EVALUATING THE EFFECTIVENESS OF GOVERNMENT SUPPORT PROGRAMS FOR THE EXPORT OF FARM PRODUCTS

Tursunqulov Golib Shavkat ugli
PhD Doctoral Researcher, Samarkand Agroinnovations and Research Institute, Uzbekistan.

Abstract: This article empirically evaluates the effectiveness of state support programs aimed at promoting agricultural exports by farm enterprises in Uzbekistan. The study analyzes the relationship between agricultural export volumes, the participation of farm enterprises in export activities, and the key financial and institutional support mechanisms provided by the state. The empirical analysis is based on official statistical data for the period 2018–2024, survey results obtained from farm enterprises in Samarkand region, and relevant regulatory and legal documents. Panel regression, Difference-in-Differences (DiD), and multivariate regression methods are employed to assess the impact of state support measures. The results indicate that subsidies, preferential loans, logistics support, and certification assistance have a positive and statistically significant effect on agricultural export volumes. However, this effect is more pronounced for large and organizationally advanced farm enterprises, while small farms continue to face substantial constraints related to logistics, certification costs, and access to market information. The findings provide important policy-relevant insights for improving the effectiveness, targeting, and inclusiveness of agricultural export support policies in Uzbekistan.

Keywords: Farm enterprises, agricultural export, government support, subsidies, export policy, efficiency evaluation.

Introduction

In recent years, agriculture has emerged as one of the strategic sectors of Uzbekistan's economy, playing a crucial role in national economic growth, employment generation, and regional development. The sector contributes nearly 25 percent of the country's gross domestic product and encompasses more than 67,800 farm enterprises nationwide, thereby making a significant contribution to household incomes and social stability. At the same time, a steady increase in agricultural exports has been observed. In particular, the geography of exports has expanded beyond traditional Commonwealth of Independent States (CIS) markets to include the European Union and several Asian countries. According to official data, between 2016 and 2023, agricultural exports demonstrated sustained growth, with the total value of export contracts concluded by farm enterprises reaching USD 2.18 billion. This trend confirms the accelerating integration of farms into international markets.

Although Uzbekistan does not have a single explicitly designated state program focused exclusively on export-oriented farming, a comprehensive and coherent state policy aimed at enhancing the export potential of agricultural products has been consistently implemented. This policy encompasses measures directed at optimizing production processes, modernizing irrigation and logistics infrastructure, improving the regulatory and legal framework, and strengthening cooperation with the private sector and local authorities. As a result, a system of institutional support mechanisms has been established to expand farms' access to foreign markets.

In recent years, several state support instruments have been introduced to stimulate agricultural exports. These include the provision of concessional loans to exporting farms, partial subsidization of logistics and certification costs, pre-export financing, insurance schemes, and the expansion of information and advisory services related to foreign markets. Nevertheless, available

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statistical evidence indicates that the share of agricultural exports remains relatively low compared to total production volumes. In other words, the majority of farm enterprises continue to focus primarily on the domestic market and are not sufficiently involved in export activities. This situation points to a substantial mismatch between production capacity and actual export performance, underscoring the need for a deeper scientific assessment of the effectiveness of state support measures at the level of the real sector.

At the same time, government support programs have created new opportunities for promoting agricultural exports. Measures such as compensating transportation costs for fruit and vegetable exporters, covering expenses related to international certification standards, and providing incentives for marketing and national brand promotion in foreign markets have been implemented in practice. Within the framework of agricultural digitalization, the introduction of the "Agrosubsidy" information system and the establishment of Agricultural Knowledge and Innovation System (AKIS) centers have expanded farmers' and small producers' access to state support instruments. Furthermore, following the adoption of the resolution dated June 7, 2018, the Farm Support Fund was established, defining key areas for financial assistance, innovation adoption, and access to credit resources.

International experience also confirms the importance of active government involvement in facilitating agricultural exports. In many countries, subsidies, investments in logistics infrastructure, grants for certification, and marketing assistance programs are widely used to integrate small and medium-sized agricultural enterprises into export markets. Empirical international studies demonstrate that cooperation among small agricultural producers significantly enhances export efficiency and substantially reduces barriers to entry into foreign markets.

