Republic of Uzbekistan

Agency for Implementation of Projects in the Field of Agro-Industrial Complex and Food Supply (UZAIFSA)

The Republic of Uzbekistan Preparatory Survey for Project for Horticulture Value Chain Promotion

Final Report

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Executive Summary

1. Background and Objectives

Agricultural sector output in the Republic of Uzbekistan ('Uzbekistan') tends to be vulnerable to the fluctuation in the production of cotton due to the global market conditions as well as the weather conditions. With a view to coping with such uncertainty, the Government of Uzbekistan ('GOU') is trying to diversify the crops to reach out for the export market through shifting the production towards horticulture and strengthening the relevant value chains.

On the other hand, the lack of facilities and capacity for forward looking farming operations is identified as the serious bottleneck for strengthening the value chain in Uzbekistan. While the demand for capital is widely recognized in horticulture production, processing and distribution, the supply of fund is not yet enough due to the banks' lending behavior. Although multiple development partners ('DPs') provide two-step loan ('TSL') projects and technical assistances ('TAs'), such demands for fund are not fully met. Overcoming these obstaciles is an urgent issue for GOU from the viewpoint of job creation, diversification of agricultural productions, introduction of productive agricultural machinery and development of logistics infrastructure.

This survey aims at facilitating the TSL for the horticulture sector in Uzbekistan (hereafter the 'Project'), in line with the policy direction of GOU to further develop the sector. Specifically, potential demand for medium-to-long-term financing, as well as for technical assistances, are examined with a view to justifying the Project, collecting/analyzing the relevant information, identifying the institutional arrangements and preparing the recommendation for the implementation plan.

2. Overview of Agriculture in Uzbekistan

Uzbekistan has achieved a robust economic growth after the transition to a market economy. The economy maintained a substantial growth at 5.1% in 2018. Agricultural sector, accounting for 28.8% of GDP in 2018, is still the key industry in this country.

Agricultural production in Uzbekistan had heavily concentrated on cotton production during the Soviet era. GOU has aimed at shifting the monopoly farming structure to a well-balanced one considering its national food security and paid a special attention to a wheat promotion policy after the independence. While the policy contributed to mitigate socio-economic confusion in the country compared to the neighboring former Soviet Union economies, the agricultural policy heavily dependent on cotton and wheat has caused a stagnant farming structure with low economic efficiency.

The crop farming structure in Uzbekistan has started to change in 2005 - 2010. The cropped area of vegetables and fruits has remarkably increased, while the area of cotton and wheat has shown a plateau or a declining trend during the time. GOU has changed a direction of agricultural policy to promote the production of vegetables and fruits, as it expects those crops to be new leading commodities to be exported. As a result, the total horticultural crop production has more than trippled during 2000 - 2015. The total export value of horticultural crops sometimes exceeded the value of cotton in recent years. GOU has actively implemented various policies to promote the production in horticultural crops with relatively high profitability and more job creation in rural areas.

The Ministry of Agriculture (MOA) established the Horticulture and Greenhouse Development Agency in March 2019 aiming at supporting *Fermer* and agricultural related companies in order to enhance value chains of horticultural crops comprehensively.

Currently, there are 3 major categories of agricultural growers in Uzbekistan. i.e. *Fermer* (a family farm enterprise), *Dekhkan* (a rural household with a small plot) and Agri-firm (a farm enterprise). The growers have emerged through several farm restructurings after the independence. While *Fermer* sector is a pillar of the national agriculture, GOU remains to hold a basic policy to avoid fragmentation of farmland or to maintain a large-scale farmland. The latest farmland optimization policy of GOU keeps a close watch on two things, i.e. enlargement of a size of farmland managed by *Fermers* and crop diversification. There are 4,556 thousand of *Dekhkan* households throughout the country at present. It implies that not only the great majority of households in rural areas but also not a small percentage of households in urban areas are categorized into the *Dekhkan* households. While *Dekhkan* sector plays an important role in horticultural crops production and livestock farming in the country, the average size of *Dekhkan*-plot is too small for general *Dekhkan* households to depend on backyard farming for living. Agri-firms still do not have much presence in agricultural production, while they have remarkably developed in recent years.

Uzbekistan historically did not have an agricultural production system backed mainly by individual private farmers before its independence. A public agricultural extension system, which systematically provides agricultural extension services to the private farmers on a continuous basis, has not been developed. While GOU has taken many actions on the extension services, they are carried out only on a project basis without sustainability. MOA has started to develop a national agricultural extension system in accordance with the Presidential Decree in April 2019. It seems that establishment of an integrated framework of the national agricultural extension system should be the key component in materializing a concept of this decree.

Uzbekistan agriculture has moved into a new age after the change of the agricultural development policy heavily concentrated on cotton and wheat to crop diversification in recent years. A task team led by a World Bank specialist suggested the following areas for further improvements in the agricultural sector.

- GOU has maintained a strict control of the entire production chain, with only few exceptions in horticulture and livestock productions.
- Strategic crops, cotton and wheat, continue to dominate the sown area of *Fermers* and the land allocation to these crops are not driven by signals.
- *Dekhkans* are disconnected from food value chains and agribusiness. Large farms do not work as core farms for *Dekhkans.*
- Farm restructuring by decrees and weak property rights in land use curtail management and investment incentives and raise issues of access-to-farmland for the rural population.
- A limited fodder base constrains livestock expansion. Crop and livestock production are decupled. As a result, both sub-sectors do not enjoy any synergy.
- *Fermers* producing high-value crop are constrained in their access to fertilizers, fuel, machinery, credit, value chains, and export channels.
- Problems pertaining to the stability and distribution of irrigation water supply have not been resolved in a satisfactory manner.

3. Horticulture Value Chain

Main vegetables produced in Uzbekistan are potato, tomato, melons, carrot & turnip, and production of those vegetables has shown rapid increase since 2000. Main fruits produced in Uzbekistan are grape, apple, apricot, peach, nectarine snd cherry, the production of which has also increased since 2000. These horticulture crops are mainly produced in southern part of the country, such regions as Samarkand, Surkhandarya and those in Fergana Valley. Considering water resource distribution, climate conditions and location of big markets within the country, crop productions in these areas are expected toexpand continuously.

Production of horticultural crops by *Dekhkans* is greater than that by *Fermers*. Farmlands area per *Dekhkan* household is much smaller than that of *Fermer*, while the number of *Dekhkan* (4.555 million) is overwhelmingly greaterthan Fermer (35 thousand). As a result, productions of vegetables and fruits (except grapes) by *Fermer* accounts for only 29.8% and 36.6% of the total, respectively. On the other hand, yields of fruits by *Fermer* are higher than those by *Dekhkan*, while the yields of vegetables by *Dekhkan* are higher those by *Fermer*.

Yield of horticultural crops in Uzbekistan is substantially high compared with surrounding countries and average of other counties in general. Yields of some fruits are higher than those in Japan. The production skills in Uzbekistan has reached to a certain level, and growers do not need a simple package of standardized technologies from abroad. Rather, their needs are becoming more sophisticated and diversified.

The Presidential Decree No. 2603 (19 September, 2016) advocates the export promotion of horticultural crops, thus, some processing companies have invested in processing plants/machines and facilities. Any registered companies and *Fermer* can export horticultural products without export tariff. Agriculture-related companies try to introduce processing equipments, refrigerating facilities/trucks, greenhouses, agricultural machinery, drip irrigation systems, etc., in order to increase their transaction volume and unit prices of crops.

In Uzbekistan, 70% of horticultural crop production by weight is by *Dekhkan*, while crop production for trading in wide area is mainly done by *Fermer* and agriculture-related companies. *Dekhkan* generally produce crops for house consumption and sell other products to middlemen at farm gates. On the other hand, *Fermer* and agriculture-related companies sell products to middlemen, wholesalers, supermarket chains, processing companies and exporters. Particularly, sales to the supermarket chains are rapidly increasing in urban areas.

The distribution volume of horticultural produce was 25.7 million tons in 2017. Out of the total amount, 67.0%, 6.4%, 12.7% and 3.6% were for the regional consumptions, for consumptions in big cities, for processing (3.5% for export and 9.2% for domestic), and for exports (as fresh products), respectively. At this moment, regional consumption is largest, while the consumption in big cities and export to Russia and neighboring countries are increasing in share.

Volume of the fruits export increased in 2017/2018 by 60%. Especially, sweet cherry is worth attention in terms of the high unit price for export. As for the fresh vegetables, export volumes of onions, carrots, eggplants and tomatoes have been increasing. In 2018, export value was 889.7 million USD, and the ratios of exported to Kazakhstan, Russia, Kyrgyz, Afghanistan and China were 44.1%, 19.7%, 9.0%, 6.0% and 5.2%, respectively. In the future, exports to EU, East/Southeast Asia, and Gulf countries are likely to be promoted. Strengthening of the food safety and sanitation inspection system is necessary, while processing and export companies will have to obtain certifications.

4. Current Status of the Banking Sector

In Uzbekistan, the level of financial intermediation had been historically lower, compared with other transitional economies in the central Asia. However, thanks to the significant progress in financial liberalization since 2017, the ratio of 'credit to the economy' significantly reached at 39.7% in 2018 from 21.8% in 2016. To the contrary, a sudden devaluation of the Uzbek Sum has seemed to decrease the people's confidence in the banking sector and national currency Uzbek Sum. This may be a hidden, fundamental problem behind the Uzbek banking sector.

Currently, with the assistance of World Bank, the government is making progress of banking sector restructuring in Uzbekistan. As of 1 May 2019, in Uzbekistan the banking sector dominates the financial market with the total bank assets of 248.4 trillion sums, which are owned by 13 banks with state ownership (85% of the total bank assets) and other 16 banks (15%). The banking sector's financial indicators show that the banking system is sound, and thus the central issue of the banking sector restructuring is on the privatization of state-owned banks.

In recent years, due mainly to the increasing financial demand, the total bank loans have reached 193.2 trillion sums annually increased by 51.8%. However, the following numerical data explains that the banks have difficulty in fund-raising, particularly mid-to-long-term fund-raising in Uzbekistan: i) The share of deposits in the total liabilities is low at 37%; and ii) share of more than one year deposits in the total deposits is low at 34%. Under such a situation, in order to deal with robust medium-to-long-term financial demand for capital investments, the banks have covered the funding gap by getting long-term borrowings (55% of the total liabilities) from the government and overseas DPs/IFIs), etc.

In reality, given the largely state-driven banking sector, there seems to be an imminent problem described as 'credit misallocation' for private sector and smaller farmers/ agri-firms. In response to such a problem, since January 2018 the government has operated the State Fund for Entrepreneurship Activity Development Support to provide with credit guarantee services, although the coverage of the services is limited.

On the other hand, if we look into the lending practice within Uzbek banks, the banks' appraisal systems are conventional and standard. Although there is a remaining slight concern that the Central Bank's direct intervention in pricing loans and providing with policy-based loan programs has damaged banks' risk management practices, there is no evidence that the current relevant regulatory framework significantly impedes the bank lending practice. However, it seems that the banks cannot satisfy the actual financial demand for horticultural value chain sector as well as farmers & private agri-firms. Besides the above-mentioned problem of banks' fund-raising, another reason is that the banks are facing with practical challenges inherently associated with agri-lending.

