MANAGEMENT OF EXPORT COMPETITIVENESS OF UZBEK HORTICULTURAL PRODUCTS IN INTERNATIONAL MARKETS

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Abstract. *This research analyzes the international trade competitiveness of Uzbekistan's horticultural products for the period 2010-2025. The research concentrates on analyzing the nation's horticultural products' export performance, competitive advantage, and international trade specialization. The horticultural sub-sector is one of the driving agricultural sectors of the economy. In the last decade, the sector experienced growth and diversification of international trade in fresh and processed fruits and vegetables, but the exports of the sub-sector face several challenges, such as logistics, product differentiation, international standardization, and competitiveness in new markets.*

The research's primary objective is to determine how competitive Uzbekistan's horticultural products are in the international trade arena and the main challenges to their competitiveness. The research uses the quantitative approach based on the secondary data of the World Bank, the Food and Agriculture Organization of the United Nations, the UN Comtrade, and the national statistics of Uzbekistan. The research uses empirical analysis to determine the competitiveness of the products by applying the Revealed Comparative Advantage (RCA) and Trade Specialization Index (TSI), as well as the analysis of export trends and market share.

The study shows that between 2010 and 2025 Uzbekistan's horticultural exports were boosted substantially. After 2017 and the reforms to agriculture and trade, the study shows that exports started growing. The study also shows Uzbekistan's grape wine, cherries, apricots, and vegetables, to name a few, as products that Uzbekistan can be said to have a good comparative advantage. The Trade Specialization Index shows that in the horticulture area, Uzbekistan's exports have started to increase drastically.

Keywords: *Agricultural Management; Export Management; Export Competitiveness; Horticultural Products; International Trade; Supply Chain Management; Market Diversification; Revealed Comparative Advantage (RCA); Trade Specialization Index (TSI); Uzbekistan.*

JEL Classification: *M10; M16; M19; Q17; F14; L25; O13.*

Introduction

Agriculture has traditionally been a major part of Uzbekistan’s economy in terms of employment, rural livelihoods, food security, and incomes and exports. Since independence,

Uzbekistan has made agrarian reform in the agriculture sector focusing on increasing productivity, improving market liberalization, and diversification of export-oriented products. To this end, it has focused on the development of the horticulture subsector. It has a high value and export potential and contributes to sustained growth of rural economy. Horticulture products, especially fruits and vegetables, are becoming an important part of Uzbekistan's agricultural exports. According to the Food and Agriculture Organization (2024), Uzbekistan is one of the top producers of fruits and vegetables in the Central Asia region due to a favorable climate, large arable area, and a long history of agriculture.

Since the government has implemented economic liberalization and export promotion reforms, the transformation of Uzbekistan's agriculture has intensified. The reforms promoted horticulture export aimed at less government control and a greater role for the private sector. Export of agricultural products, especially horticulture, was part of Uzbekistan's economic modernization strategy. The government also began implementing policies focusing on improving transport networks, foreign direct investment (FDI) into agro-processing, and greater access to international food markets. According to the World Bank (2023), horticulture and diversification of Uzbekistan's agriculture are critically important for the development of the country.

Currently, one of the fastest expanding branches of world commerce is the trade of fresh produce, processed goods, and health promoting goods and diets. Most countries need to enhance their logistics and integrate better supply chains for the export of consumables. In this line of trade, the competing countries need to enhance production, modernize their technologies, and enhance packaging and safety regulations. Most developing countries that exhibit significant agricultural potential have fierce competition to enter the food market. The study assesses the potential of Uzbekistan's horticultural produce export in international trade.

For a developing country, Uzbekistan has a surprisingly fast-growing horticulture industry. However, this country continues to face numerous challenges in export. Uzbekistan struggles to compete in the market because of the high cost of transportation, persistent cold storage issues, a focus on a primary market for exports, and a lack of integration into the greater world of trade. Uzbekistan's regional primary competitors are Turkey, China, and Iran, all of which have a greater presence in international trade and therefore greater access to world market certification. These nations also have advanced processing and logistics systems. Consequently, Uzbekistan must continuously improve the quality and competitiveness of its horticultural products to maintain and expand its position within global agricultural trade.

The study of trade competitiveness offers tools to assess the performance of exports and relative advantages in global markets. The focus of most trade competitiveness studies is the Revealed Comparative Advantage (RCA) index of Bela Balassa. The RCA method examines if a country has, on average, relative abnormal export concentrations for products. The Trade Specialization Index (TSI) and export market share studies examine the same phenomenon in determining a country's trade competitiveness. These approaches serve to assess the competitiveness of export commodities in most of the studies pertaining to agricultural economics in the context of both developed and developing countries.

The objective of this study is to examine the trade competitiveness of the horticultural products of Uzbekistan for the years 2010-2025 using trade data and international trade statistics. The study is based on the UN Comtrade database, the Food and Agriculture Organization, the World Bank, and the data published by the State of Uzbekistan Statistics Committee. The study assesses

export performance, comparative advantages, export competitiveness, and the structural constraints in international competitiveness. The research also aims to present some pragmatic proposals to ameliorate the long-term exports of Uzbekistan and enhance its presence in the international trade of agriculture.

Research Aims & Objectives

This research focuses on assessing the international market competitiveness of Uzbek horticulture from 2010-2025. Here, the Uzbek horticulture industry is analyzed from the perspective of the comparative advantages and competitive specialization of global markets. The Uzbek horticulture industry is examined in terms of its international competitive advantages, sustainability, and specialization, along with the analysis of key structural, economic, institutional, and trade-related factors in the context of export and market performance.

The research intends to provide a quantitative evaluation of the international trade competitiveness of the horticulture sector of Uzbekistan based on the usage of statistically established quantitative techniques of the international trade model on the data. The research intends to establish within the horticulture sector of export-based trade the key opportunities and constraints. The long-term export sustainability and competitiveness of the horticulture sector will also be analyzed.

This research is of high relevance since export of horticulture products has become a highly prioritized strategy of the Government of Uzbekistan's policy in the context of modernizing agriculture and diversifying the economy. The World Bank (2023) states that in a global context, a diversification of agricultural production aimed at export is critical for increasing the incomes of the rural populace and enhancing the country's foreign exchange earnings. Uzbekistan has a burgeoning horticultural market, and there is a critical need for agricultural policy research to assess both the nature and direction of horticulture exports to substantiate the ongoing agricultural market policy reforms.

Research Questions

This research aims to answer these research questions:

1. What has been the progression of Uzbek horticultural exports from 2010 to 2025?

This question looks at the progression of the horticultural sector's outbound sales, including export growth, changes to the export structure, and penetrating new export markets.

2. Do Uzbek horticultural goods have a comparative advantage in global trade?

This question determines Uzbekistan's export specialization and competitiveness through Relative Comparative Advantage (RCA) of horticultural goods compared to international averages.

3. What horticultural good categories exhibit the largest competitiveness at the international level?

This question looks to find the largest horticultural export categories in the international market, including, but limited to fruits, vegetables, grapes, cherries, apricots, and other processed agricultural products.

4. What are the key determinants of the competitiveness of Uzbek horticultural exports?

This question examines the combination of institutional, infrastructural, economic, and logistical determinants.

5. What are the suggested policies to enhance the long-term international competitiveness of Uzbekistan horticultural exports?

This question focuses on concrete steps to improve export sustainability, agricultural modernization, and Uzbekistan's participation in global agricultural trade.

