

The Importance of Mechanization in The Development of Agriculture in The Fergana Valley

Akhmedova Umida Maripjanovna

Andijan Institute of Agriculture and Agrotechnologies, Andijan, Uzbekistan



DOI : <https://doi.org/10.61796/ejheaa.v2i2.1237>



Sections Info

Article history:

Submitted: February 21, 2025
Final Revised: February 22, 2025
Accepted: February 24, 2025
Published: February 24, 2025

Keywords:

Agriculture
Farming
Labor weapons
Labor weapons
Material equipment
Advanced technology
Tractor

ABSTRACT

Objective: This study investigates the role of mechanization in transforming agriculture in Uzbekistan's Fergana Valley following independence. **Method:** An evaluative analysis was conducted on the integration of modern agricultural technologies with high-performance mechanical farming equipment to assess impacts on productivity, resource management, yield production, land optimization, and labor cost reduction. **Results:** The findings reveal a marked shift in agricultural practices in the region, driven by the adoption of advanced machinery and innovative techniques that have significantly enhanced operational efficiency and resource allocation. **Novelty:** The research underscores the unique governmental emphasis on agricultural mechanization as a cornerstone of national development, offering novel insights into the multifaceted benefits and challenges associated with technological progress in agricultural production. This study significantly contributes to the existing literature by elucidating the dynamic interplay between technology adoption and agricultural reforms, thereby providing a comprehensive framework for understanding mechanization as a pivotal factor in driving rural development and economic growth in post-independence Uzbekistan.

INTRODUCTION

Village after independence of the Republic of Uzbekistan caused serious changes in the field of Agriculture. Agriculture It is considered one of the most important sectors of the economy of Uzbekistan. This network is based on the food products of our country, processing and with the satisfaction of the demand of industries for raw materials together, from promising sources of strengthening export potential one. As we know, the agricultural sector is agriculture the fact that humanity is one of the oldest types of Agricultural Training for, the labor weapons used for farming are the main performs the task. Farming is the oldest oxen of mankind since it is one of the activities, it has long been necessary for farming the weapons of labor that will be will become important

Looking at the history of mankind, farming in every era we will witness the development of convenient labor weapons for making. The invention of motiga (hoe) in the Neolithic period of the primitive community system to be made one of the most important innovations for this period. Made of iron with the introduction of the Iron Age in the primitive system omoch, hoe, shovel and other labor weapons cover much wider areas driving, construction of dams, the possibility of extracting water from canals and ditches gives. These lead to the rise of Agriculture [1].

The agricultural industry of Uzbekistan has experienced important reforms aided by modernization after gaining independence. Uzbek farmers in the Fergana Valley improved their output because they developed ownership-minded practices together

with intelligent land usage [2]. Uzbekistan needs technological innovation as a method to boost product quality and labor efficiency and market competitiveness both at home and abroad [3]. Modern agricultural technology systems decrease physical work requirements and improve operational processes and yield quality at reduced prices [4]. The technological developments support sustainable environmental practices as well as organic farm management. Commerce modernization projects find balance through respecting traditional farming customs and rituals because they hold national value status [5]. The agricultural sector in Uzbekistan integrates automation and innovation to boost productivity through error reduction and automated processes while sustaining traditional agricultural practices.

Reducing labor and energy consumption in agricultural production of our republic, saving resources, agriculture cultivation of crops on the basis of advanced technologies and high productivity separate to the development and application of agricultural machines attention is paid. 2017-2021 Republic of Uzbekistan in the strategy of action for further development, including, "modernization and rapid development of Agriculture to further improve the reclamation of irrigated lands, development of networks of melioration and irrigation facilities, intensive methods to the field of agricultural production, the most first of all, modern agrotechnologies that save water and resources introduction, from agricultural techniques with high work performance wide use " [6]. the tasks are defined.

President of the Republic of Uzbekistan Sh.M. Mirziyoyev's decision "On measures to further improve the mechanisms of timely agricultural maintenance of Agriculture" dated May 10, 2018, PQ-3712, and the decision "On additional measures to timely supply the agrarian sector with agricultural equipment" dated April 4, 2019, are evidence that providing the agricultural sector with modern material equipment is one of the main tasks [7]. The introduction of new techniques and technologies for agricultural reform through the initiatives of the President is leading to positive changes in the field [8].

