



MINISTRY OF ECOLOGY,
ENVIRONMENTAL PROTECTION
AND CLIMATE CHANGE OF THE
REPUBLIC OF UZBEKISTAN



APPLE, APRICOT & PEAR VALUE CHAIN ANALYSIS

In the Republic of Karakalpakstan



GGGI Uzbekistan. Insight Brief 2. Green Rehabilitation Investment Project for Karakalpakstan Republic to Address Impacts of the Aral Sea Crisis (Aral Sea GRIP)

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Objective

The main objective of this Insight Brief is to describe the current flow of products and stakeholders involved in the apple, apricot, and pear value chain in Karakalpakstan. Based on the existing conditions of the value chain, this Insight Brief also presents the constraints and opportunities to be considered by regulators, technical advisory service providers and potential investors, in order to support the development and improvement of the value chain.

This Insight Brief complements the ‘Green Rehabilitation Investment Analysis’, which informs decision-makers regarding the potential return on investment for implementation of infrastructural adaptation measures at the production stage of the value chain.

Methodology

This Insight Brief employed a value chain analytical method framed by a functional analysis¹ to identify the physical flows and key stakeholders involved in the value chain from data mainly obtained at the production stage.

For this analysis, primary data collection was conducted in 2021 in 4 districts of the Republic of Karakalpakstan: Bozataw, Kegeyli, Chimbay, and Karauzyak (target area for the Aral Sea GRIP Project). A survey developed by GGGI collected information about economic activities from a total of 1,277 stakeholders who were randomly selected within each of the following categories: homestead landowners, “*dehkan*” and “*fermer*” farmers, and other agricultural entrepreneurs. Among the 887 farmers surveyed, 84 reported a specialization in vegetable farming, primarily cultivating tomato and cucumber and were able to provide detailed production statistics that form the basis of this assessment.

A number of secondary information sources (ADB, USAID, and others) were used to complement the primary data-based analysis of the value chain, and of the constraints and opportunities to be considered for its further development and improvement.

KEY TAKEAWAYS

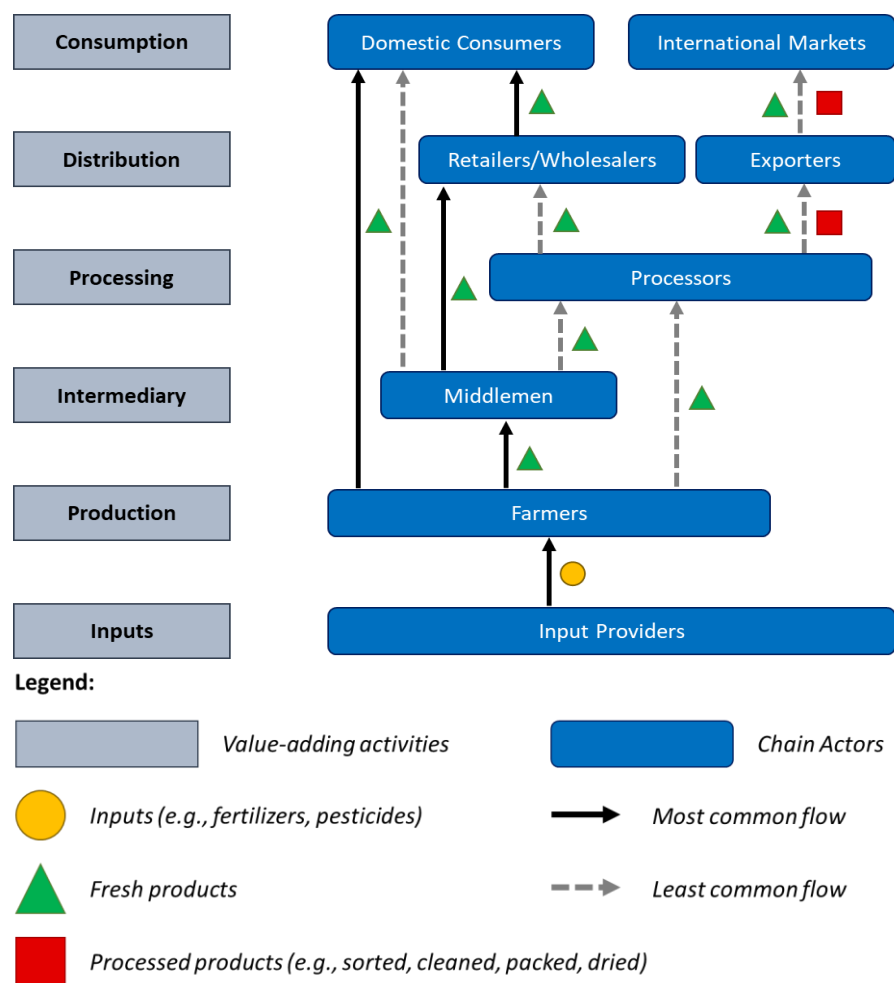
- The value chain of apple, apricot, and pear mostly ends with the commercialization of fresh products with limited value addition, with the exception of dried apricots, in the Republic of Karakalpakstan.
- Only 25% of the farmers reported selling their produce to local (district) and national intermediaries. It is notable that no strong engagement with a local, regional, or national processor exists in the region.
- The development of the apple, apricot, and pear value chains is limited by a lack of technical and managerial skills required for proper orchard production management, lack of connectivity with intermediaries and processors, and lack of exposure to marketing opportunities.
- Opportunities for improving the value chain rely in principles and activities including good agricultural practices, direct investment with clear profit gain, understanding the demand and market trends, vertical and horizontal integration, trust, transparency, and traceability, and improved branding and marketing.
- Untapped international market opportunities exists, especially for fresh apricot (estimated at USD 82 million). National market opportunities may arise due to the aimed support from the government outlined in Strategies and Plans for developing the agriculture sector with direct impact in the value chains.

