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PREREQUISITES AND PRIORITIES OF PROJECT-BASED LENDING FOR INVESTMENTS IN FIXED CAPITAL OF UZBEKISTAN

Abstract. This article examines the prerequisites and priority directions for financing investments in fixed capital in Uzbekistan within the framework of the reproduction process. The methodological foundation of the study is based on systemic and institutional approaches, which make it possible to identify the interrelationships between financial and credit mechanisms and the dynamics of fixed capital renewal. The study emphasizes the role of project finance as a long-term financing instrument that ensures the sustainability of the investment cycle, improves the efficiency of resource allocation, and contributes to the modernization of the national economy.

The scientific novelty of the research lies in clarifying the function of financing in supporting the reproduction of fixed capital, particularly in the context of structural reforms in the banking sector, improvements in the regulatory and legal framework, and the strengthening of state investment policy. Priority areas of project financing are substantiated, including the modernization of the agricultural sector, infrastructure development, and the introduction of innovative technologies, which collectively form the basis for accelerated capital investment and sustainable economic growth. In addition, the article analyzes institutional barriers and constraints that hinder the effective implementation of project financing, such as limited diversification of credit resources, restricted access of enterprises to long-term financing, and the need for further development of legal and organizational mechanisms. Special attention is paid to the role of commercial banks, government institutions, and international financial organizations in creating favorable conditions for project financing and expanding investment opportunities.

The practical significance of the study lies in the applicability of its results for the development of strategies aimed at strengthening financial and credit support for investment activity, improving institutional frameworks, and increasing the investment attractiveness of Uzbekistan's economy. The findings may serve as a basis for policy recommendations and the design of mechanisms that ensure the sustainable reproduction of fixed capital.

Keywords: finance, investment, fixed capital, reproduction process, financial and credit support, institutional frameworks, innovation, banking sector.

Аннотация. В данной статье рассматриваются предпосылки и приоритетные направления финансирования инвестиций в основной капитал в Узбекистане в рамках процесса воспроизводства. Методологическая основа исследования базируется на системном и институциональном подходах, позволяющих выявить взаимосвязи между финансово-кредитными механизмами и динамикой обновления основного капитала. Исследование подчеркивает роль проектного финансирования как долгосрочного инструмента финансирования, обеспечивающего устойчивость инвестиционного цикла, повышающего эффективность распределения ресурсов и способствующего модернизации национальной экономики.

Научная новизна исследования заключается в уточнении функции финансирования в поддержке воспроизводства основного капитала, в частности, в контексте структурных реформ в банковском секторе, совершенствования нормативно-правовой базы и усиления государственной инвестиционной политики. Обоснованы приоритетные направления проектного финансирования, включая модернизацию аграрного сектора экономики, развитие инфраструктуры и внедрение инновационных технологий, которые в совокупности формируют основу для ускоренного капиталовложения и устойчивого экономического роста. Кроме того, в статье анализируются институциональные барьеры и

ограничения, препятствующие эффективной реализации проектного финансирования, такие как ограниченная диверсификация кредитных ресурсов, ограниченный доступ предприятий к долгосрочному финансированию и необходимость дальнейшего развития правовых и организационных механизмов. Особое внимание уделяется роли коммерческих банков, государственных учреждений и международных финансовых организаций в создании благоприятных условий для проектного финансирования и расширении инвестиционных возможностей.

Практическая значимость исследования заключается в применимости его результатов для разработки стратегий, направленных на усиление финансово-кредитной поддержки инвестиционной деятельности, совершенствование институциональных рамок и повышение инвестиционной привлекательности экономики Узбекистана. Результаты могут служить основой для политических рекомендаций и разработки механизмов, обеспечивающих устойчивое воспроизводство основного капитала.

Ключевые слова. финансирование, инвестиции, основной капитал, процесс воспроизводства, финансово-кредитная поддержка, институциональные рамки, инновации, банковский сектор.

Introduction. The agricultural sector of Uzbekistan plays a pivotal role in ensuring food security, employment, and the formation of the country's export potential. In the context of ongoing modernization and structural reforms, agriculture requires significant investment in fixed capital, including agricultural machinery, irrigation infrastructure, processing facilities, and storage systems. Project financing emerges as a crucial instrument for mobilizing long-term financial resources and supporting the reproduction of fixed capital in rural areas.

The relevance of this study is determined by the need to establish effective institutional and financial mechanisms that can provide sustainable credit support for agricultural projects. Such mechanisms are essential for enhancing productivity, introducing innovative technologies, and ensuring the balanced development of rural territories. Project financing in agriculture not only contributes to the modernization of production but also strengthens the resilience of the national economy by creating stable investment cycles and reducing risks associated with seasonal fluctuations.

