USAID
FROM THE AMERICAN PEOPLE

Photo credit Brian Kiger

ASSESSMENT OF THE ESTABLISHMENT AND DEVELOPMENT OF REGIONAL AGRI-LOGISTICS CENTERS IN UZBEKISTAN NOVEMBER 2019

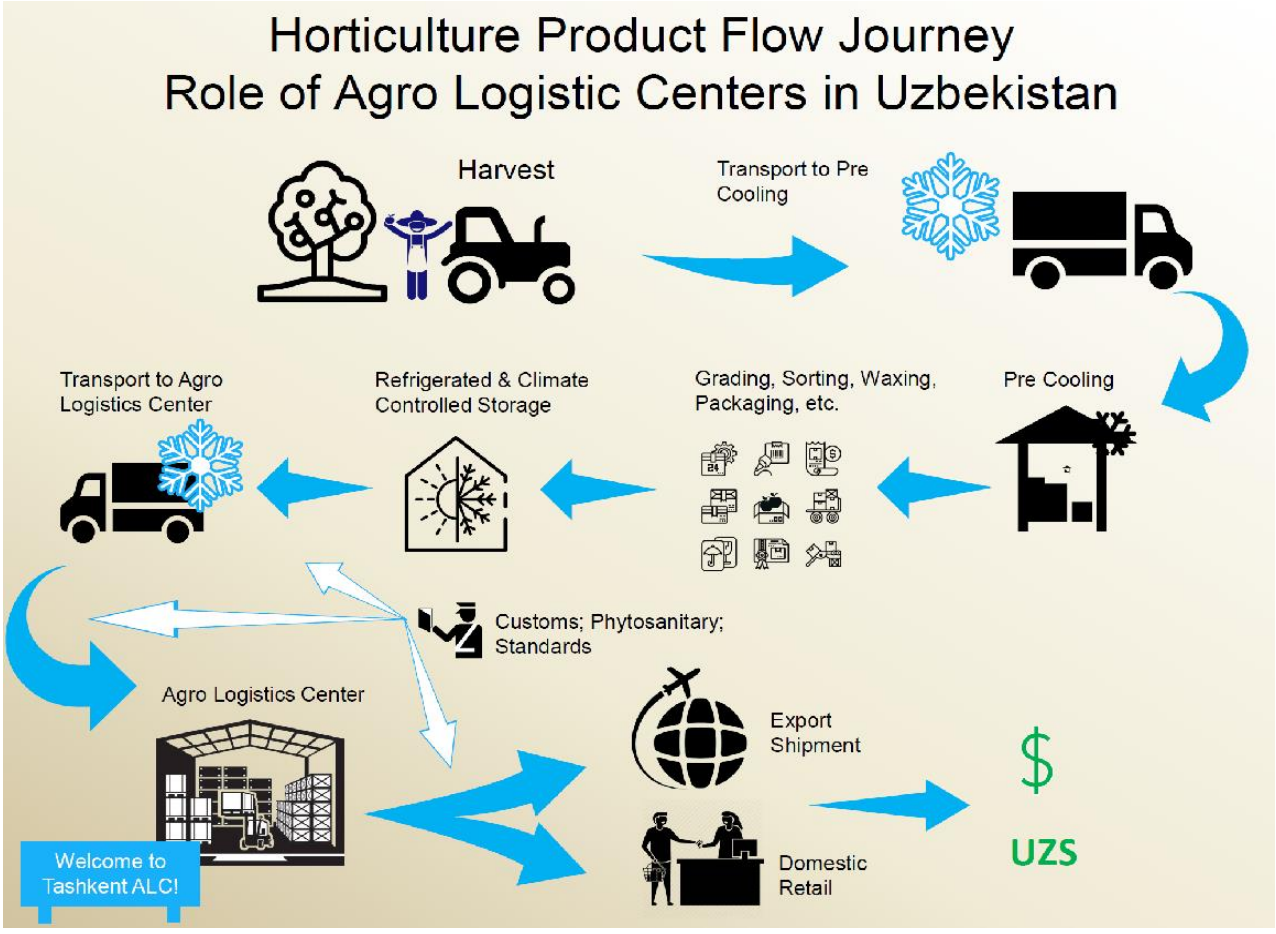
This publication was produced for review by the United States Agency for International Development. It was prepared by the World Food Logistics Organization in collaboration with Dr. Mulat Abegaz Legesse. The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

CONTENTS

EXECUTIVE SUMMARY

The World Food Logistics Organization (WFLO), the education and research arm of the Global Cold Chain Alliance (GCCA), was retained as part of the USAID-funded Uzbekistan Agricultural Value Chain (AVC) Activity to support the Uzbek government in assessing investment opportunities in the agri-logistics sector. Specifically, WFLO was tasked with identifying the needs at the local, regional, and national level to support successful investments by both the public and private sector in compliance with the Agri-food Development Strategy 2019-2030.

The WFLO team, in collaboration with food scientist, Dr. Mulat Abegaz Legesse, assessed proposed Agri-Logistics Centers (ALCs) in the Tashkent, Fergana, and Andijan regions of Uzbekistan. To complete this report, the team conducted a literature and data review and a rapid in-country assessment, followed by an analysis to formulate recommendations. This analysis compared the current state of the cold chain for horticulture to the best practices for an integrated cold chain, as shown below, to determine how to strengthen the role of the ALCs.



The key observations taken from this study include:

- **Fulfilling and maintaining the market demand for high value products is critical for the success of the ALCs.**

Although Uzbekistan is among the five leading exporters in terms of volume for fresh cherries, fresh apricots, fresh persimmons, dried prunes, dried apricots, and fresh grapes, many fruit and vegetable products are exported to lower value/traditional markets for a cheaper price, in most cases 2-3 times lower than the average world price. Uzbekistan must provide consistent high-quality volumes of the products in demand by the market.

- **Size and location of proposed ALCs have not been determined using quantitative data.**

The WFLO team found it extremely challenging to provide specific recommendations on the location, competition, size and design of the proposed ALCs without specific data to support or guide these types of recommendations. Specifically, production data combined with harvesting periods, combined with the varieties and volumes destined for specific markets should be gathered to ensure that facilities are built to the appropriate size and can be utilized year-round. Amassing this data is an international best practice when investing in temperature-control facilities.

- **A successful ALC system must include pre-cooling as a core component of the infrastructure; however, pre-cooling is not mentioned in the current ALC plan and is not currently practiced by most farmers or exporters.**

Pre-cooling of fruits and vegetables is the critical first step in the cold chain, the lack of which severely impacts shelf life and quality especially for high value products such as cherries. Products entering the cold chain that are not pre-cooled have a high amount of field heat. Cold storage and refrigerated transport trucks (reefers) are designed the maintain temperature. Loading hot produce into storage or trucks not only misses the opportunity to cool the product as quickly as possible, increasing shelf life and quality by as much as two weeks, but it also taxes the refrigeration equipment.

- **In addition to infrastructure, the success of the ALCs will depend upon the development of skills and support providing through a national Agricultural Extension Service, which is currently lacking.**

During facility visits, the WFLO team recognized that operators were asking questions or doing things that could easily be addressed by agriculture extension agents if made available to them. For example, lack of good agricultural practices including hygienic practices both at the farm and cold storage facilities, storage handling practices, manufacturing processes, documentation and record maintenance, and calibration of measuring devices were major observed challenges which require immediate attention and technical support.

Based on information to date, the key recommendations are:

1) **Reconsider ALCs as a one-stop shop for produce handling and distribution.**

Currently, the ALC concept is being considered as a 'one-stop shop' for all logistics and handling for export-oriented horticulture. However, this is not aligned with international best practice, where various integrated cold chain procedures are disaggregated. Therefore, it is recommended that the Government of Uzbekistan (GoU) consider the following:

- Physically separate the individual links (post-harvest, transport, storage, processing) of the integrated cold chain, allowing multiple facilities related to each of these links to work as "clusters" where they will have the greatest impact in the various districts of the growing regions, and expand the infrastructure naturally as economic conditions allow.

- Remove the "dirty" post-harvest activities (e.g., rinsing/cleaning, grading, sorting, packaging, pre-cooling, etc.) activities from the ALC. This is recommended primarily for sanitation considerations. This separation of functions is standard operations in most developed markets.

2) Consider ALCs as Marketing and Logistics Centers rather than Production and Processing-focused Centers.

The emphasis of the ALC should be on trans-shipment and marketing of high-value horticulture to large domestic markets or export markets. Currently, as it reads, the ALC proposal seems to focus more on handling and processing, rather than on product movement to market. The former is typically done in specialized facilities.

3) Conduct a quantitative demand assessment to drive decisions on design and location of proposed ALCs.

There is little doubt that the three regions identified (Andijan, Ferghana and Tashkent) are likely the most appropriate for the location of the assets and focus, though it is best practice to assess production and market data to formalize this decision. The primary questions which only data and expert corporate knowledge can answer in a follow-on assessment are the design criteria and effective focus of each cluster, a comparative review of "like" facilities in other countries, and the further review of additional clusters throughout the country.

4) Develop the ALC masterplan in phases.

Each ALC should be designed to service the local horticulture products in the most economically profitable manner, as informed by market demand and farm production data. For example, it is possible that the Tashkent ALC will support the retail and wholesale needs of the domestic market of Tashkent. If this example is accurate, this ALC would focus largely on local distribution, often in the mornings or late evenings, and utilize small and large vehicles for distribution. There is a similar entity in Kazakhstan, immediately outside of Shymkent, referenced more in-depth in recommendation fifteen. This facility should be assessed, and its history considered in the advisory process.

5) Examine Potential Benefits of Private Sector ALC Ownership.

As a core partner of the GCCA, an international trade association representing the businesses involved in the cold chain, WFLO experience with international best practices has demonstrated that the greatest

success and sustainability with cold chain investments occur when they are developed and managed by private sector actors. The idea that ALCs should be owned by a set of private businesses that rely on small business owners to be experts in their various fields/cold chain segments should be examined in the context of Uzbekistan as this model usually promotes the greatest efficiencies, and subsequently profitability. Alternatively, the ALCs can be structured initially as parastatal entities, 50% owned by the government and 50% owned by private businesses via a public private partnership or PPP.

6) Commission the gathering of additional data.

The WFLO team cannot make a firm recommendation on size, location, operations or proposed timelines for developing the ALCs, given the numerous variables that have yet to be determined, such as, but not limited to the availability of personnel to staff these facilities; availability of specialists to train management and staff personnel onsite at the ALCs; the management and the operations staff's ability to grasp the necessary criteria to assume ever-increasing leadership/ownership roles; and the wide variances in situations arising from the seasonal availability of incoming horticultural volume, and, the physical condition of that volume. WFLO recommends that a follow-up assessment is conducted to gather necessary data to confirm the assumptions. Once the follow-on assessment and recommendations are delivered, the GoU should endeavor to begin the process of developing the scheme as soon as possible.

7) Integrate ALCs with existing infrastructure.

The existing capacity of cold stores might be sufficient to store current volumes, however the majority of the existing cold chain infrastructure as observed by the team, with a few exceptions, is rudimentary, idle or lacking altogether. For example, critical pre-cooling sites, refrigerated facility sites, field packing operations, receiving, cleaning/rinsing/sorting/sizing/packaging sheds are often missing, preventing an integrated cold chain. However, certain structures and infrastructure may exist in the areas recommended for ALC's which may be useful to include in the cluster scheme. To integrate the existing cold stores with the planned ALCs, the GoU should conduct a thorough assessment and diagnostic analysis to identify the potential cold stores that could easily be integrated with minor improvements and retrofitting, and those that require complete rehabilitations. The potential for implementation of the proper storage/stacking discipline and handling practices, good hygienic and manufacturing practices should be also assessed.

8) Incorporate education and training on warehouse operations and facility maintenance within the plan for the ALCs.

To prevent the GoU from investing in expensive assets that do not provide a return on investment due to improper management, WFLO highly recommends incorporating training and education costs into the planning. This method could follow the "3-legged stool" method that was effective in the U.S. which involved academic institutions, the government and industry, or a method could be developed uniquely for the ALCs. WFLO has often visited countries where investments were made into the cold chain that lacked an educational component resulting in a facility that was either never used, used poorly and inefficiently, or in some cases wound up being used for a different purpose entirely.

9) Establish a plan to access the sea to reach high-value export destinations.

Uzbekistan is a doubly landlocked country, with transportation systems based on refrigerated trucks, railways and airways. This could present serious challenges and increase the transport costs for higher-value export destinations, affecting the competitiveness of fruit and vegetable exporters and limiting the export destination to neighboring countries, the traditional markets. Transport via sea could facilitate export into other Asian countries (Japan, Indonesia, South Korea), the European Union, and North America.

10) Establish an integrated plant protection and food safety control system.

The accreditation, inspection, system and product certificates issued by UZstandard is not recognized internationally, and the accreditation body is not a member of the International Laboratory Accreditation Cooperation (ILAC) or International Accreditation Forum (IAF). The plant quarantine inspection services also lack representation with the International Plant Protection Convention (IPPC) and has limited capacity, inspection tools and manpower to provide documented information and dependable services. Finally, the newly established Sanitary Epidemiological Inspection service does not have the necessary manpower, knowledge, documented information and inspection tools to provide hygiene and sanitary inspection in wholesale stores, cold storages, pack-houses, and during transport. An integrated plant protection and food safety control system including maintaining traceability, the required quality and food safety requirements should be established. The conformity assessment services of UZstandard including the laboratory services should be strengthened to provide reliable and credible analytical services on pesticide residues, heavy metals, environmental contaminates, additives, adulterants, mycotoxins and microbiological contaminants; and possibly consider internationally recognized and accredited HACCP, food safety, and possibly GLOBALG.A.P. certifications. The inspection and certification services of the considerable number of international recognized inspection and certification bodies operating in Uzbekistan could also be utilized to support the ALCs services. The Plant Quarantine Inspection and Sanitary Epidemiological Inspection services should be strengthened by competent and trained manpower, inspection tools, laboratory equipment, infrastructures and transportation services.

11) Strengthen trade facilitation organizations.

Trade facilitation organizations recently established by the GoU, which are accountable to council of Ministers including UZAgro-export, UZAgro Bank, and the Ministry of Transport, should be strengthened to spearhead the role of coordination, facilitation, and promotion of the ALCs and exports.

12) Seek donor assistance to build capacity throughout the supply chain with a focus on GLOBALG.A.P. and food safety certifications.

The technical support offered by organizations such as FAO, GIZ and USAID should be incorporated with the initiatives of the ALCs. Assistance offered by these organizations should focus on strengthening the capacity of the quality infrastructures, inspection, and certification bodies and enhancing the technical capacity of those involved in training and consultancy services, as well as the production, transportation, distribution and export of fruit and vegetables to achieve food safety requirements and GLOBALG.A.P. by accredited certification bodies.

13) Provide support and incentives to small holder farmers to adopt international production standards.

The GoU should provide aid and repayment support to smallholder farmers for adopting certifications to meet International Trade Standards such GLOBALG.A.P., ISO, Codex, etc. Additionally, there may be other GoU-based incentives that could incentivize the farmers such as tax incentives for a period of time for all export grade production. Farmers might also be incentivized to produce a data and market driven alternative crop base to work in-conjunction with the existing crop array (cherries, grapes, onions, potatoes, carrots, etc.) to expand the availability of many products, and to reduce the common glut of same products in the growing areas.

14) Provide Agriculture Extension Services to Improve Production.

The ALCs will be dependent upon volumes and high-quality produce which results in the need for Agriculture Extension Services. This is critical to improving all aspects of crop production from seed, germ plasm, plant spacing, husbandry, and harvest, through the cold chain to final retail or export delivery. This will strengthen the ability to improve the quality of crops from pre-planting all the way through final sale and will yield greater volumes through enhanced field-level knowledge and production practices.

The establishment of more greenhouse horticultural crop production would also improve the quality of production. The GoU may consider researching other high value export-focused crops to augment the existing crops such as cherries and grapes. Generally, it is recommended to encourage quality over quantity, and focus on the value proposition as opposed to production volumes.

15) Consider a visit to Shymkent, Kazakhstan to learn about their experience with an ALC.

There are several examples, including those described in the case studies, that could provide a valuable learning experience. However, WFLO experience with study tours has been that they are most effective when the difference in the industry's level of sophistication is not as stark. For example, regional study tours tend to inspire competition and an understanding of what is not only possible but feasible. Particularly, the logistics hub built in Shymkent would be an excellent opportunity to learn from the challenges and successes of a neighboring country.

INTRODUCTION

The Government of Uzbekistan's Agri-food Development Strategy 2019-2030 outlines a vision to support a thriving agri-food industry for Uzbekistan in the 21st century. This strategy identifies a development plan for Uzbekistan's agriculture, food and rural sector for the period 2019-2030, proving a long-term vision for the development of Uzbek agriculture and rural areas, as well as offering the basis for a stable, predictable, and transparent legal framework aimed at improving the business climate and stimulating investment for the modernization of the sector. This strategy also provides the basis for the institutional and budgetary reforms necessary for successful implementation.

One of the priorities of the strategy is to support the strengthening of the business environment in the agri-food sector. A high priority action linked to achieving this objective is the need to assess, design, establish and develop modern regional agri-logistics infrastructure and services.

Encouraging investment in agri-logistics infrastructure and services will help to address the high levels of post-harvest losses experienced by many Uzbek farmers today, which are caused by various factors

including: the lack of available sorting, grading, and packaging services and facilities; no pre-cooling present; limited access to localized farmer and wholesale market facilities; lack of adequate transport, storage and refrigeration services; inadequate and under developed agri-food processing facilities; and the lack of farmer knowledge of good post-harvest practices and quality standards. The solution to reducing post-harvest losses is through the proper management of the product at the farm level as well as the integrated cold chain; concurrently, the product value is maintained to international standards which positions the industry to increase higher value exports, as well as address the need to supply domestic retail with high value products. Investment in agri-logistics infrastructure and services will also help to support the government strategy of agriculture diversification and the promotion of higher value horticulture agri-food exports.

To this end, WFLO and Dr. Mulat Abegaz Legesse were retained as part of the USAID-funded Uzbekistan Agricultural Value Chain (AVC) Activity to support the Uzbek government in assessing investment opportunities in the agri-logistics sector, by identifying the needs at the local, regional and national level to support successful investments by both the public and private sector in compliance with the Agri-food Development Strategy.

The nature and type of ALCs to be developed and established depend on several factors including the type and nature of produce, product value, market requirements such as quality and food safety of the potential markets, size of the market, volume of produce, required regulatory and development supports, the nature and type of infrastructures required including access and vicinity to sea, railway, road and air transport systems. The assessment of the needs and requirements for the establishment and development of regional agri-logistics infrastructure & services in Uzbekistan targeted three regions: Tashkent, Fergana and Andijan. Following desktop research, in-country interviews were conducted between October 8th - 19th, 2019.

OVERVIEW OF THE UZBEKISTAN ALC INITIATIVE

During their in-country research, the WFLO team met with a variety of GoU representatives to learn more about their vision for ALCs. During these discussions, the team learned the GoU's ALC project is part of a larger initiative to restructure the agriculture industry to promote export-led growth and create jobs. Inspired by the high value horticulture distribution systems of Spain and France, the GoU decided it would like to adopt some of what they saw in those countries by creating a network of agri-logistics centers in various cities across Uzbekistan. The vision is to have approximately eight ALCs which will be designed as a "one-stop shops" for horticultural processing, sorting, and distribution across the 14 regions in the country. Not only are the ALC's envisioned to promote trade at the macroeconomic level, it is also envisioned that the ALCs will help to reduce post-harvest losses, improve returns to small holder farmers and create jobs at the microeconomic level.

The ALC project will start with the establishment of approximately three ALCs in Andijan, Samarkand, and Tashkent. However, one of the main observations made by the team in discussions with the GoU is the decision to establish the ALCs (e.g. how many, and where) do not appear to have been influenced by data on production capacity or demand for proposed ALC services. This is a significant observation and a critical oversight because when decisions are made without aid of relevant, accurate data, it is a lagging indicator that the assumptions made may be incorrect due to a lack of evidence to the contrary, which also indicates that other decisions may also be suspect. A more detailed discussion on demand for ALCs and recommendations for determining demand will be covered in section 4.

As per the project study, the ALCs are expected to provide the following services:

- Strengthening upstream and downstream value chain linkages and provide modern post-harvest infrastructure;
- Provide all necessary facilities and services in one place: trading, storage, processing, food safety certification, customs clearance, transport, shipping, marketing advisory services, trade finance, and commercial banking;
- Help to address the current high levels of post-harvest losses and expand horticulture produce sales in domestic and export markets;
- Introduce post-harvest processing, storage, and handling following international quality and safety standards and the ALCs expected to be the focal points of horticulture clusters in Andijan and Samarkand and the neighboring regions; and
- Help to smoothen crop seasonality and enhance price transmission to and price stability for small-scale producers, and small and medium-sized agribusinesses.