With regard to the policy recommendations, in order to accelerate the banks' improvement of agriculture-focused credit activities, the government is highly expected to play a role of further improving the relevant environment on agricultural and rural development finance in Uzbekistan. In this respect, JICA Survey Team recommends taking the following two measures: Strengthening the Credit Bureau (KATM) and creating agricultural lending manuals.

5. Gender Mainstreaming

In Uzbekistan, gender equality is advocated in the Constitution, and there is no legal discrimination by sex. The Women's Committee is the responsible governmental organization for gender mainstreaming and formulates/promotes policies/programs for gender mainstreaming in any sectors. On the other hand, Business Women Association (BWA), a NGO, supports women's businesses.

Agriculture is traditionally regarded as a work of men, consequently, it is not desirable for women to be involved in farming activities. However, the situation is changing at this moment, horticulture is the sector that women are most interested in. Both men and women work in horticulture value chain, however, their roles & responsibilities are different. Generally, women are responsible for weeding, sorting of crops, packing, sale of crops to neighborhood area, while men are responsible for irrigation, inter-tillage, application of chemical and fertilizers, business plan formulation, export of crops and so on.

Land use rights usually belong to men, and women can become "decision makers", when they become singles due to death of their husbands or divorce. When women are married, general assets including vehicles, farming machines and livestock are registered in husbands' names. It means that married women don't own assets as collaterals, which makes it difficult for them to access to loan. Moreover, when men and women get cash incomes by any works, the cash is managed as common asset of the family, which means that women cannot handle it.

Regardless of sex, small-scale crop growers, who don't have collateral, cannot access to loan. Therefore, the targets of the gender mainstreaming of the Project is female farm managers, instead of female labors or growers. Therefore, it is important to grow model female managers for other women, which can change men's way of thinking in the long run.

As a part of the TA for PFIs, one session for gender consideration shall be included, and participants from PFIs are requested to prepare draft gender policies. The result of Rural Socio-economic Survey will be introduced at the session, which enhances their understanding about gender issues in horticulture value chain. The bankers will be requested to develop practical gender policies, referring to the results of the Rural Socio-economic Survey.

Some PFIs have already developed their own gender policies, and the participants can share the policies and lessons learnt through the implementation of policies. They can review the existing policies or formulate new ones based on the discussion among them. Each bank is expected to develop each policy, instead of uniformed policy for the TSL Project. Moreover, they are requested to develop realistic indicators to assess achievement, if possible. Some banks will set such indicators, while other will not do that. Each decision has to be made by each bank.

It is planned to establish demonstration plots as TA agriculture component. It will target not only the end-users but also other general growers. According to the Council of Farmers, Dekhkan Farms and Owners of Homestead, it is possible to promote women's participation in technical training, by informing them of the training beforehand. Therefore, it is proposed to involve the Council and Khokimiyat, when the training is planned to be organized. Moreover, it is needed to set training time and date, which is available for female growers.

6. Environmental and Social Consideration

The State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection (the Committee) is responsible for review of Environmental Impact Assessment ('EIA') reports, environmental protection, and proper utilization of natural resources in Uzbekistan. The regulation stipulating the EIA procedure, namely, the Regulation on State Environmental Expertise was formulated in 2001 and it was revised in November 2018.

According to the regulation, any proposed projects in Uzbekistan are classified into four categories, namely, Category I (high risk), Category II (moderate risk), Category III (low risk) and Category IV (limited risk) in terms of project locations, scale of projects, extent of expected impacts and so on. ADB and JICA have Category A, B and C, which correspond to Category I &II, Category III & IV, and other projects, respectively.

When the JICA Environmental and Social Guidelines ('JICA Guidelines') and the regulation in Uzbekistan are compared, some gaps are identified. For instance, the regulation in Uzbekistan stipulates any project proponents to describe mitigation measures and monitoring plan in EIA reports, still, it does not instruct how to write them. It is needed to compensate such gaps by referring to the JICA Guidelines in the Project.

The expected activities by means of the loan are greenhouse establishment, introduction of cold storage facility and/or processing facility, utilization of agricultural machines and so on. Probably, they would be classified into Category IV, which can cause very minor environmental issues, and preparation of an EIA report is not needed. Still, it is noted that construction of green houses with heating system can be sorted into Category III, which requires preparation of an EIA report.

The procedures of Environmental and Social Management System ('ESMS') for the Project is as shown below following the ADB's ESMS Arrangement and the JICA Guidelines. The screening format for categorization in the Arrangement is also to be applied.

- All sub-projects comply with Uzbekistan national regulations;
- All sub-borrowers have i) no past and ongoing environmental liabilities such as non-compliance with environmental, worker health and safety issues, any liens, fines or penalties and ii) adequate capacity for environmental management;
- All sub-projects falling under Category A or Classes I & Class II are excluded from financing under the JICA TSL.
- If investment cost of a sub-project exceeds USD 1 million, approval by JICA will be necessary. All sub-projects causing involuntary resettlement and land acquisition are excluded from the financing under the JICA TSL.
- All sub-projects using JICA funds with potential environmental and/or social impacts are reviewed and evaluated to comply with the relevant laws and nature protection normative documents of Uzbekistan. Permissible standards, such as wastewater limitation standard, have yet to be established in Uzbekistan, thus, international standards, namely, IFC standards, are to be applied.

When the end-users apply for the bank loan, they are requested to fill the form including the environmental screening form. The bank staff support them for filling the form. If an applied project is sorted to Category I or II, it is not targeted by the TSL. When a project is classified into Category III, EIA report preparation is necessary,

and the applicant will delegate the task to a local environmental consultant with the support of the local government.

During operation of the sub-projects, the branch office staff of the PFIs monitor the situations and submit the monitoring reports to the bank headquarters and the PIU quarterly. The PIU will submit the monitoring report to JICA annually.

7. Rural Socio-economic Survey

Rural socio-economic survey was conducted to identify necessary technical topics to be incorporated in the TA of the Project. It consists of 1) interviews to horticulture crop growers, 2) gender workshop study and 3) interview to agriculture related companies. The target areas are Andijan, Tashkent and Jizzakh regions taking into consideration the conditions of horticulture crop production, capacity of cold storage and cold storage.

Average farmland area per grower is 11 ha, while their average annual gross income is UZS114.3 million as of 2018. On the other hand, the targeted processing and export companies employ 13.4 person and 60.6 persons on average as full-time employees and seasonal employees, respectively. Their mean sales amount is estimated at 468 tons, while trading volume is estimated at USD 545,000 in 2019. In addition, the targeted wholesalers and middlemen hire 6.6 persons and 21.7 persons on average as full-time and seasonal employees, respectively. Their mean sales amount per company is USD 16,250, while their average trading volume per company is estimated 197 tons in 2019. All the target middlemen are engaged in farming also.

The Rural Socio-economic Survey implies that the growers want to get loan for production, processing and sale of crops. 19.4% of the target growers has accessed to loan so far, and 9.7% of all growers got loan from institutional loan. The purposes of the loan are construction of green houses, cold storage facilities, warehouses, introduction of irrigation system, purchase of seeds, seedlings, fertilizers, chemical, agricultural machines and so on. Those who do not have access to loan explained that they could not secure collateral for loan.

Out of the 16 targeted agriculture related companies, eight companies have accessed to loan from banks. In addition, three companies have utilized the guarantee system by GOU. The major purposes are purchase of processing machines, followed by warehouse construction, purchase of seeds & seedlings, agricultural machines, green house construction and cold storage construction. The difficulties to get loan for the companies are business plan formulation, preparation of necessary documents and securement of collaterals.

In order to increase unit prices of crops, the target growers examine shipment earlier than usual or during winter season, introduction of new varieties, improvement of cultivation technology, introduction of greenhouse facilities and cold storage facilities. Similarly, the target agriculture related companies try to improve quality of their products by introducing new facilities.

General agricultural growers have had few opportunities to join in training of agricultural techniques so far. Therefore, it is proposed to establish demonstration farms and invite neighborhood growers including the end-users to conduct agricultural training in the TA agriculture component. The expected training topics are water-saving techniques, new varieties introduction, and biological pesticides/ integrated pest control.

Agriculture related companies raised some needs, namely, participation in horticultural expositions, inspection of food processing machine manufacturers, and business negotiation. Therefore, it is proposed to organize study tours to Japan for those companies. It is noted that improvement of the food safety certification organization (UzStandard Agency) and capacity development of scientific research institutes (fruits, vegetables, plant protection, and food hygiene & phytosanitary) will be implemented by the IBRD project, so it is desirable to collaborate with the activities.

The gender workshop study identified some issues, e.g., "It is difficult handle both home affairs and agricultural works for women", "Women don't have enough fund", "Women are lack of knowledge of agricultural techniques, and information of agricultural inputs such as seeds, seedlings, fertilizer and chemicals", "Women have difficulties to access to loan, since they don't have assets for collaterals" and so on. Noted that there was no big difference in identified gender issues between male group and female group.

Both men and women want to get loan from banks with low interest rate. However, commercial banks should secure credit by setting collateral as 125-130% of loan amount. Such situation causes difficult situations for any crop growers, who don't have collateral, to access to loan. Thus, the credit guarantee service system through the Entrepreneurship Development Support Fund has been established by the Government and started its operation since 2018. Still, it has not function very well so far, therefore, it is requested to expand the fund and functions to meet the needs of the growers for loan.

It is planned to establish demonstration farms for vegetable and fruits cultivation as TA during the Project implementation, which makes it possible for growers to learn agricultural techniques, in addition to the end-users. The Project will be able to request Khokimiyat and "Council of Farmers, Dekhkan Farms and Owners Homestead Land" to invite farmers to the training, especially, female farmers. Also, it is needed to consider women's available time and places for participation in the training when the training sessions are organized.

Through the Project, it is proposed to collect some successful case of female loan applicants by the Project and to propagate such cases among the PFIs. By using the results of gender workshop study for the TA targeting PFIs, the bankers can understand gender issues in horticulture crop value chain and take any measures for gender mainstreaming in the loan provision.

8. Similar Supporting Activities of Other Development Partners

In Uzbekistan, DPs have been providing TSL to crop growers and agriculture-related companies through intermediate financial institutions in Uzbekistan, in order to develop a horticulture value chain promotion from production to selling. At present, ADB, World Bank (IBRD), and IFAD provide provide TSL, credit lines for farmers and agro-related companies through intermediate financial institutions. Also, all of three DPs provide TA in addition to TSL support.

