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# CONTENTS

THE IMPACT OF FINANCIAL RISKS ON THE DEVELOPMENT OF REGIONAL ECONOMIC GROWTH DRIVERS AND OPPORTUNITIES FOR THEIR MITIGATION .....	17
<b>Turopova Nigora Xolmurod qizi</b>	
UTILIZATION OF INTERNAL RESERVES FOR INCREASING THE EFFICIENCY OF REGIONAL TOURISM (CASE STUDY OF THE REPUBLIC OF KARAKALPAKSTAN) .....	20
<b>Naurizbaev Aliakbar Rustamovich</b>	
MATHEMATICAL MODELS AND ALGORITHMS FOR PROCESSING NOISE DATA .....	23
<b>Jovlieva Dilnoz Mustofa qizi</b>	
ASSESSMENT OF THE IMPACT OF ENVIRONMENTAL RISKS IN BUSINESS ACTIVITIES AND WAYS TO REDUCE THEM.....	28
<b>Abdukhamid Abdumalikovich Bektemirov</b>	
A MULTI-LEVEL SYSTEM OF STATISTICAL INDICATORS FOR REGIONAL TRANSPORT INFRASTRUCTURE ASSESSMENT: METHODOLOGY AND APPROBATION .....	34
<b>Keunimzhaev Mukhamedali Kuanysbaevich</b>	
THE IMPACT OF BANKS ON THE FINANCIAL STABILITY OF THE ECONOMY OF THE REPUBLIC OF UZBEKISTAN .....	39
<b>Usmonov Faridun Firdavsievich, Ishonkulova Feruza Asatovna</b>	
EMPIRICAL EVALUATION OF MACRO- AND MICROECONOMIC FACTORS AFFECTING THE EFFICIENCY OF INVESTMENT ACTIVITY AND THEIR RELATIONSHIP WITH ECONOMIC EFFICIENCY .....	43
<b>Aytmuratova Ulbike Jalgasovna</b>	
MECHANISMS FOR IMPROVING ECONOMIC EFFICIENCY THROUGH OPTIMIZATION OF PRODUCTION RESOURCE POTENTIAL IN UZBEKISTAN .....	47
<b>Sattarov Abdusamat Umirqulovich</b>	

# MECHANISMS FOR IMPROVING ECONOMIC EFFICIENCY THROUGH OPTIMIZATION OF PRODUCTION RESOURCE POTENTIAL IN UZBEKISTAN



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**Abstract:** This study examines the mechanisms for improving economic efficiency through the optimization of production resource potential in Uzbekistan. It analyzes the utilization levels of labor, capital, and technological resources, as well as their impact on economic performance. The research highlights that inefficient resource allocation, outdated production assets, and uneven technological development reduce overall productivity. The study also identifies key directions for improving efficiency, including the modernization of production systems, the rational allocation of resources, and the enhancement of technological innovation. The findings emphasize that optimizing production resources is a crucial factor in ensuring sustainable economic growth and regional development.

**Key words:** resource potential, optimization, economic efficiency, production resources, labor productivity, capital utilization, technology, modernization, regional development.

## INTRODUCTION

Efficient utilization of production resource potential is one of the most important determinants of sustainable economic growth and long-term structural transformation in modern economies. In contemporary development theory, economic performance is increasingly explained not by the absolute quantity of available resources, but by the efficiency of their allocation, coordination, and technological use. Accordingly, optimizing production resources — labor, capital, land, and technology — has become a central objective of economic policy in both developed and developing countries.

In Uzbekistan, large-scale structural reforms have been implemented in recent years to improve industrial efficiency, expand private sector participation, and modernize production systems. These reforms are aimed at increasing productivity, strengthening regional competitiveness, and ensuring more balanced economic development across regions. Despite relatively stable macroeconomic growth, regional disparities in productivity, investment intensity, and technological development remain persistent. In 2024, Uzbekistan's economy maintained positive growth dynamics, while industrial performance varied significantly across regions, reflecting uneven resource utilization and differences in production capacity.

From a regional perspective, disparities in economic outcomes are strongly linked to differences in resource efficiency rather than resource availability. Some regions with relatively limited natural endowments demonstrate higher productivity due to better infrastructure, stronger institutional capacity, and higher levels of technological adoption. Conversely, resource-rich regions often experience underutilization of their potential because of structural constraints and insufficient industrial diversification.