ASIA DEVELOPMENT BANK (ADB) PARTNERSHIP

Financed by the ADB, the Horticulture Value Chain Infrastructure Project supports the GoU's plan to establish horticulture clusters where production and post-harvest services can be consolidated to improve efficiency and economies of scale. The proposal from the GoU is for financial support for the establishment of ALCs in two locations, Andijan and Samarkand regions, considering international best practices.

Given its mandate, the Horticulture Value Chain Infrastructure Project published a variety of studies to support its intention to finance the establishment of two ALC's in Andijan and Samarkand regions to strengthen upstream and downstream value chain linkages and provide modern post-harvest infrastructure. According to the project information document (PID), the ALCs are to provide all necessary facilities and services in one place: trading, storage, processing, food safety certification, customs clearance, transport, shipping, marketing advisory services, trade finance, and commercial banking. The ALCs will also help address the current high levels of post-harvest losses and expand horticulture produce sales in domestic and export markets. It will introduce post-harvest processing, storage, and handling following international quality and safety standards. Finally, the ALCs will be the focal points of horticulture clusters to be established in Andijan, Samarkand and neighboring regions.

This report is the output of the assessment and is organized as follows:

- Section 1: Market Overview
- Section 2: Demand for Agri-logistics infrastructure in Uzbekistan
- Section 3: Supply of Agri-logistics infrastructure in Uzbekistan
- Section 4: Quality Infrastructure and Regulatory Bodies
- Section 5: Trade Facilitation by Government Offices

- Section 6: Comparative Analysis
- Section 7: Recommendations

1. MARKET OVERVIEW

1.1 AGRICULTURE-BASED, EXPORT-LED GROWTH

Over the last 3 years, Uzbekistan has experienced a significant increase in export-led growth in the agriculture sector due to robust policy reforms undertaken by the Government of Uzbekistan. These reforms were specifically designed to promote jobs and economic growth through increased exports of high value horticultural products such as, but not limited to apricots, cherries, grapes, persimmons and plums.

In 2018, horticulture exports grew by 35 percent in both volume and value compared to 2017. This can be attributed to several factors, including positive advances in the regulatory and enabling environment discussed in this section below. The horticulture subsector is not only the most successful agricultural export subsector for Uzbekistan, but it also serves as the largest economic subsector in the country. According to the World Bank, the horticulture subsector in Uzbekistan generated 80 percent of total crop production in Uzbekistan, which in turn accounted for 53 percent of gross agricultural output in 2018. Horticulture also has a greater than average positive impact on employment amongst other agricultural sectors.

1.2 TRADE & EXPORT PERFORMANCE

Uzbekistan is a net exporter of horticulture products. It accounted for 80 percent of the agri-food export, which together with cotton fiber made up 9 percent of total export. Compared to 2015, the export volume of vegetables in 2018 grew by 133 percent and fruits by 183 percent. Uzbekistan exports more than 180 kinds of fresh and processed horticulture products. The export geography has expanded over the last 5 years to trade with more than 80 countries, allowing Uzbekistan to become: the 2nd largest global exporter of dried apricots; the 3rd largest exporter of persimmon; the 4th largest exporter of raisins and apricots; and the 5th /6th largest exporter of dried prune, fresh cherries and plums .The other major export products include fresh peaches, fresh plums, and tomatoes. The export performance of the major fruits has shown relatively steady growth between the year 2015 and 2018, refer Figure 1 below.

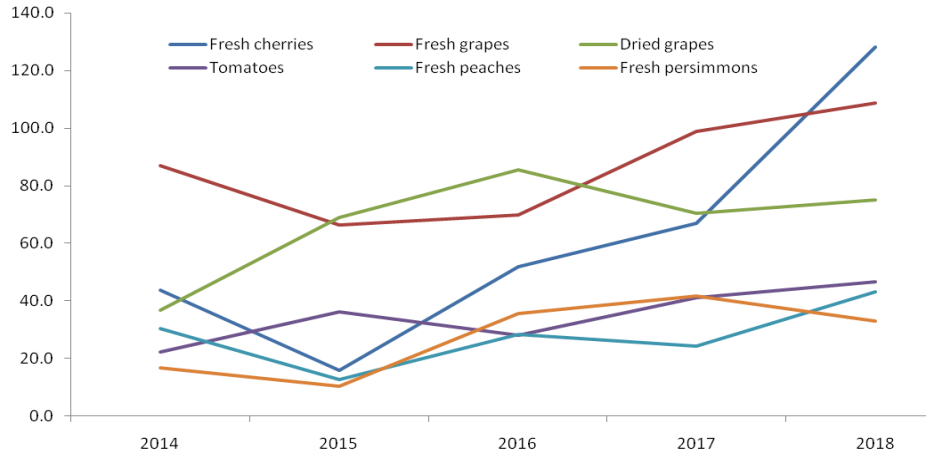


Figure 1 Five years export performance of the major fruit and vegetables of Uzbekistan in million USD

Source: International Trade Center based on UN COMTRADE and ITC statistics

All major products from Uzbekistan are exported to lower value export destination countries, at cheaper cost. As per the export performance of 2017 and 2018, except fresh cherries and fresh apricots, the average cost of exported fruits and vegetables were 2 to 3 times lower than the average world price refer table below. The highest valued exporter countries in large volume of fruit and vegetable of produce include USA, Chile, Turkey, South Africa and most EU countries; for further details of the market performance of different countries refer to Annex 4. The challenges and potentials for improvement of Uzbekistan to join the high valued exporter countries including the food safety and quality requirements and the regulatory and support organizations have been assessed and evaluated in the following sections, specifically under section 5 and 6.

TABLE 1 TWO YEARS EXPORT VALUE/TON OF THE MAJOR FRUIT AND VEGETABLES OF UZBEKISTAN

Type of Major Export Products	Average Uzbekistan Price USD/Ton		Average World Price USD/Ton	
	2017	2018	2017	2018
Fresh cherries	2186	3791	4330	4344
Dried apricot	964	991	2508	2413
Dried prunes	737	694	2299	2378
Dried grapes	905	1091	1813	2042
Fresh grapes	727	788	1764	1758
Fresh peaches	558	646	957	1157
Fresh plums and sloes	469	722	1131	1156
Tomatoes	562	847	1119	1126
Fresh apricots	891	1133	1126	1072
Fresh persimmons	571	602	974	1045

Source: International Trade Center based on UN COMTRADE and ITC statistics

Based on discussions with the Ministry of Trade and Foreign Investment while in Tashkent, countries that the government would like to target for high value horticultural exports outside of Russia include, but are not limited to: China, the European Union (EU), South Korea, Turkey, and the United Arab Emirates (UAE). As a landlocked country, the GoU has invested in construction of a railway to better facilitate trade with China. The planned ALCs are also envisioned to support increased trade outside of Russia.

1.3 REGULATORY AND ENABLING ENVIRONMENT ANALYSIS

Over the last three years, the Government of Uzbekistan made significant regulatory changes to promote horticulture exports. In 2017, the GoU:

1) Liberalized the exchange rate;
2) Ended the export monopoly of Uzagroexport;
3) Ended the mandatory sale of 25% hard currency earning and permitted to keep 100% value of earned hard currency in their account; and
4) Reduced the time to receive an export certificate and register the contract at the customs agency for horticulture exporters from 10 days to three days.

In 2018, the GoU:

1) Granted permission to use any transport for exports, not only railroad;
2) Established several "green corridors" at border crossings;
3) Eliminated minimum export prices;
4) Removed full prepayment req. for export contracts outside of Uzagroexport; and
5) Improved access to credit for horticulture agribusinesses.

Overall, these reforms reduced trade distortions affecting Uzbekistan's agriculture sector. These reforms laid the groundwork for the following resolutions to establish a network of ALCs in Uzbekistan:

- Presidential Decree #4406 of 29 July 2019; and
- Cabinet of Ministers Decree, which is specifically related to ALC project via ADB financing.

1.4 CHALLENGES AND BARRIERS TO ENTRY

While the GoU has undertaken significant industry-friendly reforms to promote export-led growth in the agricultural sector in Uzbekistan, there remain some barriers faced by horticultural farmers as summarized below:

Currently, **farmers pay a 15% VAT (initially 20% until October 1, 2019) to sell produce to domestic retailers**. As a result, farmers are choosing to sell in the informal markets and bazaars. This may also include clandestine exports via Kazakh traders/transporters.

In addition, there are **challenges with access to finance for smallholder farmers**. In order to overcome these challenges, the GoU has offered a 5% interest rate for loans to small-holder farmers to

grow certain horticulture products which can be exported and to incentivize small-holder farmers to grow according to international standards.

Kazakhstan charges Uzbekistan carriers a special tariff to carry products into or through the country, whereas Kazakh carriers are not subjected to these tariffs. As a result, it is more expensive to use Uzbek carriers, which artificially inflates the cost of goods landed in Kazakhstan, Russia, etc.

The GoU measures the amount of exports by region. As a result, some regional government administrators pressure farmers to only sell to traders who enter the region to purchase. For example: often village farmers will have an excess of a certain product and may wish to sell to an aggregator from another region who has buyers. The pressure is put on them to keep the product in the region. With no buyers to sell them to, the farmers must sell into the local market.

In addition, farmers are recommended to grow only certain crops in certain regions as it is considered more profitable and the region has more favorable climatic conditions for certain crops. In many cases, farmers also lack linkages to potential buyers in export markets. Closer cooperation and linkages between Uzbek farmers and buyers in the export markets would inevitably serve to improve the quality and quantity of the agricultural products produced, based on demand and buyer tastes.

2. DEMAND FOR AGRI-LOGISTICS INFRASTRUCTURE AND SERVICES IN UZBEKISTAN

One of the first observations made by the WFLO team after speaking with the Ministry of Agriculture is the ALC project plan and rollout strategy should be driven by objective data to confirm demand and parameters for ALC's and the locations proposed.

According to the Ministry of Agriculture, the working group for the ALC project was just formed (within hours of the WFLO team's visit). Consequently, there is a conscious effort underway by the ministry to obtain the relevant data required to confirm demand for the ALCs. However, this data may not be available for additional analysis by the WFLO team for several months, and there are already questions as to the validity of the data promised. Therefore, for the purposes of this report, the WFLO has obtained and used qualitative data from the field visits and conversations therein to assess the demand for the ALCs and to better understand what exactly the ALC's are supposed to be, and finally, to get a better sense of the situation on the ground at the proposed locations.

Once data is provided by the ALC working group (within the Ministry of Agriculture), the WFLO team recommends that a follow-on data assessment be scheduled with a scope to:

- Provide a complete report including a quantitative evaluation of the data;
- Conduct sight visits to Kazakhstan (Shymkent), and another location (possibly France, Spain, or Turkey) to better understand the genesis of the project, as well as to provide a comparison analysis between those ALC's and the proposed ALC's in Uzbekistan;
- Draft approximately 3 specific ALC, as well as ICC cluster design concepts; and
- Make specific suggested locations for the ALCs or confirm those already selected.

The WFLO team highly recommends ongoing efforts are made to validate the feasibility of the ALC project, though the tender has already been released.

Uzbekistan is currently enjoying a high demand for horticulture products from their neighbors in Kazakhstan and Russia. Demand for horticultural products from China has been rising, though China is urging its supply partners to increase quality to international standards. This growing Chinese demand is nearly limitless in its possibility, provided Uzbekistan can normalize exports to international standards.

2.1 QUANTITATIVE DEMAND ASSESSMENT: A PROPOSED METHODOLOGY

The following methodology is recommended by the WFLO team for assessing demand for the ALC services in the locations identified:

- Utilizing the OECD's "Framework For The Unrecorded Economic Activities In Transition Economies" http://www.oecd.org/sdd/na/2463883.pdf, assemble, analyze, and inform on the demand of horticulture products of Uzbekistan, following the general approach as follows:

- Assemble data sets to review the impact of the informal markets on the total VAT collected by the GoU. Data analysis may take on the following approach:

    - Capture the total domestic horticulture production in metric tons (MT).

    - Assess the post-harvest loss and "shrink" rate and adjust available quantity accordingly.

    - Assemble data on Value Added Tax (VAT) and the MT sold data on all horticulture products, including products destined for domestic consumption and export.

    - Compare the quantities on which VAT was collected with the adjusted production level to determine the difference in unrealized VAT resulting from the informal market.

- Assess the market, production, logistics, sales, and distribution data for each ALC region independently, in order to measure volume produced and demanded for each region, so that the design and inventory of infrastructure is effective in meeting the specific needs of the region.

There is a focus on VAT in the proposed methodology because the current taxing scheme incentivizes farmers to sell directly into the informal open-air markets' economy, which is unregulated. If the tax schemes change and these become regulated, then it allows the formal market to compete on a level playing field.

It is likely and expected that data analysis will show each ALC will have significant, volume, throughput, thresholds, and design differences from the other. For example, the Tashkent facility may be more focused on domestic distribution into Tashkent, whereas Andijan may be more aligned with a "Direct to Export" (export distribution) model. If this data is made available, WFLO can assist in the analysis.

3. SUPPLY OF AGRI-LOGISTICS INFRASTRUCTURE AND SERVICES IN UZBEKISTAN

Supply chains for highly perishable agricultural products like fresh vegetables and fruits comprise growers, cold chains, brokers, wholesalers, importers and exporters, retailers, shops, and input and service suppliers. The main processes include the agricultural practices from farm selection to harvesting, and the post-harvest practice from sorting, grading, packaging, storage, distribution, retailing to consumption. Several studies have been conducted on perishable fruits that do not ripen after harvest and vegetables regarding the effect of time, temperature and humidity after harvesting. These studies have indicated an increase in temperature usually results in accelerated loss of quality and reduction of shelf life, with 50 to 90% loss of quality and reduction of shelf life reported in some cases due to improper handling of post-harvest practices. Moreover, due to food related diseases and globalization of food production, consumers (especially in the Western world) have become more aware of the origin and nutritional content of their food. This leads to a growing interest in traceability, freshness and quality of products.

The ALCs are expected to address food safety and quality requirements, including post-harvest losses, and expand horticulture produce sales in domestic and export markets. They are also expected to establish small- and medium-sized cold storage and processing facilities, expand production areas, and adopt modern production technologies in intensive orchards and greenhouses.

This section comments on the observations taken from interviews and visits to Samarkand, Tashkent, Fergana and Andijan between 8 to 19 October 2019 regarding the current supply of cold chain, beginning on-farm and moving into cold storage and to destination markets via refrigerated transport.

3.1 PRODUCERS/FARMERS

Due to the seasonal nature and availability of products in the three regions, the assessment focused primarily on agricultural and post-harvest practices for grape products. The rate of deterioration of grapes increase with time, high temperature and low humidity, which cause water loss from the grapes and stems. Deterioration could therefore be limited by maintaining temperature control through an integrated cold chain using proper packaging such as expanded polystyrene packaging (EPS). EPS boxes are recommended by major producers and exporter countries, which have many benefits including light weight, less interior packaging to allow airflow, good insulation, and the ability to maintain strength in high-humidity cold storage.

As observed in the Tashkent region, grapes are picked and transferred to sheds, usually early in the morning until noon, followed by sorting, grading and packaging in the afternoon into wooden boxes or crates. All activities are conducted on-farm with transportation typically occurring in the evening between 6 and 9 PM by open trucks on rough roads. This contributes to possible contamination and damages the product further. Per this traditional practice, pre-cooling is not utilized.

In the Fergana and Andijan regions, grapes are transferred to cold storages 3 to 5 hours after harvesting and collection.

Cooling in the regions is conducted in cold storage rooms arranged in pyramid shape, which require 12-24 hours to reach the required cooling temperature. There is in general lack of pre-cooling facilities and proper pre-cooling practices.

Records and documentations should be kept including the history of land selection to final harvesting, hand picking, handling, farm packaging, storage, and transportation. However, based on the interviews,

there is no such practice that could serve as evidence for traceability, to prove that required quality and food safety standards were maintained. Records are mainly utilized for financial purposes.

A few farms reported they use mobile toilets with hand washing facilities and canteens during the harvesting period. In general, personnel standards and personal hygiene issues are not properly addressed resulting in a lack or completed absence of farm toilets, sheds, hand washing facilities, canteens, dressing areas, etc.

Farm hygiene and sanitations is not properly implemented, presence of animals (dogs) and grazing inside orchards and vineyards are common, farms are not properly protected from dust/dirt, there are no wind breaks;

Chemicals, fertilizers, and inputs are purchased from reputable suppliers in most cases, but the use of informal markets or unknown suppliers was also reported. Documentation and records on pest scouting, use of pesticides, preharvest intervals, and calibration of spraying equipment are not properly practiced.

Generally, there is lack of knowledge and awareness in the management of farms, as well as a lack of cooperatives and commercial farms to undertake and implement proper management and implement good agricultural and hygienic practices as indicated in the guidelines of UN-FAO, the Codex General Principle of Food hygiene and GOBALG.A.P. requirements. These are considered as the minimum requirements by the developed markets, such as EU, North America and Asian countries with relatively strict food safety and quality market requirements. The practices observed are primarily traditional agricultural practices with exports focused on traditional markets (the previous Soviet Union countries) with lower food safety requirements and cheaper prices. Please visit the annexes for additional information.

For the ALCs to effectively boost and enhance the export of high-value fruit and vegetables and located markets in higher value destinations, a major shift from traditional agricultural practices must occur. Good agricultural practices, including hygiene and farm management supported by cooperatives, contracts and commercial farms should be supported and coordinated closely to match the planned capacity of ALCs. There are some nascent cooperatives, forming based on support given by development partners working to implement good agricultural practices and GLOBALG.A.P. However, to date only two or three farms are GLOBALG.A.P. certified. Such efforts should be strengthened and extensively implemented in line with the ambitious plan and investment into the ALCs.

3.2 COLD STORAGES

At the time of the field visit, most of the cold storages were filled with grapes with the following observations noted:

- Some storage facilities were above capacity while others were below capacity;
- Due to the lack of pre-cooling facilities, pre-cooling was conducted in cold stores utilizing a pyramid shape, which requires 12 to 24 hours to reach the required temperature 1^0C.
- Calibration is not conducted by the Metrology Institute/Calibration bodies; rather, they believe their own equipment and do some comparisons with thermometers. Calibrated temperature and humidity

measurement devices, balance, and fire extinguishers were not available. There is limited knowledge on the importance of calibration.

- Some cold stores reported that they recorded humidity and temperature on a daily basis, but no evidence was found during the visit.

- Cold stores, loading and unloading sites were not properly cleaned. Drinking, eating and smoking occurred in and around the corridors of the cold stores, and most of the light lamps were uncovered or not properly protected. Dogs and cats walked around the facilities.

- Some of the cold rooms were built in a manner that is difficult to clean. Floors, walls and ceiling were covered with wooden materials or rough surfaces. Some were rusty.

- In general, the cold storage facilities visited require proper monitoring and storage/stacking disciplines, handling practices, and good hygienic practices, but some need complete rehabilitation (refer annex 3 for photograph presentations).

- Document handling and record keeping practices should be implemented and monitored.

It was reported that there are 200 to 300 cold stores in each region with different capacities from 100 tons to few hundred tons capacity, with 5 to 10 percent growth per year. Few cold stores have capacity between 1000 to 3000 tons, and one has 7000 tons capacity. There are newly constructed cold stores while others have turned grain stores and garages into cold stores. It was reported that existing capacity might be sufficient for the current market volume; however, with limited capacity/absence of pre-cooling facilities thorough assessment and diagnostic analysis should be conducted to identify the potential cold stores that could easily be integrated with the ALCs with minor modifications to ensure proper storage/stacking discipline and handling practices, and good hygienic and manufacturing practices. Training and capacity building support are required, including document and record handling practices, by development support agents, extension services, the Ministry of Agriculture, quarantine and calibration service providers.

3.3 EXPORTERS, BROKERS, WHOLESALERS, PROCESSERS AND FOOD PACKERS

Some major exporters, wholesalers, retailers and processers were interviewed, and processing facilities and stores were visited. The major export destinations are Russia and Kazakhstan (the traditional export markets) via auction markets and contacts established through their major customers. Dry products are exported to other countries such as China, Saudi Arabia, the United States, the United Arab Emirates, and some countries in the European Union (please see annex information for more detail).

Some exporters, wholesalers and brokers do not have their own farms and cold stores, but rent space or purchase produce directly from cold stores. These products are then sent for export or distributed to retailers within Uzbekistan.

Fruit and vegetables are transported mainly using refrigerated trucks (reefers). Exporters and brokers may use their own or those belong to the importing country. Trains and air cargo facilities were rarely utilized for fresh produce. Customs, inspection and certification process took 4-5 days, but with the introduction of one window/one stop services, this has been reduced.

Some exporters are aware of the stringent market requirements of the EU, South Korea, Japan and other markets; however, they found the market requirements difficult to achieve due to limited control and management of the process which in principle started from farm selection, agriculture, harvesting and post harvesting practices, the cold chain and the traceability requirements. Collective and integrated efforts would be required to achieve these requirements throughout the value chain. This could be achieved through, commercial and contract farming and/or cooperative arrangements.