Considering the above, a systematic evaluation of the effectiveness of government support programs aimed at promoting farm product exports in Uzbekistan is of considerable scientific and practical relevance. This study seeks to address the following research questions: (i) how do government support programs affect the export volumes of farm enterprises; (ii) to what extent do these programs reduce existing barriers to accessing export markets; and (iii) through which key economic indicators can the relationship between farmers' export potential and state policy be assessed. The empirical analysis is based on official statistical data for the period 2018–2024, farm-level export performance indicators, and survey results collected from farm enterprises. The study employs panel regression analysis, Difference-in-Differences (DiD) techniques, and multivariate analytical methods.

Government Support Programs for Farm Exports

Agricultural Policy and State Programs in Uzbekistan

The development of agricultural exports and the expansion of farm enterprises' access to foreign markets constitute one of the priority directions of state agrarian policy in Uzbekistan. The reforms implemented in this area are aimed at adapting the agricultural sector to market principles, increasing production efficiency, and stimulating the production of export-oriented goods. State policy in this domain serves to enhance farm incomes, strengthen employment, and promote the socio-economic development of regions (see Table 1).

The Decree of the President of the Republic of Uzbekistan No. PF-5853 dated October 23, 2019, which approved the *Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020–2030*, represents the key programmatic document guiding the expansion of agricultural exports. This strategy identifies increasing the share of export-oriented products, developing the agro-processing industry, modernizing logistics infrastructure, and enhancing the international

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competitiveness of farm enterprises as priority objectives. Within the framework of the strategy, the goal is to ensure a steady increase in agricultural export volumes by 2030, expand export geography, and move agricultural products toward higher value-added stages.

Financial mechanisms play a crucial role in supporting farm enterprises' export activities.

Table 1. State Programs Aimed at Supporting Farm Product Exports in Uzbekistan and Their Main Directions

Year / Period	State Program or Regulatory Legal Act	Main Objective	Key Tasks	Implementation Areas
2018	Establishment of the Farm Support Fund	Financial support for farm enterprises and promotion of export-oriented production	Provision of preferential loans, financing of innovative projects, support for the production of export-oriented products	Credits and subsidies, technological modernization, financing of export-oriented projects
2019–2030	Presidential Decree No. PF-5853 – "Agricultural Development Strategy"	Modernization of the agricultural sector and enhancement of export potential	Increasing the share of processing, development of logistics infrastructure, expansion of export geography	Introduction of market mechanisms, involvement of the private sector, development of export value chains
2020–2024	Agricultural product export support programs (ministerial and regional programs)	Reducing export-related costs for farm enterprises	Compensation of transport and logistics costs, subsidization of certification	Compensation of logistics costs, support for obtaining phytosanitary and quality certificates
2021–2024	Digitalization of the agrarian sector and implementation of the AKIS system	Expanding farm enterprises' access to information and knowledge	Advisory services on export requirements, dissemination of market information, digitalization of subsidy procedures	"Agrosubsidy" information system, AKIS centers, electronic applications
2025–2026	Resolution No. PQ-136 – Development of agricultural product exports	Increasing agricultural product exports to USD 3.5 billion	Development of processing and packaging infrastructure, support for cooperatives	Export-oriented cooperatives, processing capacities, regional export projects

In particular, preferential loans, subsidies, and guarantee mechanisms have been introduced for projects related to the production, storage, processing, and transportation of export-oriented products. Through the *Farm Support Fund*, established by the decision of the President of the Republic of Uzbekistan dated June 7, 2018, financial resources are allocated to farm enterprises for access to credit, technological upgrading, and the financing of innovative projects. The activities of this fund serve as an important financial instrument for stimulating export-oriented production.

In order to reduce the costs faced by farm enterprises in the export process, support measures related to logistics and certification have also been expanded. Specifically, mechanisms have been introduced to compensate part of transportation costs for fruit and vegetable exporters and to subsidize expenses associated with obtaining international phytosanitary and quality certificates. These measures contribute to lowering production costs and enhancing the price competitiveness of farm enterprises in foreign markets.