¹ Functional analyses provide an overall description of the value chain system, identifying the main actors and stakeholders involved, and expanding on some of the main strategic development challenges faced (EU 2022).

Value Chain

Since 2015, the Government of Uzbekistan has increasingly prioritized efforts to expand fruit production by encouraging the establishment of new orchards on land where cotton was previously cultivated, and by renovating and replanting orchards to upgrade them for modern high-density production (USAID, 2020). This diversification of agricultural production from cotton and wheat production towards fruits not only represents an opportunity for exports and value addition, but also a significant environmental opportunity to decrease water demand for irrigation² (ADB, 2016). Furthermore, ambitious targets have been set for the Republic of Karakalpakstan in Resolution of the President of the Republic of Uzbekistan No.4803 (08.11.2020),³ which aims to achieve an annual growth of ca. 20% on the volume of exports of fruit and vegetable products during the period of 2021 – 2025.

Currently, the value chain of apple, apricot, and pear mostly ends with the commercialization of fresh products with limited value addition, with the exception of dried apricots, in the Republic of Karakalpakstan. The figure below presents the value chain for apple, apricot, and pear in the region, followed by a brief explanation of each stage.



² From an estimated usage of 4,426m³ of water to grow a ton of cotton to an estimated usage of 820m³ of water for growing a ton of apple (ADB, 2016).

³ "On measures to implement the project 'Agricultural modernization of the Republic of Uzbekistan' with the participation of the International Bank for Reconstruction and Development and the International Development Association"

INPUTS

The main inputs needed by farmers on an operational basis include organic and chemical fertilizers and chemical pesticides. In terms of fertilizers, there is no clear preference between organic and chemical materials; some farmers reported using either organic or chemical materials, while others reported using a combination of the two. None of the farmers reported using organic pesticides. When asked about additional production inputs, such as packaging materials, 65% of the farmers reported having 'no need' for them, while 25% reported their use, and only 10% reported lack of availability of these inputs.

PRODUCTION

Major producers of apples, apricots, and pears include homestead landowners, *fermers*,⁴ and *dehkan*⁵ farmers. Apple was reported as the most commonly cultivated fruit, and indeed is the most preferred due to its high endurance and adaptability to various soil and climatic conditions. As a reference, ordinary apple seedlings take 4 to 5 years from planting the seedling to seeing the first fruits (UNDP 2016). Apple, apricot, and pear are cultivated either on dedicated land, or in combination with vegetables, grains, and other fruits, such as quinces and grapes. As a generalization, most of the production by homestead landowners and *dehkan* farmers is used for self-consumption, while *fermer* production is used for commercialization purposes.

In terms of production, most farmers reported limited access to water. For irrigation, farmers use fixed pumps and small petrol pumps, which bring water from collective canal networks and rivers located, on average, more than 1km from the production area. Regarding the availability of, and satisfaction with

additional critical production elements, most farmers indicated sufficient availability of productive land, and expressed medium⁶ satisfaction regarding its performance (i.e., productivity). Aside from water pumping equipment, farmers reported having 'no need' for additional capital-intensive production equipment (e.g., tractors), nor the need for additional labor. Finally, most of them agreed on the lack of availability of basic utilities besides water resources.

Box 1. Climate change, salt and dust storms, and infrastructural adaptation measures.

The most important hazards faced and reported by farmers include soil salinization, the continuous deterioration of weather conditions, and low quality of and access to water. When asked about their farming income trend over the last 3 years, 42% of the farmers reported a stable trend, 38% reported a declining trend, and only 19% reported an increase in their income trend.

When asked if they have tried implementing adaptation measures, such as drip-irrigation systems, more than 85% of the farmers mentioned that they have not tried it due to financial and technical knowledge limitations.