One exporter with 3500 hectares land had established contractual farming with 200 farmers. Unfortunately, about half of the farmers were unable to produce and supply the necessary quality product after receiving 100% initial payments. The root cause for why this happened should be studied. The exporter reported that he provided all the necessary inputs including fertilizers and pesticides as well as the necessary agronomist and plant protection expertise support. He indicated that the scattered location of farms made it difficult to control and manage the contracted farms.

The team visited another complex and integrated facility owned by German and Uzbek counterparts with more than 450 hectares of vegetable farms using furrow irrigation, 550 hectares of fruit using drip irrigation, 9 hectares of greenhouses, and 7000 tons cold storage with freezers, and processing facilities for cleaning, washing, peeling, jam, concentrate, and juice processing, filling and packing, drying and storage facilities. The drying unit has 60 tons/day capacity for drying of fruits and vegetables. This newly established complex facility, which has the capacity to export to new destinations with higher value export markets, is idle after one year. The main cause could not be explained during the visit. Priority should be made to understand the problems and facilitate the proper operation of the facilities.

A fruit freeze-drying facility owned by a major exporter was visited. The owner plans to export to the EU, Japan and South Korea, and has good hygienic and manufacturing practices in place. He has produced pilot products; the packaging line is in process.

Some of the exporters and producers are aware of the new ALCs initiative but do not well understand the function and main activities. Some consider it to be a potential monopoly. Consultation, awareness programs, and the establishment of positive relationship with exporters and producers will be required. The major partners for the ALCs are exporters, wholesalers and brokers and this relationship should be established starting from the project phase. Exporters, wholesalers and brokers were interviewed about their interest to participate as shareholders of ALCs if it were possible; almost all provided an affirmative response.

3.4 TRANSPORTATION SYSTEM AND TRANSPORTATION COMPANIES

3.4.1 REEFER TRUCKS

The private logistic center which provides service to all import/export products was visited. The center has parking for around 400 heavy trucks and storage capacity around 20,000 M^2 with an expansion project under construction. Few cold trucks were observed during the visit. There is no quarantine facility or cold storage room for fruit and vegetables, although there is one window service for plant quarantine, standards, sanitary, veterinary and customs. The one window service claimed to be an improvement over prior practices. However, there is limited knowledge of the procedures required for one window service and clearance with inspection and certification bodies including sampling and testing.

The ALCs should encourage the establishment of such facilities in different regions to linkup and integrate with warehouses and transportation facilities. The existing roads used by reefer trucks will require rehabilitation.

3.4.2 RAILWAYS

Trains are used by exporters for traditional export markets for fresh and dried fruits and vegetables products and to new export markets for dried products. Some trains have cold storage facilities, which have been in service since the Soviet Union. There is a plan by the government to expand service to China and other related destinations, updating services with modern and fast vehicles and equipment.

3.4.3 AIRWAYS

Uzbekistan Airways has 787 and 767 carriers with regular flights to Russia, UAE, Kazakhstan, South Korea, China, India and other destinations and is able to provide air cargo services at a 50% discount, for approximately $0.60 USD/kg. This price is only attractive for high value products, and there is limited service provided by the airways. Further studies will be required to identify potential markets for high-value fruits and destinations that would effectively utilize the air cargo facilities. The current capacity of the air carriers is underutilized as per the discussion made with the management staff of Uzbekistan Airways. The airport has also cold storage facilities which are not yet properly utilized. Moreover, Emirates and Turkish airlines are used to transporting fresh fruits and vegetables. The newly established ALCs could utilize these facilities with the identification of export destinations for high-value fruits and vegetable products.

3.5 PARTICIPATION OF THE PRIVATE SECTOR IN INVESTMENTS FOR ALCS

The establishment of ALCs via a public – private sector partnership (shareholder) could enhance ownership, confidence and commitment in the use of the ALCs infrastructure and services. During the visit, WFLO observed private sector development and capacity, meeting with corporations, shareholding companies, exporters, and private companies who own capital intensive and high-capacity infrastructure including warehouses, transport companies, processing companies, and cold storage facilities that could participate as partners with the ALCs. The participation of cooperatives and unions as shareholders to ALCs should also be encouraged. To effectively and efficiently utilize the ALC infrastructure and to provide credible and reputable services, well-defined and streamlined participatory management structures, responsibilities, authorities, activities, and market outlets would be required to build and enhance confidence and the participation of the private sector investment.

3.6 EXISTING PROVIDERS

Discussions with GoU representatives uncovered the need for the GoU to "inventory" the agri-logistics infrastructure in the country. This inventory is reportedly being undertaken at this time. The data should be analyzed in a follow-on assessment.

The WFLO team visited over 15 facilities during the field assessment. A summary of those facility visits (including details on facility size, operations, challenges and comments on the proposed ALC initiative) can be found in Annex.

3.7 COMPETITIVE ANALYSIS

In Samarkand, AgroMir Logistics LLC may be considered the primary competition, though they are designed to be fully vertical. However, if their assets are underutilized, it is in their best interest to purchase from local farmers thus mitigating the demand on the ALC in the region. This same concern is valid for the Gold Dried Food (GDF) company in Tashkent.

4. THE QUALITY INFRASTRUCTURE AND REGULATORY BODIES

4.1 THE NATIONAL QUALITY INFRASTRUCTURE AND UZSTANDARDS

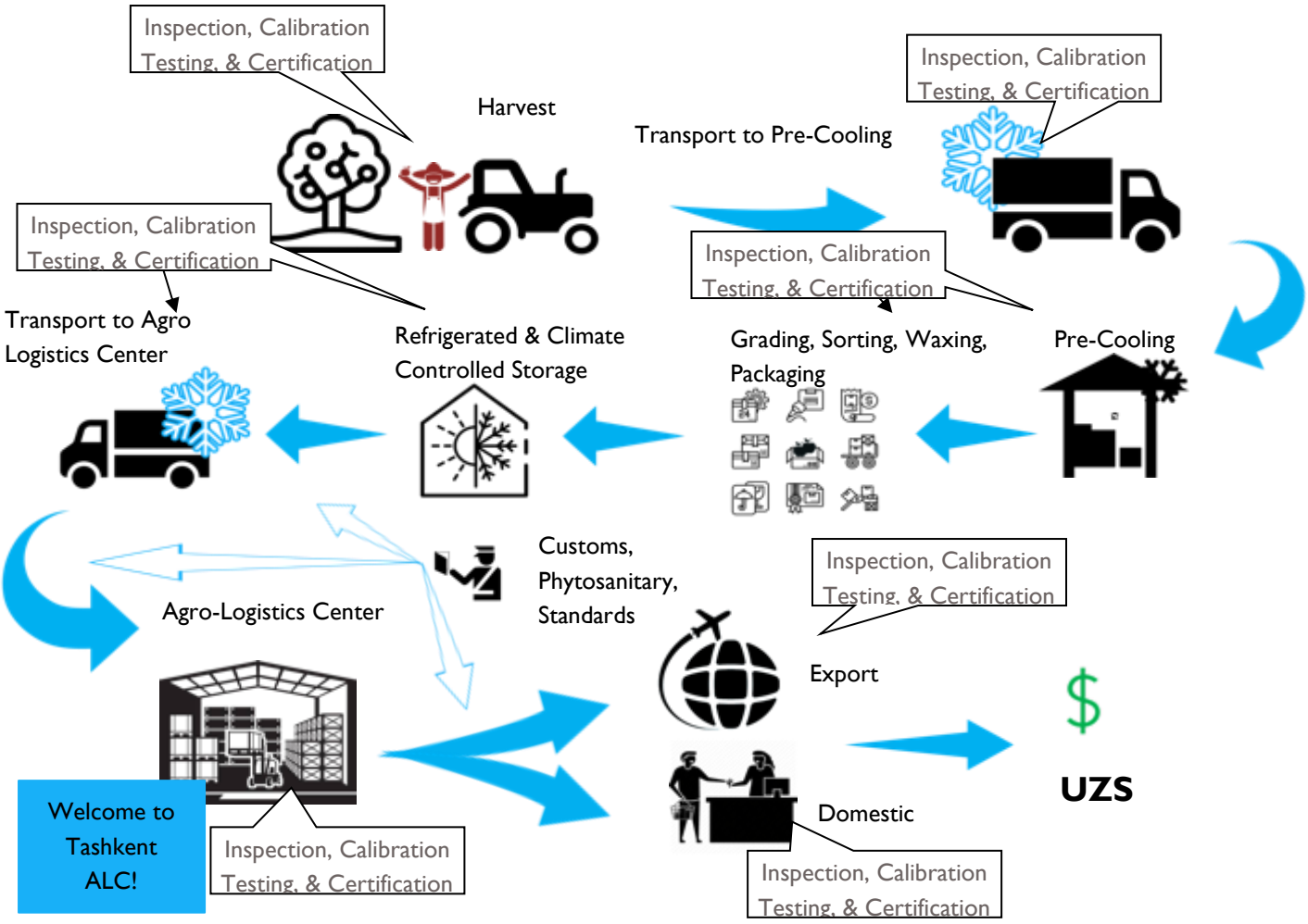
Quality infrastructure plays a significant role in facilitating trade and promoting and maintaining quality and food safety requirements. For ALCs to provide credible and dependable services they will need to be supported by accredited testing, certification, inspection, and calibration services which are the major component of the quality infrastructure along the value chain from farm to domestic and foreign markets, (see Fig 2 below). The role of quality infrastructure in the development and production of tradable, safe and high-quality fruit and vegetables and its contribution in the development of ALCs is well understood by Uzstandards.

Recently, Uzstandards has been restructured and established to accord with the practices of the National Quality Infrastructure. Accordingly, the four independent components – Standards Body, National Metrology Institute, Conformity Assessment Enterprises (Inspection, Testing, Certification), and the Accreditation Body – are independently established and held accountable to UZstandards, which is accountable to the Cabinet of Ministers. However, the newly restructured quality infrastructures are not yet internationally recognized. None of the service and certificates provided by UZstandards are internationally recognized except in the traditional market outlets (previous Soviet Union countries).

The capacity of certification and inspection bodies should be strengthened and accredited in support of ALCs for export to EU, Japan, South Korea, Indonesia, Dubai, North America and others with strict market requirements for fresh produces that may require GLOBALG.A.P. and Food Safety Certifications, using test results from accredited laboratories.

The government should enhance the technical competence of the national quality infrastructure by strengthening the NQI bodies and harmonizing the standards, offering mutual recognition of conformity assessments, providing knowledge-based decision making, and establishing standards portal agreements as required for export trade and effective control of imported products. The quality infrastructure bodies could provide periodical training and updated information on market and trade requirements for importers and exporters and on the influence and importance of quality infrastructure in foreign countries, including regional, international, overall global trade requirements such as the SPS/TBT WTO agreement.

Figure 2 The importance of testing, certification, inspection and calibration services in Agro Logistic Centers along the flow journey



The capacity of UZstandards has been evaluated in line with international competence and in recognition of the quality infrastructure. UZstandards has made some efforts to improve and maintain its recognitions including the following:

- It is now a member of ISO, an Associate Member of APAC and of BIPM. However, it is not a member of the international recognition bodies, ILAC nor IAF;
- Most standards are adopted from internationally recognized source such as ISO, Codex and related sources;
- Testing, inspection, certification and calibration services, and certificates are accredited by the Uzbekistan Accreditation Body; however, the Uzbekistan Accreditation Body is not internationally recognized, and the certificates issued by the overall UZstandards bodies could only be recognized within Uzbekistan;

- In recognition of the importance of accreditation, including regional and international recognitions, the Accreditation Body is working to be full member of APAC, and an affiliate member of ILAC and IAF to join step by step international recognition;

- The chemistry laboratory is accredited for proximate analysis by the Turkish Accreditation Agency (TÜRKAK),No: 333A TAŞKENT/ÖZBEKİSTAN and Accreditation Standard: TS EN ISO/IEC 17025:2012, File No: AB-1051-T for the list of tests for fruit and vegetable products: determination of pH, soluble solids, cadmium content, benzoic acid and sorbic acid concentrations, titratable acidity, mineral impurities content and ash insoluble in hydrochloric acid. It could be considered as a good start, however, the most important requirements for countries willing to pay premiums for fruit and vegetable products are pesticide residue, heavy metals, mycotoxins, and microbiological analysis.

- The labs facilities were briefly visited. The chemistry laboratories are equipped with some new equipment (about 2 years old) including ICP-MS, and 7000D GC-MS Triple Quad and HPLC with UV and Fluorescence detectors. ICP-MS and GC-MS were used by the laboratories for determination of heavy metals, organochlorine and organophosphorus pesticide residues, respectively. These expensive and high-tech equipment are placed in congested laboratory room.

- Nine calibration facilities are available in the country with plans to establish 21 calibration facilities.

- Standards are harmonized within the traditional markets; there are memorandums of understanding with 48 countries established;

- World Bank allocated about 20 million USD to enhance the capacity of UZStandards including laboratories but this has not yet happened; this amount of funds with additional building structure to be established by the government of Uzbekistan could enable the laboratories to build up the necessary capacity in terms of equipment and technically competent manpower to become accredited for major tests required for food safety standards and market requirement of high-valued export products. However, a minimum of 2-3 years capacity building programs is required to acquire such recognitions.

In general, there are encouraging developments to enhance the capacity of the laboratories, inspection, calibration and certifications services; however, these services are not yet recognized internationally, and much effort and intensive and extensive capacity building programs are needed. Further assessment on the capacity of existing facilities, manpower and services are also required to provide program-specific recommendations and objectives.

4.2 PLANT QUARANTINE INSPECTION

To enhance the production and export of fruit and vegetables products and to facilitate the sanitary and phytosanitary inspection and certification procedures, the government has also restructured (since last year) the regulatory bodies of the plant quarantine and food safety inspection and certification bodies, which are accountable to the Cabinet of Ministers. The capacity of the plant quarantine service was also evaluated with the following findings:

- IPPC (International Plant Protection Conventions) standards and evaluation tools and codex standards are used for inspection;

- They are currently working to be the IPPC official contact point representing the country;
- Inspection services and phytosanitary certificates are issued in import/export outlets (12 regions) and agri-logistic facilities;
- They evaluate the imported country's Phytosanitary certificates;
- Quarantine facilities are owned at import/export outlets;
- They are involved in pest scouting, reporting and receiving reports, and overall pest risk analysis;
- They are involved in sampling activities that are tested by UZstandards and/or Ministry of Health.

The inspection services and quarantine services are conducted by a newly established organization which was detached from the Ministry of Agriculture. Its service and certificates are not yet well recognized by importers the high value market of the EU, Japan, South Korea, North America, and UAE. In line with the development of the ALCs, strong support and capacity building programs are required to include better inspection and sampling tools, electronic reporting system and issuing of phytosanitary certificates, mobile laboratory facilities, transportation facilities (motorcycles or vehicles) for inspectors and intensive training for inspectors to enhance the competence of staff and to acquire international recognitions.

4.3 SANITARY EPIDEMIOLOGICAL INSPECTION

The sanitary and epidemiological inspection organization is also a newly established organization (about two months prior to this assessment in October 2019), detached from the Ministry of Health (MoH) and established as an independent institute in support of the new initiative for the development of fruit and vegetables production and export and ALC projects. This organization has the following capacity and planned activities:

- 28 staff members now, but planned to have 4000 employees/staff for overall hygiene and sanitary inspection within the country including supermarkets, wholesale stores, cold storages, pack-houses, cold trucks, railways, etc.;
- Will be involved in sampling activities for analytical services to be provided by UZstandards and the Ministry of Health;
- Well aware of the Codex and ISO standards and the Central Asia Regional Economic Cooperation (CAREC) food safety Programs;
- Has established good contacts and working with the National Codex Contact Point (MoH);
- Support requested to launch its inspection services include inspection and sampling tools, transportation for inspectors, and capacity building programs;
- Inspection and certification at import/export outlets and ALCs will be provided by the Sanitarians under the Ministry of Health.

4.4 INTERNATIONAL INSPECTION & CERTIFICATION BODIES IN UZBEKISTAN

Cert Certification and Wakefield Inspection Services were interviewed the discussions summarized below.

- Wakefield Inspection Services, the main inspection service was focused on cotton, but had recently shifted to fruit and vegetables. Currently it has limited inspection service and the number of staff reduced from 33 to 4.

- The main international certification bodies operating in Uzbekistan include: Cert Certification and TUV (major certification body and also provide regular training courses) followed by DQS, SGS, Slovak certification, Geek Certification, Intertek, CUC, etc. most of the certification focused on ISO 9001 Quality Management System (90-95%), ISO 22000 Food Safety Management System (5-10%), and GLOBALG.A.P. about 2 or 3 farms;

- Cert Management also provides training courses on different management systems and for auditors (IRCA registered);

- The accreditation body SNAS (Slovak) and TURKAS (Turkey) are also operating in Uzbekistan.

There was limited demand by producers and exporters for international certifications. This demand will certainly increase with the development of ALCs and export market to higher value export destination with strict demand for quality and food safety requirements.

4.5 STRENGTHEN THE NATIONAL FOOD SAFETY CAPACITY AND ENHANCE THE PARTICIPATION AT REGIONAL LEVEL

The state standards[1] "GOST" inherited from the former Soviet Union, are not compliant with the Codex standards and guidelines that the WTO uses for food safety measures. These should be replaced with the Russian Federation's accession to the WTO in 2012, and those implemented neighboring countries such as Kyrgyzstan, Tajikistan, and Turkmenistan. These countries are working on the implementation and establishment of a national food safety program with responsible authorities supported by FAO and IAEA.

The Uzbekistan government could implement a series of food safety programs to assist producers, regulators, and consumers with the implementation of food safety for production, distribution and consumption of wholesome and safe food, especially for export markets. Program initiatives could include the following:

[1] THE GOST STANDARDS COVER ENERGY, OIL AND GAS, ENVIRONMENTAL PROTECTION, CONSTRUCTION, TRANSPORTATION, TELECOMMUNICATIONS, MINING, FOOD PROCESSING, AND OTHER INDUSTRIES.

- Establishment of an Integrated Food Safety Control System;
- Establishment of food safety information-education-communication-training (IECT) system;
- Establishment of comprehensive food safety policy and strategy;
- Establishment of comprehensive food law and updated food safety regulations;
- Establishment of competent analytical capacity & monitoring capability;
- Establishment of organized epidemiological system and sound science-based risk assessment;
- Strengthen and enhance private sector development (food safety management system implementation, self-assessment and third-party certification); and
- Establishment of Food safety fund.

At the regional level, there should be harmonization of regional standards, mutual recognition of certifications and analytical results, laboratory networking, and the launching of inter-laboratory comparison initiatives and programs, as well as participation in the Food Safety Asia Network. This is a regional food safety collaborative arrangement drawing participants from Asia (including several Middle-East) and the Pacific, supported by IAEA and FAO.

The Central Asia Regional Economic Cooperation (CAREC) Program is a partnership of 11 countries (Afghanistan, Azerbaijan, People's Republic of China, Georgia, Kazakhstan, Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan and Uzbekistan) and development partners working together to promote development through cooperation, leading to accelerated growth and poverty reduction. The Program is in pursuit of its long-term vision of "Good Neighbors, Good Partners, and Good Prospects."

The CAREC corridors and Belt and Road Initiatives are:

- **The Almaty–Bishkek Economic Corridor (ABEC)**: the pilot economic corridor under the CAREC program, the biggest city of Kazakhstan and Bishkek, the capital of Kyrgyzstan,
- **The Shymkent-Tashkent-Khujand Economic Corridor**: links Kazakhstan's city of Shymkent with the capital of Uzbekistan Tashkent, and the city of Khujand in Tajikistan. The three cities and adjacent areas are within easy access to each other and they have a relatively large population – about 15% of the total population of Central Asia live in the Turkestan, Tashkent and Sughd regions.

Please see Annex 5 for a Summary Table on the Requirements for Phytosanitary, Food Safety & Quality Infrastructure.

5. TRADE FACILITATION BY GOVERNMENT OFFICES

5.1 UZAGRO-EXPORT

The management staff of UZAgro-export were interviewed and informed the team that the organization is newly established with 15 technical professionals but plans to increase its staff to have availability in different potential regions. Responsibilities, among others, include the following:

- Maintain awareness of the market requirements of potential export destinations, compiling the requirements and documents, and distribute them to the respective organizations as required;
- Organize study tours and training courses to exporters and development support and regulatory agencies;
- Compile and disseminate production, import and export and updated data;
- Serve as the documentation center for import and export requirements and import/export data as required;
- Facilitate Memorandum of Understandings with different export destinations; and
- Assess better market access and promote export products to different export destinations.

The organization started to execute the above activities and responsibilities; however, they require technical support and information for the services to be provided.

5.2 UZAGRO EXPORT BANK

The UZAgro Export Bank was also established to support the fruit and vegetable sector development and exports in support of the new initiatives and planned ALCs. As informed by the management staff of the Bank, responsibilities are:

- Availability with one window service in logistic centers;
- Facilitation of import and export activities including foreign exchange services;
- Loan incentives for producers and exporters with 5% interest discount; and
- Collaboration with other banks and microfinanciers to provide loans for farmers and small holders with similar discount.