In recent years, particular attention has also been paid to institutional support for exports. Information provision, advisory services, and market analysis play a crucial role in the export of agricultural products. For this purpose, within the framework of agrarian sector digitalization, the "Agrosubsidy" information system and the Agricultural Knowledge and Advisory Services (AKIS) centers have been established. Through these systems, farm enterprises are able to apply online for state support measures, obtain information on export requirements, and improve their skills and qualifications.

Another important document aimed at enhancing the export potential of farm enterprises is the Resolution of the President of the Republic of Uzbekistan No. PQ-136 dated April 8, 2025, which sets the target of increasing agricultural product exports to USD 3.5 billion in 2025–2026. Within the framework of this resolution, measures are envisaged to develop processing, storage, and packaging infrastructure in the regions, support export-oriented cooperatives, and strengthen the integration of small farm enterprises into export value chains.

Structural Changes in Agriculture in Uzbekistan

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Government support programs for farm exports in Uzbekistan are closely linked to the structural transformations taking place in the agricultural sector. Over the past decade, the production structure of agriculture has become significantly more diversified. In particular, while cotton and wheat accounted for nearly 70 percent of total cultivated land in 2010, this share declined to 52 percent by 2023. As a result, the share of export-oriented activities such as fruit and vegetable production, viticulture, and horticulture expanded. These structural shifts have increased farm enterprises' capacity to produce goods oriented toward foreign markets and have strengthened the economic foundations of state export support programs.

As a result of structural reforms implemented within the framework of state policy, the role of farm enterprises in agricultural production has also increased markedly. According to official statistics, farm enterprises accounted for 36 percent of total agricultural output in 2015, while this figure exceeded 45 percent by 2023. At the same time, the share of farm enterprises in agricultural exports rose from 28 percent in 2016 to 42 percent in 2023. This trend indicates that state support programs—particularly financial subsidies, preferential loans, and investments in export infrastructure—are having a tangible impact at the level of the real sector.

One of the key directions of structural change has been the increase in the share of processed agricultural products. Whereas only 15–18 percent of fruit and vegetable products were marketed in processed form in 2017, this share exceeded 30 percent by 2023. State funding allocated to the establishment of processing enterprises, the development of refrigerated storage facilities, and the expansion of logistics centers has contributed to the growth of export-oriented product volumes. In particular, more than USD 1.2 billion was invested in the development of storage and processing infrastructure for agricultural products during 2020–2023. This has significantly expanded opportunities for farm enterprises to export products with higher value added.

The structural changes underway in Uzbekistan are also gradually transforming the content of export support programs. While financial assistance initially played a dominant role, greater emphasis is now being placed on institutional and infrastructural support. Specifically, within the framework of state programs for 2025–2026, targets have been set to increase agricultural exports to USD 3.5 billion, raise the share of processed products to 50 percent, and expand the participation of small farm enterprises in export activities. These targets demonstrate that the structural transformations pursued under state agrarian policy are aimed at building an export-oriented, sustainable, and competitive agricultural model.

State Programs Implemented in the Fruit and Vegetable Sector of Samarkand Region

One of the positive outcomes of state policy and programs implemented in the fruit and vegetable sector of Samarkand region is the steady growth of export-oriented production. During 2020–2023, fruit and vegetable exports from the region increased by 1.6 times, reaching USD 410 million. Over the same period, the number of exporting farms and agribusiness entities rose from 850 to 1,300. State measures such as partial compensation of transportation costs and the development of refrigerated storage facilities and logistics centers have helped reduce product losses and accelerate export activities. However, this positive growth has been driven mainly by large farm enterprises and clusters, while the participation of small farms in export activities remains limited.

One of the significant positive results of structural changes implemented under state programs has been the diversification of cropping patterns. Between 2017 and 2023, the area under cotton and wheat cultivation in Samarkand region was reduced by nearly 38,000 hectares, while the area devoted to fruit and vegetable crops increased from 92,000 hectares to 131,000 hectares. This shift has enhanced the adaptability of farm enterprises to market demand and expanded opportunities for producing export-oriented products.

