УКРЕПЛЕНИЕ СЕКТОРА САДОВОДСТВА ДЛЯ ОБЕСПЕЧЕНИЯ ПРОДОВОЛЬСТВЕННОЙ БЕЗОПАСНОСТИ В УЗБЕКИСТАНЕ

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ANNOTATSIYA

Ushbu tadqiqot taklifi O‘zbekistonda bog‘dorchilik sohasining rivojlanishi mamlakatda oziq-ovqat xavfsizligini ta’minlashga qanday hissa qo‘shayotganini o‘rganishga qaratilgan. Markaziy Osiyoda joylashgan O‘zbekiston ekologik, iqtisodiy va logistika bilan bog‘liq omillar tufayli oziq-ovqat ishlab chiqarish bo‘yicha muayyan muammolarga duch kelmoqda. Taklif etilayotgan tadqiqotning asosiy maqsadi — suv resurslarini boshqarish, qishloq xo‘jaligi ekinlarini diversifikatsiya qilish va barqaror qishloq xo‘jaligi usullarini joriy etish orqali oziq-ovqat mavjudligini oshirishga xizmat qiluvchi aniq bog‘dorchilik amaliyotlarini takomillashtirishdir. Ushbu tadqiqotda eksport salohiyati va bog‘dorchilik amaliyotlari haqidagi sifatli ma’lumotlar bilan ularning ta’sirini ko‘rsatuvchi miqdoriy tahlil birlashtirilgan ikki turdagi yondashuv qo‘llaniladi. Kutilayotgan natijalar O‘zbekistonda oziq-ovqat xavfsizligini yaxshilashga xizmat qiladigan bog‘dorchilikning barqaror rivojlanish strategiyalariga muhim ta’sir ko‘rsatishi kutilmoqda.

KALIT SO‘ZLAR

bog‘dorchilik, oziq-ovqat xavfsizligi, O‘zbekiston, barqaror qishloq xo‘jaligi, suv resurslarini boshqarish, qishloq xo‘jaligi ekinlarini diversifikatsiya qilish, aniq bog‘dorchilik.

АННОТАЦИЯ

Предложение данного исследования направлено на изучение того, как развитие сектора садоводства в Узбекистане способствует обеспечению продовольственной безопасности страны. Расположенный в Центральной Азии, Узбекистан сталкивается с проблемами, связанными с производством продовольствия, из-за

КЛЮЧЕВЫЕ СЛОВА

садоводство, продовольственная безопасность, Узбекистан, устойчивое сельское хозяйство, управление водными ресурсами,

различных экологических, экономических и логистических факторов. Цель предлагаемого исследования — улучшение садоводческих практик, таких как управление водными ресурсами, диверсификация сельскохозяйственных культур и внедрение устойчивых методов ведения сельского хозяйства с целью увеличения доступности продовольствия с помощью точного садоводства. В данном исследовании будут использованы два типа подходов, сочетающих качественные данные об экспортном потенциале и конкретных садоводческих практиках с количественным анализом возможного воздействия этих улучшений. Ожидаемые результаты окажут неоценимое влияние на стратегии устойчивого развития садоводства, которые могут привести к улучшению продовольственной безопасности в Узбекистане.	диверсификация сельскохозяйственных культур, прецизионное садоводство

ABSTRACT	**KEY WORDS**
This research proposal is focused on studying how the development of the horticulture sector Uzbekistan contribution to ensure the country's food security. Situated in Central Asia, Uzbekistan faces worries related to food production due to various environmental, economic, and logistical factors. The proposed research aims to improve horticultural practices such as water management, crop diversification, and the adoption of sustainable farming techniques to increase food availability by using precision horticulture practices. This study will use two types of technique approach, combining qualitative data on the export potential and specific horticultural practices with quantitative analysis of the potential impact of these improvements. The providing outcome will be invaluable influence into sustainable development strategies for horticulture that could lead to improved food security in Uzbekistan.	horticulture, food security, Uzbekistan, sustainable agriculture, water management, crop diversification, precision horticulture

