is mainly characterized by a significant contribution from factors such as the number of contracts awarded and the type of projects in education and healthcare.

Principal Component 2 significantly depends on changes in legislation, which indicates the importance of legislative support for the success of PPP projects.

Thus, the most significant factors influencing the success of projects include the number of contracts concluded, the type of projects, as well as legislative changes. This highlights the importance of a stable legal environment and optimal allocation of contracts.

In Kazakhstan, various models of PPP can be applied in various sectors of the economy, including infrastructure construction, tourism development, energy, medicine, education, and others. Figure A.1 in the Appendix shows the PPP model and its improvement.

This model is proposed to suggest areas for improving the PPP management system.

State programs for strategic and long-term development are aimed at ensuring sustainable economic growth and development. They include the implementation of national projects in key areas such as infrastructure, healthcare, education, and innovation. PPP is a form of cooperation between the public and private sectors, the purpose of which is more efficient implementation of socially significant projects, including the creation of transport infrastructure, medical institutions, educational institutions, and the introduction of innovative technologies.

To stimulate the participation of private operators and insurance companies in the market, it is necessary to introduce a system of fiscal incentives, including tax preferences and state subsidies for participants in PPP projects. Involving state-owned companies in participation in these projects is important. Regulation of tariffs for services provided in projects helps to ensure their availability and sustainability. The creation of a fund for problem payments helps to cope with them and ensure the financial sustainability of projects. The signing by the state of partnership agreements with obligations to ensure the availability of services for all segments of the population through social support and insurance helps to guarantee equal access to quality services for all residents. Based on the results of the round table devoted to the topic of PPP in the new economic policy of Kazakhstan, after discussing the current state and prospects for the development of this form of partnership, issues of delineation of responsibility in complex infrastructure projects, as well as consideration of existing problems in the field of PPP in the road industry, healthcare, and education, the Committee

on Regional Development of the Mazhilis of the Parliament of the Republic of Kazakhstan recommends the following:

1. *To the Government of the Republic of Kazakhstan.* It is recommended to critically analyze the government's approaches to directing direct fiscal costs to construct complex infrastructure projects without a clear division of responsibility between the state and the private partner.

2. *To the Ministry of National Economy of the Republic of Kazakhstan.* It is recommended that the Ministry of National Economy compile a list of complex infrastructure projects for the implementation of cooperation between the state and the private sector in various industries.

3. *To the Ministry of Transport of the Republic of Kazakhstan.* In order to comprehensively solve problems related to the quality of road surfaces, fluctuations in bitumen prices during construction works, compliance with the terms of periods between repairs, as well as the efficient use of state property and budget funds, it is recommended that the Ministry of Transport of the Republic of Kazakhstan, JSC "KazAvtoZhol" and regional Akimats switch from state purchases for medium and major repairs of roads to concluding long-term contracts for effective (defect-free) maintenance of roads within the framework of PPP.

4. *To the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan.* It is envisaged to approve a regulatory document that will determine the procedures for implementing PPP projects in the field of solid waste management in accordance with the provisions set out in Article 366 of the Environmental Code of the Republic of Kazakhstan.

5. *To regional Akimats.* It is proposed to make changes to the process of public procurement for urban greening, moving to the conclusion of medium-term PPP contracts focused on obtaining the final result and transferring responsibility for the survival of long-lived plants and trees to the private sector partner.

$$689,960 + 800,668.4 + 1,296,612.2 + 3,873,655.2 + 1,017,813.3 + 1,700,404.1 + 856,589.5 + 11,428,241.8 + 2,793,225.39 \approx 3,112,077.899689960 + 800,668.4 + 1296612.2 + 3,873,655.2 + 1,017,813.3 + 1,700,404.1 + 856,589.5 + 11,428,241.8 + 2,793,225.3 \approx 3,112,077.89 \quad (6)$$