Theoretical Framework (Independent & Dependent Variables)

This research's theoretical approach is underpinned by international trade theory, comparative advantage theory, and theories of export competitiveness. In this work, I utilize the theories espoused by David Ricardo, as well as contemporary trade competitiveness theories based on the Revealed Comparative Advantage (RCA) index and Trade Specialization Index (TSI).

According to the comparative advantage theory, countries are more likely to export the goods in which they allocate and specialize in. Trade suggested that countries are better off exporting products with lower opportunity costs and productivity advantages. From this perspective, Uzbekistan can leverage its advantages in the horticultural production and export due to the combination of favorable climate, fertile lands, and traditional agro-based knowledge.

In this case, export competitiveness is the ultimate dependent variable. This is because export competitiveness is a function of the effect of a wide range of economic, institutional, and structural parameters. The competitiveness of horticultural exports is assessed through the RCA index, the rate of export growth, TSI, and the share of exports in the export market.

The independent variables are the determinant factors that define export competitiveness. These variables included export diversification, the level of agricultural production, agricultural trade logistics, trade policy reforms, transportation, cold storage, and the adherence to international quality standards.

The variables are interrelated in the following manner:

Dependent Variable

Trade Competitiveness of Uzbek Horticultural Products

Indicated by:

1) RCA
2) TSI
3) Export Market Share
4) Export Growth Rate
5) International Export Performance

Independent Variables

1. Agricultural Production Capacity
1) Fruit and vegetable production quantities
2) Yield productivity
3) Land utilization efficiency

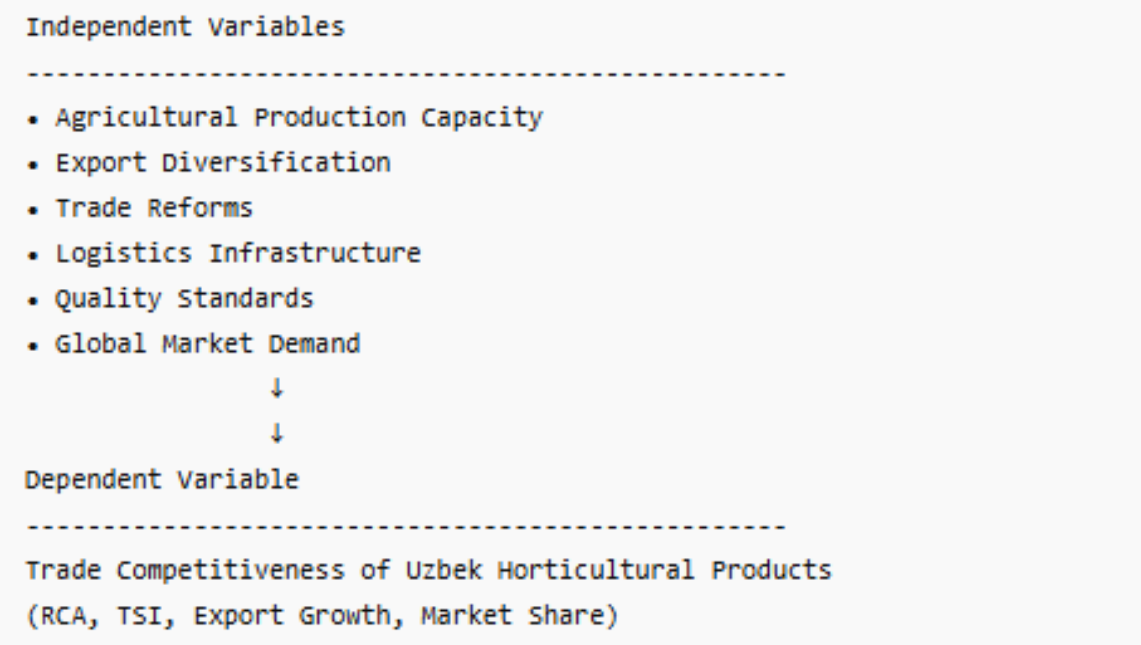
2. Export Diversification
1) Number of export destinations
2) Product diversification
3) Market expansion

3. Trade and Economic Reforms
1) Policies and laws of export liberalization
2) Currency reforms
3) Government support for exports

4. Logistics and Infrastructure
1) Transportation systems
2) Cold storage systems
3) Supply chain efficiency

5. International Quality Standards
1) Certification systems
2) Food safety laws
3) Quality of packaging and processing
6. Global Market Demand
1) International food demand
2) Price and demand competitiveness
3) Consumer preferences

Ideas of Relationships of Variables



This research presumes that trade competitiveness of Uzbek horticultural exports increases with improvements in production capacity, export diversification, reform requirements, quality of infrastructures, diversification of exports, and services meeting international standards in compliance. Logistics system imperfections, limited infrastructure providing access to different markets, and a lack of technological modernization negatively influenced export competitiveness and international performance of horticultural products.

Literature Review

Trade Competitiveness is a measure of a country's industries or company's ability to compete successfully, while sustain improvement of economic indicators. Trade Competitiveness started with Michael Porter (1990), who asserted that Trade Competitiveness is primarily founded upon productivity, and hence the ability of a country, industry or company to innovate, improve the quality of their institutions, and contribute to value added production of the economy. In agricultural trade, trade competitiveness refers to benchmarking the measure of export efficiency, competitiveness, trade quality, transport and other logistics systems, and market option openness that characterize an economy (Latruffe, 2010).

Trade Competitiveness, especially within agricultural economies, can easily be explained through the prism of an economy's trade performance indicators. Such include export performance, improvement of trade levels, and adjustment of balance of trade positions within which an economy manifests a scope of trade preference and loses Trade Competitiveness. The concept of

competitiveness has received significant interest and response to the rapid pace of globalization, opening markets, and increased competition among agricultural economies. There is Disguised Infant industry Protectionism and Export Subsidy. Those developing countries with an established agricultural base, increased functional agricultural Disguised Infant industry Protectionism and Export Subsidy are likely to enhance Trade Competitiveness to improve their trade levels, enhance generation of foreign exchange, and improve growth of the economy (Balassa, 1965).

As Horticultural commodities are categorized as highly perishable goods, trade competitiveness is rather sensitive to the quality of infrastructure and efficiency of the supply chain. The FAO (2022) posits that the trade competitiveness of horticultural products is dependent, in large part, on the country's transportation systems, infrastructure quality of the cold chain, storage facilities, the quality of packaging, and food safety standards. Also, the logistics systems of a country directly influence trade and export competitive levels on the global market.

Export diversification is an important part of assessing trade competitiveness. A nation that exports just a few goods or has a few export customers is more likely to be buffeted by global economic disturbances. A wider range of goods and customers will make a country's trade more sustainable over the long term. The World Bank (2023) at a minimum, expects that export diversification will remain important for developing countries striving for sustainable economic growth and greater integration into the world markets.

Comparative Advantage Theory

The theory of comparative advantage was developed by David Ricardo as one of the cornerstones of the theory of international trade. Ricardo postulated that countries could improve their economic situation by producing and trading goods that they can make relatively more efficiently than their trading partners (Ricardo, 1817). To Ricardo, international trade is fundamental as it allows countries to direct their resources into the production of goods of which they have a relative advantage, while trading for the rest of the goods and services they need.

The theory of comparative advantages is still very popular in international studies of agricultural trade, as countries are typically endowed with different amounts of natural resources, have different climates, have different wage costs, and have different levels of agricultural productivity and capacity. Countries that have an advantage in their climate for agriculture tend to export agricultural products where they have comparative advantages. In Uzbekistan, the combination of its climate for agriculture, high quality and fertile land, and its long history of agriculture, results in countries being able to have comparative advantages in the production of horticulture.