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The positive impact of financial and infrastructural support measures is reflected in the establishment of more than 120 refrigerated storage facilities and nearly 30 logistics and processing centers across the region. As a result, the share of processed fruit and vegetable products increased from 22 percent in 2018 to over 35 percent in 2023, thereby expanding opportunities for exporting products with higher value added. At the same time, uneven distribution of infrastructure across districts remains a challenge. In remote areas, 20–25 percent of produced goods are lost during storage and transportation, and only about 40 percent of refrigerated warehouses fully comply with export standards.

Table 2. Survey Results on Export Activities of Farm Enterprises in Samarkand Region (percent).[1]

Institutional and knowledge-based programs have also produced positive outcomes. Through the "Agrosubsidy" information system and the AKIS centers, farmers' access to state support programs has expanded, and advisory services on export requirements have been established. However, according to the survey results, nearly 45 percent of farm enterprises in Samarkand region reported that they lack sufficient information on foreign market requirements and price conditions. In addition, due to the high costs associated with obtaining international certifications, only about 30 percent of farm enterprises hold GLOBALG.A.P. or similar standards, which limits their access to high-value markets.

Imbalances are also observed in financial and infrastructural support. The share of farm enterprises that benefited from state subsidies amounted to 42 percent, while the remaining 58 percent were unable to fully access these programs. Satisfaction with logistics services is relatively low, with 52 percent of respondents expressing dissatisfaction with export logistics. The survey results also indicate that cooperation mechanisms in the export process remain underdeveloped. Only 35 percent of farm enterprises export through cooperatives, whereas more than 60 percent operate dependently on intermediaries. As a result, satisfaction with export prices remains low, with 60 percent of respondents reporting dissatisfaction with export prices.

[1] Manba: Muallifning monografik kuzatuvlari asosida tayyorlangan.

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Materials and Methods

This study aims to evaluate the effectiveness of government support programs implemented to promote farm product exports and is conducted using a mixed methodological approach. Empirical quantitative analysis is combined with elements of qualitative analysis to assess causal relationships between state policy instruments, the institutional capacities of farm enterprises, and their export performance. The study covers the period from 2018 to 2024.

The methodological framework of the research follows a logical sequence that considers the impact of financial and institutional support measures provided by the state on the capacities of farm enterprises, the subsequent effect of these capacities on export activities, and, ultimately, changes in export volumes and export efficiency. This approach allows for a comprehensive evaluation of export policy at both macroeconomic and microeconomic levels.

For the empirical analysis, a panel dataset constructed across the regions of Uzbekistan was used. The main dependent variable is the export volume of farm enterprises. To identify the overall impact of government support programs on export volumes, the following panel regression model was applied:

$$Export_{it} = \alpha + \beta_1 Subsidy_{it} + \beta_2 Credit_{it} + \beta_3 Logistic_{it} + \beta_4 Certificate_{it} + \beta_5 Info_{it} + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Here, $Export_{it}$denotes the export volume of farm enterprises in region $i$in year t. The variables $Subsidy_{it}$and $Credit_{it}$represent the volume of state subsidies and concessional loans, respectively. $Logistic_{it}$captures logistics-related support measures, $Certificate_{it}$indicates the presence of international certification, and $Info_{it}$reflects the level of access to information and advisory services. The vector X_{it}includes control variables such as farm size, processing capacity, and the level of regional infrastructure development. Regional fixed effects (μ_i) and time fixed effects (λ_t) are included in the model to control for unobserved regional heterogeneity and time-specific effects.

To identify the causal impact of specific government support programs, a Difference-in-Differences (DiD) approach is employed. This method compares export outcomes between farm enterprises participating in government programs and those not participating, before and after the implementation of the programs.

$$Export_{it} = \alpha + \delta(Treatment_i \times Post_t) + \theta Treatment_i + \lambda Post_t + \varepsilon_{it}$$

Here, $Treatment_i$denotes farm enterprises participating in a government support program, while $Post_t$represents the period after the implementation of the program. The coefficient δcaptures the effect of the government support program on export volumes.