Average increase in funding per year in thousand tenge:

$$\begin{aligned} & 3,112,077.89 - 6,899,608 \\ & \approx 317,068.8683112077.89 - 689,960 \\ & \approx 317,068.86 \end{aligned} \quad (7)$$

Financing forecast for the next five years in thousand tenge:

2024

$$3,112,077.89 + 317,068.86 = 3,429,146.75 \quad (8)$$

2025

$$3,429,146.75 + 317,068.86 = 3,746,215.61 \quad (9)$$

2026

$$3,746,215.61 + 317,068.86 = 4,063,284.47 \quad (10)$$

6. *To the Ministry of Education of the Republic of Kazakhstan.* Explore the potential for building up to 30% of schools within the framework of the national project "Comfortable School" through PPP mechanisms (as proposed by the Asian Bank) for schools with a capacity of 1,200 to 1,500 places.

For forecasting for the next five years, various methods can be used, such as trend extrapolation or time series models. After implementing the recommendations, we will consider the expected effect. Average number of projects per period:

$$\begin{aligned} & 16 + 16 + 167 + 303 + 283 + 141 + 193 + 41 \\ & + 439 \approx 131.44916 + 16 + 167 + 303 + 283 \\ & + 141 + 193 + 41 + 43 \approx 131.44 \end{aligned} \quad (4)$$

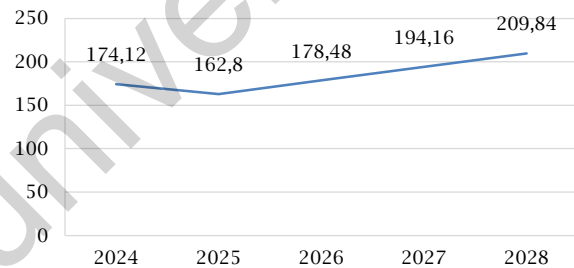
Average increase in the number of projects per year:

$$131.44 - 168 \approx 15.688131.44 - 16 \approx 15.68 \quad (5)$$

We can now forecast the number of projects for the next five years using this increase (see Figure 6).

Figure 7 shows the regression analysis of indicators from 2023–2028.

Figure 6. Expected effect from implementation



Source: Authors' elaboration.

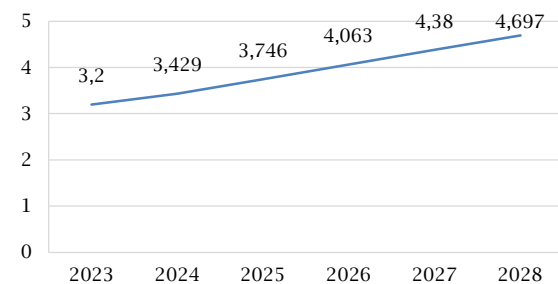
Now let's make a forecast for the amount of funding. Average financing for the period in thousand tenge:

$$4,063,284.47 + 317,068.86 = 4,380,353.33 \quad (11)$$

2028

$$4,380,353.33 + 317,068.86 = 4,697,422.19 \quad (12)$$

Figure 7. Regression analysis of indicators from 2023–2028



Source: Authors' elaboration.

The blue line shown on the graph reflects a linear regression illustrating the general growth trend of the actual projected financing volumes (in millions of tenge). Figure 7 shows that the volume of financing has a steady upward trend, which indicates the continuation of support for PPP projects in Kazakhstan during this period.

Based on the forecast based on extrapolation of trends, the following conclusions can be drawn:

The number of projects is expected to grow over the next five years. According to the forecast, it will increase to 209.84 in 2028 (see Figure 6). This indicates the continued interest and activity in the implementation of various projects.

The analysis of forecasts shows that an increase in project financing is expected in the coming years. Forecasts indicate a significant increase to about 4,697,422 thousand tenge in 2028.