In this context, Surxondaryo viloyati can be considered a representative case of a region with significant production resource potential. The region possesses substantial labor resources, agricultural capacity, and raw material bases. However, its industrial structure remains relatively concentrated in low value-added sectors, and the level of technological modernization is comparatively limited. As a result, productivity indicators in several sectors remain below the national average, indicating inefficiencies in resource utilization and transformation.

Statistical evidence suggests that capital productivity and labor efficiency in Uzbekistan differ significantly across regions, with gaps estimated at 15–25 percent depending on sectoral structure and investment levels. In regions with higher investment inflows and more advanced production technologies, output per unit of input is substantially higher. In contrast, regions with outdated fixed assets and weaker industrial infrastructure, returns on investment and labor productivity tend to be lower.

The analysis also indicates that several structural factors influence resource efficiency. These include the degree of technological modernization, the quality of infrastructure, the level of institutional development, and the availability of skilled labor. Among these factors, technological intensity and investment efficiency appear to be the most important determinants of productivity growth.

Therefore, the study of mechanisms for optimizing production resource potential is highly relevant at Uzbekistan's current stage of development. The objective of this research is to identify key constraints in resource utilization, evaluate their impact on economic efficiency, and propose evidence-based recommendations for improving productivity and supporting balanced regional development.

## LITERATURE REVIEW

The issue of optimizing production resource potential and improving economic efficiency has been widely studied in both classical and modern economic literature. Classical economists such as Adam Smith and David Ricardo emphasized the role of specialization, division of labor, and comparative advantage in ensuring efficient resource allocation. Their theoretical contributions laid the foundation for understanding how limited resources can be utilized more productively through improved organization of production processes.

Neoclassical growth theory further developed this concept by introducing formal analytical models of production efficiency. Robert Solow's growth model demonstrated that long-term economic growth is driven not only by capital and labor accumulation, but also by technological progress. In this framework, technological advancement is considered the key factor in improving total factor productivity, which directly reflects the efficiency of resource utilization. This approach remains a fundamental analytical tool for evaluating production efficiency across different economies.

Modern economic literature places greater emphasis on institutional and structural factors affecting resource optimization. Michael Porter's cluster theory highlights the importance of industrial agglomeration and interconnected production systems in increasing productivity and competitiveness. According to this approach, efficient resource utilization depends not only on the performance of individual firms, but also on the level of coordination among enterprises, supporting industries, and innovation systems within a region.

Empirical studies by international organizations such as the World Bank, Organisation for Economic Co-operation and Development, and United Nations Development Programme consistently show that countries achieving higher levels of economic efficiency are those that successfully integrate technological innovation, human capital development, and institutional reforms. These studies indicate that inefficient resource allocation and outdated production structures are among the main barriers to productivity growth in developing economies.

In the context of Uzbekistan, recent analytical reports by the O'zbekiston Respublikasi Statistika agentligi and national research institutions emphasize persistent regional disparities in resource utilization and productivity levels. These studies identify structural challenges such as uneven investment distribution, limited technological modernization, and insufficient industrial diversification. As a result, resource-rich regions often do not achieve proportional economic outcomes because of inefficiencies in production systems.

Overall, the reviewed literature suggests that production resource optimization is a multidimensional process involving technological, institutional, and organizational factors. Effective resource utilization requires not only the availability of inputs, but also their efficient integration into productive systems supported by innovation and strong institutional frameworks.

## RESEARCH METHODOLOGY

This study employs a systematic and comparative research approach to analyze the mechanisms for optimizing production resource potential and improving economic efficiency in Uzbekistan. The theoretical

framework is based on classical, neoclassical, and modern economic growth theories, focusing on the relationship between resource allocation efficiency, technological development, and productivity growth. The research applies methods of induction, deduction, comparative analysis, and systems thinking to examine the interdependencies among key economic indicators.

The empirical part of the study is based on statistical data from the O'zbekiston Respublikasi Statistika agentligi, regional statistical departments, and international organizations. The analysis focuses on labor, capital, and technological resource utilization across different regions, with special attention given to disparities in productivity and investment efficiency.