Sub-Loan Conditions of Three Similar On-going Financial Schemes

	ADB	IBRD	IFAD
Project goal	To improve access to market-based bank finance for farmers, agro-processing enterprises, owners and operators of cold storage facilities, trading and logistics service suppliers involved in the horticulture value chain. The project will help	To increase the productivity and financial and environmental sustainability of agriculture and the profitability of agribusiness in the Project Area.	To increase the incomes and assets of smallholder farmers, processors and service providers within the horticultural sub-sector. The outcomes would be: 1) creation of a viable horticultural sub-sector with modern farming techniques,

	ADB	IBRD	IFAD
	increase farm productivity, processing and storage capacity, and reduce post-harvest losses through upgrading and setting up intensive orchards, modern and efficient greenhouses, processing, storage and refrigeration facilities. This will in turn promote long-term economic and environmental sustainability and enhance profitability for farmers and agribusiness enterprises.		backward linkages to poor rural smallholders and improved access to domestic and international markets; 2) increased investments by producers, processors and service providers into productive assets in horticulture; and 3) improved farming efficiency and mobility of productive assets and produce.
Target areas	All regions	Phase I: 8 regions, Phase II: All regions except Surxondaryo viloyati state	Surxondaryo viloyati state
Target sub-sector /products	1) the manufacture and/or supply of farm technology, machinery, and infrastructure, and the supply of farm inputs and services appropriate to the production of horticultural produce, 2) the production of horticultural produce, and 3) the post-harvest handling, storage, processing and marketing of horticultural products	Crops (50%), Agricultural extension and research (50%). Horticulture subsector.	1) small-scale, private sector, actual or potential horticulture producers operating up to a maximum of 5 hectares, with special provision for those, including Dekhkan farmers, operating less than 2 hectares; 2) horticulture-related small-scale market services providers; and 3) the rural unemployed.
Eligibility of sub-borrower	1) Be an entity of entrepreneurial activities established and registered in accordance with applicable laws of Uzbekistan and be in compliance with all laws and regulations of Uzbekistan; and 2) Not be a related party with respect to the PFI under the laws of Uzbekistan and the regulations of CBU.	Any types of legal form of enterprises and individual in Uzbekistan	-
Loan purpose (equipment &/or working capital)	Investment purposes (purchase of capital assets) only	Investment in cold storages and agro-processing equipment, as well as to support entire value chain development. Sub-loans cannot be used to finance activities that involve land acquisition or resettlement of people or loss of assets or income. * As a result, 30% was for cold storage, and others such as fruit processing facilities, irrigation, greenhouse.	New investment
Loan maturity (grace period)	A maximum tenor of 10 years with a grace period to be negotiated between the PFI and the sub-borrower	Not exceed 10 years or the amortization period of the asset, whichever is shorter. Working capital loans will be up to 18 months	Maximum duration of 6 years (grace period of up to 2 years)
Maximum loan amount per sub-loan project	US$5.0 million	US$2.0 million, Working capital loans will be up to US$200,000	US$ 600,000 (including loans and grant) for agri-businesses, US$100,000 for small-scale farmers (group lending: US$500,000), US$20,000 for Dekhkan farmers
Maximum financing share to total sub-project investment costs	75%	The project will finance up to 100% of the sub-loans/ leases in US Dollars, while requiring 20% co-financing from the PFIs for UZ Sum sub-loans/leases. The sub-borrowers will be required to contribute 20% of the sub-project	80% (* Co-financing would be a maximum of 20% of the total new investment cost. Beneficiary contribution would be a minimum of at least 20% of the total new investment cost.)

	ADB	IBRD	IFAD
		financing for both USD and UZ Sums.	
Lending rate	Normally 5-6% (US$). A rate of interest determined by each PFI based on its prevailing credit and risk management policies and procedures (including the cost for i) loan origination, ii) the provision of foreign exchange to service the ADB loan, and iii) credit risk and related capital charges.)	Normally 5.5% (US$) and 15-16% (Uzbek Sum), which is determined by each PFI	Normally 4.9-5.5% (US$), which is determined by each PFI
Currency of sub-loans	US$, Uzbek Sum (no applications of loan in sum)	US$, Uzbek Sum (about 10% of total disbursed sub-loans as of now)	US$, Uzbek Sum (no applications of loan in sum)
Repayment schedule	Determined by PFI	Determined by PFI	monthly repayments
Guarantor	n.a. * PFI will be responsible for conducting due diligence on prospective sub-borrowers in accordance with the PFI's prevailing credit and risk management policies and procedures.	Determined by PFI	Determined by PFI
Collateral requirement	Collateral in the form of realizable, unencumbered assets equivalent to 125% of the value of the sub-loan	125% of the value of the sub-loan is required by PFI, which is a common banking practice in Uzbekistan	Determined by PFI
Other lending conditions	Maintain a debt-service coverage ratio in relation to the subproject/ sub-loan financing of 1.2	A sub-loan of more than US$1.0 mil requires the approval from PIU	-

Sources: Interview with each DP (April 2019), and relevant project documents prepared and disclosed by each DP.

As for TA, both ADB and IBRD provide TA for PFIs. IBRD provided PFIs with capacity building services to improve their skills in appraising agriculture-related investment loans and developing new financial products for value chain development though: 1) 5-day-training program for loan officers and branch managers of PFIs in terms of value chain financing products and tree-crop financing methodologies; and 2) a long-term TA to ensure that PFIs can appropriately manage the risks in collaboration with IFC. On the other hand, ADB facilitated training seminars for 265 PFI staff in total in terms of environmental safeguards. Also, IFAD provides CLARA tool, web-based Cash-flow-Linked Agri-Risk Assessment tool, to financial institutions in Uzbekistan. IFAD has recently required partner financial institutions to adopt the CLARA system within the IFAD-sponsored agricultural development projects in Uzbekistan.

For TA to agricultural sector, ADB, IBRD, and IFAD organize various kinds of seminars and workshops targeting wide range of candidate borrowers who are many and unspecified growers or agribusinesses in target areas, and the DPs hire many local resource people, e.g. research staff of local institutes, agronomists in regions, agribusiness, etc. for instructors/speakers of the seminars and the workshops. Especially, IBRD and IFAD assistance cover not only growers and agribusinesses who are expected to be sub-loan borrowers, but also research institutes and organizations who are playing a role in backup the whole horticulture value chain.

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List of Abbreviations

ABL	Asset-Based Lending
ADB	Asian Development Bank
BOD	Biochemical Oxygen Demand
BWA	Business Women Association
CAMELS	Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, Sensitivity to Market Risk
CAR	Capital Adequacy Ratio
CBU	Central Bank of Uzbekistan
CE	Customer Evaluation
CLARA	Cash-flow-Linked Agri-Risk Assessment
COD	Chemical Oxygen Demand
DP	Development Partner
EIA	Environmental Impact Assessment
ESMS	Environmental and Social Management System
EU	European Union
FAO	Food and Agriculture Organization
FFS	Farmer Field School
FOB	Free on Board
FX	Foreign Exchange
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GOU	Government of Uzbekistan
HACCP	Hazard Analysis Critical Control Point
HDP	Horticulture Development Project (WB/IBRD)
HSP	Horticulture Support Project (IFAD)
HVP	Horticulture Value Chain Development Project (ADB)
IBRD	Internataional Bank for Reconstruction and Development (World Bank)
IDB	Islamic Development Bank
IFAD	Internataional Fund for Agricultural Development
IFC	International Finance Corporation
IFI	Internataional Financial Institution
IMF	International Monetery Fund
IQF	Individual Quick Freezing
ISO	International Organizatrion of Standardization
JA	Japan Agricultural Cooperatives
JICA	Japan International Cooperation Agency
JPY	Japanese Yen (currency)
JV	Joint Vneture
KATM	Credit Information-Analytical Centre

L/A	Loan Agreement
LLC	Limited Liability Company
MFI	Microfinance Institution
MIFT	Ministry of Investments and Foreign Trade
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MSME	Micro, Small and Medium Enterprise
MWR	Ministry of Water Resources
NAMI	National Association of Microfinance Institutions
NBU	National Bank of Uzbekistan
NPL	Non-performing Loan
PFI	Participating Financial Institution
PIU	Project Implementation Unit
PM	Project Manager
PZVOS	EIA Draft (in Russian)
QQB	Qishloq Qurilish Bank
RCE	Repaymant Capacity Evaluation
ROA	Return on Assets
ROE	Return on Equity
RRA	Rural Restructuring Agency
SDC	Swiss Agency for Development and Cooperation
SME	Small and Medium Enterprise
SMS	Short Message Service
SOE	State-owned Enterprise
SQB	Uzbek Sanoat Qurilish Bank
TA	Technical Assistance
TSL	Two-Step Loan
UNDP	United Nations Depelopment Programme
UZAIFSA	Agency for Implementation of Projects in the Field of Agro-Industrial Complex and Food Supply
UZS	Uzbek Sum/So'm (currency)
WB	World Bank
WHO	World Health Organization
ZEP	Statements of Environmental Consequence (in Russian)
ZVOS	EIA Reports (in Russian)

1. Background and Objectives

1.1 Background of the survey

Agricultural sector output in the Republic of Uzbekistan ('Uzbekistan') tends to be vulnerable to the fluctuation in the production of cotton due to the global market conditions as well as the weather conditions. With a view to coping with such uncertainty, the Government of Uzbekistan ('GOU') is trying to diversify the crops to reach out for the export market through shifting the production towards horticulture and strengthening the relevant value chains. The effort is being materialized in terms of the increase in horticulture production and export (to the neighboring countries such as Russia and Kazakhstan) since 2005. Also this emerging sector is expected to absorb the labor force returning from abroad and urban areas.

On the other hand, the sector faces aging agricultural machinery, food processing and distribution facilities for post-harvest phase, lack of agricultural materials and skills, absence of quality assurance frameworks, etc. Also the lack of facilities and capacity for forward looking farming operations is identified as the serious bottleneck for strengthening the value chain in Uzbekistan.

While the demand for both working capital and capital expenditure is widely recognized in the area of horticulture production, processing and distribution as the above mentioned shift goes on, the supply of fund is not yet enough due to the banks' lending behavior (i.e. greater focus on shorter-term lending with the loan interest rates as high as average 14% p.a.) as well as to the lack of management capability of the borrowers. Although multiple development partners ('DPs') provide two-step loan ('TSL')[1] projects and technical assistances ('TAs'), such demands for fund are not fully met.

GOU, through the Presidents order 'The Strategy of Actions on Further Development of Uzbekistan (2017-21)', is seeking job creation, further diversification of agricultural productions, introduction of highly productive agricultural machinery, infrastructure development for storage, transportation and distribution of agro products. In order to accelerate these movements, it is critically important to solve the demand-supply mismatch for funds, as well as to provide TAs for taking full advantage of newly available funds.

1.2 Objectives of the survey

With a view to facilitating the 'Project for Horticulture Value Chain Promotion' (the 'Project')[2] to improve the financial access through medium-to-long-term financing and technical supports for the farmers and agro-related corporate entities, this survey aims at;

---

[1] Two-step loans are implemented through the financial institutions of the recipient country based on the policy-oriented financial system of the partner country. These loans provide funds necessary for the implementation of designated policies, such as the promotion of small and medium-scale enterprises in manufacturing, agriculture and other specified industries and the construction of facilities to improve the living standards of the poor. They are called 'two-step' loans because under the process, funds pass through two or more financial institutions before the end-beneficiaries receive the funds.

[2] The Project is assumed to include;
- TSL component for providing funds for working capital and capital expenditure of the horticulture farmers and related corporate entities, and
- Consulting service component for improving capacity at the executing agencies and PFIs, as well as providing

- Collecting information on potential demands for medium-to-long-term fund as well as on farming management skills,
- Identifying the justification for the TSL project,
- Collecting information for formulating the project, and
- Preparing the proposal for the TSL project.