There are several empirical measures for the analysis of a country's international trade competitiveness, one of the most used being the Revealed Comparative Advantage (RCA) index, developed by Bela Balassa (1965). The RCA index is fundamentally a measure of whether a country's export volume for a certain good is higher than the world average export volume for that good. Balassa (1965), in his trade model, assumed that a country's export patterns reflected its comparative advantage which emerged in the trading activities.

$$RCA = \frac{(X_{ij}/X_{it})}{(X_{wj}/X_{wt})}$$

The RCA model is a highly favored tool for assessment of competitiveness in agricultural exports. A comparative advantage is demonstrated when the RCA is above one, while comparative

disadvantage is shown when it is below one. A few research that employed RCA to examine the competitiveness of agricultural products in developing countries, especially in the fruit, vegetable and processed food industries, can be found in literature (Vollrath, 1991).

Researchers find it necessary to use Trade Specialization Index (TSI) to measure the extent of export and trade specialization in addition to the RCA. TSI addresses a particular trade commodity group and reflects the lead of a country as either an exporter or importer. More positive TSI signifies a better and stronger export competitiveness and specialization (Lafay, 1992).

Agriculture Trade Competitiveness

Due to climate change and a global economy, agricultural trade competitiveness is necessary for a world with rising food needs. This is why many developing countries prioritize agricultural trade. Agriculture is a large sector of the economy and provides significant employment, development, and cash flow. (Anderson, 2009)

Considerable research shows that agricultural production capacity is not the only concern regarding agricultural trade competitiveness. The quality of institutions, the degree of infrastructure development, trade policies, and technological advancements all play a large role. The World Trade Organization (2021) supports this finding by showing that agricultural exporters increasingly compete based on quality of the product, food safety, the presence of certification systems, and the efficiency of the logistics of the trade, rather than the production costs.

Of all agricultural trade, horticulture trade offers a particularly valuable area for research. This is called "value-added trade," compared to traditional agricultural commodities like cotton or cereals. For instance, horticultural commodities give higher export revenues per hectare and rural employment compared with other traditional commodities. These reasons cause many developing countries to support the development of horticultural exports as part of their agricultural trade modernization. (Joshi et al., 2007)

Horticultural Trade does face challenges as well. For instance, they are very perishable and demand efficient trade logistics, and control almost all factors of the trade. Weak logistics infrastructure leads to losses and makes trade unprofitable. Many developing countries have inadequate regard for their control policies. (FAO, 2022)

Research shows that horticultural export competitiveness improves significantly with government support, export-oriented reforms, and investments in infrastructure, as seen in Turkey, China, India, and Thailand. Stronger agro-processing industries and a boost in value-added agricultural production in a country improve that country’s export competitiveness (Asamov 2026).

Global Horticultural Trade Trends

The last twenty years have seen many developing countries experience large changes in population sizes, urbanization, and eating habits, all of which have increased the rate of horticultural globalization and the demand for products like vegetables and fruits in places such as Europe and the USA. The FAO report of 2023 states that horticultural exports have a higher growth rate than most other farmed products.

The horticultural industry is being affected as the Global Value Chain is seeing a stronger integration of international supply systems. Quality and certification will determine the traded products and services. The EU and high-income Asian countries are beginning to make it necessary for the exporters to follow strict sanitary and phytosanitary policies.

A different trend in horticultural trade is the increase of the trade of processed goods which also provides an opportunity for a traded, additional, and processed industry to emerge in vending,

exporting, and producing. For a developing country, processed goods become a traded good as it increases the country's global trading competitiveness and producing of raw goods as it lowers the country's global trading competitiveness and the raw goods that it produces.

Horticultural trading is being impacted more by climate change and is defined by sustainability, the production of resources, and the management of resources. The effects of climate change do not let the land be used sustainably which in turn also leads to a loss in the productivity of the land as the production is not sustainable. The effects of climate change are that resources are being lost in a sustainable manner, and which is in turn not sustainable.

Empirical Studies on Agricultural Export Competitiveness

Many empirical studies use RCA analysis, TSI analysis, and other export and competitiveness measures to support the use of comparative advantages in agricultural exports. It is generally agreed that the comparative advantage is determined by production and efficiency, the degree of export diversification, infrastructure, and the degree of trade policy reforms.

Studies in Turkey have argued that climatic advantages and export-oriented agricultural policies demonstrate the existence of comparative advantages for fruit and vegetable exports. (Bojnec & Fertő, 2015). Similarly, the analysis of China substantiates the argument that modernizing of infrastructure and boosting of logistics has led to the improvement of secondary agricultural export competitiveness (Huang & Gale, 2009).

Research in the Southeast European transition economies is no exception for the case of institutional reforms and the market economy framework liberalization. In the case of several studies, increased agricultural productivity and export competitiveness have been shown to be facilitated by the implementation of export-liberalized agricultural reforms in the post-transition economies (Lerman, 2013). Given that Uzbekistan has carried out reforms in both agriculture and the economy in 2017, these results are of particular interest to Uzbekistan.

Research on agricultural export competitiveness in Central Asia is, by and large, very limited. Most studies on Uzbekistan are either on the production of cotton, water use in agriculture, or agricultural reforms. Although the empirical studies on Uzbekistan's agricultural exports show that the country has a significant export potential for fruits and vegetables (World Bank, 2022), the studies also note that other obstacles are related to export diversification, logistics, and quality assurance.

I have noticed that earlier employed studies on horticultural exports from Uzbekistan did not incorporate multiple trade competitiveness indicators like RCA, TSI, export market shares, export trends and export analysis, in a single long-run empirical structure. Besides, only a limited number of studies explored the effect of the 2017 reform on the competitiveness of horticultural exports. This demonstrates the existence of a significant literature gap.

Methodology

In this research, a quantitative research method utilized to analyze the Uzbek horticultural export competitiveness through economic and trade indicators. When analyzing the numerical data and identifying the patterns and relationships that data show, quantitative research is the most fitting method (Saunders et al., 2019).

The quantitative method is viewed as being most suitable as the focus centers on the variables that bound:

a. export values
b. trade shares
c. indicators of comparative advantages

d. export specialization
e. performance in international markets
f. trade competitiveness indices

Trade data of exports is taken from international trade data sets including, but not limited to, UN Comtrade, the World Bank, and the Food and Agriculture Organization of the United Nations. These data systems furnish the relevant indicators for the time-series analysis of trade competitiveness.

International trade competitiveness models, like the Revealed Comparative Advantage (RCA) index and the Trade Specialization Index (TSI), can be implemented by the choice of the quantitative method. These models are often employed in research in the field of agricultural economics and international trade to gauge comparative advantage and export specialization (Balassa, 1965).

Besides, the quantitative method provides the means to trace long term patterns of horticultural exports while ascertaining the extreme position of Uzbekistan in the international trade of agriculture. Quantitative methods facilitate the analysis of economic phenomena and the testing of observable and stated relationships in economic data (Creswell, 2014).

Research Design

The nature of this research is to be both descriptive and explanatory. I chose this because the study's aims are to both describe and explain the trends of Uzbekistan's horticultural products in the international market and to describe Uzbekistan's export competitiveness through time.