5.3 MINISTRY OF TRANSPORT

The Ministry was also established in Feb 2019 in support of the new market initiatives and ALCs with the following responsibilities:

- Play the coordination role for the agri-logistic center to facilitate truck, train and air transport services at reasonable prices for producers and exporters;

- Coordinate trains with more than 200 cold carriages each having more than 4 with capacity to carry 40 tons, in total more than 40,000 tones, which may not be enough with the current plan to enhance the export performance of fruits and vegetables; and

- Plan expansion and establishment of new infrastructure projects including railways, asphalt roads and airports. For instance, they will facilitate the railway projects intended with the bordering countries of Kyrgyzstan, Afghanistan and Kazakhstan, linking to different Asian countries and the rest of the world.

6. COMPARATIVE ANALYSIS

Three case studies, located in Annex I, are the basis for a comparative analysis of the proposed ALCs in Uzbekistan. India provides an example of a plan that has not succeeded as originally envisioned. Turkey provides an example of steps taken to gain access into the European and worldwide trade networks via increasing transit flows. Finally, the Fresh Exports study provides a model of how a multi-functional aggregation and distribution center for fresh fruits and vegetables incorporates best practices to ensure a seamless cold chain that prioritizes safe, high quality food. It presents a case study closest to the one-stop shop concept.

6.1 RELEVANT DESIGN PRINCIPLES

The Indian scheme to develop mega food parks (MFPs) planned to operate in a hub and spoke model. It envisaged a comprehensive backward linkage by tying up with farmers and traders to procure quality raw material from the farms while also offering the opportunity to link with multinational companies and large retailers controlling the entire process from raw material procurement to preservation, testing and transportation facilities. The MFPs integrate backwards with producers and forward with the consumer markets.

The Turkish logistics infrastructure shows a high density in the industry clusters Istanbul, Gebze/Kocaeli, Bursa, Izmir, and Ankara, but the country was missing an integrated transportation and logistics strategy. In 2005, 11 intermodal freight centers were put on the government's official agenda. With support of private equity loans, these freight centers increased transportation potential by approximately 25 million tons. In addition, 5.6 million m^2 of logistics space will be ramped up for warehousing and value-added service offerings.

The Fresh Point case study lays out the operational best practices that will be expected of the ALCs if they wish to provide fresh fruits and vegetables to higher end markets. Planning for the proper location and construction of the facilities represents 50 percent of what is required to ensure the ALCs are successful. The operational practices are the other critical 50 percent.

6.2 APPLICABILITY IN UZBEKISTAN

The primary lesson learned from the India case study is the need to understand the demand and design conditions for each facility. The India food park plan was established by the government in a supply-driven model that did not account for the financial viability by negating to examine the availability of land, capital, and labor, as well as the need to seek strong supporting institutions. With a fragmented industry dominated by a large number of small manufacturers, the rentals were too high in the food parks due to

improved infrastructure. Promoters are not able to attract units as there are no direct benefits/incentives available for units to enter them resulting in under-utilization of infrastructure created there. Uzbekistan can learn from the challenges faced within India to lay the foundation for a more viable plan for the ALCs.

The Turkish case study presents an example of a successful plan, driven largely by privatization and de-centralization. Rather than emphasizing production and other processes, the logistics centers focused on transportation and logistics. Similarly, in Uzbekistan, the WFLO team believes an emphasis on transshipment and product movement efficacy will be key to the success of the ALCs especially as Uzbekistan enjoys the logistical advantage of being central to most of its trading partners.

In WFLO experience, it is common for nascent cold chain industries to disregard best practices in the initial growth phases. However, these practices are critical for countries to compete with sophisticated industries and attract higher-end markets. The practices laid out by the FreshPoint case study should be incorporated into the planning phases of the ALCs.

7. RECOMMENDATIONS

The proposed ALC project describes agriculture "clusters" in the growing regions which will focus on financing, training, equipment and energy toward strengthening the Integrated Cold Chain (ICC) components (Links). The ICC links (in process order) are:

- In-field sorting
- In-field pre-cooling or transfer to a pre-cooling facility
- Grading, sorting, washing, waxing, packaging, and additional value-added services conducted in a refrigerated processing center.
- Cold Storage/handling
- Transfer via refrigerated transportation to export market, or
- Forward linked to distribution facilities (domestic market)
- In addition to these links, consideration must be given to increasing logistical needs such as supporting the development of manufacturing and assembly of plastic crates, wooden crates, pallets, corrugated boxes, and access to equipment

Based on this understanding of the infrastructure requirements at the various links within an Integrated Cold Chain, the WFLO recommends the following actions for consideration by GoU in the implementation of the ALC vision.

7.1 PROVIDE AGRICULTURE EXTENSION SERVICES TO IMPROVE PRODUCTION

The ALCs will be dependent upon volumes and high-quality produce which results in the need for Agriculture Extension Services. This is critical to improving all aspects of crop production from seed, germ plasm, plant spacing, husbandry, and harvest, through the cold chain to final retail or export delivery. This

will strengthen the ability to improve the quality of crops from pre-planting all the way through final sale and will yield greater volumes through enhanced field-level knowledge and production practices.

The establishment of more greenhouse horticultural crop production would also improve the quality of production. The GoU may consider researching other high value export-focused crops to augment the existing crops such as apples, cherries and grapes. Generally, it is recommended to encourage quality over quantity, and focus on the value proposition as opposed to production volumes.

7.2 RECONSIDER ALCS AS A ONE-STOP SHOP FOR PRODUCE HANDLING & DISTRIBUTION

Currently, the ALC concept is being considered as a 'one-stop shop' for all logistics and handling for export-oriented horticulture. However, this is not aligned with international best practice, where various handling and processing procedures are disaggregated. Therefore, the GoU should consider the following:

- Physically separate the individual links of the ICC from the market center, allowing multiple facilities related to each of these links to work as "clusters" where they will have the greatest impact in the various districts of the growing regions, and expand this infrastructure naturally as economic conditions allow.
- Remove the "dirty" post-harvest activities (e.g., rinsing/cleaning, grading, sorting, packaging, pre-cooling, etc.) activities from the ALC. During the field trip, WFLO experts explained that, primarily for sanitation considerations, this separation of functions is standard operations in most developed markets. It was further noted that in Spain and France, these activities were not present. Those ALC were domestic-facing as opposed to export-facing, and furthermore, they received only finished goods product, not raw products.

7.3 CONSIDER ALCS AS MARKETING & LOGISTICS CENTERS RATHER THAN PRODUCTION AND PROCESSING-FOCUSED CENTERS

The emphasis of the ALC should be on trans-shipment of high-value horticulture to large domestic markets or export markets. Currently, as it reads, the ALC proposal seems to focus more on handling and processing, rather than on product movement to market. The former is typically done in specialized facilities. The emphasis of the ALC should be on product distribution efficiency, by serving as a gathering point for buyers, sellers, and transportation assets. As such, the ALC will need to have adequate parking and facilities for all stakeholders involved (even carrier drivers).

The original business model included as related to the team was a straight fee for service design, managed by a General Contractor, with service subcontractors leasing space and equipment within the ALC. The WFLO recommends consideration of a modified business model as provided for in the table below.

ALC BUSINESS MODEL RECOMMENDATIONS	
ORIGINAL BUSINESS MODEL	SUGGESTED BUSNESS MODEL
ALC chooses a GLOBALG.A.P. Certified Management Company to oversee the entire ALC and all tenants who charge fees for services.	Farmers bring or service providers pickup products and deliver to local "Cluster Service" provider to begin immediate post-harvest services, including sorting, grading, waxing, cleaning, chemical application, hydro pre-cooling, vacuum pre-cooling, forced-air pre-cooling, etc. The farmers typically pay the service providers directly for these services.
The GoU owned ALC owns all of the equipment that provides the services, and the tenants are charged rent/lease for their space and usage of equipment	Transportation Provider picks up product from pre-cooler/packing house and delivers it to the ALC refrigerated warehouse for short- or long-term warehousing. The ALC pays for this transportation and charges it back to the farmer as a deduction from the sales price of their product at the (MC) Market Center.
Farmers bring products to the ALC and have all of the services performed for them, sorting, grading, pre-cooling, put away into storage, etc. The farmer is charged for this service (most likely based on tonnage) by the various tenants/service providers.	MC chooses a GLOBALG.A.P. Certified Management Company to oversee the entire MC and all CERTIFIED (GLOBALG.A.P., HACCP, and ISO 22000) tenants who charge fees for services. The GoU owned MC owns all of the equipment that provides the services, and the tenants are charged rent/lease for their space and usage of equipment.
Traders/Buyers visit the ALC and assess the samples of each product they are interested in and in an auction format, bargain with the ALC management on the price to be paid per ton.	Traders/Buyers visit the ALC and assess the samples of each product they are interested in and in an auction format, bargain with the ALC management on the price to be paid per ton.
Trader/Buyer pays at the "window" for the product.	Trader/Buyer pays at the "window" for the product.
Trader/Buyer goes to the Customs desk, pays and receives all documentation for product transfer across border.	Trader/Buyer goes to the Customs desk, pays and receives all documentation for product transfer across border.
Trader/Buyer can bargain with trucking/carriers, rail, air desk to transfer product and pays them OR, the Trader/Buyer can supply his own transportation.	Trader/Buyer can bargain with trucking/carriers, rail, air desk to transfer product and pays them OR, the Trader/Buyer can supply his own transportation.
Product exits the building via one of the Transportation Modes with all certifications for GLOBALG.A.P. compliance, and all GoU Customs requirements.	Product exits the building via one of the Transportation Modes with all certifications for GLOBALG.A.P. compliance, and all GoU Customs requirements.

Finally, the WFLO recommends that the GoU support and enhance the clusters to facilitate the ICC as it will take a strategic focus on all levels to develop it effectively.

7.4 CONDUCT A QUANTITATIVE DEMAND ASSESSMENT TO DRIVE DECISIONS ON DESIGN AND LOCATION OF PROPOSED ALCS

The WFLO team recommends that the GoU reconfirm the locations of ALC services that have been pre-identified by gathering verifiable support data to confirm that there is sufficient incoming post-harvest volume available to keep the proposed ALC facilities operating and feasible.

ALC design and all related infrastructure should be based on demand and production data. The WFLO team recommends the GoU carefully track the production volumes of export grade produce, and as the tonnage grows, begin construction of the market centers at the optimal time. Then, the high value crops can be supplied to the market centers when there is sufficient production volume to meet the high volume demands of the processing lines, as well as the continuous volume of export bound products and domestic Tier 1 market consumers, such as hotels, restaurants, institutions and high-income households.

To develop the export of fruits and vegetables to high-margin markets, producers need to be introduced to the food safety production requirements. Premium markets demand food safety, which is why dealing with fresh agricultural products is subject to various legal and other buyer requirements. Producers and exporters of Uzbekistan should understand the market demand so that that they can be educated of the most common requirements and standards, as well as the specific requirements that apply to markets such as organic fruit and vegetables.

7.5 DEVELOP THE ALC MASTER PLAN IN PHASES

Each ALC should be designed to service the local horticulture products in the most economically profitable manner, as informed by market demand and farm production data. For example, it is possible that the Tashkent ALC will support the retail and wholesale needs of the domestic market of Tashkent. If this example is accurate, this ALC would focus largely on local distribution, often in the mornings or late evenings, and utilizing small and large vehicles for distribution. Distribution "hubs" are generally established in logistically advantageous areas, to reduce the time, resources, and cost needed to receive, process, and ship the products they serve. This model is followed in North America, Europe and South Africa by all of the leading ICC and distribution-based companies, and they continue to expand this model as they grow into new service areas, such as Asia and South America.

Conversely, Andijan, being a large producer of high value horticulture, may be "Direct to Export" focused, and be designed to rapidly receive, process, and ship on large trucks, rail, or possibly by air to new target markets as they emerge. Regardless of these examples, expert analysis of data will lead the GoU to the most advantageous site-specific design and focus of each Agri-Logistics "cluster."

Most likely, the Tashkent ALC would be the largest. All facilities need to be designed to efficiently receive and ship including export and import. They will need to have a modern warehouse management system (WMS). There should be a master plan for each facility, and it should be completed in phases, starting with the most profitable operations.

To support the ALCs, the GoU should continue to improve nationwide systematic program for road quality improvement on secondary and tertiary roads near agro-producing areas. All harvested crops begin their journey on tertiary and secondary roads before they reach the large highways. Road systems are a consideration the final location of the ALCs.

7.6 EXAMINE POTENTIAL BENEFITS OF PRIVATE SECTOR ALC OWNERSHIP

As a core partner of the GCCA, the trade association representing the businesses involved in the cold chain, WFLO experience with international best practices has demonstrated that the greatest success and sustainability with cold chain investments occur when they are developed and managed by private sector actors. The idea that ALCs should be owned by a set of private businesses that rely on small business owners to be experts in their various fields/cold chain segments, should be examined in the context of Uzbekistan as this model usually promotes the greatest efficiencies, and therefore profitability. Alternatively, the ALCs can be structured initially as parastatal entities, with 50% owned by the government and 50% owned by private businesses via a public private partnership or PPP.

7.7 COMMISSION THE GATHERING OF ADDITIONAL DATA

The WFLO team cannot make a firm recommendation for developing the ALCs, given the numerous variables that have yet to be determined, such as, but not limited to the availability of personnel to staff these facilities; availability of specialists to train management and staff personnel onsite at the ALCs; the management and the operations staff's ability to grasp the necessary criteria to assume ever-increasing leadership/ownership roles; and the wide variances in situations arising from the seasonal availability of incoming horticultural volume, and, the physical condition of that volume. Such data will be used to determine and justify the size, location and operations of the ALCs as well as an appropriate timeline for their development. WFLO has requested the required quantitative data from the MoA to develop the recommendations above. These requested data sets are included as Annex 7 in this report. If the MoA is not able to provide this data, WFLO recommends that a follow-up assessment is conducted to gather necessary data to confirm the assumptions. Once the data is available for the research team to analyze, the following information can be obtained and further provided:

1.1. Location 1 (Tashkent)
  1.1.1. Size – Facility Design
  1.1.2. Services
  1.1.3. Operations
  1.1.4. Support elements (technology, warehouse management systems, etc.)
  1.1.5. Business model
  1.1.6. Ownership type
  1.1.7. Pathway to sustainability
  1.1.8. Environmental
1.2. Location 2 (Andijan)
  1.2.1. Size – Facility Design
  1.2.2. Services
  1.2.3. Operations
  1.2.4. Support elements (technology, warehouse management systems, etc.)
  1.2.5. Business model
  1.2.6. Ownership type
  1.2.7. Pathway to /sustainability
  1.2.8. Environmental
1.3. Location 3 (Samarkand)
  1.3.1. Size – Facility Design
  1.3.2. Services
  1.3.3. Operations
  1.3.4. Support elements (technology, warehouse management systems, etc.)

1.3.5. Business model
1.3.6. Ownership type
1.3.7. Pathway to sustainability
1.3.8. Environmental

7.8 INTEGRATE ALCS WITH EXISTING INFRASTRUCTURE

The existing capacity of cold stores might be sufficient to store current volumes, however the majority of the existing cold chain infrastructure as observed by the team, with a few exceptions, is rudimentary, idle or lacking altogether. For example, critical pre-cooling sites, refrigerated facility sites, field packing operations, receiving, cleaning/rinsing/sorting/sizing/packaging sheds are often missing, preventing an integrated cold chain. However, certain structures and infrastructure may exist in the areas recommended for ALC's which may be useful to include in the cluster scheme. To integrate the existing cold stores with the planned ALCs, the GoU should conduct a thorough assessment and diagnostic analysis to identify the potential cold stores that could easily be integrated with minor improvements and retrofitting, and those that require complete rehabilitations. The potential for implementation of the proper storage/stacking discipline and handling practices, good hygienic and manufacturing practices should also be assessed.

7.9 INCORPORATE EDUCATION AND TRAINING ON WAREHOUSE OPERATIONS AND FACILITY MAINTENANCE INTO ALC PLANNING

Thorough and on-going employee training utilizing globally recognized industry association based expertise, university programs, or a cooperative effort between those two entities is essential to opening and successfully operating any and all links in the ICC framework, including large facilities like terminal markets, packing-sheds, pre-cooling, ripening, and distribution centers. The GoU should enable, or contract with, one or more globally recognized institutions and associations to provide certified, curriculum-based education in universities and within agencies and encourage small and medium businesses to gain certifications and degrees. The WFLO team recommends the GoU coordinate with academia, and the private sector as when these three institutions are aligned in a set of common goals, it is possible to reach those goals more effectively and quicker. The GoU may consider mandating and enforcing professional and associated practices.

In line with the training, a common comprehensible definition of the ALC should be established including the general and specific functions. This information should be relayed to all levels of the ICC and must include farmers, growers, cooperatives, traders, entrepreneurs, and other businesses involved throughout the supply chain.

7.10 ESTABLISH A PLAN TO ACCESS THE SEA TO REACH HIGH-VALUE EXPORT DESTINATIONS

Uzbekistan is a double land-locked country, with transportation systems based on refrigerated trucks, railways and airways. This could present serious challenges and increase the transport costs for higher-value export destinations, affecting the competitiveness of fruit and vegetable exporters and limiting the export destination to neighboring countries, the traditional markets. Transport via sea could facilitate export into other Asian countries (Japan, Indonesia, South Korea) the European Union, and North America.

7.11 ESTABLISH AN INTEGRATED PLANT PROTECTION AND FOOD SAFETY CONTROL SYSTEM

The accreditation, inspection, system and product certificates issued by UZstandard is not recognized internationally, and the accreditation body is not a member of the International Laboratory Accreditation Cooperation (ILAC) or International Accreditation Forum (IAF).The plant quarantine inspection services also lack representation with the International Plant Protection Convention (IPPC) and has limited capacity, inspection tools and manpower to provide documented information and dependable services. Finally, the newly established Sanitary Epidemiological Inspection service does not have the necessary manpower, knowledge, documented information and inspection tools to provide hygiene and sanitary inspection in wholesale stores, cold storages, pack-houses, and during transport. An integrated plant protection and food safety control system including maintaining traceability, the required quality and food safety requirements should be established. The conformity assessment services of UZstandard including the laboratory services should be strengthened to provide reliable and credible analytical services on pesticide residues, heavy metals, environmental contaminates, additives, adulterants, mycotoxins and microbiological contaminants; and possibly consider internationally recognized and accredited HACCP, food safety, and possibly GLOBALG.A.P. certifications. The inspection and certification services of the considerable number of international recognized inspection and certification bodies operating in Uzbekistan could also be utilized to support the ALCs services. The Plant Quarantine Inspection and Sanitary Epidemiological Inspection services should be strengthened by competent and trained manpower, inspection tools, laboratory equipment, infrastructures and transportation services.

7.12 STRENGTHEN TRADE FACILITATION ORGANIZATIONS

Trade facilitation organizations recently established by the GoU, which are accountable to council of Ministers including UZAgro-export, UZAgro Bank and the Ministry of Transport, should be strengthened to spearhead the role of coordination, facilitation and promotion of the ALCs and exports.

7.13 SEEK DONOR ASSISTANCE TO BUILD CAPACITY THROUGHOUT THE SUPPLY CHAIN WITH A FOCUS ON GLOBALG.A.P. AND FOOD SAFETY CERTIFICATIONS

The technical support offered by organizations such as FAO, GIZ and USAID should be incorporated with the initiatives of the ALCs. Assistance offered by these organizations should focus on strengthening the capacity of the quality infrastructures, inspection, and certification bodies and enhancing the technical capacity of those involved in training and consultancy services, as well as the production, transportation, distribution and export of fruit and vegetables to achieve food safety requirements and GLOBALG.A.P. by accredited certification bodies.

7.14 PROVIDE SUPPORT AND INCENTIVES TO SMALL HOLDER FARMERS TO ADOPT INTERNATIONAL PRODUCTION STANDARDS

The GoU should provide aid and repayment support to smallholder farmers for adopting certifications to meet International Trade Standards such GLOBALG.A.P., ISO, Codex, etc. Additionally, there may be other GoU-based incentives that could incentivize the farmers such as tax incentives for a period of time for all export grade production. Farmers might also be incentivized to produce a data and market driven alternative crop base to work in-conjunction with the existing crop array (cherries, grapes, onions,

potatoes, carrots, etc.) to expand the availability of many products, and to reduce the common glut of same products in the growing areas.

Additionally, the GoU should continue to reform food standards and practices and enable enforcement agencies concurrently. If the Government invests in effective, professional enforcement of food standards, including domestic products, it can rapidly raise the cumulative bar on all foods, thus reducing foodborne illnesses and associated costs, and increasing food export potential.

While encouraging the adoption of food safety standards, the GoU should establish a list of standards for post-harvest activities as related to agricultural personnel safety and related to crop phyto-sanitary foundation practices. Examples may include:

- No product allowed on bare floors;
- All products placed upon pallets at all times; and
- Provide safe and clean areas for employees to wash hands, change clothes, etc.