The outcome of this survey will be one of the inputs for JICA to;

- Appraise the loan to finance the proposed TSL project from the view point of PFI candidates' financial conditions, credit appraisal capability, lending methods, as well as the existence/appropriateness of the entities for improving farming operation skills, and
- Identify and understand the current status of other DPs' supports in the similar areas.

In identifying other DPs' supports the relevant legal/institutional/market factors, such as (but not limited to) the following factors, shall be well taken into account.

- Existing land policies
- Legal environment for the collaterals
- Current status of the value chains
- Ongoing policy initiatives by GOU (such as the 'Agricultural Modernization Strategies 2030' and the farmland reform focusing on clustering)

Also in designing the Project to address the needs from the farmers and agri-business entities, important to consider what kind of technical consulting services should be accompanied by the loan. While JICA Survey Team believes in the leverage of the loan bringing about the discipline among the borrowers in receiving the technical consulting services, the need for coupling/separating them shall be examined in detail as a part of this survey.

consultation on farming operation, business planning, and production/quality management (including those with Japanese style methodologies).

2. Overview of Agriculture in Uzbekistan

2.1 Agricultural Environment

Uzbekistan has achieved a robust economic growth after the transition to a market economy. The economy expanded at 7 % level of real growth for a decade after 2006. While the growth rate has been slowing down slightly after the decade, the economy still maintained a substantial growth at 5.1% in 2018. Agricultural sector, accounting for 28.8% of GDP in 2018, is still the key industry of this country. Though the employment rate in agricultural sector has been decreasing since the economic reform, the rate of male and that of female were 28.7% and 27.6%, respectively in 2018.

Uzbekistan is a landlocked country located in the center of Eurasia with about 447sousand km^2 or 44,740 thousand ha of total land area. Majority of the land area is mainly occupied by desert plains while steep sloped high-mountains range along the border on the south to the east. The country has a typical continental climate condition. While the maximum temperature in a summer season exceeds 40 C^o in some places, the minimum temperature in a winter season is sometimes recorded below -20 C^o. The annual precipitation in the most part of the country is less than 300 mm. A major part of the little precipitation is recorded during the winter to the spring seasons. Table 2-1-1 shows the climate data of the capital city, Tashkent.

Table 2-1-1 Climate Data in Tashkent City (1982-2012 Ave.)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ave. Mean temp (C^o)	1.4	3.4	8.9	15.7	20.6	25.5	27.6	25.7	20.7	14.0	8.0	3.5
Ave. Min. Temp (C^o)	3.0	-1.5	3.7	9.6	13.6	17.7	19.5	17.2	12.4	7.0	2.5	-0.9
Ave. Max Temp (C^o)	5.9	8.3	14.2	21.9	27.6	33.3	35.8	34.3	29.1	21.1	13.5	8.0
Precipitation (mm) (Annual: 429mm)	53	51	75	61	36	12	5	2	4	28	46	56

Source: https://ja.climate-data.org

Under the above-mentioned climatic conditions, most of crops are planted in about April and harvested during July - September, except for wheat, which are seeded before the winter season, and some crops grown in greenhouses. Most of crops are grown in irrigated farmland area[3] due to the scarce precipitation. Water resources are the most serious constraints for farming in Uzbekistan. Only 10% of the national land area is used for cropland area as shown in Table 2-1-2. While water resources mostly depend on Amudarya river and Syrdarya river, which are both international rivers, roughly 80% of the surface water originated from neighbor countries. Securing stable water resources in cooperation with neighbor countries remains the most top priority issue for the development of agriculture in Uzbekistan.

[3] Irrigated farmland area is 3,357 thousand ha (The Data Collection Survey on Agriculture Sector in Republic of Uzbekistan, Final Report, June 2017, JICA)

Table 2-1-2 Land Use of Uzbekistan in 2016

Land Use Category		(1000 ha)	(%)
1	Agricultural land	26,770	59.8
	1) Cropland	*4,769*	*10.7*
	2) Land under permanent meadows and pastures	*22,002*	*49.2*
2	Forest land	3,208	7.2
3	Water body	2,200	4.9
4	Other land use	12,563	28.1
	Total Area	**44,740**	**100.0**

Source: JICA Survey Team made from FAOSTAT

Soil salinization is another critical issue of Uzbek agriculture. The areas suffered from the serious damage are Karakalpakstan, Bukhara, Jizzakh, Navoi, Syrdarya and Khorezm[4]. Soil degradation due to a monopoly farming with cotton and wheat is also progressing in many areas in Uzbekistan in addition to the soil salinization. It is needed to revive a soil friendly farming incorporating fodder and legume crops with cotton and wheat.

2.2 Government Agricultural Policy

Agricultural production in Uzbekistan had been heavily concentrated on cotton production during the Soviet era. About 70% of irrigated farmland areas were occupied by cotton, while a substantial amount of food crops, mainly wheat, were imported at the same time. GOU has aimed at shifting the monopoly farming structure to a well-balanced one considering its national food security and paid a special attention to a wheat promotion policy after the independence. As a result, the country did not have a serious confusion in agricultural comparing to neighbor countries which have split off from the Soviet-Union, even though the production had dropped once immediately after the independence. On the other hand, the agricultural policy heavily dependent on cotton and wheat has caused a stagnant farming structure with low economic efficiency.

The crop farming structure in Uzbekistan has started to chatnge in 2005 – 2010. The cropped area of vegetables and fruits has remarkably increased, while the area of cotton and wheat has shown a plateau or a declining trend during the time. GOU has changed a direction of agricultural policy to promote the production of vegetables and fruits, as it expects those crops to be new leading commodities to be exported.

The Cabinet Ministers Resolution No. 311[5] has announced an aggressive policy to increase the production of vegetables (including potato and melons) and fruits (including grape) for overseas markets. The Resolution has also designated 30 districts extended throughout the country as vegetables and fruits promotion areas. The Presidential Decree PD-2460[6] has presented a new farmland optimization plan as shown in Table 2-2-1, approved by the cabinet on 1st May 2016, to transfer the area of cotton and wheat to other crops by scaling-down the farmland size for creating job

[4] The Data Collection Survey on Agriculture Sector in Republic of Uzbekistan, Final Report, June 2017, JICA

[5] Cabinet Ministries Resolution of the Republic of Uzbekistan dated on 20th November 2013, No. 311

[6] Presidential Decree of the Republic of Uzbekistan dated on 29th December 2015, PD-2460 "On future measures of reforms and development of agriculture for 2016-2020"

opportunities in rural areas. The Presidential Resolution PD-2505[7] has also indicated an export promotion policy of horticultural produce and products by enhancing horticulture value chains comprehensively. The Resolution aimed at shifting cotton and wheat farming to horticulture farming, as well as modernizing processing and storage facilities of horticulture crops. As described above, the government agricultural policy has clearly changed its strategy from the past cotton and wheat oriented to the crop diversification oriented.

Table 2-2-1 Farmland Optimization Plan (2016-2020)

No	Crops	Cropping Area (ha)			Production (x 1000 ton)		
		2015	2020	Change (+/-)	2015	2020	Change (+/-)
1	Cotton	1,285,500	1,115,000	-170,500	3,350.0	3,000.0	-350.0
2	Grain Crop (Wheat)	1,132,680	1,082,680	-50,000	7,305.0	8,500.0	+1,195.0
3	Potatoes	80,292	116,292	+36,000	2,670.0	3,601.0	+931.0
4	Vegetables	191,950	282,950	+91,000	9,923.0	12,925.0	+3,002.0
5	Fruit & Melons	261,877	279,877	+18,000	2,731.0	3,380.0	+649.0
6	Fodder Crops	309,072	359,372	+50,300	18,725.0	20,286.0	+1,561.0
7	Oilseed Crops	14,300	28,300	+14,000	98.0	160.0	+62.0
8	Vineyards (Grape)	143,800	155,000	+11,200	1,556.0	1,830.0	+274.0
	Total	3,419,471	3,419,471	-	46,358.0	53,682.0	7,324.0

Source: Presidential Decree of the Republic of Uzbekistan dated on 29th December 2015, PD-2460

The Ministry of Agriculture (MOA) has never developed its own comprehensive strategy on agricultural development as 95% of its budget used to be disbursed to irrigation sub-sector before the separation and independence of the Ministry of Water Resources in February 2018[8]. A working team to develop a new Ministry's strategy, Uzbekistan Agri-food Development Strategy 2019 – 2030, has finalized the strategy through consultation with a donor society in Uzbekistan including JICA and the strategy was approved by the Ministry in July 2019. The strategy focuses upon the following 10 strategic priority areas of intervention.

1) Strategic Priority 1: Ensuring food security for all citizens of Uzbekistan
2) Strategic Priority 2: Establishing a robust agri-business climate to facilitate trade and export
3) Strategic Priority 3: Developing world class value chains in target sub-sectors
4) Strategic Priority 4: Attracting private investments
5) Strategic Priority 5: Ensuing sustainable use of our precious natural resources
6) Strategic Priority 6: Developing modern public institutions and services
7) Strategic Priority 7: Gradual diversification of public expenditure in support of the sector
8) Strategic Priority 8: Development of a network of agriculture knowledge, information and advisory services
9) Strategic Priority 9: Revitalization rural areas through diversification and community engagement
10) Strategic Priority 10: Development robust sector statistics and data collection system

[7] Presidential Resolution of the Republic of Uzbekistan dated on 5th March 2016, PD-2505 "On measures for further development of the resource base and increased processing of agricultural products in 2016-2020"

[8] A voice of the Minister of Agriculture in the meeting with the JICA Survey Team on 2nd April 2019

As discussed before, the horticultural sub-sector is designated as a high-priority area in the national agricultural policy in recent years. Then, the 10 strategic priority areas pay attention to develop value chains of agricultural sector from the production up to the processing for value addition. According to MOA, the Ministry has a higher priority on technologies of greenhouse farming and intensive fruits gardens (dwarf varieties cum dense spacing) in horticulture crop promotion. The Ministry also emphasizes on policies to promote a cluster of agribusinesses and a cooperative farming among farmers in addition to the technologies development.

The Presidential Resolution PD-4239[9] on 14th March 2019 has instructed related ministries and agencies to take necessary actions for realizing the following 2 policies by utilizing financial assistance from foreign countries. The Resolution has asked the ministries and agencies to materialize various measures to support the policies, such as a preferential interest rate, subsidies, technical assistance, information services, etc. as soon as possible.

1) To promote agricultural associations among horticultural growers
2) To establish pilot horticultural associations in 8 districts in 4 regions in 2019-20 (see Table 2-2-2)

Table 2-2-2 Pilot Horticultural Associations Plan

No	District	Region
1	Gallaaral	Jizzakh
2	Zaamin	
3	Bulungur	Samarkand
4	Urgut	
5	Altyarik	Fergana
6	Kuva	
7	Kibray	Tashkent
8	Parkent	

Source: Presidential Resolution of the Republic of Uzbekistan dated on 14th March 2019, PD-4239

The Department of Supporting Entrepreneur and Cluster, which is newly established and in charge of the Resolution inMOA, has explained that agricultural associations including horticultural associations shall be agricultural cooperatives organized by all stakeholders in a value chain i.e. growers (*Fermers* and *Dekhkans*) and related agribusinesses on a voluntary basis. The associations would have the following business activities as modeled JA in Japan.