INTRODUCTION

Uzbekistan is considered one of the largest agricultural producers in Central Asia, yet it has major difficulties in ensuring food security for its growing population. Agriculture, particularly horticulture, plays a key role in food production and stable economy of the country. However, the sector faces a number of issues such as climate change, inefficient water use, outdated farming techniques, there are some drawbacks about infrastructure modern approach, and export logistics. These challenges have shown urgency for innovative solutions to ensure food security. (Green, P. L., & Singh, R. K. (2021)

Great importance as fruits, vegetables, and other crops significantly should be mentioned to contribute to the diet of Uzbekistan's population. Acknowledgement of the country is the necessity to strengthen horticultural practices to address food shortage and increase the overall productivity of the agricultural sector. However, these attempts need to be supported by research focusing on key areas of high degree states and improvement strategies.

This research proposal points to study how the development of the horticulture sector in Uzbekistan can contribute to ensuring food security. Specifically, the research will focus on improving water resource management, promoting crop diversification, and introducing sustainable farming practices. By studying the influence of these improvements, the research will provide practical recommendations for policymakers, farmers, and agricultural experts to enhance the productivity and sustainability of the horticulture sector. (Johnson, M. T. (2023)

The outcome of this research is important for several reasons. First, the research will provide invaluable understanding of specific challenges faced by the horticulture sector in Uzbekistan and how these challenges can be addressed. Second, by focusing on sustainable and innovative agricultural practices, such as precision technologies, the research will contribute to wider global discussions on sustainable development and food security. Third, the findings will assist policymakers in developing strategies to improve food security, reduce dependency on imports, and create a more sustainable and self-sufficient horticulture sector in Uzbekistan.

LITERATURE REVIEW

Agriculture in Uzbekistan is primarily reliant on irrigation sourced from the Amu Darya and Syr Darya rivers. However, water scarcity, inadequate irrigation infrastructure, and inefficient use of water resources present

significant challenges to agriculture, especially in areas where horticultural crops are grown (Khusanov, 2017). In recent years, the government has implemented reforms to address these issues, but much remains to be done to modernize agricultural practices.This study explores the potential impacts of climate change on greenhouse horticulture in arid regions, emphasizing the increased water and energy demands for crop production in controlled environments. The research highlights that rising outdoor temperatures will require more water-based cooling systems to maintain optimal conditions within greenhouses.

The study proposes that saltwater cooling could significantly enhance the efficiency and sustainability of greenhouse systems in desert regions, where conventional cooling methods typically consume substantial water resources. The study utilizes a greenhouse simulator to analyze data from four diverse locations: the Netherlands, Spain, Saudi Arabia, and Namibia (Goddek, Simon, et al.). Horticultural exports were paid attention to by policy makers and scientists. Many developing countries focus on improvement and modernization of the horticultural field as considered important diversity and mitigate rate of poverty. This transformation was seen for the past decades according to fruits vegetables and flowers range of export from high level countries have risen enormously Horticultural exports have significant potential for reducing poverty due to their reliance on low-skilled labor in both production and post-harvest processes, as well as the high inherent value of the crops produced. (Aksoy and Beghin, 2005) while other specialists have discussion wither a good approach exclude small holder farmers from export chain (e.g. Dolan and Humphrey, 2000, Reardon et al., 2009) ;(Van den Broeck, Goedele, and Miet Maertens) Horticultural production was noticeable such as fruits and vegetables in urban areas it played crucial in improving local sustainable food chain and provide fresh products to the table of city dwellers the interest has been mentioned recent years population of world faced problem during Covid-19 and climate change bad situation in Ukraine (S. Treuherz, C. Yap, S. Rowson)