The purpose of this research is to identify the prerequisites and define the priority directions of project financing of investments in the agricultural sector of Uzbekistan, with a particular focus on the reproduction process of fixed capital. The study aims to analyze institutional and economic conditions for the development of project financing, assess its impact on capital formation in agriculture, and propose strategic measures to improve financial-credit mechanisms. By addressing these issues, the research contributes to the understanding of how project financing can serve as a driver of sustainable growth and modernization in Uzbekistan's agrarian economy.

Article Objective. The objective of this article is to identify and systematize the prerequisites for the development of project financing of investments in fixed capital in Uzbekistan, as well as to define its priority directions within the framework of the reproduction process, with particular emphasis on the agricultural sector of the economy. The study aims to highlight the role of project financing as a long-term funding instrument that ensures modernization of the production base, infrastructure development, and the introduction of innovative technologies, thereby contributing to sustainable economic growth and enhancing the investment attractiveness of the national economy.

Methodology. The methodology of this study is based on a comprehensive approach that integrates systemic, institutional, and comparative methods of analysis.

- **Systemic approach** is applied to identify the interrelations between project financing, the reproduction process of fixed capital, and sustainable economic development, with particular emphasis on the agricultural sector.
- **Institutional analysis** is used to examine the regulatory framework, the role of the banking sector, state institutions, and international financial organizations in shaping the conditions for project financing.

- **Economic and statistical methods** are employed to evaluate the dynamics of investments in fixed capital, the structure of credit resources, and the efficiency of their utilization in agriculture and related industries.
- **Comparative analysis** allows for the assessment of Uzbekistan's experience in project financing against international practices, especially in countries where project financing has been successfully implemented in agriculture and infrastructure projects.
- **Factor analysis** is applied to identify key prerequisites and constraints in the development of project financing, including the availability of long-term resources, the financial stability of enterprises, and institutional barriers.
- **Forecasting methods** are used to determine prospective directions for the development of project financing of investments in fixed capital and to model its potential impact on the reproduction process in the agricultural sector.

Thus, the methodology combines theoretical and empirical approaches, enabling the study not only to identify the prerequisites and priorities of project financing but also to propose practical recommendations for improving financial-credit mechanisms in Uzbekistan.

Literature Review. The issue of reproduction of fixed capital occupies a central place in economic theory, beginning with the classics of political economy. K. Marx in *Capital* emphasized the necessity of constant renewal of production assets for expanded reproduction [Marx, 1867]. D. Ricardo considered capital as a key factor of production and growth [Ricardo, 1817]. A. Marshall developed ideas on the interaction between capital and labor [Marshall, 1920]. In the 20th century, R. Solow proposed the neoclassical growth model, where investment in fixed capital serves as the main driver of long-term development [Solow, 2008]. R. Lucas and P. Romer, within the framework of endogenous growth theory, demonstrated the interconnection between capital accumulation and innovation [Lucas, 1988; Romer, 1994]. These studies form the theoretical foundation for analyzing project financing as a tool for capital reproduction.

Modern research pays attention to the role of financial institutions in ensuring investment activity. F. Mishkin views the banking sector as a key channel for transforming savings into investments [Mishkin, 2019]. J. Stiglitz emphasizes institutional barriers and the need for regulation of financial markets [Stiglitz, 2017]. M. Friedman links the effectiveness of credit mechanisms to the stability of macroeconomic policy [Friedman, 2002]. The works of R. Levine and T. Beck show a direct correlation between the development of the financial system and economic growth [Levine, Beck, 2004]. In the post-Soviet space, studies by V.M. Heyets [Heyets, 2018], S.M. Kovalev [Kovalev, 2017], and Sh. Saidov [Saidov, 2020] demonstrate the specifics of forming financial and credit mechanisms in a transitional economy.

Project financing as a special form of long-term funding has been developed in the works of R. Brealey and S. Myers [Brealey, Myers, 2020], L. Gitman [Gitman, 2019], and R. Johnson [Johnson, 2018]. These authors systematize approaches to risk management and the structure of financing large investment projects. French researchers J. Tirole [Tirole, 2006], P. Artus [Artus, 2018], and M. Aglietta [Aglietta, 2015] consider project financing as a tool for enhancing the resilience of corporate investments. In Central Asian countries, project financing is studied in the context of infrastructure and agricultural projects [Rakhmonov, 2021; Komilov, 2022].

In recent years, Uzbekistan has witnessed growing interest in project financing as a mechanism for funding investments in fixed capital. Studies by M.M. Islamova [Islamova, 2024] and A. Akhatkulov [Akhatkulov, 2024] analyze the dynamics of attracting foreign investments and the role of project financing in economic modernization. Reports by the State Committee of Statistics of Uzbekistan [State Statistics Committee, 2025], the World Bank [World Bank, 2023], and the Asian Development Bank [ADB, 2022] record an increase in investments in infrastructure and the agricultural sector, highlighting the need to improve financial and credit mechanisms.