1) Contract farming between member growers and member agribusinesses
2) Collective operation and management of machinery, facilities and vehicles
3) Group purchase of farming input, i.e. chemical fertilizers, agricultural chemicals, farm machinery, fuel, etc.
4) Production, storage, processing and marketing
5) Business advertisement to exporters
6) Extension of production techniques and farm management knowledge

[9] Presidential Resolution of the Republic of Uzbekistan dated on 14th March 2019, PD-4239

While agricultural cluster development is another popular word in Uzbekistan, the business concept of agricultural clusters and that of agricultural associations are not same, even though the both have the same objective to accelerate a mutual linkage of all stakeholders in a value chain, according to MOA. The former, which have been developed in a cotton value chain, are groups of related agribusinesses including crop growers by an initiative of leading company or individual, while the latter are cooperative organizations jointly managed by an equal partnership of members consisted of relatively small-scaled growers and agribusinesses. The Ministry of Agriculture has a vision to promote agricultural value chains through competition as well as cooperation between the clusters and the associations.

As a matter of realization, the fundamental concept of agricultural associations shares the similar philosophy of *Kolkhoz* in the Soviet era or *Shirkat* after the independence. It seems that security of independent and flexible management by voluntary-spirited members and guarantee of equal rights of all members would be key factors in success of new agricultural associations. As JA in Japan is a basic model of the associations according to MOA, Japan will be able to contribute to develop them by sharing its practical information based on its long experience in agricultural cooperative movement.

Based on the fact that horticulture crop production brings about high profits, export expansion and job creation, the Horticulture and Greenhouse Development Agency was established in March, 2019[10]. The agency aims at supporting *Fermer* and agricultural related companies and gives importance to water saving irrigation. Moreover, greenhouses and orchards are developed dispersedly at this moment, which leads to inefficient collection of crops for processing. The agency, therefore, has a plan to specify locations of greenhouses and orchards in specified areas based on the soil conditions and available irrigation water. The organization structure of the agency is as illustrated below:

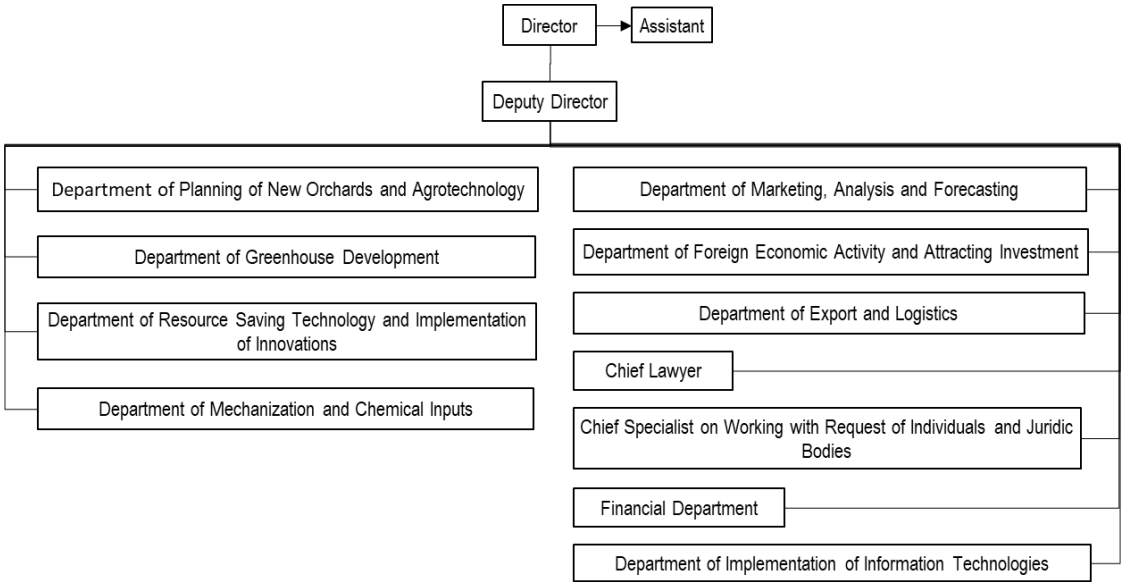


Figure 2-2-1 Organization Structure of Horticulture and Greenhouse Development Agency

[10] Based on Decree of Cabinet No. 481, 11th June 2019, "About the approval of regulatory legal acts regulating activity of Agency for development of horticulture and greenhouse established under the Ministry of agriculture of the Republic of Uzbekistan" the Agency was established.

2.3 Crop Production

The following crops are major crops grown in Uzbekistan in terms of harvested area.

1) Cotton,
2) Cereals (wheat and barley)
3) Potato, Vegetables (tomato, carrot & turnip, onion, cucumber and cabbage) and Melons
4) Fruits (apple, apricot, peach & nectarine, plum and cherry) and Grape

Potato, vegetables, melons, fruits and grape could be categorized into "horticulture crops"[11] in general, though the categorization of "horticulture crops" is not popular, and horticulture sometimes means only fruits in Uzbekistan. "Horticulture crops" in this report mean the above crops otherwise specified.

Table 2-3-1 outlines crop production in Uzbekistan after 2000.

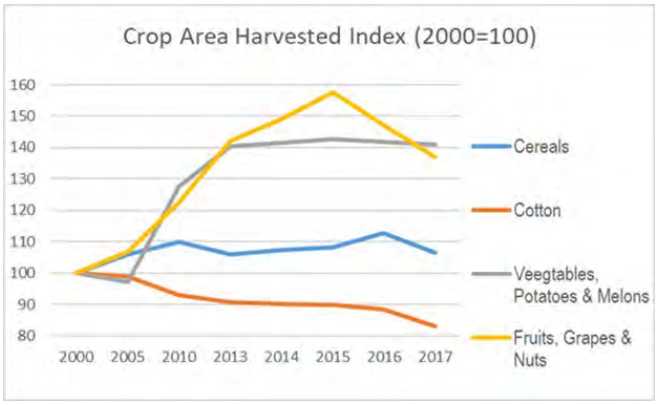
Table 2-3-1 Crop Production in Uzbekistan (2000 – 2017)

Crops		2000	2005	2010	2013	2014	2015	2016	2017
Cereals	Harvest Area (ha)	1,524,500	1,615,890	1,675,200	1,617,286	1,635,900	1,651,800	1,717,468	1,622,320
	Production (ton)	4,107,900	6,534,570	7,473,500	7,704,980	7,890,990	8,014,002	7,875,684	7,043,156
	Yield (ton/ha)	2.69	4.04	4.46	4.76	4.82	4.85	4.59	4.34
Cotton (seed)	Harvest Area (ha)	1,444,500	1,427,330	1,342,500	1,308,750	1,301,100	1,300,000	1,279,350	1,201,182
	Production (ton)	3,001,800	3,728,400	3,442,800	3,361,204	3,400,200	3,361,300	3,227,556	2,900,175
	Yield (ton/ha)	2.08	2.61	2.56	2.57	2.61	2.59	2.52	2.41
Vegetables, Potatoes & Melons	Harvest Area (ha)	230,404	223,805	294,100	323,529	326,095	328,896	326,534	324,688
	Production (ton)	3,832,182	5,065,058	9,235,700	12,338,606	13,446,662	14,692,264	14,308,160	13,949,773
	Yield (ton/ha)	16.63	22.63	31.40	38.14	41.24	44.67	43.82	42.96
Fruits, Grapes & Nuts	Harvest Area (ha)	247,727	264,390	303,500	351,669	369,380	390,268	364,662	339,085
	Production (ton)	1,435,558	1,626,923	2,724,920	3,643,990	4,000,320	4,406,468	4,335,537	4,348,050
	Yield (ton/ha)	5.79	6.15	8.98	10.36	10.83	11.29	11.89	12.82
Other crops	Harvest Area (ha)	81,312	65,972	105,683	95,911	96,650	96,084	90,226	76,357
	Production (ton)	182,177	87,898	134,361	179,733	190,454	199,523	189,960	185,624
	Yield (ton/ha)	2.24	1.33	1.27	1.87	1.97	2.08	2.11	2.43
Total	Harvest Area (ha)	3,528,443	3,597,387	3,720,983	3,697,145	3,729,125	3,767,048	3,778,240	3,563,632
	Production (ton)	12,559,617	17,042,849	23,011,281	27,228,513	28,928,626	30,673,557	29,936,897	28,426,778

Source: JICA Survey Team made from FAOSTAT

Figure 2-3-1 shows a remarkable increase of vegetables (including potato and melons) and fruits (including grape and nuts) in the harvested area during 2005 – early 2010s, while a continuous decrease of the cotton area after 2000. As the harvested area of all crops doesn't change much, it implies progress of crop conversion from cotton to other crops during the time. Considering that cotton is almost exclusively produced by *Fermers,* the progress implies a change of crop farming structure in the *Fermer* sector.

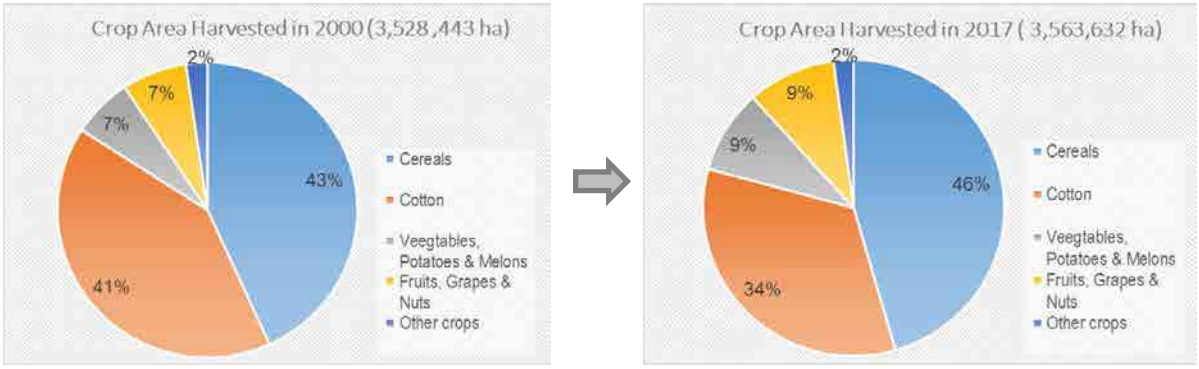
[11] Potato, vegetables, melons, fruits and grape are usually independently categorized in Uzbekistan statistics



Source: JICA Survey Team made from FAOSTAT

Figure 2-3-1 Change of Crop Harvested Area in Uzbekistan (2000 – 2017)

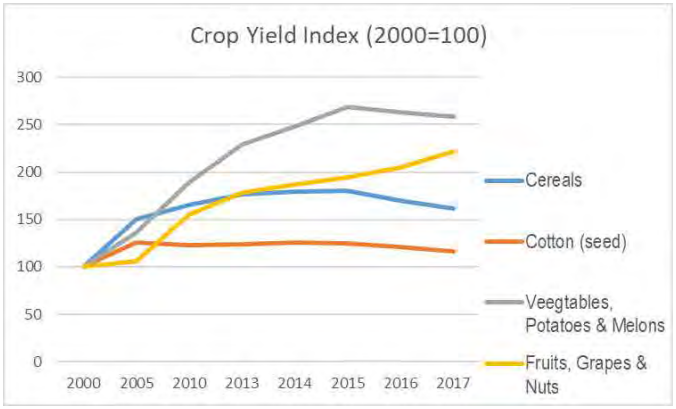
While the percentage of cotton harvested area to the total crop harvested area was 41% in 2000, the percentage came down to only 34% in 2017. Instead, the percentage of cereals, vegetables and fruits increased during the same time, as shown in Figure 2-3-2.