7.15 CONSIDER A VISIT TO SHYMKENT, KAZAKHSTAN TO LEARN ABOUT THEIR EXPERIENCE WITH AN ALC.

There are several examples, including those described in the case studies, that could provide a valuable learning experience. However, WFLO experience with study tours has been that they are most effective when the difference in the industry's level of sophistication is not as stark. For example, regional study tours tend to inspire competition and an understanding of what is not only possible but feasible. particular, the logistics hub build in Shymkent would be an excellent opportunity to learn from the challenges and successes of a neighboring country.

ANNEX 1: CASE STUDIES

ANNEX 1A: INDIA MEGA FOOD PARK SCHEME (MPS)

OVERVIEW:

The 'Food Park Scheme' (FPS), introduced in 1992-93 has evolved through three phases over the past 24 years. In the first phase (1992-93 to 2007-08), state governments had been entrusted with the responsibility of promoting food processing industrial estates/ parks. The common facilities were funded by the Central government subject to a maximum of Rs 40 million (approximately US$ 565,000) for each park. However, these food parks were conceptualized in a traditional 'industrial estate' mode with no forward and backward linkages within the supply chain.

In order to provide a major thrust to food processing a paradigm shift was introduced in the approach towards food parks when a 'Mega Food Parks Scheme' (MFPS) was introduced in 2007-08. While the FPS focused on the role of state governments in setting up these parks, the new scheme (MFPS) was designed to attract private investment in creating state-of-the-art infrastructure for food processing in the country.

At present, 17 of the planned Mega Food Parks are operational.

WHY SELECTED FOR CASE STUDY:

The India Mega Food Parks Scheme is a relevant example of a government managed food distribution logistics project, similar to the ALC project in Uzbekistan. It is also an example of the challenges for the "one-stop shop" vision for food handling and distribution, which is also what is being considered by the Government of Uzbekistan. The fact that there are similar products, infrastructure and maturity levels of cold chain markets make it appropriate to explore.

DESCRIPTION OF PROJECT:

A salient feature of the new MPFS scheme is that it operates in "hub and spoke model," comprising Collection Centers (CCs), Primary Processing Centers (PPCs) and a Central Processing Center (CPC). The CPC is promoted as a hub. It has food processing units with industry-specific common infrastructure, packaging, environmental protection systems, quality control labs, testing facilities, and trade facilitation centers. This is connected with PPCs which offer cleaning, grading, sorting and packing facilities; dry warehouses; and specialized cold stores including pre-cooling chambers, ripening chambers, mobile pre-coolers and mobile collection vans. These PPCs in turn are connected with CCs which are managed by farmers, self- help groups or local entrepreneurs as farm level aggregation points for adjoining areas. The CPC, PPCs and CCs may be located in a radius of 100-120 km from the hub. The objective was to promote efficient supply chain management from farm gate to retail outlets. The CPC spreads over 50-100 acre of land for Central processing. In addition, 2-5 acre of land is required in surrounding region for setting up PPCs. These parks are implemented by Special Purpose Vehicles (SPVs). The Central government offers financial assistance up to a maximum of Rs 500 million (approximately US$7,000.000) for common infrastructure and facilities for backward and forward linkages Under the 12th Plan, in 2012, the scheme entered the third phase when a scheme for 'Mini Food Parks' was also proposed to cater to the need for smaller states. The private developers of mini parks are proposed to be entitled to a maximum grant of Rs 200 million from the Central government.

In addition, MFPs also offer regular infrastructure required for running successful business such as road network, drainage, power supplies, and telecommunications. While all food parks offer agglomeration economies, the MFPS introduced in 2007- 08 envisages a comprehensive backward linkage by tying up with farmers and traders to procure quality raw material from the farms. It also offers opportunity to tie up with multinational companies and large retailers for marketing by controlling the entire process from raw material procurement to preservation, testing and transportation facilities. In this ecosystem, food parks are integrated backwards with producers and forward with the consumer markets. Thus, the shift from traditional industrial food park to mega food parks has been a paradigm shift in policy making to develop the industry.

WHAT MADE IT SUCCESSFUL OR WHAT MADE IT FAIL:
Contrary to expectations, however, the performance of MFPS also remains far from satisfactory. Until now, 37 proposals have been accorded final approval. Of them, 17 are operational.

The scheme has been subjected to several independent evaluations over the past few years and several reasons have been offered for unsatisfactory performance.

FACTOR CONDITIONS:
At the core of their poor performance is a lack of the availability of three key factors: land, capital and labor. Land is the basic requirement for such parks. At least 50 acres of land for the project is to be arranged by the SPV in which the anchor investor holding majority holding is required to set up at least one food processing unit with an investment of not less than Rs 10 crore. Land acquisition of at least 50 acres has been a challenge for a company that is not in real estate business.

COMPETITION AND RIVALRY:
The initial policy of allocating one project to each state has led to some good proposals not being selected in larger states. Under the current policy, one district can have only one food park. These conditions curtail competition and tend to create inertia.

SUPPORTING INSTITUTIONS:
These are large projects that require constant government support and incentives throughout their implementation. The ministry has drawn up a panel of Activity Management Consultants (PMC) to support implementation of the projects but their role is limited in the issues pertaining to land, statutory clearances and bank loan. Further, there are tenuous delays in bureaucratic decisions and procedure of obtaining various types of statutory clearances from state government departments/ agencies are complex and time taking.

SUPPORTING INFRASTRUCTURE:
Successful clusters include supporting actors such as universities, standards-setting agencies, vocational training institutions, research community, and financial institutions. In contrast, most other parks are located in isolated areas with no such ecosystem.

DEMAND CONDITIONS (DEMAND FOR MFPS):
This industry is fragmented and has been dominated by a large number of small manufacturers. In 2011, the 5-firm concentration ratio was 34%. The share of informal sector in 2006 was as high as 35%. The small units normally look for cheap land. The rentals are high in parks due to improved infrastructure. Further, the land is available only on lease which cannot be used as collateral for bank loans. These costs are not offset by fiscal incentives for units to locate inside the MFP. Promoters are not able to attract

units to their MFPs as there are no direct benefits/incentives available for units to enter them resulting in under-utilization of infrastructure created there.

ANNEX 1B: ANNEX 1B: CASE STUDY: TURKEY AGRO LOGISTICS DEVELOPMENT[2]

OVERVIEW:

A well-developed, efficient transportation and logistics sector is the backbone for any economy. As the markets in Asia, Central Asia (CIS), and the Middle East are likely to become further integrated into the European and worldwide trade networks, an increase in transit flows passing through Turkey is expected. Turkey's longer-term economic policies are all directed towards 2023 – the year of the 100th anniversary of the modern Republic of Turkey. A target of reaching an export volume of about 500 billion USD – more than doubling the 2012 volumes– has been set by the Turkish government. An enabler and an important factor in realizing this goal will be the development and massive modernization of the transport and logistics infrastructure.

WHY SELECTED FOR CASE STUDY:

Looking at logistics centers in Turkey is advantageous because of similar product and climate for both countries. In addition, the Ministry of Agriculture in Uzbekistan expressed a desire to better understand the Turkish distribution models as opposed to those in the Euro zone. An understanding how Turkey has developed to become a major fruit and vegetable exporter will give Uzbekistan an insight into potential models to modify or adopt to help make Uzbekistan a more successful exporter of horticultural products.

DESCRIPTION OF THE ACTIVITY:

The Turkish logistics infrastructure shows a high density in the industry clusters Istanbul, Gebze/Kocaeli, Bursa, Izmir, and Ankara. An integrated transportation and logistics strategy, however, was missing in the past. In order to meet its own economic objectives by 2023 and to meet the expectations on being a true Eurasian hub, Turkey needs to increase the efficiency in the transportation sector and has to close gaps in the trans-shipment infrastructure as soon as possible (see also Basev 2011, e.g., the study results).

In 2005, the idea to implement 11 intermodal freight centers according to the German-European based Güterverkehrszentrum (GVZ) was put on the official agenda by the Turkish Ministry of Transportation and Communication and TCDD. With support of private equity loans, an amount of about 300 million USD was to be invested in the construction of these freight centers which are considered to contribute significantly towards an additional transportation potential of about 25 million tons. In addition, 5.6 million m² of logistics space will be ramped up for warehousing and value-added service offerings. The 11 freight centers were to be implemented in Istanbul (Halkalı), Izmit (Köseköy), Samsun (Gelemen), Eskişehir (Hasanbey), Kayseri (Boğazköprü), Balıkesi. As of 2014, besides the Ankara logistics center, intermodal freight centers had been established in Samsun (Gelemen), Kaklık (Denizli) and Izmit (Köseköy).

---

[2] THIS CASE STUDY HAS BEEN DEVELOPED FROM A SERIES OF EXCERPTS FROM A REPORT ON "TRANSPORT, LOGISTICS AND SUPPLY CHAIN SERVICES IN TURKEY
HTTPS://WWW.UTIKAD.ORG.TR/IMAGES/HIZMETRAPOR/STEFANISKANUTIKAD_TRANSPORTLOGISTICSANDSUPPLYCHAINSERVICESINTURKEY-0678.PDF

The Turkish model was successful based on a number of reasons. Access to finance, privatization and experience based management and ownership, the de-centralization of all of the ICC components, and other actions all led to the eventual success. Privatization and de-centralization are among the recommendations for the GoU to consider for the ALCs.

The success of the Turkey logistics centers was based on an emphasis of transportation and logistics rather than on production and other processes. This is something to consider, as the GoU looks to structure the planned ALCs in Uzbekistan. The WFLO team believes that an emphasis on transshipment and product movement efficacy will be key to the success of the ALCs in Uzbekistan. In addition, Uzbekistan enjoys the logistical advantage of being central to most of its trading partners. A focus on logistics as a growth industry should be carefully reviewed.

ANNEX 1C: CASE STUDY: FRESHPOINT, SOUTH FLORIDA (USA)

OVERVIEW:

Founded in 1987 as A One A Produce and Dairy, FreshPoint (a Sysco company) South Florida serves the region with the finest quality products, and the most reliable service available. FreshPoint assets include the following:

- 170,000 square-foot facility.
- Refrigerated loading and receiving dock.
- New refrigerated delivery fleet with approximately 70 straight trucks and 28 tractor/trailers.
- Constant GPS tracking through XRS tablet system within the truck.
- Customized distribution programs to meet special needs.
- Internet ordering through myFreshPoint.com.

WHY SELECTED FOR CASE STUDY:

FreshPoint was selected because it is a multi-functional, aggregation/distribution center that featured a variety of logistics and value-added services in one facility, similar to the "one-stop shop" concept envisioned for the ALCs in Uzbekistan.

DESCRIPTION OF THE ACTIVITY:

FreshPoint South Florida contained eight divisions (wholesale, retail, export, cruise ship provisioning, value-added, tomato repacking, ripening and organic) under one roof.

Other distribution facilities of broad liners (e.g., numerous Sysco Foodservice and Kraft Foodservice facilities) were routinely visited to gain much of the below experience.

WHAT MADE IT SUCCESSFUL:

FreshPoint succeeded based on the management team's keen attention to details. These details are listed below in the Key Takeaways Section.

The company had exceptionally insightful leaders, who knew how all the divisions and function fit together and directed the employees to implement the vision.

KEY TAKEAWAYS FROM AN "INSIDER" FOR THE GOU

Below are specific examples of how an aggregation center/distribution center can work:

Location:

A *distribution center/operating company/logistics center/aggregation center* must be constructed in the correct location for the receiving and the rapid shipping of produce/dairy/processed/value-added product(s). Considerations such as availability and access to reliable:

- Growers/packers and shippers
- Operating/functioning rail lines

- Local roads and highways
- Communication networks
- Functioning air terminals
- Trucking companies
- Retail, wholesale, terminal, markets
- Personnel/labor
- Uninterrupted power sources
- Maintenance companies (e.g., for refrigeration, machinery repair)
- Suppliers of distribution center supplies (e.g., boxes, pallets, load stabilizing materials, office supplies, operations equipment (pump-jacks, electric jacks)

Specific examples of how ideally this distribution center can successfully work is primarily premised on strict adherence to a cold chain, starting at post-harvest practices, handling, transportation, etc., to the facility are:

- Supervised and proper post harvesting handling greatly impacts the quality of product being received at the facility.
- Refrigerated receiving & shipping docks
- Numerous (4-6) temperature zones (dependent on the complexity of the product-mix being received at the distribution center)
- Temperature, humidity, air circulation and ethylene management/control
- Reliable work force
- Experienced trainers/educators and supervisors to train all operations personnel (e.g., receivers, handlers, Quality Control (QC), cooler managers, product selection personnel.)

The primary functions of distribution centers are buying, receiving and shipping-out. Specifically, a distribution center is typically not for long-term storage. Produce arrives and is shipped-OUT as rapidly as possible (unless otherwise arranged as in the case of some longer-termed storage for root crops, cabbage, etc.).

Buying:

- At time of purchase, the buyer enters into the computer system all necessary purchase details for product to be received.

- depending on the software, the product is tracked from time of purchase through receiving to sales and shipping.

Receiving/receiving office:

Receivers at time of receiving, work with buyers, to insure what was purchased and what is being received is verified and accurately documented. This is important because any discrepancies can be reported via phone by the buyer to the shipper. Any latency in this reporting can prove costly.

- Digital cameras used to document: shifted/ fallen loads, floor-stacked versus pallet loaded product, etc.

- It is necessary to have a well-organized and well managed receiving office to handle driver calls, organize grower/packer/shipper manifests, purchase orders from buyers, etc.

Quality Control (QC):

- Must training employees repetitively to ensure knowledge to know exactly what product(s) they are looking-at/receiving, and, WHAT they need to be continuously looking-for. These are imperatives to determine the quality of incoming product.

- Delivery truck and drivers are detained until QC results are determined. Any and all discrepancies, i.e., condition and quality of product, quantity, bill-of-lading, etc. must be resolved before driver departures.

- Digital cameras to document: frozen product, decayed/moldy product, unusually soil-laden products, etc.

Cooler manager:

- Following QC, palletized products are removed from the refrigerated receiving dock and "put-away" into the appropriate temperature-controlled cooler and into the appropriate racked slot.
    - each cooler manager is responsible for their individual coolers
    - product rotation within each racked slot
    - temperature monitoring and reporting any abnormalities.
    - weekly inventory, by physically counting the slotted products.
    - sanitation of coolers: picking-up decayed/crushed product and all other debris. Cooler/facility sanitation is constant!

- Cooler sanitation was 20% cooler manager and 80% janitorial ops.

Sales:

- Informs customers (via phone, e-mail, text, etc.), what is available for sale, volumes, packaging, price, etc.

- Since inventory is entered INTO the computer system at the time of receiving, in like manner, inventory will be deducted from the system as sales occur.

Selectors:

- Provided a list of products to select and palletize.

- Pallets are orderly placed on the refrigerated shipping area floor/loading dock for eventual loading.

Shipping out:

- Shipping from the distribution center can be best described as the process(es) of:

    - Refrigerated produce shipping trucks are PRE-cooled then properly loaded and loads secured for shipping (e.g., load-locks, pallet strapping, pallet wrapping with netting or shrink wrap, corner boards, etc.)

    - Short-haul mixed loads: ensure pallets are loaded in proper order for unloading in order of stops.

    - Long-haul loads: ensure sufficient ventilation, properly secured and utilize inexpensive temperature recording devices. Where necessary, install ethylene neutralizing devices.

Sanitation practices:

- Customers can be expected to regularly tour these facilities, in particular retail customers.

- Private and/or government certification personnel will tour and inspect the facility.

- Without exception, use of any tobacco product inside the entire facility was prohibited.

- Designated smoking areas were located outside the facility and away from doorways.

- Without exception, consumption of liquid and solid foods is done inside a designated cafeteria area. Never inside the refrigerated facility.

Processing/value-added pre-cut:

- Processing is often and interchangeably a highly generalized and all-inclusive term. However, from extensive experience processing per se refers strictly to juicing of products from which very little profit can be gained.

- Value-added pre-cut refers to peeling, slicing, dicing, halving, cubing, vacuum-packing, creating salsas, of products, increasing the raw products' value, thus, value-added. This value-added operation was under the same roof/same facility as the entire distribution center.

- Initially, a value-added pre-cut facility was a manual process merely for rinsing, whole peeling and vacuum packing, e.g., potatoes, onions, carrots, etc.

- The more complex and detailed value-added pre-cut practices (e.g., dicing, slicing, halving, cubing, creating salsas, etc.) came to fruition much further along in the distribution center's successful operation.

- Experience with produce value-added operations, and selling value-added_products to retail, wholesale/foodservice, cruise ship provisioning, export, institutional provisioning, provided the distribution center operating company with extraordinary profitability and positive irreplaceable reputation for reliability and quality.

- For obvious health-related sanitation certification reasons, sanitation, cleanliness, employee responsibility, management + supervision, personnel training, product-flow, the wearing of gowns, facial hair & head hair nets, special non-irritating gloves, slip-proof boots are brought to new & enhanced acute levels of diligence inside a value-added facility.

- A competent and fully certified private company was contracted to clean and sanitize the value-added facility each evening.

ANNEX 2: ASSESSMENT ITINERARY

Date	Time	Organization (it includes travel time)	Eric S.	Lola G.	Patrick H.	Mulat L.
7 Oct. Monday	9.00-11.00	AVC office				
	11:00-1200	World Bank and ADB				
	12.00-14.00	**Lunch**				
	14.00-15.00	Ministry of Agriculture				
	15.00-16.00	Center for Standard				
	16.30-17.30	Boston Consulting Group				
8 Oct, Tuesday	10.00-11.30	Korzinka - Grocery Store				
	11.30-13.00	Green Desert LLC, exporter				
		Red Pack LLC, exporter				
		Exim Agro LLC, exporter				
		CMG Group LLC, exporter				
	13.00-14.00	**Lunch**				
	15.00-16.00	Highway logistic Center (Tashkent)				
	17.00-18.30	FAO Office				
9 Oct, Wednesday	9.00-9.30	Recap @ hotel				
	10.00-11.00	GIZ				
	11.00-12.00	Macro - Grocery Store				
	13.00-14.00	**Lunch**				
	14.30-15.30	GDF's pack house facility				
	16.30-17.30	ASG Group				
	16.00-17.00	Cert International				
	17.00-18.00	Wake Field (Pre-shipment inspection)				
10 Oct, Thursday	9.00-9.30	Recap @ hotel				
	10.00-11.00	Uzstandard Agency				
	11.00-12.00	Plant Quarantine Inspection				

	13.00-14.00	**Lunch**				
	14.00-15.00	UzAgro Export				
	14.00-15.00	Uzbek Food Holding				
	15.30-16.30	Commercial Banks				
11 Oct, Friday	9.00-9.30	Recap @ hotel				
	10.00-12.00	Ministry of Health (Sanitary Epidemic Station)				
	10.00-12.00	Ministry of Investments and Foreign Trade				
	12.00-13.00	AVC office				
	13.00-14.00	**Lunch**				
	14.30-16.00	Ministry of Transport and Uz Rail Ways				
	16.30-18.00	Uz Airways Cargo				
12 October, Saturday	9.00-10.00	Tashkent-Parkent				
	10.00-11.30	Zarkent Kholmat FE, Cold Store				
	11.30-13.00	Zarkent Universal FE, Cold Store				
	13.00-14.00	**Lunch**				
	14.00-15.00	Parkent - Tashkent				
13 October, Sunday		Fly to Ferghana				
		Train to Samarkand				
		Check in to hotels				

Date	**Time**	**Organization (it includes travel time)**	Eric S.	Lola G.	Patrick H.	Mulat L.
13 October, Sunday	7.00-8.00	Samarkand Wholesale Market				
	10.00-11.00	Alisher Karimov, producer, cold store, export				
	11.00-12.00	Rahmat Sobirov - producer, cold store				
	12.00-13.00	Najmiddin Isomiddinov, producer, cold store				
	13.00-14.00	Lunch				

	15.00-17.00	Agro Mir Group Cluster, producer, cold store, export				
14 October, Monday	8.30-9.00	Recap @ hotel in Samarkand				
	9.30-10.30	Samarkand Provincial Khokimiyat				
	11.00-12.00	Samarkand Custom Committee				
	12.30-13.30	**Lunch**				
	19.00-23.00	Travel to Tashkent by Afrosiab train				
15 October, Tuesday	10.00-13.00	Discussion of findings				
	13.00-14.00	**Lunch**				
	18.00-20.00	Presentation of initial findings to the Ministry of Ag				

Date	**Time**	**Organization (it includes travel time)**	Eric S.	Lola G.	Patrick H.	Mulat L.
14 October, Monday	8.30-9.00	Recap @ hotel in Ferghana				
	9.30-10.30	Ihlos ACB LLC (Processor, Exporter)				
	11.00-12.00	Linden LLC (Cold store, Farmers)				
	12.30-14.00	**Lunch**				
	14.00-15.30	Tuhtasin Rahmatov, prod, cold store, export				
	16.00-17.00	Isokjon Boymatov, producer, cold store				
	18.00-19.00	Ferghana Asia Hotel				
15 October Tuesday	8.30-9.00	Travel to Andijan (Recap in car)				
	9.30-13.00	Andijan Custom Committee; Uzstandards; Plant Quarantine Inspection Unit				
	13.00-14.00	**Lunch**				
16 October Wednesday	8.00-9.00	Shuhrat Agrifirm, exporter				
	9.30-12.30	Dolanalik Bogbon Mevas FE, producer, cold store				
	13.00-14.00	**Lunch**				

	14.30-15.30	Davron Agrosanot AF, producer, cold store, exporter				
	16.00-17.00	Izzatulloh Avia Trans LLC, cold store, exporter				
	18.00-19.00	Check in to Andijan Hotel				
17 October Thursday	8.00-9.00	Travel to Navigul				
	9.00-10.30	Navigul Horticultural Cluster, producer, cold store				
	13.30-15.00	**Lunch**				
	16.00-21.59	Train to Tashkent from Andijan				
	22.00-23.00	Check in to Hotel in Tashkent				
18 October Friday	9.00-9.30	Recap at Hotel in Tashkent				
	9.30-11.30	Gulbog Guliston Cooperative in Parkent District				
	11.30-13.00	Review of findings				
	13.00-14.00	**Lunch**				
	15.00-16.00	Discussion of initial findings with MoA				
	16.30-17.30	Recap with feedback from MoA				
	18.00-19.00	Check in to Hotel in Tashkent				
19 October Saturday	TBD	Fly out of Tashkent				

ANNEX 3: FACILITY VISIT SUMMARIES

#	Firm/ Company Name	Prov	Dist	Main Activity/business	Private/ Public	Capacity (MTs)	Contact First Name	Family name	Phone	WFLO visit comments (services, operations, business model)	Challenges	Comments on proposed ALC
1	Agro Mir Group Cluster	Samarkand	Jomboy		Private		Zafar	Ashurov		Total Agro Mir Group Cluster has 2000 ha land and planning to expand the garden in future. Garden drip irrigated by channel or drilled water from 120- 140 depth. 60% high quality of fresh fruits exported, and the other 40% low quality goes for making juice.		
2	ASG Group	Tashkent	Tashkent	Vertically integrated company. Manages production, storage, logistics and export of horticultural goods.	Private	Company controls 20,000 Ha, in Tashkent and other regions. 230 Ha total for Horticulture, the rest is for Cotton/Wheat/Legumes 2 Logistics Centers, 1 in Termez is in use, 2,200MT Capacity (14 rooms) of refrigerated. Forced Air Pre-Cooling maybe 20 MT, 2nd one is in Angor district (Southern) not yet completed, 4,000MT capacity.	Bobur	Teshaboev	94 657-9454	Primary Services provided in Logistics centers are: 1. (Receive Boxed Products) 2. Pre-Cool 3. Cold Storage 4. Provide Shipping to Destination 5. Certifications-Local Uzbek Standards only at this time. Future plans to get Global Gap, BRC, ISO 22000		Favorable of government ALC initiative.