Project financing acquires particular importance in the agricultural sector, where the reproduction of fixed capital is associated with the renewal of agricultural machinery, irrigation infrastructure, and processing capacities. Classic works by T. Schultz [Schultz, 1983], Hayami and Ruttan [Hayami, Ruttan, 1985] demonstrated that agricultural modernization is impossible without

long-term investments. Contemporary studies by the OECD [OECD, 2021], FAO [FAO, 2023], and national authors (Rakhimova, 2022; Saidov, 2020) confirm that project financing is a key instrument for sustainable development of the agricultural sector.

The literature analysis shows that:

- Project financing is considered a crucial tool for the reproduction of fixed capital.
- Theoretical studies emphasize its role in ensuring sustainable growth.
- Practical works demonstrate the specifics of its application in different countries and sectors of the economy.
- In the context of Uzbekistan, project financing is particularly relevant for the agricultural sector, where it contributes to the modernization of the production base and enhances the investment attractiveness of the economy.

Thus, the literature review confirms the necessity of further study of the prerequisites and priority directions of project financing of investments in fixed capital in Uzbekistan within the framework of the reproduction process.

Results. Investment in fixed capital is considered a fundamental determinant of structural transformation and long-term economic growth. In the agricultural sector, capital accumulation enhances productive capacity through mechanization, technological upgrading, and the expansion of processing infrastructure, thereby increasing value added and labor productivity. According to the theory of capital deepening, sustained investment reduces dependence on extensive labor inputs and facilitates the transition toward more efficient, capital-intensive production models. At the macroeconomic level, investments in fixed assets strengthen intersectoral linkages, stimulate export-oriented growth, and contribute to employment reallocation, forming the economic basis for sustainable development.

In the period 2021–2026, emphasis was placed on the industrialization of the agricultural sector and the creation of agro-clusters. State credits were directed toward strategic projects, while commercial banks and international institutions became the key sources of financing for processing and exports.

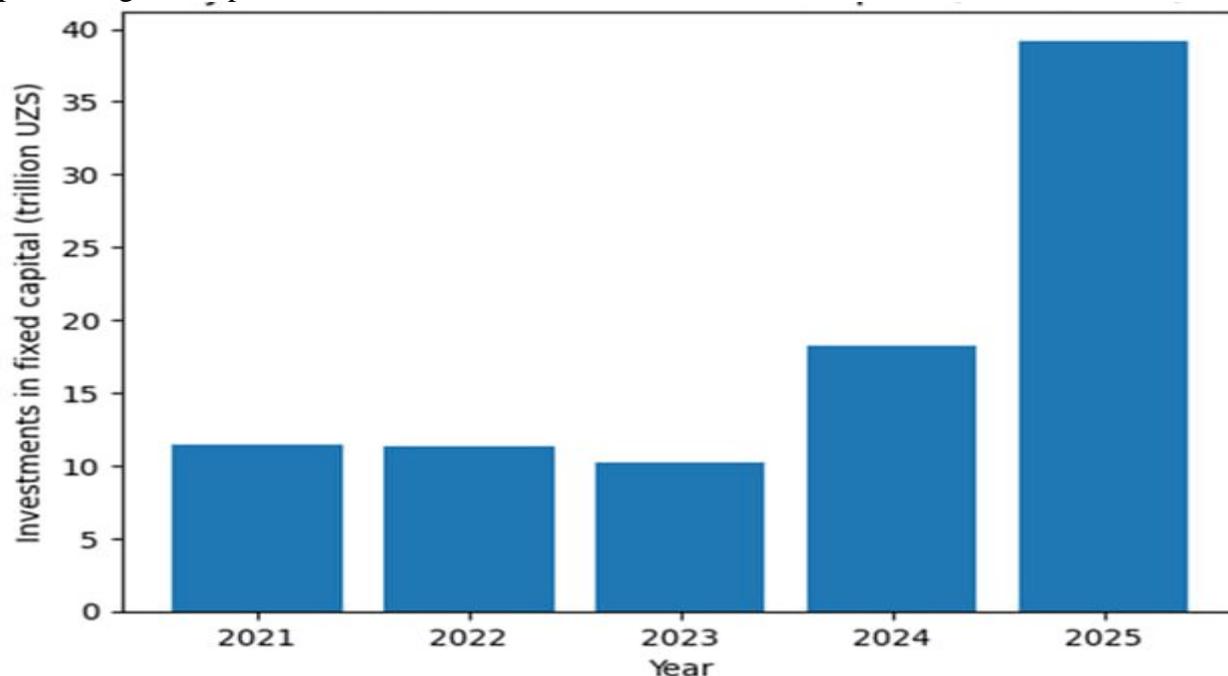


Figure 1. Dynamics of investments in fixed capital in agriculture (2021–2025)

The share of commercial banks exceeded 40%, and that of international institutions reached 25–30%. The growth of credit provision was accompanied by an increase in production indicators. Grain yields rose from 2–2.5 tons per hectare in the 1990s to 5–6 tons per hectare in the 2020s. Cotton production stabilized at 2.5–3 million tons, with the share of domestic processing

exceeding 70%. Fruit and vegetable exports increased from 200–300 thousand tons in the 1990s to 1.5–2 million tons by 2026, while foreign currency revenues grew from approximately \$200 million to \$2 billion.