Source: JICA Survey Team made from FAOSTAT

Figure 2-3-2 Change of % of Crop Harvested Area in Uzbekistan (2000 – 2017)

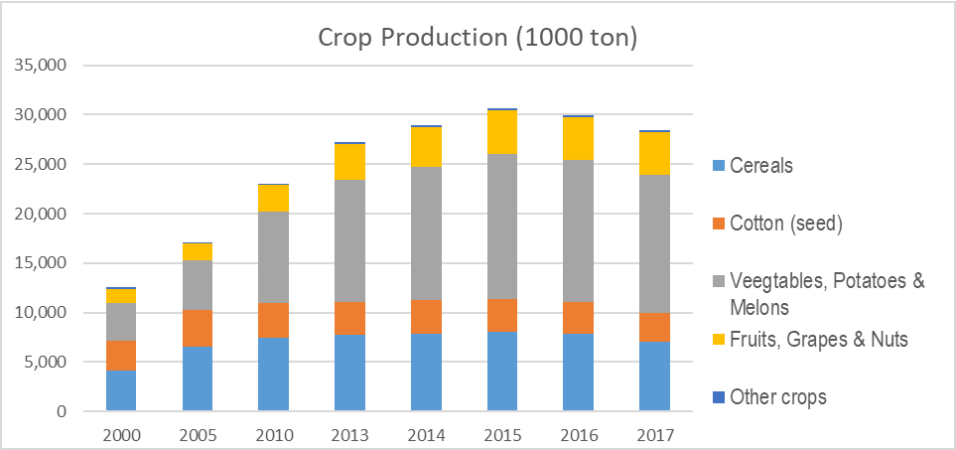
Crop productivity (ton/ha) in Uzbekistan shows a remarkable improvement during 2005 – early 2010s. Compering the productivity in 2000 and that in 2007, the increase of cereals, vegetables and fruits has recorded about 1.5 times, about 2.5 times and about 2.0 times, respectively. While the productivity of cotton also recorded a steady improve during early 2000s, it has peaked out since 2005 (see Figure 2-3-3).



Source: JICA Survey Team made from FAOSTAT

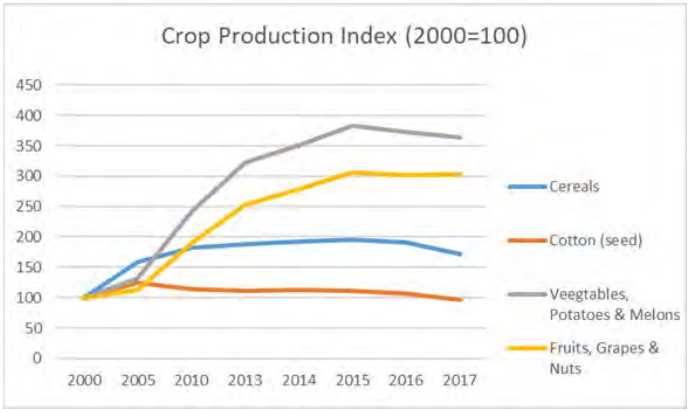
Figure 2-3-3 Change of Crop Productivity (ton/ha) in Uzbekistan (2000 – 2017)

Consequently, the total crop production has increased more than 2 times during 2000 – 2015, mainly leaded by vegetables and fruits sub-sectors (see Figure 2-3-4 and Figure 2-3-5). However, harvested area of all crop sub-sectors shows a stagnant or down trend since 2015 (see Figure 2-3-1), and the productivity also shows a similar trend except for fruits (see Figure 2-3-3). It seems that the crop production in Uzbekistan has generally levelled off in recent years. Uzbekistan needs an innovative erasure to break through the on-going stagnation in crop production.



Source: JICA Survey Team made from FAOSTAT

Figure 2-3-4 Crop Production in Uzbekistan (2000 – 2017)

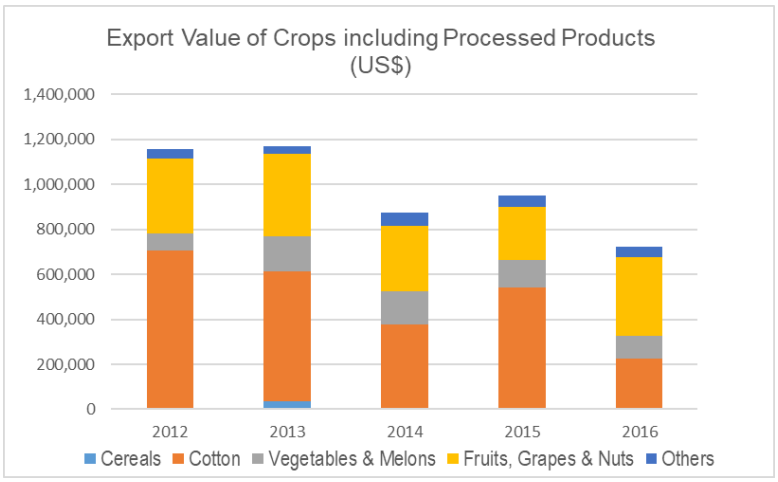


Source: JICA Survey Team made from FAOSTAT

Figure 2-3-5 Change of Crop Production in Uzbekistan (2000 – 2017)

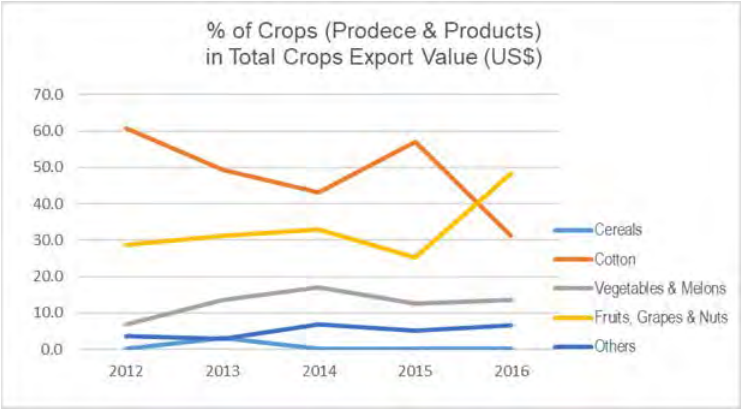
2.4 Export of Crop Produce and Products

Figure 2-4-1 shows total export value of crop produce and products from Uzbekistan in 2012 -16. Cotton has represented exporting commodities in Uzbekistan for long time. The value of horticultural crops sometimes exceeded the value of cotton in recent years. Horticultural crops have increased their presence in the export market, while cotton is still a leading commodity. The value of horticultural crops remains relatively at a stable level in recent years, though the value of cotton fluctuates from year to year. The percentage of horticultural crops to total crops in terms of the export value tends to increase in contrast with cotton which tends to decrease (see Figure 2-4-2). It is expected that the export of horticultural crops will favorably increase in the future, as the Government has actively implemented various policies to promote the production in horticultural crops in order to replace cotton with horticultural crops as leading exporting commodities.



Source: JICA Survey Team made from FAOSTAT

Figure 2-4-1 Change of Export Value of Crop Produce and Products (2012 – 2016)



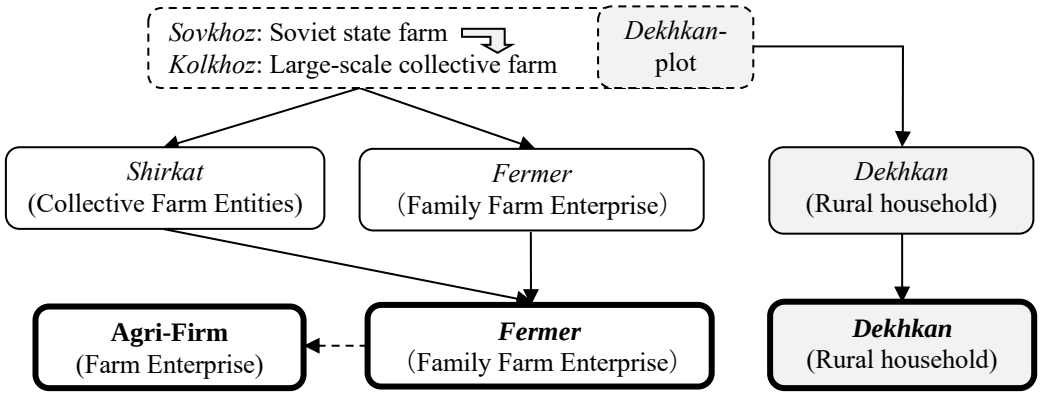
Source: JICA Survey Team made from FAOSTAT

Figure 2-4-2 % of Export Value by Crop Sub-sectors (2012 – 2016)

The export value of fruits sub-sector always exceeds the value of vegetables sub-sector in recent years. The major exported crops (including the products) in vegetables sub-sector are tomato, cabbage, chili & pepper, cucumber and onion, while the crops in fruits sub-sector are grape & raisin, cherry, apricot, peach & nectarine, persimmon and walnuts (see '3.2.3 Export and Import of Horticultural Products' for detailed information).

2.5 Agrarian System

The Government has farmland property rights for the whole country under the present agrarian system in Uzbekistan. The Government leases out farmland to an adult person with sufficient qualification. There are 3 major categories of agricultural growers, i.e. *Dekhkan* (a rural household with a small plot), *Fermer* (a family farm enterprise) and Agri-firm (a farm enterprise) in Uzbekistan at present. The growers have originated in *Sovkhoz* and *Kolkhoz* system of the Soviet Union and emerged through several farm restructurings after the independence. The change of the growers is illustrated in three major stages as shown in Figure 2-5-1.



Source: JICA Survey Team made from FAOSTAT

Figure 2-5-1 Change of Agricultural Growers in Uzbekistan

After the independence, GOUhas implemented a gradual economic reform policy including agrarian reforms, and the Government has kept a state control of farmland to avoid an excessive land fragmentation. Immediately after the independence, the Government shifted *Sovkhoz* to *Kolkhoz.* Then, the Government had established *Sherkats* (Collective Farm Entities), which were transformed from the former collective farms, and were expected to be the main pillar of the national agriculture. A number of *Fermers* are also established at the same time. However, *Shirkhats* were dissolved into individual *Fermers*, as *Shirkhats* had failed to establish a proper management system as a collective farm. In recent years, entrepreneurs or enterprises have started to invest their capital into a large-scale farm business (Agri-firm). There are about 270 Agri-firms in the whole country[12].

