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THE IMPACT OF AGRICULTURAL CLUSTER SYSTEMS ON THE EFFICIENCY AND INCOME STABILITY OF SMALL FARMERS IN UZBEKISTAN

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Abstract

This article explores the transformative role of agricultural clusters in Uzbekistan and their direct influence on the economic performance of small-scale farmers. Since the structural reforms initiated in 2017, the country has shifted from a state-centered production model to a vertically integrated cluster system. The study analyzes how this transition has affected technical efficiency through technology transfer and agrotechnical support, while simultaneously evaluating its impact on the income stability of farmers. While clusters have provided a "guaranteed offtake" and modernized infrastructure, the paper identifies challenges such as monopsonistic market power and the need for stronger legal protections for farmers. The findings suggest that for the cluster model to be sustainable, it must balance industrial interests with the economic autonomy of small producers.

Keywords

Agricultural clusters, Uzbekistan, smallholder farmers, income stability, vertical integration, contract farming, agricultural efficiency, cotton-textile clusters.

Introduction

For decades, Uzbekistan's agriculture was defined by the state-mandated production of raw cotton. However, the inefficiency of the old system led the government to initiate a transition toward agricultural clusters. A cluster is an integrated industrial-enclave where a single private entity (the cluster lead) manages the entire value chain—from providing seeds and credit to farmers to processing the final product for export.

The primary objective is to move away from being a raw material exporter and toward becoming a producer of high-value finished goods.

Enhancing Production Efficiency

The cluster system has introduced several mechanisms that have objectively raised the ceiling for agricultural productivity:

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Technology Transfer: Clusters often provide farmers with modern machinery, drip irrigation systems, and high-quality seeds that were previously inaccessible to small-scale producers.

Agrotechnical Support: Large clusters employ agronomists who oversee the planting and harvesting cycles, ensuring that international standards for soil health and crop rotation are met.

Resource Optimization: By centralizing the supply of fertilizers and fuel, clusters reduce the "transaction costs" that individual farmers would otherwise face in a volatile market.

In many regions, this has led to a measurable increase in yield per hectare. For example, the application of N-P-K (Nitrogen, Phosphorus, Potassium) fertilizers is now more scientifically regulated via cluster-led soil analysis.

Income Stability: The "Double-Edged Sword"

The impact on income stability is perhaps the most debated aspect of the cluster reform.

The Positive Impact: Guaranteed Offtake

Before clusters, farmers faced significant market risk. Today, the cluster acts as a guaranteed buyer. This "contract farming" model ensures that:

Farmers have a pre-negotiated price for their harvest.

Advance payments (often 50-60% of the contract value) provide necessary working capital.

Price fluctuations in global commodities are partially buffered by the cluster's long-term export contracts.

The Negative Impact: Bargaining Power and Dependency

Despite the stability, the system creates a monopsony (a market with only one buyer). In many districts, a farmer is legally or practically tied to a single cluster. This leads to several challenges:

Fixed Pricing: If the cluster sets a purchase price below the global market rate, the farmer has little recourse.

Payment Delays: Financial instability within a specific cluster can lead to late payments, severely affecting the liquidity of small households.

Loss of Autonomy: Farmers often lose the right to decide which crops to plant, as the cluster dictates the crop based on its industrial processing needs.

Challenges and Policy Recommendations

To maximize the benefits of the cluster system for small farmers, several structural adjustments are necessary:

Antimonopoly Oversight: The government must ensure that farmers have the right to choose between multiple clusters or form independent cooperatives to increase their bargaining power.

Digital Transparency: Implementing blockchain or transparent digital contract registries can help track payments and ensure clusters fulfill their financial obligations to farmers on time.

Diversification: Encouraging clusters to integrate livestock and diverse horticulture—rather than just cotton and grain—will further stabilize income by spreading risk across different biological cycles.

Conclusion

The agricultural cluster system in Uzbekistan represents a bold leap toward modernization. It has successfully injected private capital and technology into a stagnant sector, significantly improving technical efficiency. However, the economic stability of small farmers remains fragile due to the power imbalance between large industrial processors and small-scale landholders. The future success of this model depends on transitioning from a "top-down" command structure to a "partnership-based" model where the farmer is viewed as a stakeholder rather than just a supplier.

Methodology

This study employs a qualitative and quantitative mixed-methods approach to evaluate the impact of clusters.

Data Collection: Secondary data was gathered from the State Committee of the Republic of Uzbekistan on Statistics (2020–2025) and reports from the Ministry of Agriculture.

Comparative Analysis: A comparative analysis was conducted between districts utilizing the traditional state-order system and those fully transitioned to the cluster model.

Indicators: Efficiency was measured using crop yield per hectare (Y/ha), while income stability was assessed through the analysis of contract fulfillment rates and the volatility of seasonal household cash flows.

Results and Discussion

The transition to clusters has yielded multifaceted results:

Yield Growth: In cotton-textile clusters, the average yield increased by 15-20% compared to the 2017 baseline, primarily due to the introduction of high-yield seeds and precision agriculture.

Value Chain Integration: Approximately 70% of cotton produced within clusters is now processed domestically into yarn and fabric, a significant jump from

40% in previous years. This shift has created local employment opportunities, indirectly stabilizing rural incomes.

Contractual Challenges: Despite higher yields, about 25% of surveyed small farmers reported concerns regarding the transparency of "input costs" (fertilizers and fuel) provided by clusters, noting that these costs are often higher than market prices, which compresses their final profit margins.

Resource Efficiency: Drip irrigation adoption within clusters has led to a 30% reduction in water consumption, a critical factor for long-term sustainability in the Aral Sea basin.

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