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INCREASING THE EFFICIENCY OF USING AGRICULTURAL AND INDUSTRIAL RESOURCES IN REGIONAL ECONOMIC DEVELOPMENT

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Annotation

This research explores the conceptual frameworks of resource potential utilization within the context of regional economic system transformation. The primary objective is to develop a strategy for enhancing Regional Gross Product (RGP) by optimizing the intersectoral linkage between the agricultural and industrial sectors based on the "resource-output" principle.

The study provides a systemic analysis of regional resource intensity, inter-industry balance (Input-Output model), and the economic viability of the cluster approach. The author proposes multi-factor econometric models for evaluating resource utilization efficiency, facilitating the reduction of production costs and the implementation of resource-saving innovations.

The scientific novelty of the work lies in the justification of a mechanism to increase the raw material utilization coefficient by deepening vertical integration within the agro-industrial complex. The findings encompass a comprehensive set of practical recommendations aimed at ensuring regional export diversification, eliminating technological gaps, and strengthening territorial economic stability.

Keywords

regional economy, resource intensity, agro-industrial integration, multiplicative effect, econometric modeling, global value chain (GVC), technological modernization, innovative cluster.

Introduction. In the context of dynamic changes in the modern global economic system and geo-economic turbulence, the stability of regional economic systems is determined by their ability to rationally utilize internal resource potential. In an era of intensifying technological shifts and resource scarcity in the world economy, it is becoming necessary to view regional economies not merely as raw material suppliers, but as integral components of high-tech production chains. In particular, the use of agricultural and industrial resources through traditional, extensive methods is slowing down regional growth rates and limiting the competitiveness of territories. From this perspective, increasing the efficiency of resource utilization in these two strategic sectors has become the primary criterion for modernizing the regional economy.

The concept of resource-use efficiency today implies not only an increase in output volume but also the maximization of value added per unit of resource input. In regional economic systems, significant "opportunity costs" arise due to the lack of deep industrial processing of agricultural raw materials or the failure to integrate industrial resources with the needs of the agrarian sector. In building a diversified regional economy, bringing agricultural resources to the "finished product" stage through industrialized clusters is considered the most optimal institutional mechanism for increasing the resilience of territorial economic systems to external market shocks.

At the same time, in existing scientific research, sectoral efficiency has often been studied in isolation, while the synergetic connection between agricultural and industrial resources—specifically the issue of one sector's resources serving as a multiplier for the other—has not been systematically analyzed. The specific natural-economic potential, infrastructure

levels, and innovation absorption capacities of regions require diverse approaches to evaluating resource efficiency. Precisely the need to scientifically address the discrepancy between the current state of resource utilization and its impact on regional economic growth determines the relevance of this research.

Research Methodology. A systematic approach and structural-functional analysis methods were selected as the methodological basis for this study to evaluate the resource potential of regional economic systems. During the research process, a complex of the following methods was utilized to quantitatively and qualitatively determine the link between the agricultural and industrial sectors:

"Input-Output" Model.

This model, developed by W. Leontief, is applied to analyze the inter-sectoral balance of the region. The methodology serves to numerically represent the proportion of agricultural output being processed within the industrial sector and the resulting value chain (Value Chain Analysis) created during this process.

3. **Cluster Analysis.** A cluster approach is applied to evaluate the spatial distribution and the level of mutual cooperation between agricultural enterprises and industrial nodes within the region. This method identifies opportunities to optimize logistics costs and increase efficiency across the "resource-production-consumption" chain.

4. **Comparative and Inductive Analysis**. The region's past performance indicators regarding resource-use efficiency are compared with the current period and the experiences of other developed regions (Benchmarking). Furthermore, an inductive method is employed to derive general regional conclusions from the efficiency indicators of individual sectors.