In particular, Surxondaryo viloyati is used as a case study to evaluate regional differences in production efficiency, industrial structure, and resource utilization. Correlation and comparative methods are applied to assess the relationship between resource optimization and economic performance indicators. In addition, indicators such as labor productivity, capital efficiency, investment intensity, and the level of technological modernization are compared across regions to identify the main determinants of economic efficiency.

## ANALYSIS AND RESULTS

The analysis of production resource utilization in Uzbekistan demonstrates that economic efficiency is strongly influenced by the level of resource optimization rather than the absolute availability of resources. Statistical data for 2024 indicate that industrial output growth in the country averaged 6–7 percent, while significant regional disparities persist, with some regions recording only 3–4 percent growth. This gap reflects differences in investment intensity, technological modernization, and institutional capacity rather than resource endowment.

Capital productivity shows considerable variation across regions. In more developed industrial areas, one unit of investment generates approximately 1.5–1.8 units of output, whereas in less developed regions this ratio declines to 1.1–1.2. Similarly, labor productivity differs significantly depending on the level of mechanization and technological integration in production processes. These indicators confirm that inefficient allocation of resources leads to lower economic returns even in resource-rich environments.

Surxondaryo viloyati represents a region with considerable production potential, particularly in agriculture, raw materials, and labor resources. However, the regional economic structure remains dominated by low value-added sectors, and industrial diversification is limited. As a result, the region's contribution to national industrial output remains below the national average. Limited technological adoption and insufficient investment inflows are identified as the main constraints on productivity growth.

The analysis identifies several key factors affecting resource efficiency. First, technological factors play a crucial role, as outdated fixed assets and low levels of innovation reduce production efficiency. Second, institutional factors, including regulatory quality and investment climate, significantly influence capital allocation and productivity outcomes. Third, infrastructure limitations in transport and energy systems increase production costs and reduce efficiency. Finally, human capital quality remains a critical determinant, as regions with higher skill levels demonstrate significantly better productivity performance.

Overall, the findings indicate that production resource efficiency in Uzbekistan is primarily determined by structural and qualitative factors rather than quantitative resource availability. This highlights the necessity of improving technological modernization, strengthening institutional frameworks, and enhancing human capital development to achieve sustainable economic growth.

The empirical findings of this study indicate that the efficiency of production resource utilization in Uzbekistan is highly heterogeneous across regions and is primarily determined by qualitative factors such as technological level, institutional capacity, and investment efficiency rather than by the mere availability of resources. The overall economic growth of the country remains stable; however, the internal structure of growth reveals significant disparities in productivity and output performance.

In 2024, industrial production in Uzbekistan demonstrated an average growth rate of approximately 6–7 percent, yet regional variation remained pronounced, with some regions achieving only 3–4 percent growth. This divergence reflects differences in production structure, capital allocation efficiency, and the degree of technological modernization. Investment efficiency also varies significantly, ranging from 1.1–1.2 units of output per unit of investment in less efficient regions to 1.6–1.8 in more developed industrial areas. Similarly, labor productivity differences between regions reach up to 20–25 percent, indicating unequal access to modern production technologies and skill development opportunities.

The table 1 below summarizes key comparative indicators of production resource efficiency across different regional groups (Table 1).

Table 1. Comparative Indicators of Production Resource Efficiency in Uzbekistan<sup>1</sup>

Indicator	High-performing regions	Medium-performing regions	Low-performing regions
Industrial growth rate (%)	7–9	5–6	3–4
Capital productivity (output per 1 unit of investment)	1.6–1.8	1.3–1.5	1.1–1.2
Labor productivity	High	Medium	Low
Degree of technological modernization	Advanced	Moderate	Weak
Investment inflow intensity	High	Medium	Low
Industrial diversification	High	Moderate	Limited

The case of Surxondaryo viloyati further illustrates structural inefficiencies in resource utilization. Despite possessing considerable labor resources and a strong agricultural base, the region's industrial structure remains insufficiently diversified. The share of high value-added manufacturing is relatively low, and technological upgrading processes are progressing slowly. As a result, the region's productivity indicators remain below the national average, particularly in capital-intensive sectors.