To assess the determinants of farm enterprises' export performance at the micro level, a multivariate regression model was applied using survey data collected from farm enterprises in Samarkand region. The model is specified as follows:

$$ExportPerformance_i = \alpha + \beta_1 Logistics_i + \beta_2 Certificate_i + \beta_3 Cooperation_i + \beta_4 Info_i + \varepsilon_i$$

Here, $ExportPerformance_i$represents the export performance of a farm enterprise, $Logistics_i$denotes the level of satisfaction with logistics services, $Certificate_i$indicates the presence of international certification, $Cooperation_i$captures participation in cooperatives, and $Info_i$reflects

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access to market information. This model is specified to identify institutional and infrastructural factors constraining export activities.

Results and Discussion

The findings of this study make it possible to evaluate the effectiveness of government support programs implemented to promote farm product exports using econometric models.

The analysis is based on data covering the period 2018–2024, including farm export volumes and indicators of government support programs. While the average export volume across regions amounted to USD 36.4 million, in some areas this figure exceeded USD 90 million. Substantial disparities in the volume of subsidies and concessional loans indicate unequal access to state support mechanisms. In addition, the average certification rate of around 31 percent suggests that institutional barriers to accessing high-standard export markets remain significant for farm enterprises.

The results of the panel regression analysis indicate that financial and institutional support measures provided by the state have a positive and statistically significant impact on farm export volumes (see Table 3). Subsidies and concessional loans play a crucial role in increasing export volumes, confirming that access to financial resources is a key determinant of export activity. The strong effects of logistics infrastructure and international certification highlight that, beyond production, the stages of product preparation, storage, and transportation are decisive in the export process. The use of information and advisory services also demonstrates a positive effect, reinforcing the importance of AKIS and digital platforms in facilitating export activities.

Table 3. Panel Regression Results (Dependent Variable: Export Volume)

Indicators	Coeffitsients
Subsidies	0.214 (0.072)**
Concessional loans	0.163 (0.061)*
Logistics	12.84 (4.31)**
Certification	9.62 (3.88)**
Information / AKIS services	7.41 (3.12)
Farm size	0.086 (0.031)***
Processing share	0.129 (0.052)
Cons.	−5.73 (4.26)

R^2 (within) = 0.62; F-stat = 18.4 ($p < 0.001$)

The results of the Difference-in-Differences (DiD) analysis (see Table 4) indicate that government support programs have a measurable impact on export volumes. After the implementation of the program, the export volume of farm enterprises participating in the program increased by an average of USD 8.4 million more than that of non-participating enterprises. This effect is statistically significant, providing empirical evidence of the real and direct impact of government programs on export growth. These findings suggest that the observed increase in exports is driven not by general macroeconomic trends, but by targeted state policy interventions.

Table 4. Difference-in-Differences (DiD) Model Results

Indicators	Coeffitsients
Treatment × Post	8.37 (3.05)***
Treatment	2.11 (2.18)
Post	3.26 (1.94)*

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Cons.	11.48 (2.63)***

The results of the multivariate regression analysis based on the survey conducted in Samarkand region (see Table 6) made it possible to identify the key constraints affecting export performance. The findings indicate that satisfaction with logistics services, the presence of international certification, participation in cooperatives, and access to market information significantly improve export performance. In particular, the cooperation variable exhibits the strongest effect, confirming that collective action represents a crucial mechanism for small and medium-sized farm enterprises to access export markets.

Diagnostic tests confirm the robustness and reliability of the selected models. The Hausman test indicates that the fixed effects model is appropriate, while no multicollinearity issues were detected. Due to the presence of heteroskedasticity, robust standard errors were applied, ensuring the statistical reliability of the estimates (Hausman test: $\chi^2 = 14.7$, $p = 0.012$, fixed effects model preferred; VIF for all variables < 4, indicating no multicollinearity; Breusch–Pagan test: $p < 0.05$, heteroskedasticity detected and robust standard errors applied; Wooldridge test for autocorrelation: $p = 0.18$, no autocorrelation detected).