Photo - Intensive garden with drip irrigation system established in Bozataw District by UNDP's project 'Developing climate resilience of farming communities in the drought prone parts of Uzbekistan'. Project duration: May 2014 - November 2021.

⁴ An independent economic entity that conducts commercial agricultural production using land plots that are leased.

⁵ Small-scale family farm that produces and sells agricultural products based on the personal labor of family members, on a

household plot of land granted to the head of the family for life as an inherited possession.

⁶ On a scale of low, medium, and high performance satisfaction.

According to surveyed farmers, local (district level) final consumers were the main customers for 75% of the farmers. Only 17% of the interviewees reported selling a significant proportion of their produce to local (district) intermediaries, while 8% sold primarily to national intermediaries. In terms of difficulties faced when trying to sell their products, most of the farmers reported having 'no' difficulties. However, product quality issues were mentioned to be a barrier for trying to place higher prices. Additionally, it is notable that no engagement with a local, regional, or national processor was reported by the surveyed farmers.

Figure 1. Apples produced in Karakalpakstan.



Regarding farmer experiences operating and managing farm activities, basic technical and managerial skills have primarily been learned from family members and via peer learning from other farmers. Only 5% of the farmers interviewed reported having received formal education or training to improve their technical and managerial skills.

In terms of conducting their farming activities following the regulatory framework, 75% of the farmers reported being satisfied with the public administrative permits and processes, while 25% reported being dissatisfied. In addition, and according to their perception, 85% of the farmers perceive a business-friendly environment in terms of conducting their business, obtaining necessary permits, and trading across districts.

INTERMEDIARY & PROCESSING

Intermediaries and processors are weakly integrated into the value chain. Only 25% of the farmers are connected to local and

national intermediaries, while none of the farmers reported being engaged with processors. In terms of availability of intermediary services (i.e., transportation, storage, and refrigerated transportation and storage), only 5% of the interviewees reported these services as being available and accessible, while 26% mentioned their lack of availability and accessibility, and 69% expressed having 'no need' for these services.

Regarding processed fruit products, two companies (vertically integrated) in Karakalpakstan are acknowledged to be engaged in processing fresh fruits into dried fruits (including apricot) (See Table 1).

DISTRIBUTION & CONSUMPTION

Fresh apple, apricot, and pear, as well as dried apricot, are the most common products traded and distributed to final consumers in Karakalpakstan. In terms of distribution, exchange of these products occurs at local level (district or village) between families, at district traditional markets (bazaars), neighborhood stores, and through national high-value retail stores such as Korzinka.

The final price in markets varies. For example, during April 2022, the range of prices for fresh apples in Karakalpakstan was UZS 6,000 (min) to UZS 8,000 (max) per kilogram (Agromart 2022). Meanwhile, the range of prices for dried apricot in Karakalpakstan was UZS 25,000 (min) to UZS 30,000 (max) per kilogram over the same period (Agromart 2022).

Table 1. Fruit production, processing, and export companies in Karakalpakstan.

Company Name	Products	Capacity of Production per Year
Polat Gulnara	Fresh fruits and dried fruits	Up to 100 tons per year per product
Nukus Agro Impeks	Fresh and dried fruits prepared for export	Up to 500 tons per product
Agro Eksim Gold	Fresh fruits prepared for export	Up to 500 tons per product

Source: (MIFT Karakalpakstan 2021).

Constraints & Opportunities

CONSTRAINTS

In Karakalpakstan, based on the findings described above, the development of the apple, apricot, and pear value chains is limited by a lack of technical and managerial skills required for proper orchard production management, lack of connectivity (whether through access or perceived need) with intermediaries and processors, and lack of exposure to marketing opportunities (that are linked to production quality limitations). This analysis of the constraints limiting fruit value chain development in Karakalpakstan reflects those identified for Uzbekistan. According to secondary sources, the most important limitations in the country include low access to higher yielding seedlings, lack of knowledge about modern fruit orchard growing techniques, high production costs, and under-developed logistics and market infrastructure services (UNDP 2016) (ISCAD 2022). These constraints clearly contribute to low quality produce, high post-harvest losses, and loss of export opportunities (UNDP 2016).

According to the report 'Agricultural value chains activity in Uzbekistan 2015 – 2020', almost all of the country's high-quality fresh fruit produce goes to export markets, with local consumers benefiting from second tier products accessible through local markets. Under these conditions, local supermarkets conduct minimal marketing and advertising efforts, and there is a lack of price transparency at local markets (bazaars). Regarding processed fruit products (i.e., dried fruits), processing is usually conducted using traditional technologies and practices that result in quality and food safety issues substantially below those produced with modern practices (USAID 2020).

Reflecting the conclusions of GGGI's analysis, this report concludes that there is a strong need for product quality improvement throughout the value chain, starting from the seedlings, production practices, processing, and logistics, complemented with branding and marketing efforts (USAID 2020).