Investments in the processing of agricultural raw materials became a key factor in the transformation of the agricultural sector. While in the 1990s the volume of investments amounted to about \$100–150 million, by 2026 it had reached \$1.5–2 billion. The main directions included modernization of flour mills, establishment of meat and dairy plants, development of the textile industry, and fruit and vegetable canning. As a result, the share of processed products in exports rose from less than 10% to 30–35%.

Agro-clusters became the most important instrument for integrating production and processing. They combine raw material cultivation and its processing into a single system, which increases efficiency, reduces losses, and boosts exports of finished products. Cotton clusters ensured the growth of the textile industry, grain clusters supported flour and bakery production, and fruit clusters enabled the production of juices, canned goods, and dried fruits. By 2026, dozens of agro-clusters oriented toward exports were functioning in the country.

The combined effect of investments and project financing was expressed in a significant increase in export potential. Foreign currency revenues from fruit and vegetable exports increased nearly tenfold, while the structure of exports shifted from raw materials to products with high added value. This demonstrates that project financing and the creation of agro-clusters became key factors in the sustainable development of Uzbekistan's agricultural sector.

Discussion. The findings of this study demonstrate that the expansion of investments in fixed capital played a substantial role in the structural transformation of Uzbekistan's agricultural sector. The observed dynamics—growth in agricultural value added alongside a declining share of employment—are consistent with classical theories of capital deepening and productivity growth in developing economies.

The reduction in agriculture's share of total employment should not be interpreted as a contraction of the sector. On the contrary, empirical data indicate that absolute agricultural output and value added continued to increase. This suggests that investments in fixed assets—such as modern machinery, processing facilities, storage infrastructure, and logistics—contributed to higher labor productivity and more efficient use of resources. Similar patterns have been documented in other transition and emerging economies undergoing agricultural modernization. A notable result is the role of agro-clusters as an institutional mechanism linking investments in fixed capital with macroeconomic outcomes. By integrating production, processing, and export activities, agro-clusters enhanced backward and forward linkages within the economy. Investments directed toward clusters stimulated demand for industrial equipment, transport services, and financial intermediation, thereby generating multiplier effects beyond the agricultural sector itself. This supports the argument that agricultural investments can have economy-wide impacts rather than sector-specific effects only.

Furthermore, the shift in export structure from raw agricultural commodities toward processed products with higher value added indicates qualitative improvements in growth. From a macroeconomic perspective, this transformation contributes to more stable foreign currency revenues and reduces vulnerability to price volatility in global commodity markets. Therefore, investments in fixed capital not only increased production capacity but also improved the resilience and competitiveness of the agricultural sector.

Nevertheless, it should be noted that the analysis is based on aggregated macroeconomic indicators and descriptive statistics. While strong associations between investment growth, productivity gains, and structural employment shifts are observed, the study does not claim strict causality. Future research could employ econometric modeling to further isolate the impact of fixed capital investments on GDP growth and employment dynamics.

Conclusion. This study examined the role of investments in fixed capital in shaping the macroeconomic development of Uzbekistan's agricultural sector during the period of intensified modernization. The results indicate that increased investment volumes were associated with higher

agricultural value added, rising labor productivity, and a structural shift in employment from agriculture toward other sectors of the economy.

Despite a decline in agriculture's share of total employment and GDP in relative terms, the absolute contribution of the sector to national output continued to grow. This reflects the transition from labor-intensive to capital-intensive agricultural production, supported by investments in processing industries and the development of agro-clusters. As a result, the structure of agricultural exports shifted toward products with higher value added, strengthening export potential and foreign exchange earnings.

The findings suggest that investments in fixed capital constitute a key factor for sustainable agricultural development and broader economic transformation. Policy measures aimed at expanding access to long-term financing, strengthening project-based investment mechanisms, and supporting agro-cluster development can further enhance the macroeconomic impact of agricultural investments. Overall, the experience of Uzbekistan demonstrates that targeted investments in fixed capital, when combined with institutional innovations such as agro-clusters, can contribute significantly to productivity growth, structural change, and long-term economic resilience.

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