6. CONCLUSION

Thus, it can be said that in Kazakhstan, PPP is regulated by the Law on Public-Private Partnership and other regulatory acts that define the legal basis for cooperation between the state and the private sector. PPP is actively used in various fields, such as transport infrastructure (construction and reconstruction of highways, airports, railways), energy (construction of power plants, development of alternative energy sources), social sphere (construction of educational and medical institutions), housing construction, tourism development, and others. Based on the analysis of the data obtained, in our opinion, it is necessary to consider the possibility of further development of the existing PPP model by introducing new options. For example, Kazakhstan has already introduced such attractive tools as a direct agreement, rewards for success, and compensation for currency risks that cannot be fully implemented within the framework of the existing PPP model. Therefore, it is worth paying attention to modernization with an emphasis on financial support tools.

In Kazakhstan, PPP plays an important role in the implementation of various projects and programs for the development of infrastructure, the social sphere, the economy, and other spheres. PPP in Kazakhstan is regulated by law and is one of the priorities of state policy.

The study showed that despite the obvious successes in the development of the PPP system in Kazakhstan, there is a need for significant reforms to eliminate existing barriers and improve the effectiveness of project management. Currently, 1,085 projects worth 2.1 trillion tenge have been implemented in the country, but 98% of them are at the local level, which indicates the weak development of large infrastructure initiatives. In order to achieve the set economic goals, it is necessary to attract larger private capital and international investors.

Forecasts show that with the implementation of the proposed measures, such as the creation of a specialized financing fund and the involvement of international partners, the volume of investments can grow to 4,697 million tenge by 2028 — an increase of 51%. This will also be accompanied by an increase in the number of projects to 210 over the same period. The introduction of financial instruments such as compensation for currency risks and the “success fee” mechanism can

potentially significantly increase the attractiveness of private sector participation in large projects, thereby increasing their scale and efficiency.

It is especially important to reduce administrative barriers and speed up the process of concluding contracts, which will reduce time costs and improve the preparation of facilities for transfer to private partners. Long project review periods and unavailability of facilities remain a serious obstacle, which limits the participation of private capital and reduces the pace of infrastructure development.

An analysis of legislative changes also shows that frequent legal adjustments, of which more than 100 have been made since 2015, create legal instability that scares investors away. Eliminating this legal uncertainty is essential for increasing the number of projects and attracting foreign investors, especially in strategically important sectors such as transport, energy, and healthcare. For example, transport projects, which account for 40% of total financing, require further improvement of legislation to support growth in this sector.

The proposed structural and logical model of PPP management, based on international experience, represents not only a theoretical basis but also a practical plan to improve interaction between the public and private sectors. It is expected that the implementation of these recommendations will not only increase the number of projects and the volume of their financing but also qualitatively improve the country's infrastructure, ensuring sustainable economic development and improving the quality of public services. The projected increase in financing to KZT 4,697 million and an increase in the number of projects by 60% by 2028 indicate the potential for real transformations in the economy of Kazakhstan with the effective use of the PPP mechanism.

The modernization of the PPP system, aimed at eliminating systemic barriers, improving legislation, and attracting international partners, will be a key factor in achieving the goals of sustainable growth and improving the quality of life in Kazakhstan.

Thus, this article represents an important contribution to the study of PPP in Kazakhstan and has significant potential to influence further research and practical application. First, the article proposes a structured PPP management model that can be adapted and applied in other transition economies facing similar barriers. The identified problems, such as administrative barriers, financial risks, and low readiness of facilities for transfer to the private sector, are relevant for many developing countries, and the proposed recommendations can serve as a basis for improving approaches to PPP management.

Secondly, the article lays the foundation for the development of new financial instruments, such as compensation for currency risks and the “success fee” mechanism, which can stimulate the attraction of private capital. These tools have the potential to be the subject of more in-depth study in the future, including an analysis of their effectiveness and adaptability in various sectors of the economy.

Thirdly, the results of the study confirm the need for international cooperation to improve the quality of implementation of PPP projects.