Box 2. Female participation along the value chain of fruits.

In terms of female employment along the value chain, there is significant participation and direct involvement in production, harvest processes, and local marketing and sales. Women are highly engaged during seasonal work, in medium and large commercial farms, and in their home gardens. However, they have limited access to necessary production-related inputs including financial resources and equipment, limited access to technical/marketing information, and limited agency with regard to management and decision-making capacity (USAID 2019).

Stage	Female (%)	Male (%)
Exports	5	90
Local market wholesales	45	60
Local market retail sales	65	30
Post-harvest	40	60
Harvest	85	10
Production	90	10

Source: Taken from (USAID 2019)

OPPORTUNITIES

In order to develop and exploit opportunities to increase domestic consumption and export competitiveness through the production of high-quality and high-price fruits, researchers have identified the guiding principles of FRUITS+ as a mechanism for value chain improvement. These principles represent best practices in fruit marketing across multiple studied countries, including Uzbekistan (USAID 2020).

Figure 2. Guiding principles of FRUITS+.



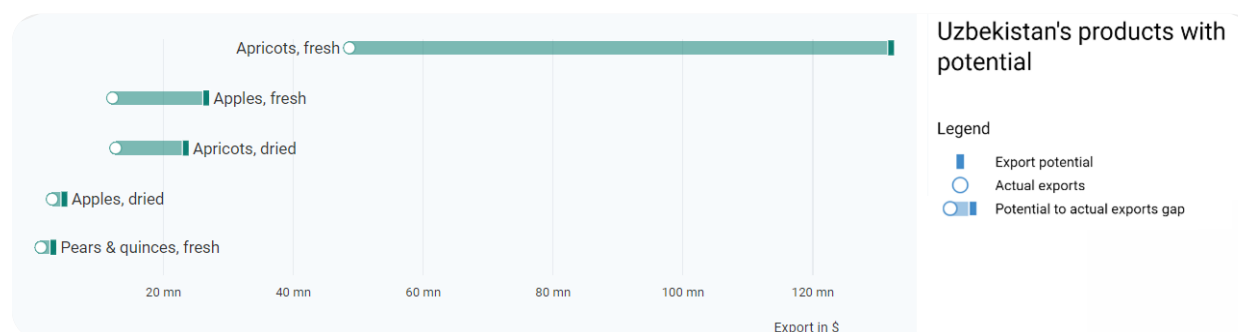
Source: (USAID, 2020).

In addition to these principles, market trends and positive external factors could be leveraged in order to support the development of the value chain. One of them is the current commitment by the government - as outlined in the Agriculture Strategy 2030 - to create a favorable agri-business environment & enhance value-chains, reduce state involvement & improve the investment environment, ensure the rational use of natural resources & enhance environmental protection, gradually diversify state expenditure, and develop research, education, information & advisory services (GGGI 2022). In addition to this, the rapid development of channels through supermarkets for higher quality fruits, compared to direct sales at traditional markets, represents a market opportunity that can support investment in production and post-harvest technologies.

In terms of post-harvest technologies for fruits, potential investments in regionally available technologies include pre-cooling equipment, sorting and grading equipment, packaging equipment, and new packaging materials. The resulting high-value processed fruits can yield higher prices on the market and are easier to transport, upgrading the volume and quality of Uzbekistan's internal and exportable fruit produce (USAID 2020).

According to the International Trade Centre (ITC 2022), Uzbekistan has an export potential⁷ estimated at USD 131 million for fresh apricots, USD 25 million for fresh apples, USD 22 million for dried apricots, and USD 3.6 million for dried apples, while for fresh pears & quinces the export potential is estimated to be USD 1.9 million (See Figure 3). Considering Uzbekistan's current exports of these products, there is a significant untapped potential to increase foreign exchange earnings of USD 82 million from fresh apricots, USD 17 million from fresh apples, USD 12 million from dried apricots, USD 1.4 million from dried apples, and USD 1.5 million from fresh pears & quinces.

Figure 3. Uzbekistan export potential for apples, apricots, and pears (fresh and dried) (2022).



Source: (ITC 2022).

Finally, in order to support gender inclusion in, and economic empowerment through development of the fruit value chains, targeted interventions may be required to address the obstacles currently faced by three different types of female groups. First, the female horticulturalists group, which includes both female farmers and women doing farming within their home gardens. Second, women-led harvest and post-harvest groups, specialized in the production phase; pruning; and picking, sorting, grading, and packing work. Finally, the female agricultural business owners' group, including not only pre-existing female consolidator business owners, exporters, and cold storage owners, but also women who would like to start or expand their agricultural business and who lack the necessary information and experience to engage effectively in these activities (USAID 2019).

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⁷ Export potential information is based on an economic model that combines the exporter's supply with the target market's demand and market access conditions (ITC 2022).



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