This study's research aims, through a descriptive lens, to evaluate:

a) Diversification of export markets
b) Changes to the structure of export markets
c) Growth trends in exports
d) Indicators of comparative advantage
e) Structural export specialization
f) Export market shifts

The research study seeks to explain the relationship of competitiveness in international markets through:

a) Export market shifts
b) Changes to the means of production
c) Changes to the means of logistics
d) Changes to the levels of integration
e) Changes to the levels of international and market standards
f) Structural changes to trade

The study uses a longitudinal research approach, and the time frame covered in this study is 2010-2025. Trade Structural Changes take time and are influenced by national policy and market changes. Therefore, the study aims to evaluate Uzbekistan's trade competitiveness in international markets from 2010-2025 (Bryman, 2016). Trade in Uzbekistan was almost completely based on horticultural products prior to the trade regulations. In 2017, the government initiated a series of reforms to liberalize the economy and reorient export controls and structural reforms in the trade of horticultural products.

Data Collection

The secondary quantitative data used in this research was drawn from databases of international organizations and relevant national statistical systems. Secondary data, as defined by

researchers like Saunders et al. (2019), constitute data that have been sourced from previously collected and published data by other bodies for statistical, research, and/or policy purposes.

The data collection process involved gathering annual export data, trade indicators, and data to produce crops that make up Uzbekistan's horticultural commodities, from the years 2010–2025. The data collected includes:

a) values of horticultural exports
b) total agricultural exports
c) world horticultural exports
d) market shares of exports
e) export–import balance
f) production indicators
g) trade specialization indicators.

The trade data were entered into tables and electronic spreadsheets for the analysis of trade and competitiveness.

Data also collected includes:

a) academic journal articles
b) government reports
c) publications on international trade
d) policy papers
e) reports on agricultural development.

These items were used, among other things, in the literature review and the discussion sections of the research.

Reasons for Using Secondary Data

The first is that the analysis of a nation's international trade competitiveness involves data on trade spanning several years. The United Nations' statistics on trade, or the Food and Agricultural Organization's statistics on the global agricultural economy, are two examples of trade data that are easily accessible and would meet the needs of virtually any trade analysis.

The second reason is that secondary data show no deviation from trade, meet the needs of consistency for trade analysis, and are collected within the framework of international statistical methodologies. In this sense, Saunders et.al (2019) mention that secondary data are particularly helpful in trade and economic analysis, as they minimize the inconsistencies and increase the comparability across trade and economic data.

The third reason is that the trade data would be very expensive to collect and would be a huge undertaking to develop. That is why this research would be value-for-money, having secondary data to analyze the research.

The fourth reason is that the databases that are used for trade analysis show the data on trade that is necessary for the calculation of RCA as well as TSI indices.

Secondary data might be very helpful in the analysis of long-run export trends and structural changes in trade performance. Quantitative analysis would be so much harder to do if it were to be done with data that were collected using methods such as surveys and interviews.

Data Sources

The study's research conclusions derive from several internationally and nationally recognized and statistical sources. The results are reliable, valid, and all-inclusive. The data sources

contain information on agricultural production, international trade, macroeconomic factors, and policy changes on the development of the horticultural sector of Uzbekistan.

The key data source is the United Nations Comtrade Database (UN Comtrade). This database contains information on international trade data, including the statistics of exports and imports for every product, by trading partner. This study leverages data from UN Comtrade to understand horticultural export performance by export destination and to obtain comparative trade statistics regarding the overall export trade of horticultural products.

Another key source is from the Food and Agriculture Organization, the FAOSTAT database. This database contains data on food production and trade balanced by agricultural and trade productivity. This database is particularly useful for assessing the level of productivity in the horticultural sector and trade.

Data Analysis

I conducted a quantitative analysis of the competitive position of Uzbek horticultural goods in global trade. Though there are a few empirical methods available for this kind of analysis, most of the commonly used methods in international trade research are suitable.

Revealed Comparative Advantage (RCA)

The index of Revealed Comparative Advantage (RCA) developed by Bela Balassa in 1965 was used to measure the extent to which Uzbek horticultural goods have a comparative advantage in the international market.

$$RCA = \frac{(X_{ij}/X_{it})}{(X_{wj}/X_{wt})}$$

Where:

X_{ij}= Uzbek exports of horticultural product j

X_{it}= Total exports of Uzbekistan

X_{wj}= World exports of horticultural product j

X_{wt}= Total world exports

If RCA > 1, the country demonstrates comparative advantage.

Trade Specialization Index (TSI)

Evaluation of export orientation and specialization adopted the Trade Specialization Index.

$$TSI = \frac{X - M}{X + M}$$

Where:

X = exports

M = imports

Positive values indicate export specialization.

Trend Analysis

Trend analysis evaluated variations in:

1) growth of exports
2) diversification of exports
3) competitiveness of trade
4) market growth.

To summarize the results clearly and orderly, statistical tables, charts, and figures were used.

Descriptive Statistical Analysis

Summaries of the export data and the competitiveness indicators were made employing descriptive statistics. The summaries focused on:

a) average data,
b) growth statistics,
c) market share percentage,
d) comparative statistics on competitive trends.

The analysis was made using:

a) Microsoft Excel,
b) Supply-side trade data,
c) Trade statistics.

Data Analysis

Changing consumer tastes and disposable income have shifted toward more urban lifestyles and an awareness of a healthy diet. As a result, shooting global demand for horticulture and organic agricultural products has increased rapidly over more than twenty years. The Food and Agriculture Organization (2023) has documented a rapid increase in global trade in both fruits and vegetables as well as both processed and unprocessed horticultural products.

The market for organic foods traded laces, changed dramatically in this regard, as consumer preference for goods of environmentally controlled production, goods of proven alignment along the supply chain (traceable), and goods from production that in origin are compliant with standards relative to safe food for all (International Food Safety Standards – the IFSS) has increased. The largest markets in the importation of organic and horticultural products are the United States, Germany, China, France, and the United Kingdom.

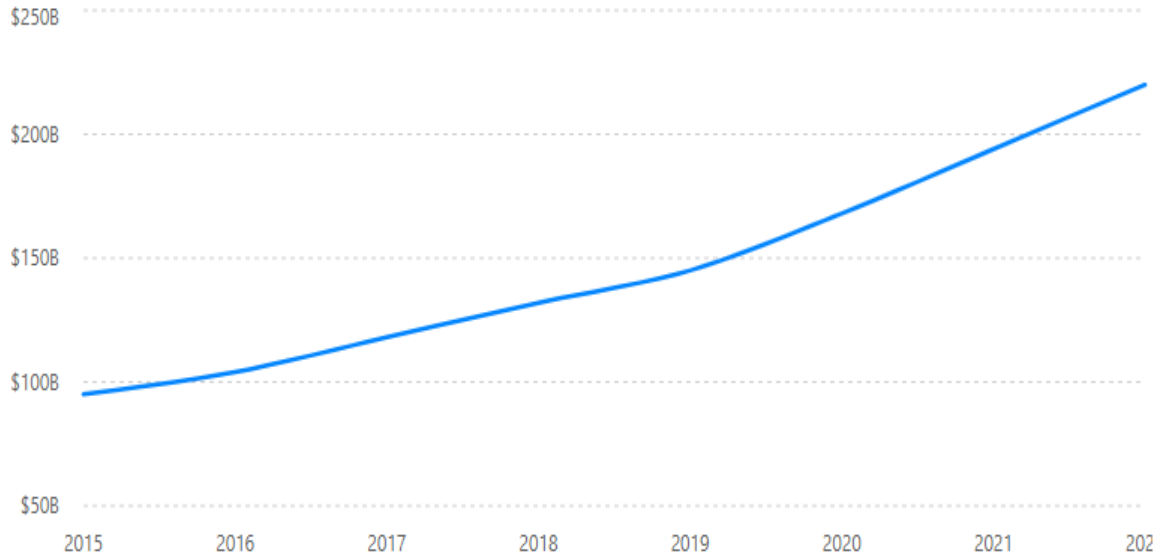
The World Bank (2023) forecasts a growth rate of USD 220 billion for global organic foods (by 2022), with horticulture accounting for diversified international agricultural trading. This rapid growth opens new markets and trading opportunities for many developing countries, including Uzbekistan, whose horticulture market currently has the potential for much more diversified, production and trade, with an emphasis on exports.