Despite the broad significance of the work, the study has a number of limitations:

1. The analysis is based on data only from Kazakhstan, which may limit the universality of

the conclusions. An international comparison could provide a deeper understanding of the successes and failures of PPPs in a global context.

2. The focus is on the education, health, and transport sectors, which leaves other important areas such as innovation, tourism, and ecology less explored. Future research could expand this analysis to include other industries.

3. The article mainly focuses on economic aspects, leaving insufficiently studied the social and environmental effects of the implementation of PPP projects.

In this regard, future work could focus on comparing the effectiveness of different PPP models, examining the role of public opinion and citizen involvement in decision-making, as well as analyzing the impact of PPP on inequality and accessibility

of services. In addition, a promising area is the development of an interdisciplinary approach that includes legal, social, and technical aspects of project management.

It can also be noted that due to the lack of transparent access to up-to-date information about current projects, both for business and society and for us, researchers, it is impossible to objectively assess the effectiveness of implemented or ongoing initiatives. The lack of transparency undermines the credibility of the system. In addition, there are restrictions on the part of government agencies that are completely unprepared for an open dialogue on PPP issues. While businesses openly talk about their problems and difficulties in initiating such projects, civil servants and the staff involved completely avoid discussions, especially with researchers.

REFERENCES

- Biyyagutane, M., Micelotta, E. R., & Clegg, S. R. (2021). Policy networks and socio-symbolic work: The failure of public-private partnership (PPP) in Kuwait. *Academy of Management Proceedings*, 2021(1). <https://doi.org/10.5465/AMBPP.2021.12495abstract>
- Casady, C. B., & Baxter, D. (2020). Pandemics, public-private partnerships (PPPs), and force majeure | COVID-19 expectations and implications. *Construction Management and Economics*, 38(12), 1077-1085. <https://doi.org/10.1080/01446193.2020.1817516>
- Cui, C., Liu, Y., Hope, A., & Wang, J. (2018). Review of studies on the public-private partnerships (PPP) for infrastructure projects. *International Journal of Project Management*, 36(5), 773-794. <https://doi.org/10.1016/j.ijproman.2018.03.004>
- Gafurova, G. T. (2013). Zarubezhnyy opyt razvitiya mekhanizmov gosudarstvenno-chastnogo partnerstva [Foreign experience in the development of public-private partnership mechanisms]. *Finance and Credit*, 48(576), 62-72. <https://shorturl.at/24fka>
- Hartman, P., Ogden, J., & Jackson, R. (2020). Contract duration: Barrier or bridge to successful public-private partnerships? *Technology in Society*, 63, Article 101403. <https://doi.org/10.1016/j.techsoc.2020.101403>
- Hodge, G. A., & Greve, C. (2007). Public-private partnerships: An international performance review. *Public Administration Review*, 67(3), 545-558. <https://doi.org/10.1111/j.1540-6210.2007.00736.x>
- Iazzolino, G., Chiappetta, F., & Chiappetta, S. (2018). Relational capital and financial performance: An empirical analysis on a sample of Italian firms. *Problems and Perspectives in Management*, 16(1), 245-258. [https://doi.org/10.21511/ppm.16\(1\).2018.24](https://doi.org/10.21511/ppm.16(1).2018.24)
- Ibrahim, F. B., & Jantan, A. H. B. (2024). Challenges, barriers, and solutions in public-private partnerships (PPP): A comprehensive review. *International Journal of Professional Business Review*, 9(10), Article e04830. <https://doi.org/10.26668/businessreview/2024.v9i10.4830>