The successful integration of Urban Horticulture (UH) will require a progression from small-scale individual efforts to community-led projects, eventually expanding to larger-scale market gardening. This expansion will occur both within urban greenspaces and through high-value, year-round production in controlled-environment systems within urban infrastructure. UH plays diverse roles in creating sustainable cities and communities, including enhancing citizens' health and wellbeing, supporting biodiversity, and

providing a reliable source of fresh produce. (J.L. Edmondson,et all) Water management in horticulture effective water use is crucial for increasing the productivity of horticultural crops in Uzbekistan. According to Mominov et al. (2019), water scarcity is a major limiting factor. Crop diversification and food security Well-established crop diversification strategy for improving food security by reducing reliance on a single crop, such as wheat, which dominates agriculture in Uzbekistan.

Horticultural crops, such as fruits, vegetables, and medicinal plants, can serve as additional sources of income and nutrition for farmers. According to research by Khomidov (2021), crop diversification can reduce the risks associated with crop failure and increase the resilience of food systems. Furthermore, crop diversification can improve the variety of available food products, contributing to better dietary diversity and nutrition for the local population. Sustainable agricultural practices The adoption of sustainable agricultural practices is critical for ensuring the long-term productivity of agriculture while preserving the environment. These practices include soil conservation, integrated pest management, and organic farming. However, many farmers in Uzbekistan continue to tend to use traditional farming methods, which often lead to soil degradation, excessive pesticide use, and water pollution (Gulomov et al., 2018). The implementation of sustainable practices, such as organic farming and agroforestry, can help mitigate these issues and ensure the long-term sustainability of the horticulture sector (Sadykova, 2020).

METHODOLOGY

This study will employ a mixed-methods approach, combining qualitative and quantitative data collection methods. This approach will allow for a comprehensive understanding of the issues and opportunities in Uzbekistan's horticulture sector. The study will involve two main groups of participants: farmers in Uzbekistan's horticulture sector and agricultural experts. A sample of 50 farmers opinion from various regions of Uzbekistan, including those heavily dependent on horticulture, will be selected. These farmers will be chosen using stratified random sampling to ensure diversity in terms of crop types, farming practices, and geographical location. In addition to farmers, 10 agricultural experts from local universities, government agencies, and NGOs will be interviewed to gather expert opinions on the potential for improving water management, crop diversification, and sustainable agricultural practices in the horticulture sector.

RESULTS AND FINDINGS

The research revealed several key findings about the current state of the horticulture sector in Uzbekistan, specifically regarding water management, crop diversification, and the adoption of sustainable farming practices. Firstly, the study highlighted that inefficient water use remains a significant barrier to the productivity of horticultural crops. Many farmers continue to rely on outdated irrigation methods, which are wasteful and often ineffective in addressing the water scarcity issues prevalent in Uzbekistan. The findings indicated that the introduction of more efficient irrigation systems, such as drip irrigation and precision agriculture technologies, could significantly improve water use efficiency and, in turn, increase crop yields. This improvement in water management practices is essential for ensuring the sustainability of the horticulture sector, particularly in light of the increasing threat of climate change and water scarcity (Mominov et al., 2019). Secondly, the research showed that crop diversification is not widely adopted, with many farmers focusing primarily on staple crops like wheat. However, those who engaged in crop diversification, particularly by introducing horticultural crops like fruits, vegetables, and medicinal plants, reported increased income and resilience to market fluctuations and crop failures. Diversification also contributed to better food security and dietary diversity for local populations. The study found that promoting crop diversification could reduce the risks associated with monoculture farming and provide more sustainable sources of income for farmers, as well as contribute to the overall stability of food production in the country (Khomidov, 2021).Lastly, the adoption of sustainable farming practices was found to be limited but essential for the long-term health of the agricultural sector. Farmers who implemented organic farming techniques, agroforestry, and integrated pest management practices saw improvements in soil health and reduced dependency on chemical fertilizers and pesticides. However, many farmers still relied on traditional farming methods, which led to issues like soil degradation, excessive pesticide use, and water pollution (Gulomov et al., 2018). The research concluded that greater investment in training and education about sustainable practices is necessary to foster long-term sustainability in the sector.