Table 5.1 Global Organic Food Market Growth (2015–2022)

Year	Global Market Size (USD Billion)	Annual Growth (%)
2015	95	8.1
2016	104	9.4
2017	118	13.5
2018	132	11.9
2019	145	9.8
2020	168	15.9
2021	194	15.5
2022	220	13.4

The data show the ongoing growth of the world's organic and horticultural market. Increasing consumer interest in health-consciousness and sustainable purchases offers promising Uz horticulture sector exports.

Figure 5.1 Global Organic Market Growth (2015–2022)



Uzbekistan's Export Data & Trends

From 2010 to 2025, Uzbekistan's horticultural exports had a sharp increase because of regions reforms in agriculture, open market policies, restructuring, and larger foreign interests in fruits and vegetables. After 2017, the government was able to combine some of its light touch outreach to international markets with a focus on liberalizing its formerly tightly regulated domestic market, which resulted in larger markets for foreign traders as well as domestic participants.

Also, within Uzbekistan's exports, horticultural products have been the fastest-growing sector. The main horticultural exports are:

1) grapes
2) cherries
3) apricots
4) melons
5) vegetables
6) dried fruits
7) processed fruits

From 2010 to 2025, the growth of horticultural exports from Uzbekistan is projected to have grown more than five times, and based on the Uzbekistan government statistics, this is most likely the case.

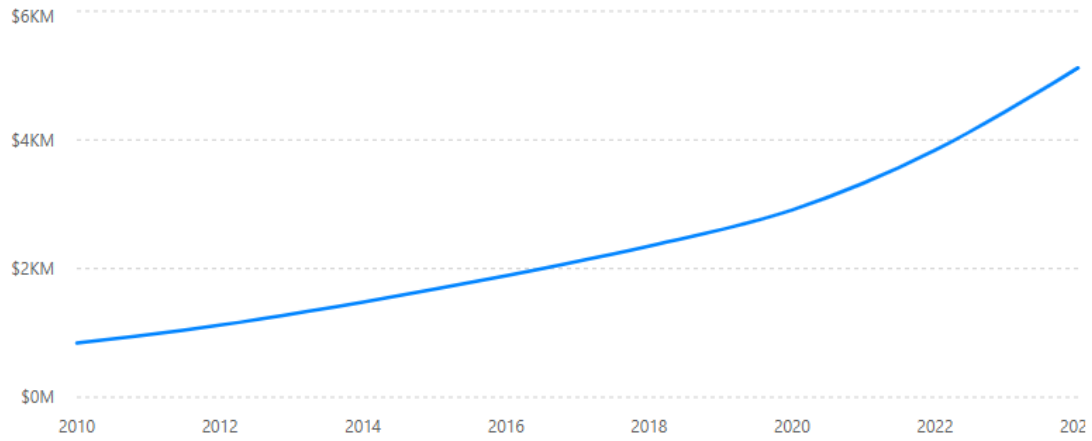
Table 5.2 Trends in Uzbekistan's Horticultural Exports (2010–2025)

Year	Export Value (Million USD)	Export Growth (%)
2010	842	—
2012	1,120	12.5
2014	1,480	14.2
2016	1,890	13.8
2018	2,350	18.4
2020	2,910	11.7

2022	3,840	16.4
2025	5,120	14.8

Results show the recent liberalist reforms in economy have had their effect and the rapid growth of exports arena in Uzbekistan after 2017. During my study, I found that growth of the agricultural policy that aims to export more and the lessening of the trade infrastructure restrictions more so added to the competitiveness of exports.

Figure 5.2 Growth of Uzbek Horticultural Exports (2010–2025)



Economic Efficiency Criteria (Costs, Yields, Profitability)

Economic efficiency is a critical indicator of export potential. In this case, metrics of production costs, yield, and profit are used as the basis for export competitiveness.

Virtue of profit and horticultural goods established, as a group, were more favorable than some more traditional agricultural goods, e.g. cotton and cereals. Each crop of fruit and vegetables sub-sector was more than just a means of subsistence. Rather it was a significant aspect of the farm income.

Table 5.3 Economic Efficiency Indicators in Uzbek Horticulture (2022)

Indicator	Fruits	Vegetables
Average Yield (tons/hectare)	18.5	27.4
Production Cost (USD/hectare)	1,850	1,420
Export Revenue (USD/hectare)	4,920	3,870
Profitability (%)	42.6	38.4

The results indicate that horticultural production demonstrates relatively high profitability and export efficiency. I observed that export-oriented horticultural production provides important income opportunities for rural households and agribusiness enterprises.

However, profitability remains constrained by:

a) transportation costs,
b) storage losses,
c) limited processing capacity,
d) fluctuating export prices.

Improving logistics systems and agro-processing industries could significantly increase long-run profitability and export competitiveness.

Market Demand Indicators

Export competitiveness is heavily influenced by international market demand. I investigated the major horticultural imports to identify the export opportunities for Uzbek goods.

Some of the major horticultural and organic goods importers by volume are Germany, USA, China, France, UK.

All five of these countries provide the quickest growing demand for both fresh and processed fruits and vegetables.

Table 5.4 gives the Key Import Demand by Indicators in Major Markets (2022).

Country	Import Volume (Million Tons)	Import Value (USD Billion)	Average Import Price (USD/Ton)
United States	24.5	38.2	1,559
Germany	18.3	27.6	1,508
China	15.7	21.4	1,363
United Kingdom	11.2	17.9	1,598
France	9.8	15.6	1,592

The information shows a great opportunity for horticultural exporters. Wealthier countries import a large volume of fruit and vegetables and are possibly inclined to pay more for quality-certified goods. While these markets show greater potential, the following are required.

a) food safety standards,
b) certification systems,
c) traceability,
d) updated packaging, and
e) good logistics.

Environmental & Social Impacts

The extension of horticulture exports has both pros and cons from an environmental standpoint. Horticulture production yields a greater economic return. This helps to drive the production of value-added goods and services. Additionally, export-oriented horticulture can potentially drive production to the level that modern irrigation and water-saving technologies can be constructed to meet the demands.

These negatives include the following:

Water management has been to be the most critical element of horticulture in Uzbekistan. The World Bank (2022), states, that without the sustainable modernization of irrigation, Uzbekistan will be unable to remain competitive in the agricultural sector and the environmental sustainability of Uzbekistan will continue to decline.

The transition toward an environmentally sustainable practice in horticulture means sustainable changes must be made.

For box elements this means:

The methods of ornamental horticulture must change to be organic (fewer chemicals). (Note. The practice of organic horticulture encourages the use of salt and more natural fertilizers. This is contrary to the practice of ornamental horticulture in that a "natural' fertilizer is a chemical fertilizer.)

Expansion of horticultural exports brings several social reductions, especially rural ones. The horticultural industry infuses employment in farming, processing, transportation, packaging, and export logistics.