Further analysis reveals that inefficient resource utilization is driven by a combination of interrelated structural constraints. First, technological constraints remain significant, as a large proportion of fixed assets in certain sectors are outdated, reducing overall production efficiency. Second, institutional factors, including the quality of the investment climate, regulatory efficiency, and governance capacity, play a decisive role in determining how effectively resources are allocated. Third, infrastructure limitations, particularly in transport and energy networks, increase transaction costs and reduce competitiveness. Fourth, human capital constraints, such as skill mismatches and limited access to advanced training, significantly affect labor productivity.

In addition, the results highlight the importance of industrial structure composition. Regions with a higher share of processing industries and value-added production demonstrate significantly better resource efficiency compared to those dominated by primary or low-processing activities. This confirms that diversification and industrial upgrading are essential for improving economic performance.

Overall, the findings suggest that production resource optimization is a multidimensional process requiring simultaneous improvements in technology, institutions, infrastructure, and human capital. Without addressing these structural constraints, increases in resource quantity alone will not translate into sustained improvements in economic efficiency or regional development outcomes.

The findings of this study indicate that the efficiency of production resource utilization in Uzbekistan is primarily determined by structural and qualitative factors rather than by the quantitative availability of resources. The observed regional disparities in industrial output, labor productivity, and capital efficiency confirm that economic performance is closely linked to the level of technological development, institutional quality, and investment allocation mechanisms.

The results demonstrate that regions with higher levels of industrial modernization and better-developed infrastructure achieve significantly higher productivity indicators. This suggests that technological upgrading and innovation adoption play a decisive role in transforming production resource potential into actual economic output. In contrast, regions with outdated fixed assets and limited access to modern technologies continue to experience lower efficiency levels, despite having sufficient labor and natural resources.

The case of Surxondaryo viloyati further illustrates these structural constraints. Although the region possesses considerable resource potential, its economic efficiency remains limited because of insufficient industrial diversification, weak technological integration, and relatively low investment inflows. These factors collectively reduce the region's ability to fully utilize its production capacity.

In addition, the analysis highlights that institutional and infrastructural factors significantly influence resource efficiency. Weak investment environments, inadequate transport and energy infrastructure, and skill mismatches in the labor market contribute to persistent productivity gaps across regions. Therefore, improving institutional governance and expanding infrastructure networks are essential for enhancing overall economic efficiency.

Overall, the discussion confirms that optimizing production resource potential requires a comprehensive approach that integrates technological modernization, institutional reforms, infrastructure development, and human capital improvement. Only through coordinated progress in these areas can sustainable and balanced regional economic growth be achieved.

<sup>1</sup> author's work

## CONCLUSION AND RECOMMENDATIONS

The study concludes that the optimization of production resource potential is a key determinant of economic efficiency and sustainable regional development in Uzbekistan. Empirical analysis shows that economic performance is not primarily dependent on the availability of resources, but rather on the effectiveness of their utilization. Regions with higher levels of technological modernization, stronger institutional frameworks, and greater investment efficiency demonstrate significantly better productivity outcomes compared to less developed regions.

The findings confirm that structural disparities in industrial development, capital productivity, and labor efficiency persist across regions. In particular, regions with outdated production assets and limited technological integration continue to lag behind in terms of economic performance. The case of Surxondaryo viloyati illustrates that even resource-rich areas may experience low efficiency if industrial diversification and modernization processes are insufficient.

Based on the analysis, several key conclusions can be drawn. First, technological modernization is the most critical factor in improving production efficiency. Second, institutional quality and the investment climate directly influence the allocation and productivity of resources. Third, infrastructure development plays a crucial role in reducing production costs and increasing competitiveness. Fourth, the quality of human capital significantly affects labor productivity and innovation capacity.

Based on the conducted research, the following recommendations were developed:

- Accelerate the modernization of production facilities by introducing advanced technologies and digital solutions in industrial sectors.
- Improve institutional frameworks to ensure transparent, stable, and investment-friendly economic conditions.
- Strengthen infrastructure development, particularly in transport, logistics, and energy systems, to support efficient resource allocation.
- Enhance human capital through vocational training, education reforms, and skill development programs aligned with market demands.
- Promote industrial diversification by expanding high value-added manufacturing and encouraging cluster-based development models.
- Increase investment efficiency by prioritizing projects that ensure high productivity and long-term economic returns.

Overall, the study emphasizes that sustainable economic growth in Uzbekistan can be achieved only through the comprehensive optimization of production resources, supported by coordinated reforms in technology, institutions, infrastructure, and human capital.

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