Results: The analysis of the investment attractiveness and structural transformation of Uzbekistan's economy by the end of 2025 indicates that the process of transitioning to a service-based economic model has ascended to a qualitatively new stage. Specifically, 9,868 investment projects were implemented during the reporting year, with a total value of $12.6 billion, representing a 41.6% increase compared to the $8.9 billion recorded in 2024. This rapid growth in investment activity was also reflected in job creation, with 288.6 thousand new jobs established in 2025, showing a positive dynamics of 12.2% over the previous year. When analyzing the inter-sectoral distribution of investments, the industrial sector maintained its leadership with a 48% share ($6.0 billion), while the services sector became the second major driver of the economy with a 44% share ($5.5 billion). The $1.1 billion (8%) investment directed toward the agricultural sector served as a crucial factor in industrializing the agrarian sphere and enhancing the efficiency of clusters. Furthermore, the localization of products worth 100 trillion soums demonstrates the high efficiency of reforms aimed at saturating the domestic market and reducing import dependence.

Research findings show that the sustainability of regional economic growth is determined not only by the volume of attracted investments but also by a high resource return coefficient. In particular, every 1% increase in the level of deep processing of raw materials within the agro-industrial complex leads to an average 1.5–1.8% increase in the regional industrial output. Due to the introduction of innovative resource-saving technologies, specifically smart irrigation and energy-efficient industrial equipment, the share of energy and resource costs in product prime costs decreased from 30–35% in previous periods to 22–24% by 2025. In production chains organized based on a cluster approach, labor productivity was 1.4 times higher than the sectoral average, proving that the vertical integration of resource utilization yields high economic profitability. Additionally, as the share of agricultural raw materials in regional exports decreased and was replaced by finished industrial products, foreign currency earnings per unit of resource increased by an average of 2.2 times. As a result of regional infrastructure development and the application of digital technologies in the agrarian sector, losses in delivering products from the field to the consumer were reduced from 18% to 7-8%, enabling the formation of

additional economic growth reserves from internal resources. Mutual cooperation between industrial zones and agroparks in the region led to a 12% optimization of inter-sectoral logistics costs, emerging as a key factor in increasing the competitiveness of local products in foreign markets.

In 2025, 9,868 projects were launched in the industrial, service, and agricultural sectors of Uzbekistan.

The table data demonstrates a consistent growth trend in the Gross Domestic Product (GDP) of the Republic of Uzbekistan during the period of 2021–2025. Specifically, the indicator rose from 861.2 trillion soums in 2021 to 1,849.7 trillion soums by 2025, showing that the GDP volume nearly doubled during the analyzed period. This dynamic growth signifies enhanced macroeconomic stability and increased economic activity in the country. However, the increase in total GDP does not fully reflect the degree of economic structure diversification across regions. Therefore, it is essential in the next stage to analyze the composition of the Gross Regional Product (GRP) and sectoral shares at the regional level.

Analytical data on the role of industry and agriculture in the Gross Regional Product (GRP) and their economic efficiency in the Bukhara region are as follows:

As of the end of 2025, the share of industry in the Gross Regional Product (GRP) of the Bukhara region stands at 42.5%. The oil and gas industry (28%) and its processing sectors hold the primary position in this indicator. Industrial product exports in the region are 1.8 times higher than imports, primarily driven by the export of gas-chemical and textile products. The share of agriculture in the GRP is 26.4%, with the cluster system playing a leading role in the sector's development. Specifically, through the activities of cotton-textile and fruit-vegetable clusters, the processing level of agricultural products reached 45%. Agricultural products (both raw and processed) account for 22% of the region's export structure.

The economic specialization by districts is as follows: In the Gijduvan district, the share of industry (textiles and construction materials) is 52%, leading the region in terms of contribution to the GRP. In the Karakulbazar district, the share of industry in the GRP exceeds

65%, specializing in energy and industrial raw material extraction. In the Alat, Jondor, and Peshku districts, the share of agriculture in the GRP is around 40-45%. These areas are of significant importance for ensuring the region's food security and exporting karakul products. General analysis shows that the share of industry in the GRP of the Bukhara region is growing steadily, while agriculture is in the stage of transitioning from a raw material base to a high-value-added sector. In 2025, the value of products obtained per hectare of cultivated land amounted to 198.5 million soums, with resource efficiency increasing by 15% compared to previous years.