The farmland area to be leased to *Fermers,* who are playing a major role in the national agriculture, is stipulated in the related laws and regulations. As shown in Table 2-5-1, the area has frequently changed in accordance with the national agrarian policies of the time.

Table 2-5-1 Change of Farmland to be leased to *Fermers* in Irrigated Areas

Fermer Category	Before	1st Optimization (2008/09)	2nd Optimization (2015/16)	3rd Optimization (2019)
Cotton & Wheat:	Min. 10 ha	Min. 30 ha	Min. 30 ha	Min. 100 ha
Wheat + Vegetables	—	—	10 – 15 ha	Min. 20 ha
Vegetables or Melons	Min. 1 ha	Min. 5 ha	Min. 5 ha (1- 5 ha in 2017)	Min. 5 ha
Fruits or Vineyard				Min. 10 ha

Source: JICA Survey Team made from Related Information

At the time of newly establishment of *Fermers*, the Government leased minimum 10 ha of farmland to *Fermers* who grew state-controlled crops, i.e. cotton and wheat, while only minimum 1.0 ha of farmland was leased to *Fermers* who grew other crops in irrigated areas. In 2008/09, the Government adopted a new farmland optimization policy in order to improve the production efficiency of *Fermers* though increasing the farmland area per *Fermer*. Consequently, cotton and wheat *Fermers* could be allowed to use minimum 30 ha of farmland, while minimum 5 ha of farmland was allocated to other *Fermers* in irrigated areas. Then, the Government has started crop diversification policies in recent years as mentioned before. After announcement of the Presidential Decree PD-2460 in 2015, fragmentation of farmland progressed rapidly with increased number of *Fermers* who grew horticultural crops, though the designated farmland area to *Fermers* did not change basically. A special measure on the farmland lease as shown in Table 2-5-1 was taken in 2017 along with the actual status of the land fragmentation. However, the increased number of newcomers with a weak business base especially in fruits production came to be a serious issue. The Cabinet Ministries Resolution No.14[13] in 2019 has stipulated again a new farmland optimization policy to *Fermers* in order to increase the scale of farming operation.

As shown in Table 2-5-1 clearly, the stipulated farmland size allocated to *Fermers* has increased with new farmland optimization policies. It implies that GOU holds a basic policy to avoid fragmentation of farmland or to maintain a large-scale farmland. The JICA Survey Team observed a

[12] Detailed Sector Assessment Document: Agriculture, Natural Resources, and Rural Development, ADB 2018

[13] Cabinet Ministries Resolution of the Republic of Uzbekistan dated on 11th January 2019, No. 14

case that a crop grower manages a certain small size of farmland by renting from a *Fermer* nearby during its field visit. However, such a personal farmland subleasing is not allowed by on-going laws and regulations. It must be noted carefully that there is no crop grower to manage less than 5 ha of farmland legally under the present agrarian system in Uzbekistan, except for *Dekhkans* who are allowed to manage a tiny plot up to 0.35 ha including for buildings in irrigated areas. It is expected that a certain number of personal farmland subleasing might be continuously existing, even though it is illegal, in accordance with diversification of crops and value chains promoted by the Government. The diversification should stimulate crop growers to diverse their interest and requirements for the farm management including a flexibility in farming operation. A report of ASA led by a Word Bank agriculture economist[14] suggests that the Government Uzbekistan should address the present agrarian system for liberalizing farmland market in order to make a significant impact on agricultural development.

2.6 Fermer and Dekhkan

Fermers are a main pillar of the national agriculture among agricultural growers, i.e. *Dekhkans*, *Fermers* and Agri-firms. *Dekhkans*, however, play a significant role in producing horticultural crops and livestock breeding. On the other hand, Agri-firms still don't have much of presence in agricultural production, while they have remarkably developed in recent years. Description in this sub-chapter is made, as *Fermer* and *Dekhkan* are not familiar to non-Uzbek people. Table 2-6-1 shows the definition of *Fermer* and *Dekhkan*.

Table 2-6-1 Definition of *Fermer* and *Dekhkan*

	Fermer	*Dekhkan*
Basic definition	Individual commercial farm organized as a legal entity operating leased land	Small-scale family-based farm, based on household plot operation
Utilized labor	Family members, as well as permanent and seasonal workers	Mainly family members, with option to hire seasonal workers
Land tenure	Long-term land lease (up to 50 years). The land lease duration depends on the fulfillment of state procurement target. Family size can vary with respect to production specialization	Lifetime inheritable possession. Size of allocated land: 0.35 ha for irrigated land; 0.5 ha for rainfed land. This includes also area for buildings
Ownerships	Any adult person with sufficient agricultural qualification	Former workers of agricultural enterprises, rural families
Production specialization	Only agricultural produce indicated in land lease contract. Mainly cotton and wheat	Any agricultural produce, mainly wheat, vegetables, fruits and livestock

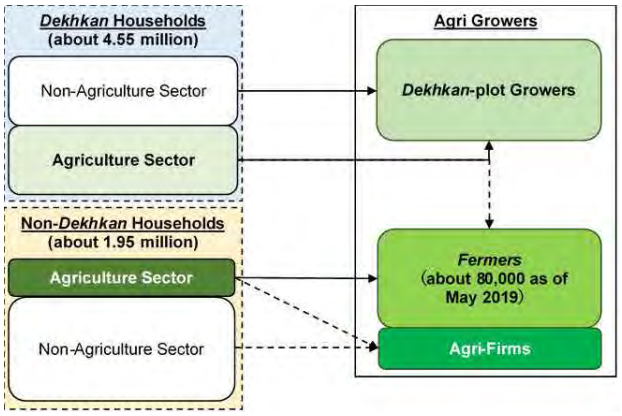
Source: Farm Restructuring in Uzbekistan: How Did It Go and What is Next? ASA "Support to Agriculture Modernization in Uzbekistan", January 15, 2019

Fermers are family commercial farms or farm owners organized as a legal entity for managing farmland leased from the Government. The Government has institutionalized *Fermers* in parallel with dissolving collective farms after the independence. Uzbek people generally recognize that *Fermer* mean a farmer in English. Qualified individuals are given the right to use a farmland by the Government for maximum 50 years and the district governments hold the authorization right of

[14] Farm Restructuring in Uzbekistan: How Did It Go and What is Next? ASA "Support to Agriculture Modernization in Uzbekistan", January 15, 2019

Fermers. The size of farmland differs in accordance with a crop stipulated in a land lease contract concluded between a *Fermer* and the Government (see Table 2-5-1). While *Fermers* are given authority to use a farmland by the Government, they are obliged to grow crops, mainly cotton and wheat, instructed by the Government. *Fermers* have not a 100 % of free hand in their farm management.

Dekhkans mean agricultural producers belong to the commons including farm laborers in local word. It is generally recognized that *Fermers* (farmers) aren't categorized into *Dekhkans*, as *Fermers* manage or operate above a certain size of farmland. *Dekhkans* in Uzbekistan are actually households who have been given land-use rights for a small backyard (*Dekhkan*-plot/*tomorka*) for housing and home gardening during the Soviet era (see Figure 2-5-1), and they are continuously allowed having the rights even after the independence[15]. Therefore, almost households in rural areas are recognized as *Dekhkans*. Considering that a half of workforce in rural areas are working in non-agricultural sectors, it is not a right understanding that *Dekhkans* are always equal to real agricultural producers or workers. As will be described later, the average size of *Dekhkan*-plot is too small for general *Dekhkans* to depend on backyard farming for living. Many *Dekhkans* mainly depend on income from non-agricultural sectors for their livelihood. It is expected that most of *Dekhkans* working in agricultural sector are farm workers hired by *Fermers*. In the meantime, there are not a small number of *Fermers* who have land-use rights of *Dekhkan*-plot together with their *Fermer* rights (see Figure 2-6-1).



Source: JICA Survey Team made

Figure 2-6-1 Image of *Fermer* and *Dekhkan* in Uzbekistan

Table 2-6-2, though it is not a new information, shows income structures of *Fermers* and *Dekhkans* which were revealed through a socio-economic survey to 800 households by IFAD in 2007[16]. According to the table, a production value from *Dekhkan*-plot including for home consumption was only about 25% of the total income of sample *Dekhkans*. It implies that the value from *Dekhkan*-plot is not sufficient to maintain the whole livelihood of *Dekhkans*, even though a *Dekhkan*-plot could generate a substantial amount of additional income. In addition, farm incomes of sample *Dekhkans* remain only about 1/3 of the total income even including the value from *Dekhkan*-plot. The table

[15] In a strict sense, "*Dekhkan"* in traditional common words doesn't have the same meaning as "*Dekhkan"* in the present landholding system in Uzbekistan. However, "*Dekhkan"* is usually used without paying attention to the difference.

[16] Agriculture Diversification and Modernization Project, Final Project Design Report, 25 Aug 2017, IFAD

clearly shows that majority of sample *Dekhkans* much depend on non-farm incomes for their living. On the other hand, farm incomes of sample *Fermers* exceed 70% of their total income according to the table. It implies that majority of *Fermers* made a living mainly from the farm incomes. It is interesting that the percentage of income value from *Dekhkan*-plot of sample *Fermers* was almost same as that of sample *Dekhkans*. It seems that a large number of *Fermers* generate a certain additional income from *Dekhkan*-plot.

Table 2-6-2 Income Structures of *Fermer* and *Dekhkan*

Income Source	Proportion of the cumulative household income (%)	
	Dekhkan	*Fermer*
<Farm incomes>		
Income earned from sales of agricultural products harvested on ***Dekhkan*-plot**	13.8	15.0
Consumption of agricultural products from ***Dekhkan*-plot**	11.3	8.6
Income earned from sales of agricultural produce harvested on **farm plot**	-	39.6
Consumption of agricultural products from **farm plot**	-	8.4
Incomes from **employment in agricultural sector**	7.8	1.1
<Non-farm incomes>		
Incomes from employment in non-agricultural sector	30.4	8.0
Incomes from non-agricultural entrepreneurial activity	9.6	3.9
Incomes from labor migration	7.2	0.9
Retirement and disability pensions	10.4	5.5
Allowances to disadvantaged families and disadvantaged families with children	2.8	0.9
Other incomes	6.7	8.1

Source: Agriculture Diversification and Modernization Project, Final Project Design Report, 25 Aug 2017, IFAD

2.6.1 *Fermer*

Designated farmland size to be leased to *Fermers* has changed in accordance with the national agrarian policies of the time, as mentioned before. As the total national farmland area doesn't change more or less, the number of *Fermers* varies in inverse relation to the designated farmland size. The inverse relation is clearly shown in Table 2-6-3, when it is analyzed with Table 2-5-1. The number of *Fermers,* managing 52.7 ha of farmland in average, are about 80,000 throughout the country as of May 2019. Considering that the total number of households in Uzbekistan is estimated to 6.54 million in 2018[17], *Fermer* households occupy only 1.2% of the total households. The latest (the third) farmland optimization policy stipulated in the Cabinet Ministries Resolution No.14 keeps a close watch on two things, i.e. enlargement of a size of farmland managed by *Fermer* and crop diversification.