- Kazakhstan Public-Private Partnership Center. (n.d.). *History*. <https://kzppp.kz/en/>
- Lam, P. T. I., & Yang, W. (2020). Factors influencing the consideration of public-private partnerships (PPP) for smart city projects: Evidence from Hong Kong. *Cities*, 99, Article 102606. <https://doi.org/10.1016/j.cities.2020.102606>
- Ma, H., Zeng, S., Lin, H., & Zeng, R. (2020). Impact of public sector on sustainability of public-private partnership projects. *Journal of Construction Engineering and Management*, 146(2). [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001750](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001750)
- Murphy, J., Vallières, F., Bentall, R. P., Shevlin, M., McBride, O., Hartman, T. K., McKay, R., Bennett, K., Mason, L., Gibson-Miller, J., Levita, L., Martinez, A. P., Stocks, T. V. A., Karatzias, T., & Hyland, P. (2021). Psychological characteristics associated with COVID-19 vaccine hesitancy and resistance in Ireland and the United Kingdom. *Nature Communications*, 12, Article 29. <https://doi.org/10.1038/s41467-020-20226-9>
- Pan, D., Chen, H., Zhou, G., & Kong, F. (2020). Determinants of public-private partnership adoption in solid waste management in rural China. *International Journal of Environmental Research and Public Health*, 17(15), Article 5350. <https://doi.org/10.3390/ijerph17155350>
- Parliament of the Republic of Kazakhstan. (2015). *Law of the Republic of Kazakhstan on Public-Private Partnership* (No. 379-V). <https://adilet.zan.kz/rus/docs/P1400001413>
- Shah, I. A., & Haq, I. u. (2022). Convergence or divergence in economic growth of Commonwealth of Independent States (CIS). *Studia Universitatis "Vasile Goldis" Arad - Economics Series*, 32(4), 58-80. <https://doi.org/10.2478/sues-2022-0019>
- Spahiu, M. J., & Durguti, E. A. (2023). Impact of financial liberalization on export: Evidence from Kosovo. *Studia Universitatis "Vasile Goldis" Arad - Economics Series*, 33(2), 95-111. <https://doi.org/10.2478/sues-2023-0010>
- Stepanov, M. S., & Legostaeva, A. A. (2022a). Public-private partnership management systems: Analysis of foreign experience. *Bulletin of "Turan" University*, 4(96), 249-261. <https://doi.org/10.46914/1562-2959-2022-1-4-249-261>
- Stepanov, M. S., & Legostayeva, A. A. (2022b). Sistema upravleniya proyektami gosudarstvenno-chastnogo partnerstva V respublike kazakhstan: Analiz problem i perspektiv [Public-private partnership project management system in the Republic of Kazakhstan: Analysis of problems and prospects]. *Central Asian Economic Review*, 1, 86-100. <https://rmebrk.kz/magazine/1362#>
- Stepanov, M. S., Legostaeva, A., & Kurmanalina, A. (2023). Mechanism for assessing social and economic efficiency in the project management system of public-private partnership of the Republic of Kazakhstan. *Economic Series of the Bulletin of L. N. Gumilyov ENU*, 2, 154-167. <https://doi.org/10.32523/2789-4320-2023-2-154-167>
- Tang, M., Wang, Y., & Yang, Y. (2023). Political influences of stakeholders on early termination of public-private partnerships: A study on China's toll road projects. *Public Performance & Management Review*, 46(6), 1354-1381. <https://doi.org/10.1080/15309576.2023.2204081>

Wang, H., Xiong, W., Wu, G., & Zhu, D. (2017). Public-private partnership in public administration discipline: A literature review. *Public Management Review*, 20(2), 293–316. <https://doi.org/10.1080/14719037.2017.1313445>

Wang, N., & Ma, M. (2020). Public-private partnership as a tool for sustainable development - What literatures say? *Sustainable Development*, 29(1), 243–258. <https://doi.org/10.1002/sd.2127>

World Bank. (2017). *Version 3: Public-private partnerships. Reference guide*. World Bank Group. <https://ppp.worldbank.org/public-private-partnership/sites/default/files/2024-08/PPP%20Reference%20Guide%20Version%203.pdf>