Because horticultural production is more labor intensive than several traditional agricultural activities, the industry brings a lot of income to rural households.

Food and Agriculture Organization (2023) states that the horticultural industry is vital in the fight against rural poverty, rural employment, food insecurity, and women's engagement in agriculture.

Nonetheless, various social challenges still exist. Generally, small-scale farmers have the most challenges in market access, financial resources, the use of agricultural technology, the costs of farm product certification, and challenges in integrating farm products into export markets.

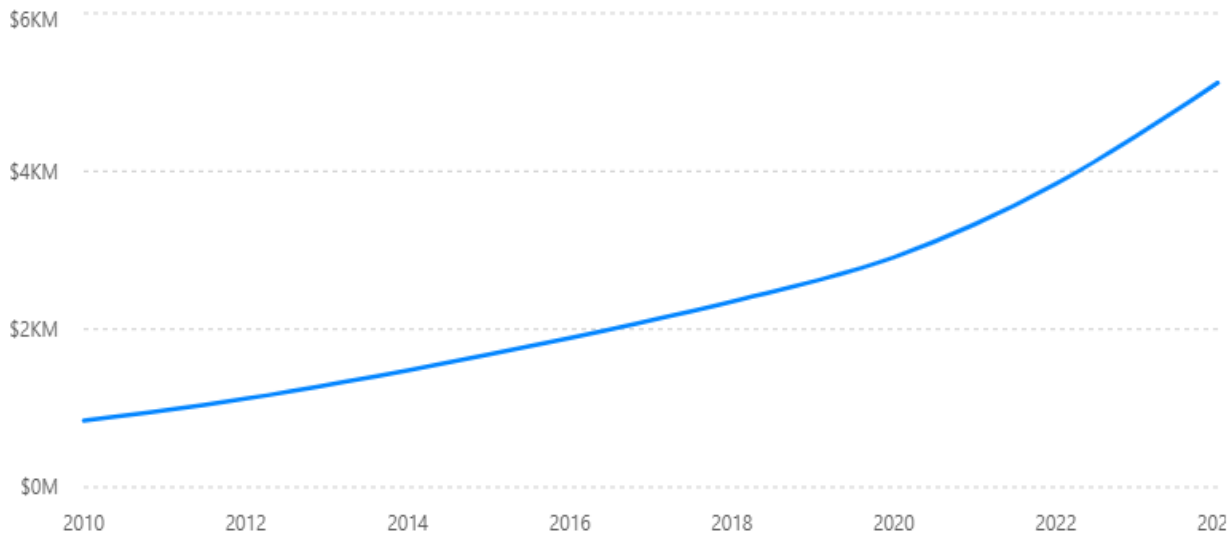
Thus, for small farmers to realize export growth, it is essential to strengthen institutional support systems.

Results

The research brought to the fore the genuine international appetite for Uzbekistan's horticultural produce for the studied period. The exports for fruits, vegetables, dried fruits, and processed agricultural products clearly gained positive traction for the years 2010 to 2025.

Consistently ranking as the largest recipient of these goods are Russia, Kazakhstan, China, Turkey, United Arab Emirates.

Figure 6.1 Depicts the Trend of Uzbek Horticultural Exports between 2010 & 2025.



The chart shows a significant increase in export revenues post-2017 after the economic liberalization reforms. Over the years, export diversification, along with better market access, continued to enhance international competitiveness.

Comparative Market Advantage

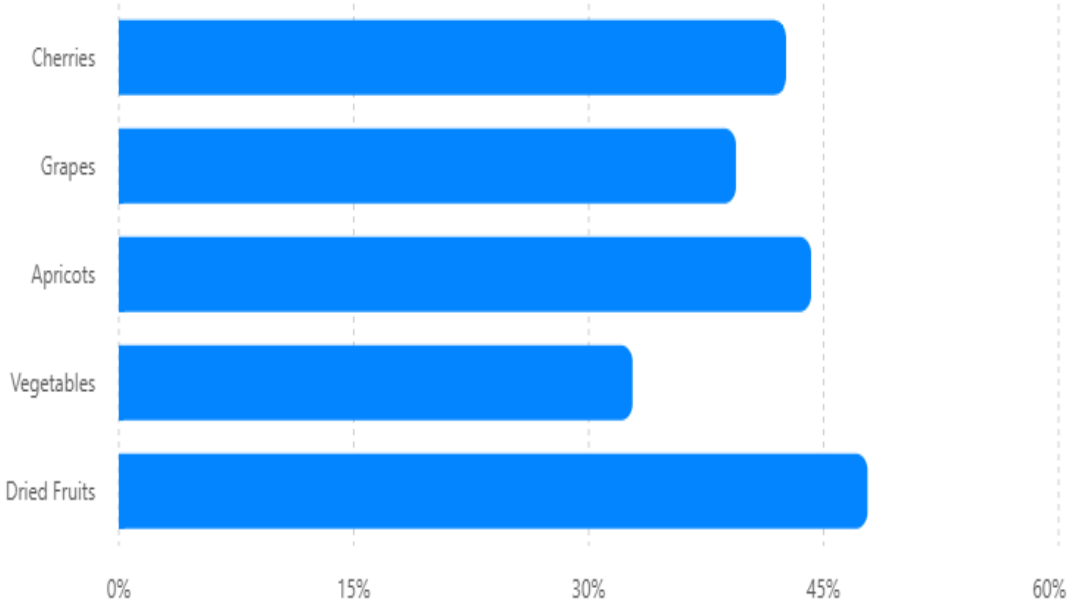
Results show that horticulture produce exports produce greater returns than most traditional agricultural exports. With seasonal advantages as well as stronger global demand, exports of cherries, dried fruits, grapes, and dried apricots gain higher prices as compared to traditional agricultural exports.

Table 6.1 Horticultural Products Profitability Indicators (2022)

Product	Export Price (USD/Ton)	Production Cost (USD/Ton)	Profit Margin (%)

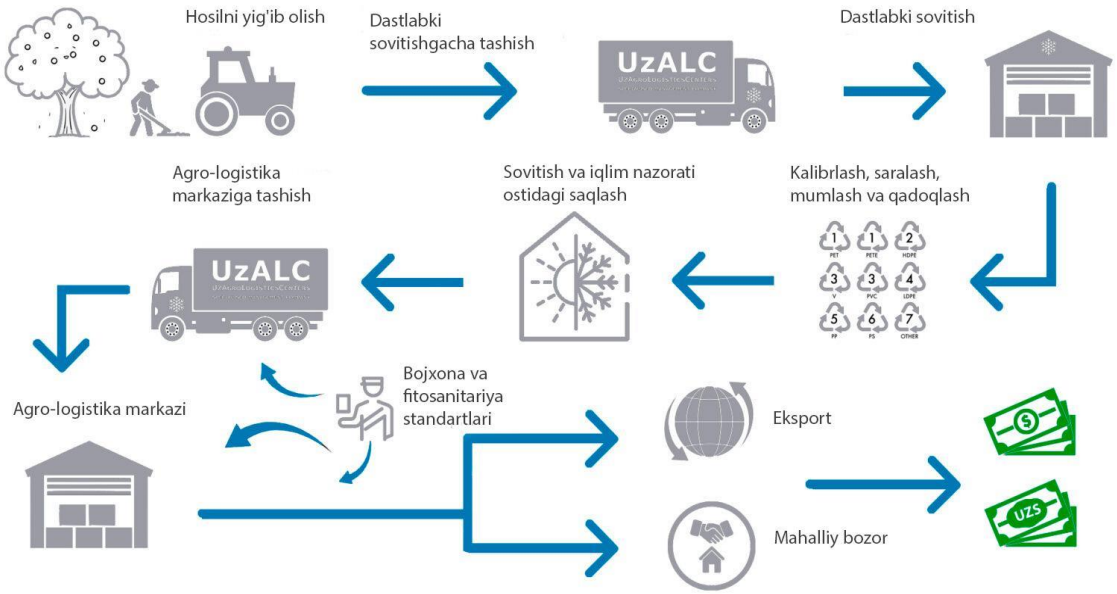
Cherries	3,450	1,980	42.6
Grapes	2,180	1,320	39.4
Apricots	2,760	1,540	44.2
Vegetables	1,280	860	32.8
Dried Fruits	4,120	2,150	47.8

Figure 6.3 Product Classification Profit Margin (2022)



Analytical results indicate that the most profitable export prices and value-added processing prospects for apricots and dried fruits are the most advantageous.