3	Anglesey Food (Korzinka.uz)	Tashkent	Tashkent	Grocery store/fresh produce	Private	5,300	Ilhom	Usmanov	93 502-0906	Fruit and Vegetable sales are 12-14% (15% by value in winter) of overall sales now; huge amounts, selling 25 MT/day potatoes, 4 MT of apples/day. They own their own cold stores now to supply themselves, and sell 11MT/day bananas, they have their own full supply chain now and buy direct from Ecuador, including ripening rooms. The problem with buying from local wholesalers was, fluctuations in prices, supplies, product availability fluctuations, as well as inconsistent quality concerns. Now, due to their volumes, they buy direct from large farming interests, foreign traders, etc.		
4	GDF	Tashkent	Tashkent	Established and opened in 2015, this is a well-appointed, full service exporter of Fresh and Processed Fruits and Veggies, including cutting for prep/deli ready foods. Capable of variable size/calibration processing lines for small – large caliber fruits.	Private		Yorkin	Inomov	90 988-1122	A fully capable fresh/processed horticulture export company with an apparently knowledgeable operations director. However, they are not doing any work.	The operation was virtually silent and empty, with lights turned off, equipment covered with plastic and covered in dust. There were no fresh or processed foods visible, and no trucks moving.	In a processing-based business, (typically high volume, high efficiency), an empty facility is often an indicator of the inability to obtain enough quality product to feed the production pipeline. This indicator must be considered when determining the viability of ALC's.

				Volume: 50MT/day								
5	CMG LLC		Tashkent or Ferghana ? (Firms interviewed all together in Tashkent, but believe they be based in Ferghana)	Export	Private	CMG, Green Dessert and Red Pack are all firms based in Ferghana. Average facility in Ferghana hold about 1,000-2,000 metric tons of product. There about 100 such facilities in the Ferghana region.	Mirjohongir	Akbarov	99 844-5388	Primary exports from the valley are fresh grapes, raisins, persimmon, and stone fruits.	Lack of reliable electricity (frequent outages); No pre-cooling taking place; no proper facilities for grading, sorting and packing. .	Exporters felt that proposed ALC scheme was designed to crowd out the private exporters/logistics providers in Uzbekistan. The ALCs would allow the GoU to monopolize the Russian, European and Chinese export markets. These operators were not a fan of the idea.
6	Green Desert LLC Eco Fruit			Prod, Export (dried products)	Private	see above	Dilshod	Akbarov	90 115-0045			
7	Red Pack LLC			Export (mainly melon)	Private	see above	Roma	Salamatov	90 707-0651			

8	Izzatulla Igbolijon, LLC, Persimmon Receiving Cold Storage	Ferghana			Private	1,000 MTs • 125 mt in each of his 8 CS rooms. • Uses water on floors for humidification. • Russia primary export market • 18 permanent employees • 100 max employees during peak season • 16 years in the business. • Buys, receives, stores, conditions/ripens, sells and exports. • Gross is approximately $5.5 million per year	Turgunov	Igbolijon				Wants ALC to come to his area.
9	JHLOS ASB LLC	Ferghana		Exporter: receives, stores, brokers	Private		Mirzamatov	Eldorjon				Very receptive to ALC concept. Open to allowing the GoU ALC functions take over all the ancillary functions which he clearly is not expert at, again: rejected loads, incomplete paperwork, incomplete certifications, non-adherence to certifications, late arriving trucks, frozen loads, hot loads etc.

10	Linden LLC	Ferghana	Altyaryk	Production, Consolidation, Cold Storage	Private	3000 MTs • 1 year old facility • 24 cold storage rooms. • Front rooms hold 60-70 mt • Back rooms hold 100 my • Overall sanitation observed was very good.	Islom	Mamatov	91 110-0059	Have some farms but primary business is receiving and cooling, and direct exporting mainly to Russia :cherries, apricots, peaches, plums, apricots, and carrots, also.		
11	Macro	Tashkent	Tashkent	Grocery store/fresh produce	Private							
12	Sobirov Ergash boglari FE	Samarkand	Samarkand	Production/ Cold Storage	Private	200	Rahmat	Sobirov	90 505-4266	32 Hectare Farm, 15 grape, 15 apple, 2 wheat Cold Storage: 200MT, built in 2010, 2 rooms, 100MT each, ceiling height 4.5 mtrs. 1st cold storage built in the area; the pre-cooling area will be in the corridor. Not yet pre-cooling, so for 9 years he has been providing sub-standard products. The Pre-Cooling area is not yet equipped, in the process of building the front end receiving/shipping, post-harvest processes, and pre-cooling area. 2nd business: 15 Ha land total, 8Ha orchards, 2Ha Peach, 6Ha apple, 2Ha vineyard and 5Ha wheat 1 cold storage room 70MT and 2 being built	Lack modern tools, would like more access to export markets, lack understanding of international and Uzbek food safety standards.	ALC could be helpful if it helped to provide access to buyer, provide access to transportation (especially air and rail) and documentation would be very helpful.

	Toshboev Azizbek Cold Storage	Ferghana		Cold Storage	Private	7,000	Toshboev	Azizbek		• 7,000 mt Cold Storage • 1,000 mt freezer • Grower of: Apples, Cherries, Apricots, Nectarines, Plums, some lemons.		• Proposed ALC's will be of tremendous help to this operation as they are in chronic, near desperate, need of a business manager/marketing arm
13	Tursunov Asrorkhon Farm & Cold Storage		Samarkand		Private	280				Cold Storage was established in 2007. 4 cold rooms with a capacity of 70 tons each, and one pre-cooling room. Handling post-harvest activities as, sorting, grading and packaging was organized in proper way, because cold storage was established inside of vineyard.	Shortage of skilled agronomists; Shortage of etymologists; No cold chain association; lack of linkages to buyers; shortage of seasonal workers.	Suggested location of ALCs: 1. Tashkent # 1 2. Ferghana Valley (center of the Valley, not Andijan. 3. Near Termez area (due to early crop potential) 4. Samarkand region 5. 4th location would be – Khorezm (Northernmost part of Uz, they grow primarily apples, pears
14	UzAgro Export	Tashkent	Tashkent	A Joint-stock company . In last 3 years opened 5 trade houses in Russia, 2 in Kazakhstan and 1 in Novosibirsk.	Public		Thru Ministry			One of the largest exporters of fruits and vegetables. It holds 2nd place on export of apricots and 5th place cherry.	Needs training and additional staff. They lack experts who can consult clients on American and European standards.	In favor of ALC initiative. The potential to offer high volumes and diversity of high quality and certified products will attract buyers and dealers.

15	Zarkent Universal 600 ton	Tashkent	Parkent	Production, Consolidation, Cold Storage, and Export	Private	Facility designed to store 600MT designed, but actually storing 800MT.Built in 2015-2016, Turkish Design. Vineyard operating since 1950. Construction of cold storage started in 2015 and completed in 2016.	Inomjon	Ashurov	93 380-5444	10 rooms, central cooling, Bitzer compressors 2 farms, 2 sons: 22Ha 4Ha Cherries & 18 Grapes, the other farm grows 4Ha apples and 4Ha Cherry 22Ha grapes Provide storage other farmers.	lack of immediate pre-cooling. Currently, at approx. 5pm they load product in the field on 3-4MT trucks and transit to reefer facility it arrives at facility at 6pm until 9pm. A reasonable estimate is that between 4-8T% of water weight loss is occurring in their grapes. Phytosanitary, food safety, quality grade and labeling requirements, takes a lot of time at each point. Frequent opening of truck door for checking procedure affects the temperature of the refrigerated tracks	ALC idea is great. It would help to alleviate a lot of "headaches" if it's not cost prohibitive. Could use ALC in their region. Have 200,000 Ha of grapes, which equates 20,000MT of grapes (yield 10MT/HA) just in the Zarkent village. The biggest advantage of using the ALC is that once that truck is filled and sealed no one should open that truck again until it gets to the customer! Currently, trucks are opened and closed constantly at the official Inspection locations. If the ALC can provide all the certificates, it will be a HUGE help.
16	Zarkent Buloq Suvi	Tashkent	Parkent	Production, Consolidation, Cold Storage, and Export	Private	100	Shuhrat	Kholmatov	93 506-9008	is this Zarkent Kholmat?		

ANNEX 4: FIVE YEARS EXPORT PERFORMANCE OF MAJOR FRUIT AND VEGETABLES PRODUCTS OF UZBEKISTAN

Data in thousand USD by types of fruits and vegetables.

ANNEX 4.1 SUMMARY OF FIVE YEARS EXPORTS IN THOUSAND USD

Exports	2014	2015	2016	2017	2018	5 years Average	% Share
Total Edible fruit and nuts; peel of citrus fruit or melons excluding nuts	**301404**	**204523**	**327047**	**360368**	**480368**	**334,742**	**100,00**
Fresh grapes	86,867	66,300	69,809	98,922	108,670	86,114	**25.73**
Dried grapes	36,892	68,956	85,530	70,495	75,155	67,406	**20.14**
Fresh cherries (excluding sour cherries)	43,624	15,738	51,687	66,916	128,194	61,232	**18.29**
Fresh peaches, incl. nectarines	30,297	12,796	28,239	24,402	43,015	27,750	**8.29**
Fresh persimmons	16,753	10,453	35,480	41,678	33,126	27,498	**8.21**
Subtotal	**236,695**	**210,399**	**298,749**	**343,422**	**434,772**	**304,807**	**91.06**
Tomatoes, fresh or chilled	22,262	36,156	28,004	41,009	46,612	34,809	

ANNEX 4.2 FIVE YEARS SUMMARY BY MAJOR EXPORT DESTINATIONS IN THOUSAND USD

Major Export Destinations	2014	2015	2016	2017	2018	5 years Average	% Share
Fresh grapes	**86,867**	**66,300**	**69,809**	**98,922**	**108,670**	**86,114**	**100.00**
Kazakhstan	84,714	57,611	51,539	63,897	60,806	63,713	**73.99**
Russian Federation	527	8,503	17,267	28,315	38,123	18,547	**21.54**
Kyrgyzstan	1,590	7	796	6,251	8,344	3,398	**3.95**
Dried grapes	**36,892**	**68,956**	**85,530**	**70,495**	**75,155**	**67,406**	**100.00**
Kazakhstan	10,064	22,362	28,706	19,569	9,135	17,967	**26.65**
China	8,573	19,428	25,342	16,041	20,065	17,890	**26.54**
Latvia	5,514	7,604	4,962	3,952	4,445	5,295	**7.86**
Saudi Arabia	-	298	5,826	10,129	9,800	5,211	**7.73**
Germany	1,302	4,170	7,693	2,839	4,458	4,092	**6.07**
Belarus	1,675	2,679	1,467	3,602	4,301	2,745	**4.07**
Ukraine	2,861	2,036	1,001	2,129	2,782	2,162	**3.21**
Russian Federation	525	471	1,110	2,271	5,373	1,950	**2.89**
United States of America	995	1,319	1,497	1,405	3,237	1,691	**2.51**
Azerbaijan	222	750	1,662	2,235	3,224	1,619	**2.40**
Poland	1,089	1,729	885	603	1,068	1,075	**1.59**

Major Export Destinations	2014	2015	2016	2017	2018	5 years Average	% Share
United Arab Emirates	867	732	387	1,323	1,035	869	**1.29**
Georgia	156	448	450	1,021	1,219	659	**0.98**
Fresh cherries (excluding sour cherries)	**43,624**	**15,738**	**51,687**	**66,916**	**128,194**	**61,232**	**100.00**
Kazakhstan	42,037	14,701	41,527	47,480	102,549	49,659	**81.10**
Russian Federation	989	794	9,550	13,621	11,499	7,291	**11.91**
Kyrgyzstan		90		5,161	10,745	3,199	**5.22**
Korea, Republic of	548	151	542	443	2,245	786	**1.28**
Tomatoes, fresh or chilled	**22,262**	**36,156**	**28,004**	**41,009**	**46,612**	**34,809**	**100.00**
Kazakhstan	20,445	34,410	23,422	30,458	25,074	26,762	**76.88**
Russian Federation	1,762	1,425	3,985	7,113	19,259	6,709	**19.27**
Kyrgyzstan	55	318	589	3,376	2,196	1,307	**3.75**
Fresh persimmons	**16,753**	**10,453**	**35,480**	**41,678**	**33,126**	**27,498**	**100.00**
Kazakhstan	16,602	9,645	27,682	29,120	19,727	20,555	**74.75**
Russian Federation	151	692	7,035	11,308	11,469	6,131	**22.30**
Fresh apricots	**27,738**	**11,083**	**29,584**	**20,544**	**47,159**	**27,222**	**100.00**
Kazakhstan	26,731	10,439	18,714	13,658	30,277	19,964	**73.34**
Russian Federation	414	644	10,478	5,016	11,998	5,710	**20.98**
Kyrgyzstan	558	-	187	1,823	4,374	1,388	**5.10**
Fresh peaches, incl. nectarines	**30,297**	**12,796**	**28,239**	**24,402**	**43,015**	**27,750**	**100.00**
Kazakhstan	29,195	11,685	17,808	11,417	20,314	18,084	**65.17**
Russian Federation	111	1,111	9,057	10,234	16,877	7,478	**26.95**
Kyrgyzstan	986	-	1,358	2,729	5,782	2,171	**7.82**

ANNEX 4.3 EXPORT TRADE PERFORMANCE OF THE FRUITS AND VEGETABLES SECTOR

The below examines trade performance of the world and Uzbekistan position in the world market (2017 and 2018) by major exporters in 000' USD, in tons and price USD/ton

LIST OF EXPORTERS FOR PRODUCT: HS CODE 080929 FRESH CHERRIES (EXCLUDING SOUR CHERRIES)

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	2201056	3031172	World	508331	697842	World	4330	4344
1.	Chile	571249	1078972	Chile	81488	184566	New Zealand	14936	13602
2.	Hong Kong	301736	647801	Hong Kong	69321	138312	Australia	11815	11358
3.	USA	604094	500458	USA	106656	83972	Canada	5646	6394
4.	Turkey	159042	161674	Turkey	60121	75304	USA	5664	5960
5.	Uzbekistan	67026	141044	Uzbekistan	30609	33811	Chile	7010	5846
6.	Spain	77631	73301	Spain	26574	31442	Italy	4059	4825
7.	Canada	57068	69664	Azerbaijan	14439	23320	Hong Kong	4353	4684
8.	Australia	40503	61153	Greece	15515	16909	Netherlands	4052	4487
9.	New Zealand	63343	44192	Moldova	8376	11652	Argentina	4690	4180
10.	Azerbaijan	23155	37988	Canada	10107	10896	Uzbekistan	2190	4172
11.	Italy	51058	35002	Italy	12580	7255	Austria	3663	3698
12.	Greece	31617	31043	Austria	6866	6198	Belgium	3999	3662
13.	Netherlands	26622	25747	Netherlands	6570	5738	France	4410	3434
14.	Austria	25149	22921	Serbia	8543	5482	Germany	3485	3190
15.	Germany	12558	16008	Australia	3428	5384	Spain	2921	2331
16.	Argentina	17181	15242	Germany	3603	5018	Turkey	2645	2147
17.	Serbia	14197	9654	Poland	527	4315	Greece	2038	1836
18.	Belgium	7039	9592	Argentina	3663	3646	Serbia	1662	1761
19.	France	11748	6648	New Zealand	4241	3249	Azerbaijan	1604	1629
20.	Moldova	4166	6528	Belgium	1760	2619	Poland	1820	984
21.	Poland	959	4244	France	2664	1936	Moldova	497	560

LIST OF EXPORTERS FOR PRODUCT: HS CODE: 080610 FRESH GRAPES

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	8325551	8564726	World	4719379	4872224	World	1764	1758
1.	Chile	1232464	1232960	Chile	703861	726793	Japan	19714	19605
2.	USA	902978	924505	Italy	493824	461653	South Korea	6970	10889
3.	Italy	863476	795308	USA	384814	419905	Netherlands	2443	2706
4.	Netherlands	656331	781522	Afghanistan		401184	Australia	2644	2694
5.	Peru	651212	763142	South Africa	337168	324084	Germany	2158	2528
6.	China	735160	689599	Peru	268182	322087	UK	2307	2516
7.	South Africa	540961	570327	Netherlands	268655	288830	China	2622	2488
8.	Spain	321229	398131	China	280361	277162	France	2395	2408
9.	Hong Kong	363648	369197	Hong Kong	202228	200913	Peru	2428	2369
10.	Australia	294785	306812	Turkey	277743	180238	Spain	2238	2333
11.	India	271572	288619	India	185172	171719	Denmark	2836	2307
12.	Egypt	232956	221545	Spain	143553	170658	Egypt	2070	2306
13.	Mexico	246057	198125	Mexico	195948	146830	Belgium	2131	2221
14.	Afghanistan		127369	Uzbekistan	136012	137943	Brazil	2162	2212
15.	Uzbekistan	97939	120910	Australia	111495	113879	USA	2347	2202
16.	Turkey	195392	120888	Egypt	112527	96072	UAE	821	2068
17.	Greece	149492	110322	Greece	93441	67725	Hong Kong	1798	1838
18.	Brazil	96207	88067	Moldova	80239	48121	South Africa	1604	1760
19.	Germany	70724	77076	Brazil	44493	39818	Italy	1749	1723
20.	Namibia	38054	50108	Macedonia	28224	31577	Chile	1751	1696
21.	France	34693	34303	Germany	32769	30484	India	1467	1681
22.	Japan	26397	29251	Iran	11081	28600	Greece	1600	1629
23.	UAE	3658	29063	Lebanon	16676	23373	Namibia	1373	
24.	Moldova	38626	25124	France	14484	14247	Mexico	1256	1349
25.	Iran	7016	20512	UAE	4456	14055	Uzbekistan	720	877
26.	UK	15334	16462	UK	6647	6542	Iran	633	717
27.	Macedonia	14136	15166	Belgium	9508	5205	Turkey	703	671
28.	South Korea	8490	13884	Denmark	3049	4848	Moldova	481	522
29.	Lebanon	7323	11700	Japan	1339	1492	Lebanon	439	501
30.	Belgium	20264	11560	South Korea	1218	1275	Macedonia	501	480
31.	Denmark	8646	11184	Namibia	27708		Afghanistan		317