Overall, the study found that addressing water management inefficiencies, promoting crop diversification, and encouraging the adoption of sustainable agricultural practices are crucial for improving food security and the overall sustainability of the horticulture sector in Uzbekistan. These improvements would not only enhance local food production but also reduce

the country's dependency on imports and increase its self-sufficiency in food production.

Klassifikator_	2010	2011	2012	2023
Republic of Uzbekistan	1676.3	1820.6	1981.7	3121.7
Republic of Karakalpakstan	24.7	27.4	30.5	67.1
Andijan region	358.9	396.9	439.5	685.9
Bukhara region	150.9	163.5	179.5	305.8
Jizzakh region	56.3	61.7	65.6	100
Kashkadarya region	73.4	80.6	88.7	175.6
Navoi region	61.3	69.7	77	106.5
Namangan region	126.3	138.1	158	374.1
Samarkand region	231.7	251.2	273.1	368.2
Surkhandarya region	92.3	101.5	108.8	182.3
Syrdarya region	19.8	21.3	24.7	46.4
Tashkent region	108.2	108.7	109.1	126
Fergana region	256.4	276.9	296.5	411.4
Khorezm region	116.1	123.1	130.7	170.9
Tashkent city	0	0	0	1.5

Table – 1. Indicates growth by region.[1]

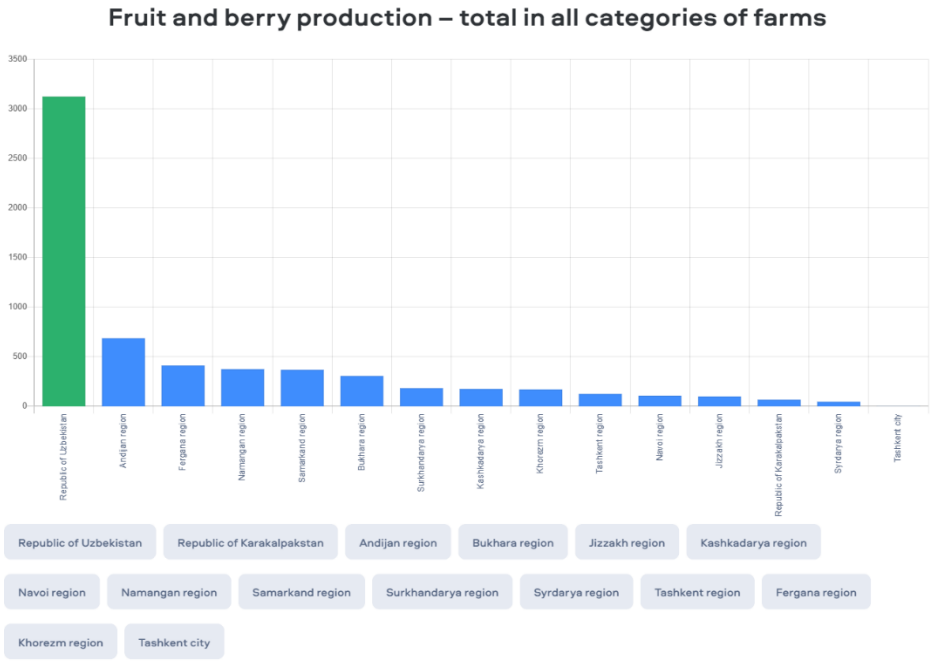
Since gaining independence, the Republic of Uzbekistan has been on a path of stable economic and social development. In recent years, various regions of the country have shown growth trends. Statistical data clearly illustrate Uzbekistan's overall progress and the changes in regional indicators.