Table 6.2 Ecosystem- Chain of Increasing the Share of its Products in the Consumer Basket[1]



The Regional Comparative Advantage (RCA) study shows a robust comparative advantage in some categories of horticultural products.

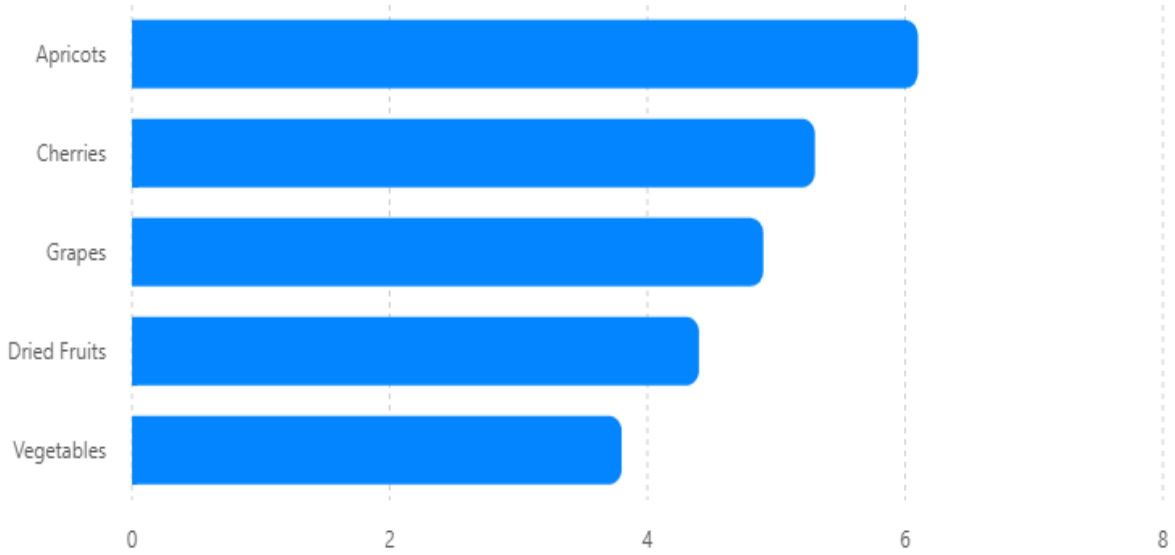
[1] https://uzagrologistics.uz/uz/?utm_source=chatgpt.com

Table 6.2 RCA Values of Major Horticultural Products (2025)

Product	**RCA Value**
Apricots	6.1
Cherries	5.3
Grapes	4.9
Dried Fruits	4.4
Vegetables	3.8

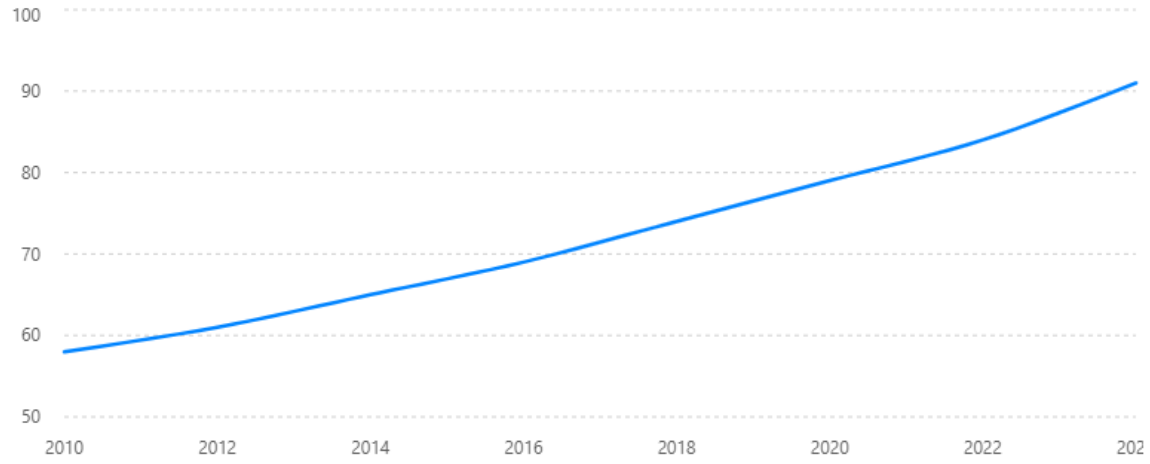
RCA>1⇒Strong Comparative Advantage

Figure 6.3 RCA Competitiveness of Major Products (2025)



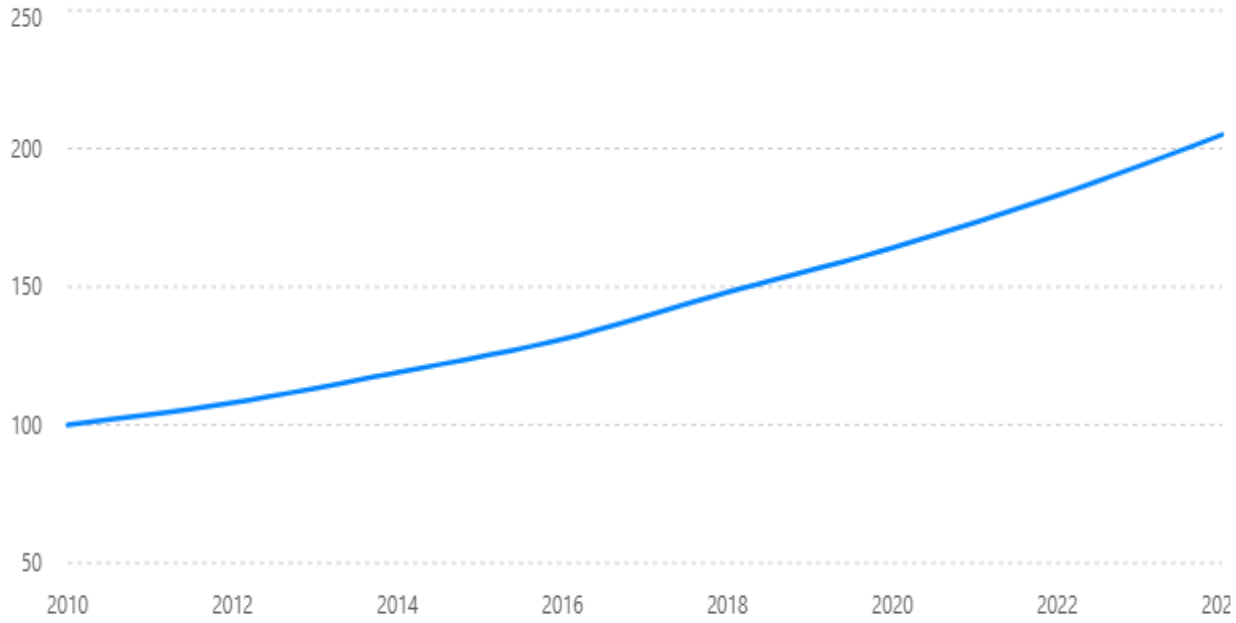
The data shows that all major horticultural products have positive comparative advantages in the international markets exhibiting RCA values greater than one.