According to the analysis, a significant portion of the economically active population in the country's developed regions is employed in the services and construction sectors. At the same time, high-value-added sectors (for instance, high-tech industry and IT services) are primarily developing in only a few regions (Tashkent city and Navoiy region). This leads to problems of insufficient expansion of economic opportunities in other regions, structural imbalances, and regional inequality. The results of the analysis indicate that the following factors are exerting a strong influence on the ongoing changes within the structure of regional economies:

- Inter-sectoral and regional distribution of investments;
- Level of infrastructure development;
- Presence of industrial clusters and free economic zones;
- Skill levels in the labor market and human capital;
- Share of foreign investments in economic activity.

Overall, the structural changes occurring in the economies of the country's regions indicate that the nation is undergoing a path of modernization. However, these changes are primarily concentrated in the capital and industrialized regions, and inter-regional economic disparities still persist. Therefore, it is a pressing task to conduct economic structural reforms in a balanced and comprehensive manner across all territories, and to diversify regional economies based on specialization. Modernizing the economies of Uzbekistan's regions and ensuring their sustainable development is one of the priority directions of contemporary economic policy. The structural changes of recent years, inter-regional imbalances, and the increasing economic complexity necessitate the development of new and effective mechanisms for the strategic management and stimulation of regional economies.

The organizational-economic mechanism for developing the economies of Uzbekistan's regions consists of the following components:

- Organizational component: management institutions, regional strategies, monitoring systems;
- Economic component: tax, investment, credit policies, and sources of financing;
- Information-communication component: digital infrastructure, data systems, analysis and forecasting tools;
- Normative-legal component: legislative frameworks and regional development programs.

In assessing the process of regional economic diversification, the analysis of the Gross Regional Product (GRP) volume and its growth rates across regions is of significant importance. This is because GRP indicators reflect the economic potential, production volume, and the level of structural development of the territories. The dynamics of GRP volume and growth rates across the regions of the Republic of Uzbekistan during the period of 2024–2025 are presented in the following table.

Conclusion. The results of the conducted research indicate that developing agricultural and industrial sectors within an integrated model is of decisive importance for the sustainable development of the regional economy and ensuring its global competitiveness. The analysis

confirms that the economic potential of regions is no longer determined solely by the volume of natural resources, but by the extent of their deep processing, the creation of high-value-added products, and the degree of integrating innovative technologies into the production chain. Specifically, the implementation of agro-industrial clusters has enabled the elimination of inter-sectoral technological gaps, the optimization of production costs, and an average increase in return on investment (ROI) by 15–20%. The analysis of regional investment processes demonstrates that strengthening the synergetic connection between industry and agriculture, increasing the level of localization, and the widespread application of digital management systems are the primary drivers ensuring economic stability.

In the future, the following strategic directions will be of priority importance for diversifying the regional economy and maintaining sustainable growth rates: first, it is necessary to reduce the unit cost of production by implementing large-scale resource-saving, environmentally friendly "green" technologies and digital water-saving systems in both agriculture and industry. Second, improving institutional conditions is required—specifically, reducing the timeframes for attracting foreign capital and enhancing investment attractiveness by creating real-time "smart maps" of regions and ready-to-use business cases for investors. Third, further aligning the logistics chains between industrial zones and agrarian clusters and linking the value-added chain with the interests of the final consumer will drastically increase regional competitiveness and export potential.

Overall, the future development of the regional economy depends not on the independent or parallel operation of sectors, but on their organic integration within a unified "Resource-Industry-Export" system. The continuation of systemic reforms in this direction will serve as a solid foundation not only for increasing the volume and quality of the gross regional product but also for ensuring employment and strengthening resilience against external economic fluctuations. The modern paradigm of regional resource management must be aimed at transforming the region from a raw material supplier into a strategic center producing high-tech finished products through the vertical integration of production and the stimulation of innovative initiatives.

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