The overall figures for Uzbekistan increased from 1,676.3 in 2010 to 3,121.7 in 2023, indicating consistent growth in the country's economy and various sectors.

Regional Growth Dynamics: The Republic of Karakalpakstan started at 24.7 in 2010 and reached 67.1 in 2023. While this indicates growth, the region remains at a relatively lower level compared to others. Andijan Region demonstrated significant growth, with values rising from 358.9 in 2010 to 685.9 in 2023, reflecting a strong economic performance. Bukhara Region saw an increase from 150.9 to 305.8, showcasing a steady development trend. Similarly, Jizzakh Region grew from 56.3 to 100, although at a more moderate pace compared to other regions. Kashkadarya Region increased from 73.4 in

[1] Here's a summary of the data provided for the years 2010, 2011, 2012, and 2023 across different regions and the Republic of Uzbekistan: (https://siat.stat.uz/reports-filed/341/rate-data)

2010 to 175.6 in 2023, indicating substantial growth. Navoi Region also



experienced stable progress, with values rising from 61.3 to 106.5. Namangan Region recorded a significant rise from 126.3 in 2010 to 374.1 in 2023, highlighting rapid economic activity in the region. Samarkand Region showed steady progress, increasing from 231.7 to 368.2. Surkhandarya Region also demonstrated growth, with figures rising from 92.3 in 2010 to 182.3 in 2023. Syrdarya Region saw a moderate increase from 19.8 to 46.4, indicating slow but steady progress. Tashkent Region, however, recorded only a slight increase from 108.2 in 2010 to 126 in 2023, making it one of the slower-growing regions. Fergana Region showed solid growth, with figures increasing from 256.4 to 411.4. Khorezm Region also experienced moderate growth, rising from 116.1 to 170.9. Tashkent City started at 0 in 2010 and reached only 1.5 in 2023, indicating minimal change compared to other regions.

CONCLUSION

Figure – 1. Fruit and berry production- total in all categories of farms.[2]

This statistical analysis demonstrates that the Republic of Uzbekistan and all its regions are experiencing consistent development. While some areas are growing at a faster rate, others are progressing more gradually. These variations may be influenced by the economic potential and investment climate of each region. In the future, economic reforms and investments are expected to further strengthen sustainable growth across the country.

[2] Here's a summary of the data provided for the years 2010, 2011, 2012, and 2023 across different regions and the Republic of Uzbekistan: (https://siat.stat.uz/reports-filed/341/rate-data)

Overview, most regions of Uzbekistan show consistent growth from 2010 to 2023, with some areas (such as Andijan and Namangan regions) experiencing more pronounced increases. Tashkent city, however, recorded minimal change over the same period.