LIST OF EXPORTERS FOR PRODUCT: HS CODE 080620 DRIED GRAPES

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	1559894	1900057	World	860276	930318	World	1813	2042
1.	Turkey	408211	490407	Turkey	268585	278929	USA	2429	3330
2.	USA	308024	284012	Iran	96421	113673	Australia	3312	3225
3.	Afghanistan		188306	USA	126832	85295	Afghanistan		2935
4.	Chile	116574	155616	Uzbekistan	77901	68888	Greece	2125	2908
5.	Iran	152709	152938	Afghanistan		64150	UK	2523	2631
6.	South Africa	99441	150047	Chile	51788	62734	Germany	2428	2524
7.	Argentina	49347	80301	South Africa	48962	61232	Chile	2251	2481
8.	Uzbekistan	61565	58811	Argentina	27455	41243	South Africa	2031	2450
9.	Greece	41474	50874	China	13792	23739	Netherlands	2358	2444
10.	China	29387	45736	India	24058	22966	Argentina	1797	1947
11.	India	33867	43643	UAE	12301	19446	China	2131	1927
12.	Netherlands	25952	31433	Greece	19521	17497	India	1408	1900
13.	UAE	20153	30523	Netherlands	11004	12863	Belgium	1810	1886
14.	Germany	24528	24546	Germany	10103	9726	Turkey	1520	1758
15.	Australia	12820	19239	Belgium	9376	9225	UAE	1638	1570
16.	Belgium	16969	17396	Australia	3871	5966	Iran	1584	1345
17.	UK	8852	11327	UK	3509	4306	Uzbekistan	790	854

LIST OF EXPORTERS FOR PRODUCT: HS CODE 0702 TOMATOES, FRESH OR CHILLED

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	9029024	9524061	World	8070680	8457382	World	1119	1126
1.	Mexico	1943161	2260996	Mexico	1742619	1831837	Canada	2058	2152
2.	Netherlands	1972500	1919738	Netherlands	1097088	1084705	Italy	2358	2147
3.	Spain	1131330	1095202	Spain	809527	812571	Tunisia	1666	2092
4.	Morocco	578154	686784	Iran	531998	572856	Germany	2044	2007
5.	Canada	415971	411723	Morocco	527724	568509	Netherlands	1798	1770
6.	France	374109	369820	Turkey	525690	530087	France	1622	1654
7.	USA	333441	325046	Afghanistan		397997	USA	1640	1503
8.	Turkey	290138	289827	Jordan	282271	257889	Spain	1398	1348
9.	Belgium	304443	283845	France	230586	223557	Belgium	1388	1286
10.	Iran	154400	244739	Belgium	219417	220695	Egypt	1513	1281
11.	China	216812	207269	USA	203359	216286	Mexico	1115	1234
12.	Azerbaijan	151595	177381	China	265304	204011	Morocco	1096	1208
13.	Jordan	223392	168274	Canada	202164	191369	Azerbaijan	987	1032
14.	Italy	157491	160134	Azerbaijan	153578	171922	China	817	1016
15.	Afghanistan		94580	Poland	78391	88264	Poland	837	895
16.	Poland	65609	78986	Portugal	109285	78934	Belarus	851	851
17.	Portugal	61683	66883	Italy	66803	74589	Portugal	564	847
18.	Belarus	72427	53718	Albania	70334	70000	Uzbekistan	774	760
19.	Uzbekistan	40273	46802	Belarus	85163	63123	Malaysia	690	668
20.	Germany	38456	43739	Uzbekistan	52032	61610	Jordan	791	653
21.	Tunisia	24272	42121	Malaysia	47259	46605	Turkey	552	547
22.	Egypt	31726	41705	Egypt	20964	32568	Albania	483	540
23.	Albania	33982	37815	Germany	18814	21791	Iran	290	427
24.	Malaysia	32624	31108	Tunisia	14569	20133	Afghanistan		238

LIST OF EXPORTERS FOR PRODUCT: HS CODE 080910 FRESH APRICOTS

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	464244	495546	World	412442	462069	World	1126	1072
1.	Spain	122763	168939	Spain	89008	108956	USA	2183	2134
2.	France	84379	50233	Suriname	0	89327	Austria	1797	2059
3.	Uzbekistan	20308	48353	Turkey	63538	70734	Hungary	1224	1827
4.	Italy	56326	42214	Uzbekistan	22801	42664	Netherlands	1448	1826
5.	Turkey	44192	41019	France	56412	28276	Jordan	1749	1822
6.	Suriname	0	35813	Italy	44609	26503	Germany	1455	1788
7.	Greece	16522	21425	Greece	24681	23925	France	1496	1777
8.	Jordan	14631	10595	Iran	11805	7698	Italy	1263	1593
9.	USA	17186	9942	Armenia	3905	7215	South Africa	1634	1556
10.	Germany	4343	7270	Jordan	8366	5816	Spain	1379	1551
11.	Netherlands	6505	6847	USA	7874	4658	Uzbekistan	891	1133
12.	Iran	7346	6373	Germany	2984	4067	Greece	669	896
13.	South Africa	6757	5663	Netherlands	4493	3750	Iran	622	828
14.	Armenia	1571	5041	South Africa	4134	3639	Kyrgyzstan	799	760
15.	Austria	3324	3643	Kyrgyzstan	2233	2654	Armenia	402	699
16.	Hungary	4238	2130	Austria	1850	1769	Turkey	696	580
17.	Kyrgyzstan	1785	2018	Hungary	3462	1166	Suriname		401

LIST OF EXPORTERS FOR PRODUCT: HS CODE 080930 FRESH PEACHES, INCL. NECTARINES

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	2244397	2259179	World	2346188	1953146	World	957	1157
1.	Spain	896062	933164	Spain	921995	739849	Japan	8464	9280
2.	Italy	192821	192476	Greece	186009	159741	Australia	2772	2855
3.	Chile	109550	137488	Italy	223243	157238	Afghanistan		2479
4.	USA	126931	134612	Turkey	88811	126814	South Africa	1908	2059
5.	Greece	88026	98137	Chile	82963	96250	France	1604	1922
6.	China	141179	90349	USA	56803	70568	USA	2235	1908
7.	Turkey	69783	87135	Uzbekistan	43108	65147	Hong Kong	1746	1754
8.	Jordan	80874	53076	China	95975	63393	Netherlands	1248	1706
9.	France	70514	49412	Jordan	59005	49970	Belgium	1447	1593
10.	Uzbekistan	24066	42098	Belarus	83579	44385	Germany	1133	1485
11.	Netherlands	41050	41714	Lithuania	88214	40596	Portugal	958	1433
12.	Australia	26871	39913	France	43974	25703	Chile	1320	1428
13.	South Africa	32680	38055	Netherlands	32883	24458	China	1471	1425
14.	Hong Kong	13983	33364	Serbia	43560	23618	Spain	972	1261
15.	Germany	17796	28467	Germany	15711	19168	Italy	864	1224
16.	Serbia	41133	26150	Hong Kong	8010	19027	Egypt	1113	1173
17.	Lithuania	36617	20385	South Africa	17128	18479	Azerbaijan	1095	1112
18.	Japan	14473	16017	Australia	9695	13982	Serbia	944	1107
19.	Portugal	12283	15498	Egypt	19250	12588	Jordan	1371	1062
20.	Egypt	21429	14772	Guinea	31039	11344	Guinea	767	1031
21.	Guinea	23822	11694	Portugal	12823	10818	Turkey	786	687
22.	Afghanistan		11480	Azerbaijan	7259	9519	Uzbekistan	558	646
23.	Belgium	39974	10936	Belgium	27622	6865	Greece	473	614
24.	Belarus	13707	10855	Afghanistan		4631	Lithuania	415	502
25.	Azerbaijan	7949	10586	Japan	1710	1726	Belarus	164	245

LIST OF EXPORTERS FOR PRODUCT: HS CODE 081070 FRESH PERSIMMONS

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

Country	in 000' USD		Country	In Tons		Country	Price USD/Ton	
	2017	2018		2017	2018		2017	2018
World	587970	547173	World	603635	523780	World	974	1045
Spain	215915	204277	Spain	214904	168341	Japan	4730	5032
Azerbaijan	90891	114539	Azerbaijan	118305	150913	New Zealand	4912	4525
China	112071	85977	China	66621	58673	South Africa	1924	2103
Uzbekistan	43283	34078	Uzbekistan	73006	55023	Netherlands	1644	1999
Netherlands	9577	10865	Lithuania	19517	15078	USA	1855	1956
Lithuania	10560	10701	Poland	16467	9669	Portugal	1492	1864
Poland	12638	8053	Korea	7085	5736	Germany	1476	1690
USA	6544	7767	Netherlands	5826	5436	France	1461	1648
Korea	8149	7639	France	5586	4222	China	1682	1465
France	8162	6958	Italy	5574	4218	Italy	1212	1463
Italy	6753	6173	USA	3527	3970	Korea	1150	1332
New Zealand	6322	5462	South Africa	4138	2428	Bangladesh	874	1276
South Africa	7960	5105	Germany	3024	2065	Spain	1005	1213
Japan	3027	3492	Bangladesh	1619	2023	Poland	767	833
Germany	4464	3489	Portugal	2375	1636	Azerbaijan	768	759
Portugal	3543	3050	New Zealand	1287	1207	Lithuania	541	710
Bangladesh	1415	2582	Japan	640	694	Uzbekistan	593	619

LIST OF EXPORTERS FOR PRODUCT: HS CODE 080940 FRESH PLUMS AND SLOES

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	849460	847615	World	751117	733167	World	1131	1156
1.	Chile	138052	173747	Chile	97237	120555	Australia	2650	2963
2.	Spain	112637	102360	Spain	99195	71672	UAE	1088	2136
3.	South Africa	83877	84808	Turkey	45700	68146	France	1658	2127
4.	Hong Kong	69079	76927	South Africa	66769	57948	Netherlands	1785	2029
5.	USA	71719	61156	Moldova	49223	44907	USA	2289	1855
6.	Italy	62029	57813	Italy	57380	44510	Hong Kong	1982	1781
7.	Netherlands	45236	47730	Hong Kong	34847	43205	Syria	1231	1723
8.	China	37280	40296	China	20670	33533	Portugal	1071	1498
9.	Turkey	23767	22131	USA	31331	32969	South Africa	1256	1464
10.	Uzbekistan	14300	20307	Uzbekistan	30480	28114	Chile	1420	1441
11.	France	26752	17576	Iran	44689	26031	Spain	1136	1428
12.	Iran	23026	16863	Netherlands	25342	23520	Italy	1081	1299
13.	Australia	12784	16436	Serbia	15450	19162	Germany	1497	1265
14.	Moldova	17436	12927	Poland	2470	9254	China	1804	1202
15.	UAE	1111	9054	Greece	4317	8366	Viet Nam	1201	
16.	Serbia	10629	8462	France	16137	8264	Uzbekistan	469	722
17.	Germany	7312	7350	Myanmar	1051	7822	Azerbaijan	667	686
18.	Syria	4026	6715	Hungary	11171	7647	Iran	515	648
19.	Viet Nam	6930	5766	Azerbaijan	6087	6290	Greece	683	631
20.	Greece	2949	5276	Germany	4883	5811	Myanmar	117	630
21.	Poland	2701	5166	Australia	4824	5547	Poland	1094	558
22.	Myanmar	123	4931	UAE	1021	4239	Hungary	875	555
23.	Portugal	7964	4789	Syria	3270	3897	Serbia	688	442
24.	Azerbaijan	4058	4317	Portugal	7434	3197	Turkey	520	325
25.	Hungary	9772	4243	Viet Nam	5771		Moldova	354	288

LIST OF EXPORTERS FOR PRODUCT: HS CODE 081320 DRIED PRUNES

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	547914	526200	World	238337	221238	World	2299	2378
1.	Chile	175212	163423	Chile	76531	72062	Germany	4975	5166
2.	USA	140138	142248	USA	34058	35390	Netherlands	4982	4719
3.	Argentina	45156	53196	Argentina	20779	29397	China	4979	4426
4.	France	43803	40666	Uzbekistan	24139	24644	Italy	3904	4140
5.	Uzbekistan	17784	17095	France	11556	12664	Kyrgyzstan	5861	4124
6.	Iran	11686	15389	Iran	5456	7327	Poland	4446	4104
7.	Netherlands	17030	12666	Moldova	7535	5220	USA	4115	4019
8.	Germany	14170	11758	Serbia	4685	3034	Belgium	3300	3890
9.	Poland	4464	7444	Netherlands	3418	2684	France	3790	3211
10.	Serbia	10515	7267	Spain	5528	2661	UK	3410	3198
11.	Spain	12587	7009	Hong Kong	1554	2399	Spain	2277	2634
12.	Moldova	8286	6546	Germany	2848	2276	Serbia	2244	2395
13.	Bulgaria	5726	4535	Bulgaria	2222	1990	Bulgaria	2577	2279
14.	Hong Kong	2718	3603	Poland	1004	1814	Chile	2289	2268
15.	Kyrgyzstan	844	2557	UK	783	673	Iran	2142	2100
16.	China	2096	2408	Kyrgyzstan	144	620	Argentina	2173	1810
17.	Belgium	4620	2377	Belgium	1400	611	Hong Kong	1749	1502
18.	Italy	3724	2343	Italy	954	566	Moldova	1100	1254
19.	UK	2670	2152	China	421	544	Uzbekistan	737	694

LIST OF EXPORTERS FOR PRODUCT: HS CODE 081310 DRIED APRICOTS

SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Exporters	in 000' USD		Major Exporters	In Tons		Major Exporters	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	World	373682	334808	World	148979	138736	World	2508	2413
1.	Turkey	266928	253377	Turkey	94999	93801	South Africa	6653	7484
2.	South Africa	6866	9303	Tajikistan	15587	10904	Germany	5703	5671
3.	France	8444	7646	Uzbekistan	10889	7453	France	6236	5647
4.	Uzbekistan	10494	7387	Spain	2137	5054	UAE	3855	5473
5.	Spain	3250	7352	Kyrgyzstan	3283	4124	Italy	3064	4985
6.	Germany	8036	6079	Belarus	2638	3673	Canada	4945	4845
7.	Netherlands	5101	5944	Netherlands	1248	1562	UK	5037	4703
8.	USA	8711	4877	France	1354	1354	USA	5503	4558
9.	Tajikistan	3729	2842	South Africa	1032	1243	Pakistan	5067	3914
10.	Belarus	1684	2701	Germany	1409	1072	Netherlands	4087	3805
11.	Kyrgyzstan	2482	2588	USA	1583	1070	Denmark	4922	3168
12.	Iran	1040	2422	Iran	473	1051	Lithuania	2859	2701
13.	Italy	3698	2283	Denmark	347	549	Turkey	2810	2701
14.	UK	1617	2173	UK	321	462	Iran	2199	2304
15.	UAE	744	1746	Italy	1207	458	Spain	1521	1455
16.	Denmark	1708	1739	Lithuania	454	371	Uzbekistan	964	991
17.	Canada	1266	1473	Pakistan	193	348	Belarus	638	735
18.	Pakistan	978	1362	UAE	193	319	Kyrgyzstan	756	628
19.	Lithuania	1298	1002	Canada	256	304	Tajikistan	239	261

ANNEX 4.4 LIST OF MAJOR IMPORTERS FOR UZBEKISTAN'S FRUITS AND VEGETABLES PRODUCT

The below is for 2017 and 2018, by major exporters in 000' USD, in tons and price USD/ton.

HS CODE FRESH CHERRIES (EXCLUDING SOUR CHERRIES), SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	66916	128194	Total	30609	33811	Total	2186	3791
1.	Kazakhstan	47480	102549	Kazakhstan	21536	24675	Korea	2752	4923
2.	Russian	13621	11499	Russian	6316	2891	UAE	2900	4374
3.	Kyrgyzstan	5161	10745	Kyrgyzstan	2427	5470	China		4297
4.	Korea	443	2245	Korea	161	456	Kazakhstan	2205	4156
5.	China	0	636	China		148	Russian	2157	3978
6.	UAE	145	398	UAE	50	91	Kyrgyzstan	2126	1964

LIST OF IMPORTERS FOR UZBEKISTAN'S PRODUCT: HS CODE 080610 FRESH GRAPES, SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	98922	108670	Total	136012	137943	Total	727	788
1.	Kazakhstan	63897	60806	Kazakhstan	88243	66195	UAE	1393	2424
2.	Russia	28315	38123	Russia	38272	47984	Mongolia	1681	1500
3.	Kyrgyzstan	6251	8344	Kyrgyzstan	9122	22125	Belarus	963	949
4.	Belarus	157	671	Belarus	163	707	Kazakhstan	724	919
5.	Ukraine	42	567	Ukraine	48	678	Ukraine	875	836
6.	UAE	39	80	UAE	28	33	Russia	740	794
7.	Mongolia	121	33	Mongolia	72	22	Kyrgyzstan	685	377

LIST OF IMPORTERS FOR UZBEKISTAN'S PRODUCT: HS CODE 080620 DRIED GRAPES, SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	70495	75155	Total	77901	68888	Total	905	1091
1.	China	16041	20065	China	21108	27474	Saudi Arabia	12838	9032
2.	Saudi Arabia	10129	9800	Saudi Arabia	789	1085	USA	6887	7895
3.	Kazakhstan	19569	9135	Kazakhstan	26589	12418	Germany	7413	5850
4.	Russia	2271	5373	Russia	2171	4151	Poland	2393	2738
5.	Germany	2839	4458	Germany	383	762	Belarus	1779	1809
6.	Latvia	3952	4445	Latvia	3634	3065	Azerbaijan	1386	1786

7.	Belarus	3602	4301	Belarus	2025	2378	Georgia	1621	1717
8.	USA	1405	3237	USA	204	410	Latvia	1088	1450
9.	Azerbaijan	2235	3224	Azerbaijan	1613	1805	Russia	1046	1294
10.	Ukraine	2129	2782	Ukraine	2839	3745	UAE	582	1021
11.	Georgia	1021	1219	Georgia	630	710	Ukraine	750	743
12.	Poland	603	1068	Poland	252	390	Kazakhstan	736	736
13.	UAE	1323	1035	UAE	2272	1014	China	760	730

LIST OF IMPORTERS FOR UZBEKISTAN'S PRODUCT: HS CODE 0702 TOMATOES, FRESH OR CHILLED, SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	41009	46612	Total	73006	55023	Total	562	847
1.	Kazakhstan	30458	25074	Kazakhstan	48539	30223	Kyrgyzstan	2625	1159
2.	Russia	7113	19259	Russia	19042	18358	Russia	374	1049
3.	Kyrgyzstan	3376	2196	Kyrgyzstan	1286	1895	Kazakhstan	627	830

LIST OF IMPORTERS FOR UZBEKISTAN'S PRODUCT: HS CODE 080910 FRESH APRICOTS SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	20308	48353	Total	22801	42664	Total	891	1133
1.	Kazakhstan	13628	30275	Kazakhstan	15078	25348	Ukraine	882	1357
2.	Russia	4782	11828	Russia	5655	11991	Kazakhstan	904	1194
3.	Kyrgyzstan	1868	5787	Kyrgyzstan	2034	4995	Kyrgyzstan	918	1159
4.	Ukraine	15	228	Ukraine	17	168	Russia	846	986

LIST OF IMPORTERS FOR UZBEKISTAN'S PRODUCT: HS CODE FRESH PEACHES, INCL. NECTARINES, SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	24066	42098	Total	43108	65147	Total	558	646
1.	Kazakhstan	11339	19943	Kazakhstan	20024	28669	Kazakhstan	566	696
2.	Russia	9958	15977	Russia	18050	25672	Russia	552	622
3.	Kyrgyzstan	2715	5977	Kyrgyzstan	4928	10475	Kyrgyzstan	551	571

LIST OF IMPORTERS FOR UZBEKISTAN'S PRODUCT: 081070 FRESH PERSIMMONS,
SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	41678	33126	Total	73006	55023	Total	571	602
1.	Kazakhstan	29120	19727	Kazakhstan	48539	30223	Belarus	943	986
2.	Russia	11308	11469	Russia	19042	18358	Kazakhstan	600	653
3.	Kyrgyzstan	833	869	Kyrgyzstan	1286	1895	Russia	594	625
4.	Belarus	216	752	Belarus	229	763	Ukraine	605	506
5.	Ukraine	179	300	Ukraine	296	593	Kyrgyzstan	648	459