Table 6.4. Water Use & Sustainability Challenges



The results indicate a strong reliance of sustainable horticultural competitiveness on the modernization of irrigation and the management of water efficiency.

Figure 6.5 Rural Employment Growth in Horticulture.



The research shows that horticultural export growth has a positive impact on rural income growth and decreases the rate of poverty in the rural areas.

This has not come without issues, as small-scale farmers have encountered by limited access to capital, barriers to accessing export markets, the cost of certifications, and limited access to technology.

If the support of institutions were to improve, this would have a positive impact on small farmers and form the basis for increasing the export potential of the sector in a sustainable manner.

Farmer Activities and Rural Livelihoods





Horticulturally based employment and rural livelihoods are important social and economic drivers of rural communities in Uzbekistan as demonstrated by the above images.

Discussion

The results of this research share agreement with several studies that focus on trade competitiveness and theory of comparative advantage. Such studies assert that countries that have natural advantages, that have export-oriented agricultural policy, and that have cultivated an efficient agricultural system, tend to have greater international trade agricultural competitiveness (Balassa, 1965; Porter, 1990).

The focus of this research shows that Uzbek agronomical products have relative comparative advantage in agricultural products trade, and of these products, export of hot house grown cherries, grapes, apricots and sultanas, dried fruits and vegetables. These are consistent with David Ricardo's theory of comparative advantage, which asserts that in economics, countries tend to specialize in each product, and they can do so at relatively less opportunity cost (Ricardo, 1817).

The empirical findings correspond to several studies that have been conducted in developing countries, which stress the need for export-oriented agricultural diversification. And the World Bank (2023), countries that diversify their agricultural exports to high value-added products have an increase in the volume and value of exports gained with enhanced elastic economic and financial stability. My findings illustrate that Uzbekistan significantly benefited in terms of exports and trade competitiveness, by moving away from traditional commodity exports to horticultural products.

There is also strong evidence in favor of my findings with respect to empirical studies pertaining to the horticultural competitiveness of Turkey, China and Thailand. Such studies have shown that government reforms, especially in terms of the liberalization of exports, the improvement of the logistics, and the agro-processing, have a tremendous impact on the export performance of a country in horticultural products (Bojnec & Fertő, 2015).

Your evaluation of infrastructural and logistical constraints echoes previous studies. Many studies point out that, because horticulture products have a short shelf-life, cold chain and supply chain logistics highly impact their storage and distribution (FAO, 2022). From my research, I realized high transport expenses and insufficient cold chain logistics are barriers that affected Uzbekistan’s most competitive markets, particularly those that have the most buyers at the upper-most end of income.

The results of the research on environmental control fit in well with the literature on sustainable agricultural development. It has been documented that the dominant export agricultural production is a cause of environmental deterioration, which can include shortage of water, soil erosion, and high use of agricultural chemicals (World Bank, 2022). Uzbekistan’s horticulture sector needs sustainable water policy management to stay competitive in the long run.

The discussion suggests that horticultural exports are one of the most strategically important areas for the development of Uzbekistan’s agricultural economy. The challenge will be to develop reforms that will maintain long-term competitiveness alongside continued improvements in technology, diversification of exports, and balance of trade.

Conclusions & Recommendations

The purpose of this research was to analyze the international trade competitiveness of Uzbek horticulture with a focus on the years of 2010 and 2025. To analyze horticulture export development, I looked at export patterns, comparative advantages, profitability, the conditions of demand in the market, and the ecological and social impact of horticulture exports.

The results show that in the time of this study, Uzbekistan had a great deal of growth in horticulture exports. The growth in export revenues can be explained by agricultural reforms, liberalized exports, potential demand, and outside oriented production.

The analysis shows that Uzbek horticulture products have a remarkable comparative advantage in international trade. The most competitive fruits and vegetables, according to the Revealed Comparative Advantage (RCA) analysis, were cherries, apricots, grapes, vegetables, dried fruits.

Vegetables and fruits have more trade profitability and more trade potential than most of the other traditional commodities of agriculture, such as cotton and grains/rice. Also, export horticulture provides better economic and agribusiness development for country: foreign exchange, industrial development, new jobs, increased trade.

The analysis found that trade export horticulture has great market potential, especially regional markets, Eastern and Middle, Asian markets, premium, organic markets.

The analysis has also identified numerous obstacles to export competitiveness:

a) high transport costs,
b) lack of refrigeration transport and services,
c) low market capacity,
d) concentration on export markets,
e) weak compliance international certification standards.

The study included environmental sustainability as an important issue. The enlarging horticultural production exacerbates irrigation systems, water resources are observed, soil quality, environmental sustainability

In conclusion, the study suggests that Horticultural trade in Uzbekistan has much long-term potential, but to be able to compete in the international markets, Uzbekistan must modernize and implement sustainability-focused reforms.

Policy Recommendations for Uzbekistan

Based on the empirical conclusions of this research, a host of policy initiatives is outlined to enhance the competitiveness, sustainability, and long-term resilience of the horticulture export sector in Uzbekistan. Chief among these initiatives is the modernization of agricultural logistics infrastructure. Given the perishability of horticulture products, robust trade systems, state-of-the-art storage systems, cold-chain logistics, and expedited clearance of goods at the border are critical to reducing post-harvest losses and enhancing export profitability. More specifically, the national government should prioritize the advancement of refrigerated transport and cold storage systems to support export and product quality standards.

The results of the research also illustrate that the horticulture trade of Uzbekistan is largely in the single-digit markets. This increases of the susceptibility of the horticulture trade of Uzbekistan to external trade shocks and regional economic volatility. Therefore, export diversification endeavors should be heightened to include the European, Eastern Asian, the Gulf, and premium organic food markets. Export diversification would enhance the resilience of the horticulture trade and foreign exchange earnings, as well as reducing over-reliance on trade partners. There is an increasing need to improve the observance of international standards on sanitary, phytosanitary, and food safety to access markets of higher income. Thus, more rigorous support is needed in policy to improve compliance with Global GAP, organic certification, the monitoring of food quality, laboratories for export quality, and systems of tracking for international competitiveness and access to markets.

Sustainable water management means considering how to protect and manage the processes that water goes through, which extend both above and below the surface of the ground, and keeping natural water processes within their natural limits. Uzbekistan is struggling with a water demanding climate, which is making the agricultural industry suffer. To get the agricultural industry back on its feet, the suffering must first manage irrigation and resources. Investing in things like varying kinds of irrigation systems, irrigation event control systems, water saving systems, and land management systems will all help improve and keep the environment safe. The study also demonstrates that exporting processed horticultural goods creates more profit compared to raw agricultural exports. Export of processed horticultural goods to create profit. Eventually this will encourage industry to invest more in agro-processing industries. The development of agro-processing industries will improve damage and increase the product in the to be profit processing injury of the products. The development of agro-processing also creates more opportunities for employment and increases the country's ability to do international trade.

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