APPENDIX

Figure A.1. Public-private partnership project development model

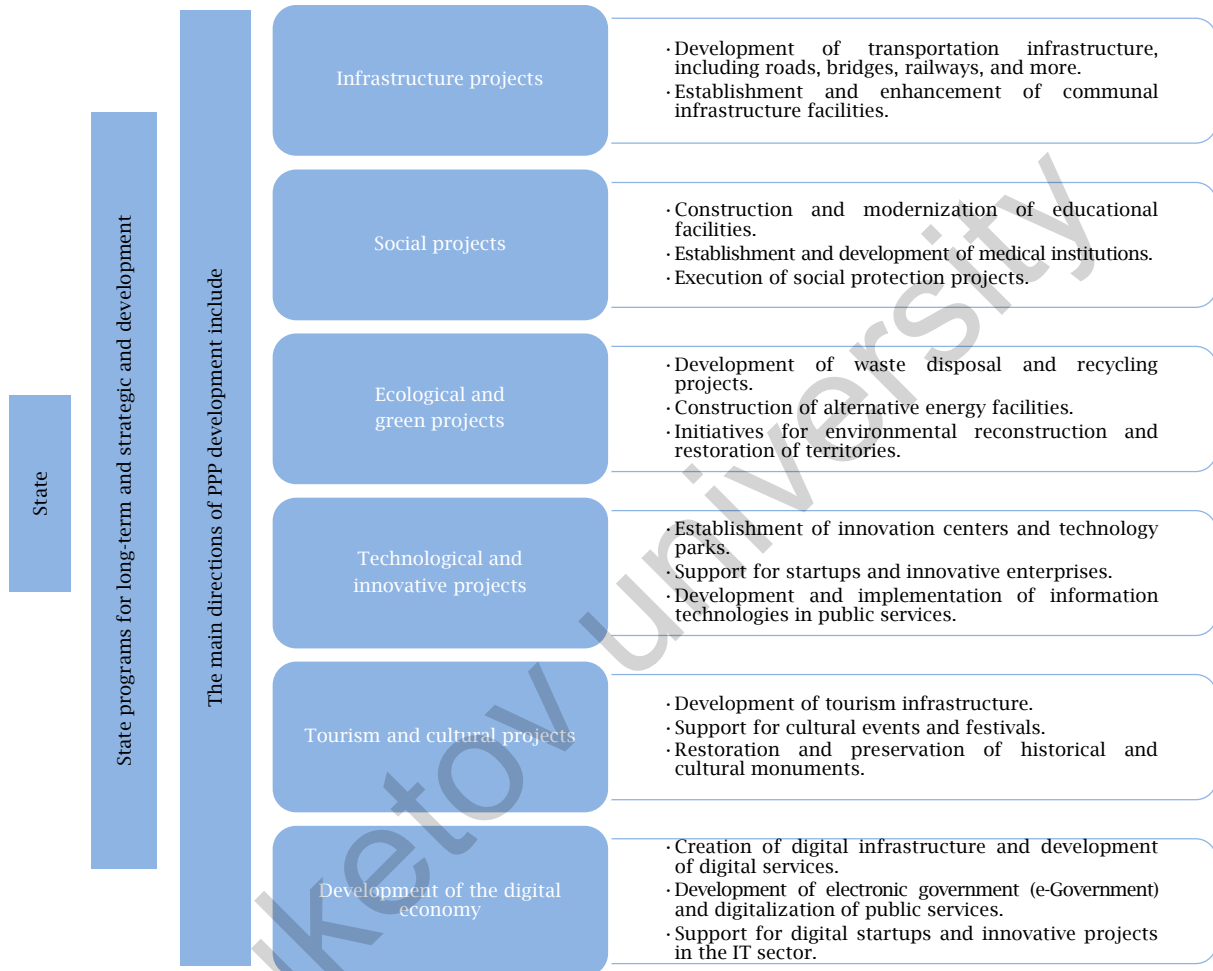


Figure A.2. Expected results of the project