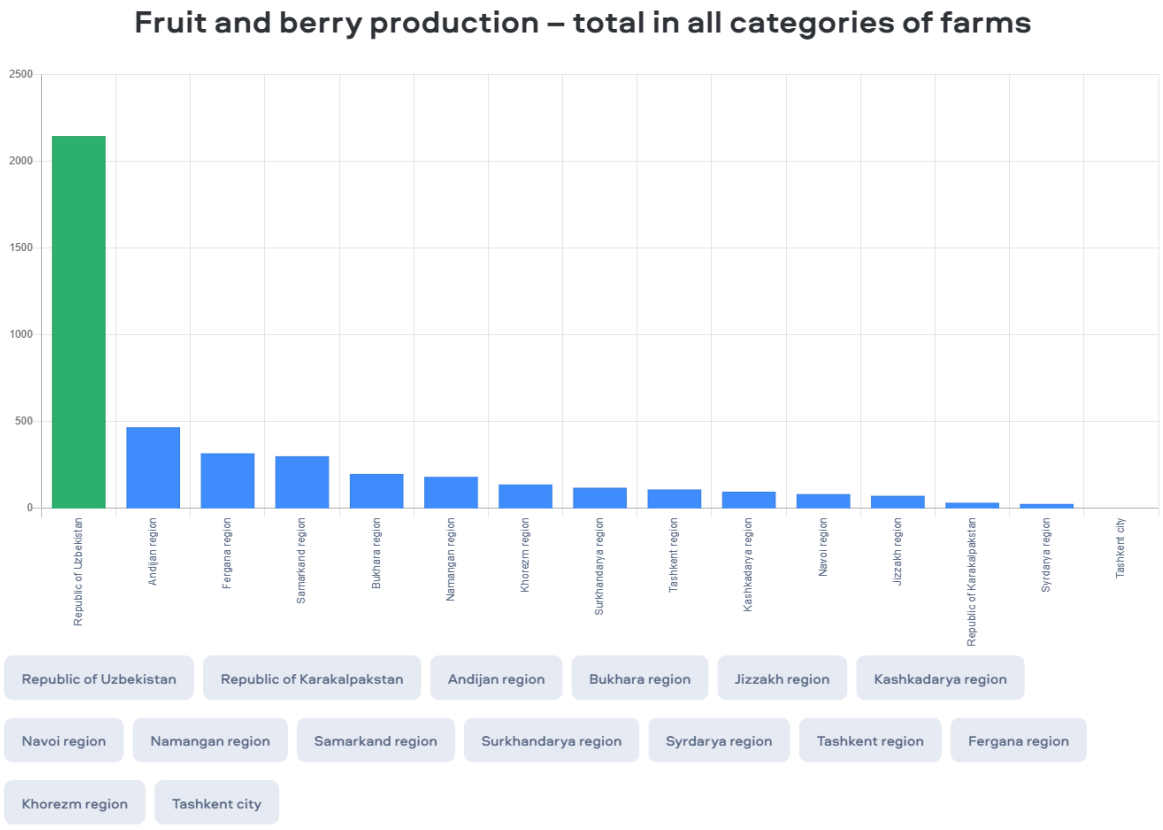


Figure – 2. Fruit and berry production- total in all categories of farms.[3]

The bar graphs provide data of comparison horticulture products fruit and berry totally in all categories of farms between two years 2013 and 2023

Overall although the diagrams experienced change in fruit and berries however within decade production of fruit and berry have not showed remarkable result it is tiny change during this span in 2013 around 2400 tons when it comes to 2023th the figure up approximately 3200 tons per year according to capacity of fruit production in regions of this country remained with almost the same index from 2013 to 2023

[3] Here's a summary of the data provided for the years 2010, 2011, 2012, and 2023 across different regions and the Republic of Uzbekistan: (https://siat.stat.uz/reports-filed/341/rate-data)

In the case Uzbekistan horticulture sector production should be improved by including up to date technologies and involving foreign skillful exports to exchange experience

CONCLUSION

In conclusion, this research underscores the critical role that enhancing the horticulture sector can play in ensuring food security in Uzbekistan. Given the challenges posed by inefficient water use, climate change, and outdated farming practices, it is evident that the horticulture sector must undergo significant improvements. The study highlights that introducing modern water management techniques, such as precision irrigation, is essential for overcoming water scarcity issues and boosting crop productivity. Furthermore, promoting crop diversification can help reduce Uzbekistan's dependency on staple crops like wheat, providing farmers with a broader range of income sources and improving food security. Additionally, the adoption of sustainable agricultural practices is crucial for the long-term health of the sector, ensuring that farming is both productive and environmentally responsible. Although some farmers are already benefiting from practices like organic farming and agroforestry, there remains a need for greater education and support to expand these methods across the sector. By addressing these key areas—water management, crop diversification, and sustainability—Uzbekistan can increase its food self-sufficiency, reduce its reliance on imports, and foster a more resilient and sustainable agricultural system. The findings from this research will be invaluable for policymakers, farmers, and agricultural experts as they work together to strengthen the horticulture sector and improve food security for the country's growing population.

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