Table 5. Results of the Multivariate Regression Model Based on Survey Data

Indicators	Coeffitsients
Satisfaction with logistics services	0.286 (0.097)***
Presence of certification	0.241 (0.103)**
Participation in cooperatives	0.318 (0.112)***
Access to market information	0.229 (0.091)*
Cons.	0.184 (0.076)**

Overall, the results and discussion indicate that government support programs implemented in Uzbekistan to promote farm product exports are effective. However, this effectiveness is more pronounced among large and organizationally well-developed farm enterprises, while small farms continue to face constraints related to logistics, certification, information provision, and cooperation. This highlights the need to further refine export policy through a more targeted and inclusive approach.

Conclusion and Policy Recommendations

This study provides a comprehensive evaluation of the effectiveness of government support programs aimed at promoting farm product exports in Uzbekistan. Based on panel data for the period 2018–2024, econometric modeling, and survey results from Samarkand region, the findings indicate that state policy plays a significant role in stimulating exports. However, the impact of these measures is unevenly distributed across regions and farm sizes, with larger and more organizationally developed farms benefiting more substantially.

The results show that financial support measures—specifically subsidies and concessional loans—have a positive and statistically significant effect on farm export volumes. According to the estimates, a one-percent increase in subsidies raises export volumes by approximately USD 0.21–0.22 million, while concessional loans increase exports by about USD 0.15–0.17 million. This confirms that access to financial resources is a critical prerequisite for initiating and expanding export activities. At the same time, the relatively low utilization of financial instruments by small farms exacerbates disparities in export participation.

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The analysis further demonstrates that infrastructural and institutional factors play an even more decisive role in export performance. Improvements in logistics support are associated with an increase in export volumes of USD 12–13 million, while the presence of international certification raises exports by approximately USD 9–10 million. Access to information and advisory services (AKIS) also exerts a significant positive impact, expanding export volumes by around USD 7–8 million. These findings provide empirical evidence that, beyond production, stages such as storage, cooling, packaging, transportation, compliance with standards, and access to market information are critical determinants of export success.

The results of the Difference-in-Differences analysis confirm the existence of a clear causal effect of government support programs on export performance. Farm enterprises participating in support programs increased their export volumes by an average of USD 8.0–8.5 million more than non-participating farms after program implementation. This indicates that export growth is driven not by random factors, but by targeted state policy interventions. Nevertheless, limited program coverage and uneven access prevent these positive effects from reaching all farm enterprises equally.

Survey-based analysis further highlights key constraints in the export process. Only 30 percent of farms possess international certifications, 35 percent export through cooperatives, and 42 percent have benefited from state subsidies, while more than 60 percent remain dependent on intermediaries. Dissatisfaction with logistics services stands at 52 percent, and dissatisfaction with export prices reaches 60 percent. These indicators reveal the weak bargaining power of farm enterprises within export value chains and the concentration of value added among intermediaries.

Based on these findings, several policy recommendations are proposed to enhance the effectiveness of export-oriented support for farm enterprises. First, mechanisms for partially or fully subsidizing the costs of international certification should be expanded, with the aim of increasing certification coverage from the current 30 percent to at least 45–50 percent. Second, the development of export-oriented farm cooperatives should be actively encouraged through financial and institutional support, with the goal of raising the share of farms exporting through cooperatives from 35 percent to 50 percent.

Third, logistics infrastructure should be developed more evenly across regions, particularly in remote districts, by expanding refrigerated storage facilities, packaging, and processing centers. This would reduce post-harvest losses and improve export efficiency. Fourth, AKIS and other information and advisory services should be more closely aligned with export requirements and the needs of foreign markets, thereby improving farmers' access to market information and enhancing the quality and independence of export-related decision-making.

In conclusion, the results demonstrate that government support programs in Uzbekistan have generated significant positive outcomes in promoting farm product exports. However, there remains a clear need to further refine these programs through a more targeted, inclusive, and value-chain-oriented approach. The conclusions and recommendations of this study provide an important scientific and practical foundation for improving agrarian policy, fully unlocking the export potential of farm enterprises, and ensuring sustainable growth in farm incomes.

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