RESEARCH METHOD

Recent research on agricultural development in Uzbekistan highlights the country's transition towards a market-oriented economy, with a focus on modernizing the agricultural sector through mechanization and diversification [9]. The government's policy to mechanize cotton harvesting aims to reduce reliance on manual labor, though this may impact the livelihoods of seasonal workers [10]. Uzbekistan's economic transformation is driven by industrialization, innovation, and infrastructure development, requiring continued investment and international cooperation [11]. The agricultural sector remains a significant contributor to the country's GDP and gross value added, with ongoing efforts to improve productivity and efficiency [12]. Challenges persist, including limited technical knowledge among farmers, insufficient advisory capacities, and the need for modern machinery and equipment to meet safety and quality standards in production, harvesting, and processing [13]. Local farmers and agricultural

workers and field professionals need to participate in expert interviews that will give insights about the changes that modern technological adoption brought to farming activities. First-hand experiences would convert statistical information into meaningful insights which provide both quantitative and qualitative evidence about the advantages and disadvantages of mechanization.

The research method needs to perform an analysis which compares Uzbekistan's agricultural sector with its counterparts in different countries sharing comparable agricultural practices. Research methods that compare Uzbekistan with other nations will assist in determining its agricultural mechanization development while suggesting techniques to enhance its current state.

This analytical framework amalgamates historical information with statistical analytics and case study research to assess how agricultural mechanization strengthens both agricultural efficiency and productivity through policy reviews and expert professional insights. The research method delivers an extensive framework to analyze how the agricultural sector of Uzbekistan has progressed alongside its associated difficulties.

RESULTS AND DISCUSSION

The current stage of the development of a globalized society is defined as the age of its developed techniques and technologies. In every aspect of social life, in all areas of human activity, in the cultivation of agricultural products, in the production of quality products in industrial enterprises, in construction sites, in the event of massive irrigation and melioration, the newly improved technologies and technical devices that implement them are used based on the current level of demand.

The importance of providing the network with high-performance techniques and technologies in the modernization of Agriculture is invaluable. It is no secret that in the following years a large part of the drive and chop tractors used in agriculture and agricultural machinery became obsolete and served their service life. Also, the cost of production of agricultural products is increasing as a result of the lack of performance of such techniques, the standard of fuel consumption does not meet modern requirements. In this regard, it is required to attract high-performance, modern and resource-saving techniques to agriculture, in this regard, first of all, to strengthen cooperation with leading foreign companies. In particular, serious attention is paid to further expansion of cooperation with the German company *Klass* for the production of modern, high-performance tractors, grain harvesters and other agricultural techniques.

Agriculture also in Andijan region after independence a number of activities have been carried out to update their techniques. As a result, in 1991-2016, 83 drive tractors, 259 chopiks tractor, 127 haulage tractors, 26 mini tractors, 47 ploughs, 394 sprayer, 293 priseps, 354 cultivators, 78 combine harvesters, 2 excavators and other high-performance techniques were purchased. Which in turn proper organization of mechanization in agricultural processes from what has been revealed [14].

Effective work on the mechanization of Agriculture was also carried out in the Namangan region between the past period. 12,360 units were procured into the province for the development of agricultural techniques between 1991 and 2016, with driving tractors 393, chop tractor 1,613, mini tractor 54, transport tractor 904, wheat combine 267, fodder combine 26, cotton picker 44, tractor trailer 1,236, Seeder Sailer 622, grain planter 42, cultivators 1253, chisel 286, omoch 345, ground leveler 225, spray 626, reclamation techniques 118, toothed borona 3072 [15].

Radical positive measures are being taken by the Republican government to achieve intensive efficiency in Republican Agriculture. One of the most important factors in this regard was the introduction of the cluster system in particular. The development of Zero agriculture in harmony with industry, the application of advanced foreign technologies, techniques and mechanisms, the realization of agricultural products as finished products in the domestic and foreign markets is achieved. For these purposes, in 2021, 600 million for the development of Agriculture of the Republic. The fact that the Dollar is allocated funds is evidence of our opinion.

CONCLUSION

Fundamental Finding : The integration of high-performance techniques and advanced technologies has markedly improved crop yields and resource management across the Republic. **Implication :** This enhancement underscores the critical role of continuous technological investment and innovation in optimizing agricultural practices and fostering sustainable development. **Limitation :** Nonetheless, the analysis is limited by region-specific factors and variable environmental conditions that influence yield outcomes. **Future Research :** Further studies are warranted to investigate the adaptation of emerging mechanization technologies to diverse local contexts, with a focus on developing resilient agricultural systems in the face of evolving climatic and economic challenges.

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Andijan Institute of Agriculture and Agrotechnologies, Andijan, Uzbekistan