LIST OF IMPORTERS FOR UZBEKISTANIS PRODUCT: HS CODE 080940 FRESH PLUMS AND SLOES,
SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	14300	20307	Total	30480	28114	Total	469	722
1.	Kazakhstan	9791	13601	Kazakhstan	20151	18487	Kazakhstan	486	736
2.	Russia	3493	4518	Russia	7855	6400	Russia	445	706
3.	Kyrgyzstan	966	2079	Kyrgyzstan	2352	3114	Kyrgyzstan	411	668

LIST OF IMPORTERS FOR UZBEKISTANIS PRODUCT: HS CODE 081320 DRIED PRUNES
SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	17784	17095	Total	24139	24644	Total	737	694
1.	Kazakhstan	14125	11746	Kazakhstan	20167	18600	Belarus	1163	1114
2.	Russia	731	2195	Russia	677	2022	Russia	1080	1086
3.	Ukraine	1113	1025	Ukraine	1363	1374	Georgia	1037	907
4.	Belarus	791	862	Belarus	680	774	Turkey	714	795
5.	Turkey	502	833	Turkey	703	1048	Ukraine	817	746
6.	Kyrgyzstan	14	112	Kyrgyzstan	43	490	Kazakhstan	700	632
7.	Georgia	141	107	Georgia	136	118	Kyrgyzstan	326	229

LIST OF IMPORTERS FOR UZBEKISTANIS PRODUCT: HS CODE 081310 DRIED APRICOTS
SOURCES: ITC CALCULATIONS BASED ON UN COMTRADE AND ITC STATISTICS

S. No	Major Importers	in 000' USD		Major Importers	In Tons		Major Importers	Price USD/Ton	
		2017	2018		2017	2018		2017	2018
	Total	10494	7387	Total	10889	7453	Total	964	991

1.	Kazakhstan	6796	2979	Kazakhstan	7763	3537	Germany	1949	2213
2.	Iraq	750	887	Iraq	737	903	Belarus	1359	1533
3.	Russian	643	1155	Russian	485	852	Russian	1326	1356
4.	Ukraine	602	635	Ukraine	582	676	Iraq	1018	982
5.	Belarus	556	929	Belarus	409	606	Turkmenistan	1127	952
6.	Turkmenistan	658	197	Turkmenistan	584	207	Ukraine	1034	939
7.	Germany	152	177	Germany	78	80	Kazakhstan	875	842

ANNEX 5: SUMMARY TABLE ON REQUIREMENTS FOR PHYTOSANITARY, FOOD SAFETY & QUALITY INFRASTRUCTURE, PROPOSAL ON CAPACITY BUILDING PROGRAMMES

Required Institutions	Evaluation Parameters/Matrix Criteria			Relevant Institute in Uzbekistan	Observations/Recommendations
	Evaluation Tools	Requirement for recognitions	Membership		
Plant Health	Phytosanitary Capacity Evaluation (PCE) Tools & several FAO and regional IPPC committees guideline documents and tools	Requirements for Phytosanitary Certificates (FAO) & other regional and other foreign country's	IPPC, FAO, regional FAO and IPPC	Plant Quarantine Inspection Ministry of Agriculture	- There are several evaluation tools to assess and conduct thorough and diagnostic analysis on national Phytosanitary capacity. As per the interview with the management such assessments were not conducted before. To enhance the development of the national capacity in support of the development of ALCs, such tools shall be applied for establishment of reliable and feasible capacity building program including training, inspection tools, laboratory equipment, infrastructures and transportation services. - The plant protection institute is newly restructured institute, which is aware of the IPPC and FAO requirements and requested capacity building to meet the requirements - The plant protection/Phytosanitary body is not yet the member of IPPC/FAO, which could assist the international recognition of the Phytosanitary certifications & exchange of information on plant protection issues;
Food Safety	Several assessment guidelines on National Food Safety & Control Systems (Codex, FAO, EU & others)	Requirements for food safety policy, strategy, generic food law and integrated control systems (Codex, FAO, EU & others)	Codex, regional and national codex committees	Sanitary Epidemiological Inspection Ministry of Health	- There are several national capacity evaluation tools to assess and conduct thorough & diagnostic analysis on the national Food safety capacity and food control system. As per the interview with the management such assessment was not conducted before. To enhance the development of the national capacity in support of the development of ALCs, such tools shall be applied for establishment of reliable and feasible capacity building programs; including training, inspection tools, laboratory equipment, infrastructures and transportation services. - The sanitary inspection body is a newly established institute, which is under resourced in terms of manpower, inspection tools, infrastructures & facilities - The Ministry of Health is the national codex point and member of codex; however, the national codex committee shall be

Required Institutions	Evaluation Parameters/Matrix Criteria			Relevant Institute in Uzbekistan	Observations/Recommendations
	Evaluation Tools	Requirement for recognitions	Membership		
					established & strengthened with the participation of fruit & vegetable producers and exporters and active participation with international and regional codex committee on fruits and vegetables
The National Quality Infrastructure There are several World Bank documents and national Quality Infrastructure Development projects, WTO SPS/TBT documents including the World Bank and PTB document on Ensuring Quality to Gain Access to Global Markets A Reform Toolkit on Quality infrastructure				Agency for Standardization Metrology and Certification of Uzbekistan (UZStandards)	- There are several evaluation tools to assess and conduct thorough and diagnostic analysis on the capacity of the National Quality Infrastructure. As per the interview with the management such assessment was not conducted before by applying such tools. To enhance the development of the national capacity in support of the development of ALCs, such tools shall be applied for establishment of reliable and feasible capacity building programs
Standards	ISO Guidelines and experience from other national standards & regional standard bodies	Minimum standards/ requirements Codex, ISO, IPPC, BIPM	ISO, regional standards bodies	Standardization Directorate	- Standards Institutes is following the ISO and Codex standards for establishment of standards; - The national standards is member of ISO, GOST, CAREC, and has established MoU with different national standards body; - The number & type of standards, dissemination & implementation mechanisms should be assessed; support should be given for capacity building programs including training, documentation and dissemination; - Institutional responsibility & the organizational structure should be clearly defined
Conformity Assessment	ISO/IEC Guideline documents; ISO standards requirement for accreditations; experience & requirements set by other national & regional conformity assessment bodies	Internationally Accredited certification bodies & accredited laboratories; implement and maintain the requirements of the relevant ISO/IEC standards	Mutual recognition of certification & test results at regional level and market/ trade partners	Conformity Assessment Directorate Testing & Certification Centers	- Except the proximate analysis for fruit & vegetables accredited by TURKAK, none of the analytical results & certifications provided by the conformity assessment body internationally recognized - The conformity Assessment Body shall be strengthened including the testing laboratories and certification bodies to get accredited and internationally recognized. We were informed by the management about 20 million USD allocated by the World Bank for laboratories which shall be effectively utilized for this purpose, assistance will be required in this regard; - Institutional responsibility & the organizational structure shall be clearly defined - The laboratory services shall be strengthened to provide reliable and credible analytical services on pesticide residues,

Required Institutions	Evaluation Parameters/Matrix Criteria			Relevant Institute in Uzbekistan	Observations/Recommendations
	Evaluation Tools	Requirement for recognitions	Membership		
					heavy metals, environmental contaminates, additives, adulterants, mycotoxins and microbiological contaminants; capacity building programs including training, infrastructure, laboratory equipment, chemicals, consumables, accessories, etc. required; - The certification services which could be provided on HACCP, food safety, possibly GLOBALG.A.P. shall be strengthened and internationally recognized
National Metrology	BIPM Guidelines & ISO/IEC Guidelines for accreditations required for calibration labs, experience & requirements set by other national & regional conformity assessment bodies	Internationally accredited calibration laboratories; shall implement the requirements of the relevant ISO/IEC standards for accreditation of calibration labs	BIPM, regional metrology institutes	Metrology Directorate/ Department & Regional calibration centers	- The Metrology Institute is Associate Member of BIPM; - Calibration labs not yet accredited by internationally recognized bodies; - Calibration services were not provided to visited farms, cold stores and export outlets; - Institutional and organizational structure was not clearly defined; - Detail assessment and capacity building program required to provide dependable and reliable calibration services for ALCs and backward linkage to the farm level - The capacity building programs should include training, infrastructure, establishment of national etalons/measurement systems, calibration equipment, consumables, accessories, etc.
Accreditation Body	IAF and ILAC Guideline documents; Other national and regional accreditation bodies	Recognized by IAF and ILAC/Mutual recognition with regional & internationally recognized body	Membership of IAF and ILAC, regional accreditation bodies	Directorate of Accreditation & Inspection Control	- The accreditation body is not yet recognized by IAF nor by ILAC - The Accreditation Body is Associate Member of APAC, not member of IAF nor ILAC, - Institutional responsibility & the organizational structure shall be clearly defined - The accreditation services which are provided in support of the ALCs services including the accreditation for certifications, testing and calibration services shall be internationally recognized, accordingly the capacity of the accreditation body shall be assessed and strengthened; - The capacity building programs should include training, competent & certified auditors.

ANNEX 6. PHOTOGRAPHS

Challenges of cold storage rooms, campus sanitation and hygiene, infrastructure, building, dogs & cats are inside the campus, trash, dusts, leftover, etc., all are not acceptable

Wooden crates not recommended, stacking not acceptable

Poor hygienic practices, wall, floor, roof

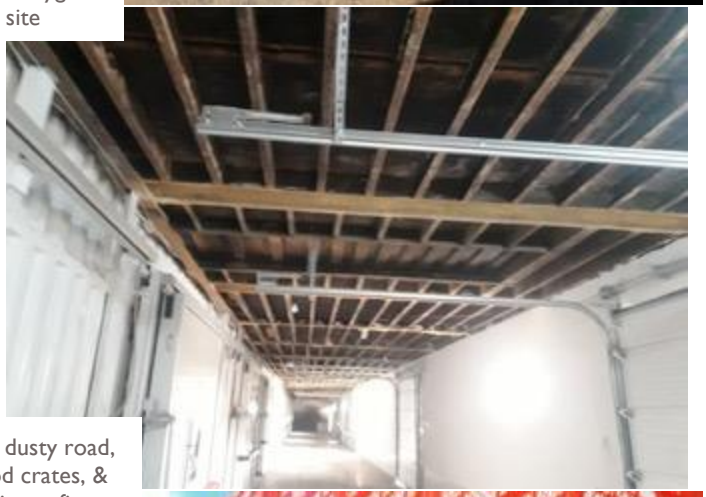
Note: In general cold storage facilities do not fulfil the requirements of personnel standards: toilet, hand washing, working dresses (safety shoe and dresses), dressing rooms, and canteen facilities, infrastructure, building, loading and unloading are not hygienic and not properly designed, there is no proper stacking/storage discipline

Relatively better established fruit drying facility manageable for cleaning & worker dresses, labelling & packaging

There is no proper loading & unloading site & not clean

Old heavy truck facility transferred into cold storage room, the building renovation, inside wall construction the loading & unloading sites not acceptable

Relatively good cold store but dusty road & hygienic loading site



Cold store dusty road, dusty wood crates, & unhygienic roofing

Lack of Stacking/ storage discipline, and hygienic practice

Cold store, wood crate manufacturing plant & green house (dusty, not hygienic, improper manufacturing practice)

Pyramidal cooling in the absence of pre-cooling facilities

Greenhouse plant infected by virus, rusty cold store wall

Calibration mass, volume, temp, fire extinguisher, etc., not known

Dogs & trash inside vineyards

Vineyards and orchards not properly protected from dusts, lack of wind protector

Among more than 30 wine varieties produced in the country

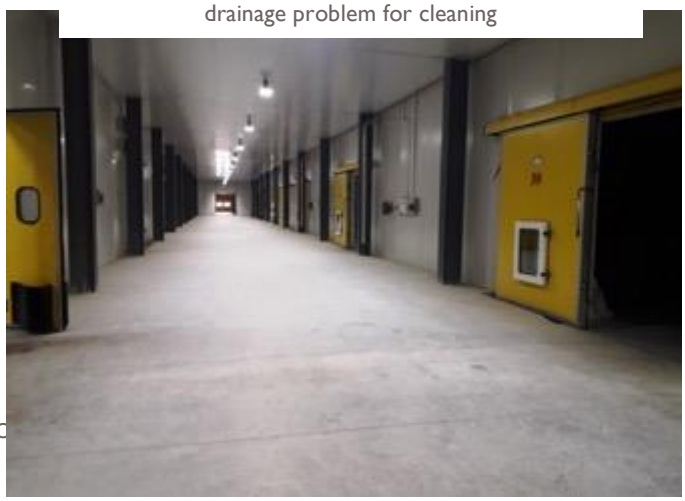
Grape packaging for reservations & export

Complex and Integrated Fruit & Vegetable Farm, Greenhouse,

Processing (cleaning, washing, juicing, extraction, filling, packaging drying) plant)

Loaded with diversified machineries

Cold storage including freezers about 7000 tons capacity, drainage problem for cleaning



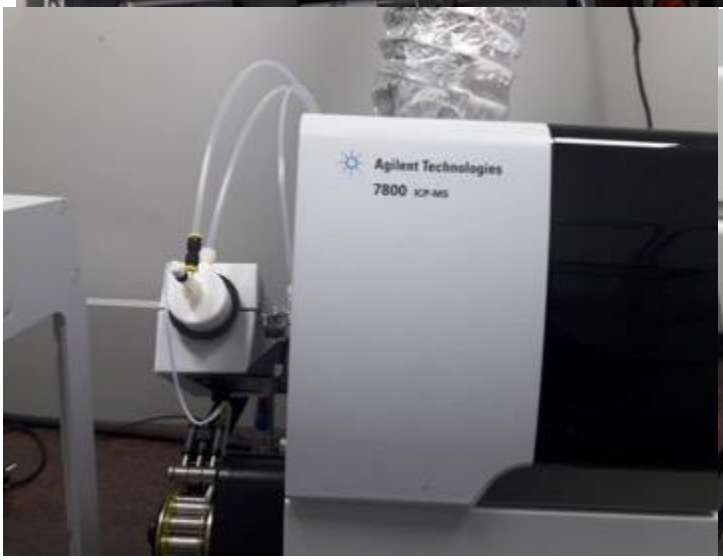
Walls and floors including epoxy floors are not properly constructed within one year period already damaged

Loading and unloading sites were not properly constructed

Machineries were not functional, not cleaned & accumulated heavy dusts

Truck transportation facilities, warehouse & one window service

UZstandards Laboratories are equipped with some Agilent equipment GCs (including 7000D Triple Quadrupole GC/MS), HPLC and ICP-MS (7800)



ANNEX 7: REQUESTED DATA SETS FROM THE MINISTRY OF AGRICULTURE

DATA SETS OF DATA FROM 2018 AND FORECAST FOR 2023

Number of Small Holder Farms by size of land and location	Small Holders <1Ha	Small Holders 1-5Ha	Farmers >5Ha<10	Farmers >10<50Ha	Farmers >50<100Ha	Farmers >100<500Ha	Farmers >500<1000 Ha	Farmers >1000Ha	Each of the Previous data sets by District		
Number of Small Holder Farms by location											Each of the previos data sets by Andijan, Tashkent, and Samarkand Regions
Number of extension agents available per region											Each of the previos data sets by Andijan, Tashkent, and Samarkand Regions
Annual Top Crop revenue producers	#1 Revenue Crop	#2 Revenue Crop	#3 Revenue Crop	#4 Revenue Crop	#5 Revenue Crop	#6 Revenue Crop	#7 Revenue Crop	#8 Revenue Crop	#9 Revenue Crop	#10 Revenue Crop	Each of the previos data sets by Andijan, Tashkent, and Samarkand Regions
Annual Top crop revenue producers by MT	#1 Revenue Crop	#2 Revenue Crop	#3 Revenue Crop	#4 Revenue Crop	#5 Revenue Crop	#6 Revenue Crop	#7 Revenue Crop	#8 Revenue Crop	#9 Revenue Crop	#10 Revenue Crop	Each of the previos data sets by Andijan, Tashkent, and Samarkand Regions
Annual Top crop revenue producers by Ha	#1 Revenue Crop	#2 Revenue Crop	#3 Revenue Crop	#4 Revenue Crop	#5 Revenue Crop	#6 Revenue Crop	#7 Revenue Crop	#8 Revenue Crop	#9 Revenue Crop	#10 Revenue Crop	Each of the previos data sets by Andijan, Tashkent, and Samarkand Regions
Annual Top crop revenue producers by $US	#1 Revenue Crop	#2 Revenue Crop	#3 Revenue Crop	#4 Revenue Crop	#5 Revenue Crop	#6 Revenue Crop	#7 Revenue Crop	#8 Revenue Crop	#9 Revenue Crop	#10 Revenue Crop	Each of the previos data sets by Andijan, Tashkent, and Samarkand Regions
Top 5 Crop sales SOLD IN TASHKENT REGION	#1 Crop & MT & $US	#2 Crop & MT & $US	#3 Crop & MT & $US	#4 Crop & MT & $US	#5 Crop & MT & $US						
EXPORTED Top crop rev producers by MT by Country	#1 MT & Country	#2 MT & Country	#3 MT & Country	#4 MT & Country	#5 MT & Country						
Average Days in storage per Crop	Crop 1 MT and Days in Storage	Crop 2 MT and Days in Storage	Crop 3 MT and Days in Storage	Crop 4 MT and Days in Storage	Crop 5 MT and Days in Storage	Crop 6 MT and Days in Storage	Crop 7 MT and Days in Storage	Crop 8 MT and Days in Storage	Crop 9 MT and Days in Storage	Crop 10 MT and Days in Storage	
Cold Storage buildings by Regions Districts	Andijan Districts	Tashkent Districts	Samarkand Districts								

AIR CARGO FACILITIES

Availiable cargo facilities by region	Capacity of cold storage facilities by pallet space or	Type & Capacity of Air carrier	Number of flights per week	Quantity transported in MT 2014	Quantity transported in MT 2015	Quantity transported in MT 2016	Quantity transported in MT 2017	Quantity transported in MT 2018	Contact information of person at each airport
Andijan Region									
Tashkent Region									
Samarkand Region									
Bukhara Region									
Fergana Region									
Jizzakh Region									
Karakalpakstan Republic									
Kashkadarya Region									
Khorezm Region									
Namangan Region									
Navoiy Region									
Surkhandarya Region									
Syrdarya Region									

EXPORT DESTINATION AND QUANTITY

Originating Uzbek Airport (list all airports)	Export destination cities (airports)	Cities of interest to UA for increasing Cargo traffic	Export MT in 2014	Export MT in 2015	Export MT in 2016	Export MT in 2017	Export MT in 2018	List of Requirements from Uzbek Airlines for Fresh Produce Shippers

PRODUCTION DATA

crop	district	province	2014, 2015, 2016, 2017, 2018 and each year forecasted for 2019 through 2029																		
			Total Ha	Total Harvested Mt per Ha	MT exported	MT sold in Uzbek	Total number of ALL farms	Number of small farms	Average amount of Ha for small farm	Average Yield (MT) per Ha for small farms	Number of medium farms	Average amount of Ha for medium farms	Average Yield (MT) per Ha for medium farms	Number of Large farms	Average amount of Ha for Large farms	Average Yield (MT) per Ha for large farms	avarage farm gate price/kg	average cost for Xport Transportation/kg	avg Export sale price Country/kg	Quality loss by district	Quantity loss by district
cherry (sweet)																					
cherry (sour)																					
apricot																					
plum																					
peach																					
nectarine																					
apple																					
pear																					
quince																					
grape																					
melon																					
water melon																					
tomatoes																					
onion																					
cabbage																					
lettuce																					
garlic																					
populate with top horticulture crops by MT produced																					

DEMAND DATA

crop	Region (Province)	Country	2014, 2015, 2016, 2017, 2018, and each year forecasted from 2019-2029								
			retail sales price/kg inside Uzbek Informal Bazaar	retail sales price/kg inside Uzbek Formal Markets	wholesale sales price/kg inside Uzbek	Number of transporters licensed by each country	MT imported by country	Number of bazaars per district-Uzbek	Number of small grocery stores per district - Uzbek	Number of large supermarkets per district-Uzbek	avg sale price in foreign contry/kg
cherry (sweet)											
cherry (sour)											
apricot											
plum											
peach											
nectarine											
apple											
pear											
quince											
grape											
melon											
water melon											
tomatoes											
onion											
cabbage											
lettuce											
garlic											
populate with top horticulture crops by MT Xported											

INFRASTRUCTURE DATA

crop	Region (Province)	District	2014, 2015, 2016, 2017, 2018 and each year forecasted for 2019 through 2029									
			Number of refrigerated trucks licensed in each district	Capacity in MT for each truck licensed in each district	Average days crop is held in storage	number of currently useable cold storage facilities	Storage capacity in MT per each cold storage facility	number of pre-colers	pre-cooling capabiity in MT per 24 hours	number of Sorting Grading and Packaging businesses	capability in MT per 24 hours for each Sorting Grading and Packaging business	Number of extensio n agents
cherry (sweet)												
cherry (sour)												
apricot												
plum												
peach												
nectarine												
apple												
pear												
quince												
grape												
melon												
water melon												
tomatoes												
onion												
cabbage												
lettuce												
garlic												
populate with top horticulture crops by MT Xported												