[17] https://www.helgilibrary.com

Table 2-6-3 Change of Number of *Fermers*

Fermer Types	before 2nd Optimization (on 1st April 2016)			after 2nd Optimization (on 25th May 2016)			after 3rd Optimization (on 1st May 2019)		
	Number	%	Ave. Farm Size (ha)	Number	%	Ave. Farm Size (ha)	Number	%	Ave. Farm Size (ha)
Cotton & Wheat	53,702	52.9	56.1	53,862	33.6	55.2	25,727	31.9	93.0
Vegetables & Melons	3,489	3.4	9.5	6,480	4.0	4.0	4,510	5.6	10.3
Wheat + Vegetables	6,470	6.4	22.3	12,341	7.7	9.2	8,404	10.4	52.9
Fruits & Grapes	25,006	24.6	7.5	74,113	46.2	2.8	22,225	27.5	11.8
Livestock	6,900	6.8	28.2	6,974	4.3	29.3	9,931	12.3	88.2
Others	5,887	5.8	9.1	6,602	4.1	7.9	9,968	12.3	23.5
Total	101,454	100.0	-	160,372	100.0	-	80,765	100.0	52.7

Sources: Detailed Sector Assessment: Agriculture, Natural Resources, and Rural Development, ADB 2018
Ministry of Agriculture, the Republic of Uzbekistan

A rapid increase and decrease of number of *Fermers* in a short period as shown in Table 2-6-3 may have a negative impact on farm management. As farmland is the most important infrastructure for farming, *Fermers* would hesitate to make an active investment in farming without securing stable farmland rights. The Government policy should pay more attention to this issue.

Table 2-6-4 shows distribution of *Fermers* by age groups and by sexes in 2019. The age groups of 30s and 40s who should be in their most productive years occupy a large percentage of the total *Fermers,* while there are a small percentage of *Fermers* aged more than 60 years old. The percentage of female *Fermers* is only 7.1% of total. The percentage of younger generation groups in female *Fermers* is a little bit higher than the percentage in male *Fermers.*

Table 2-6-4 Distribution of *Fermers* by Age Groups and by Sexes in 2019

Age		Male		Female		Total	
		Number	(%)	Number	(%)	Number	(%)
1	below 30 years	9,726	(13.2)	1,122	(19.9)	10,848	(13.7)
2	30 - 40 years	22,197	(30.2)	2,150	(38.1)	24,347	(30.8)
4	40 - 50 years	26,711	(36.4)	1,464	(25.9)	28,175	(35.6)
5	50 - 60 years	12,409	(16.9)	703	(12.4)	13,112	(16.6)
6	Over 60 years	2,391	(3.3)	210	(3.7)	2,601	(3.3)
	All Age	**73,434**	**(100.0)**	**5,649**	**(100.0)**	**79,083**	**(100.0)**

Source: Ministry of Agriculture, Republic of Uzbekistan

Table 2-6-5 shows distribution of *Fermers* by educational background groups in 2019. All *Fermers* have an educational qualification of high school graduate or more, even 37.3% of the total *Fermers* are graduates from universities or more. This may be caused by the present system that a *Fermer* right is only given to qualified people in terms of attitude on farming, financial ability, educational background, etc. However, the percentage of *Fermers* learned technical education in agricultural field in universities or high schools are only 31.6%. It means that almost 70% of *Fermers* don't have an educational background in agriculture.

Table 2-6-5 Distribution of *Fermers* by Educational Background Groups in 2019

No	Education	Number	(%)
1	**High Level (University)**	**30,817**	**(37.3)**
1-1	Agri Field	12,278	(14.8)
1-2	non Agri Field	18,539	(22.4)
2	**General High School**	**12,011**	**(14.5)**
3	**Vocational High School**	**39,868**	**(48.2)**
3-1	Agri Field	13,818	(16.7)
3-2	non Agri Field	26,050	(31.5)
	Total	**82,696**	**(100.0)**

Source: Ministry of Agriculture, Republic of Uzbekistan

2.6.2 *Dekhkan*

It was commonly understood that the total number of *Dekhkan* households, having *Dekhkan*-plot rights, was about 4.70 million. The latest statistics information as shown in Table 2-6-6 shows that the number is 4.46 million as of 2019. The percentage of *Dekhkan* households to the total households is as high as 69.5%. In the meantime, the percentage of rural population is only 49.4% in Uzbekistan according to the Government statistics information[18]. It is considered that not only the great majority of households in rural areas but also not a small percentage of households in urban areas where have urbanized in a short time are categorized in the *Dekhkan* households.

Table 2-6-6 Number of *Dekhkans* and their Land Use in 2019

No	Region	No. of Owner (x 1000)	Total (ha)				Average per Owner (ha)				Cropping Intensity (%)
			Tomorka Area	Cropping Area	Wheat (winter) Area	Spring Crops Area	*Tomorka* Area	Cropping Area	Wheat (winter) Area	Spring Crops Area	
1	Rep. of Karakalpakstan	273.8	31,219.0	27,336.0	3,883.0	27,336.0	0.11	0.10	0.01	0.10	114.2
2	Andijan	477.4	24,541.0	15,383.0	9,158.0	15,383.0	0.05	0.03	0.02	0.03	159.5
3	Bukhara	287.5	39,480.0	24,012.0	15,480.0	24,000.0	0.14	0.08	0.05	0.08	164.4
4	Jizzakh	178.6	20,283.4	18,638.0	1,646.1	18,638.0	0.11	0.10	0.01	0.10	108.8
5	Kashkadarya	462.6	55,964.0	46,919.0	9,045.0	46,919.0	0.12	0.10	0.02	0.10	119.3
6	Navoi	136.2	11,530.4	6,925.0	4,606.0	6,925.0	0.08	0.05	0.03	0.05	166.5
7	Namangan	372.3	19,898.0	14,226.0	5,672.0	14,226.0	0.05	0.04	0.02	0.04	139.9
8	Samarkand	538.5	61,840.0	28,824.0	32,816.0	29,024.0	0.11	0.05	0.06	0.05	214.5
9	Surkhandarya	406.6	48,940.0	36,449.0	12,503.0	36,438.0	0.12	0.09	0.03	0.09	134.3
10	Syrdarya	117.4	12,751.0	9,826.7	2,924.0	9,826.7	0.11	0.08	0.02	0.08	129.8
11	Tashkent	458.8	31,030.0	30,791.9	238.1	30,791.9	0.07	0.07	0.00	0.07	100.8
12	Fergana	584.3	41,039.0	26,503.0	14,538.0	26,503.0	0.07	0.05	0.02	0.05	154.9
13	Khorezm	261.6	36,559.0	19,214.0	17,345.0	19,214.0	0.14	0.07	0.07	0.07	190.3
	Total	4,555.6	435,074.8	305,047.6	129,854.2	305,224.6	0.10	0.07	0.03	0.07	142.6

Note: While *tomorka means a backyard in local words, it is used to mean Dekhkan*-plot in the table
Source: Uzbekistan Council of *Fermers*, *Dekhkans* and Landowners

Table 2-6-6 shows that a *Dekhkan* household has only 0.1 ha of land rights of *Dekhkan*-plot or *tomorka* in average, while related regulations and laws stipulate that the maximum size of *Dekhkan*-plot is 0.35 ha in irrigated areas (see Table 2-6-1). As a part of *Dekhkan*-plot is usually used

[18] Demographic situation, January-December 2017, State Committee of the Republic of Uzbekistan on Statistics

for buildings, the average actual cropping area is as low as 0.07 ha. Many *Dekhkan* households must utilize their *Dekhkan*-plot intensively, even though, the climate condition in Uzbekistan is not suitable for a year-round cropping in open-field condition. The average cropping intensity of *Dekhkan*-plot is 142.6%. While winter wheat is grown in about 40% of their cropping area, other crops growing during spring to summer seasons, mainly vegetables, are planted in almost 100% of the cropping area.

2.7 Agricultural Extension

Uzbekistan historically had not an agricultural production system by individual private farmers before its independence. A public agricultural extension system, which systematically provides agricultural extension services to the private farmers on a continuous basis, has not been developed. While the Government has taken many actions on the extension services, they are only carried out on project basis without sustainability. In addition, the extension services to none state control crops including horticultural crops were very weak, as the Government agricultural policy had much leaned to cotton and wheat. According to horticultural crops growers, they are getting technical information through SNS networks, an agronomist belongs to inputs sales companies and/or a self-hired agricultural consultant from abroad in some cases. It seems that there are a substantial number of growers, especially relatively small-scale growers, who cannot properly access to necessary technical information.

According to MOA, the Presidential Resolution PD-429219 regarding the development of national agricultural extension system has newly announced in April 2019. The Resolution stipulates the basic concept as follows;

- An Information and Advisory Center on Agricultural Technologies (Extension Center) will be established in the Tashkent State Agrarian University and its 3 branch campuses in Surkhandarya, Karakalpakstan and Andijan
- Agricultural technical consulting services are provided to individual growers through the Extension Centers

The Resolution also stipulates that the Extension Centers shall be managed with its own financial sources. It is, therefore, expected that the technical consulting services shall be provided by collecting a kind of service fee from beneficial growers. According to the Ministry of agriculture that the Government has a plan to establish an Extension Centre in all 13 regions (including the Republic of Karakalpakstan) in the country in the future and the Department of Agriculture of each regional Government shall supervise the activity of the Extension Centre.

Actual measures to establish the Extension Centers shall be gradually taken over the next several months, as the Government doesn't have much time after the announcement of the Resolution. However, it might take a long time to materialize the concept of the Resolution. The Resolution only shows basic principles of the necessary measures, such as (i) to train up specialists and trainers in agricultural technical dissemination, (ii) to materialize a road map for the gradual creation of a network of the Extension Centers, (iii) to leverage an international cooperation in technical assistance

[19] Presidential Resolution of the Republic of Uzbekistan dated on 17th April 2019, PD-4292

and grant funds, etc. Establishment of a comprehensive framework of the national agricultural extension system must be a precondition to materialize the concept of the Resolution.

The Government has a policy toward the development of large-scale farming system by limited number of private farms. Since about 80,000 *Fermers* throughout the country are expected to be a pillar of the national agriculture by the Government, the national agricultural extension system should be reasonably consistent with the policy. The Government intends to develop *Fermers* to be an entity managing farming business. They need to make continuous efforts to improve their capacity for growing crops, as well as for managing farming business. In view of such circumstances, the national agricultural extension system should establish mechanism in which *Fermers* are able to use services from agronomists and business consultants on their own initiative as needed. The following policy measures would promote the mechanism.

1) To strengthen agricultural research and development (developing applicable farming technologies and techniques at field level)
2) To cultivate capable agronomists and business consultants (private sector oriented)
3) To regularize and develop consulting business for *Fermers* (a qualification system of agronomists and business consultants, matching them to *Fermers*, etc.)

2.8 Council of Farmers, Dekhkan Farms and Owners of Homestead Lands

Based on PD 3318 (2017), Council of Farmers, Dekhkan Farms and Owners of Homestead Lands was established in June, 2018. The council aims at protection of land use rights of crop growers, and provision of comprehensive supports for crop production, processing and sale. As of August 2019, around 1,100 growers in total have participated in training sessions by the Council. It took only one year after the council was set up, however, the council can be involved in organization of the TA agriculture component.

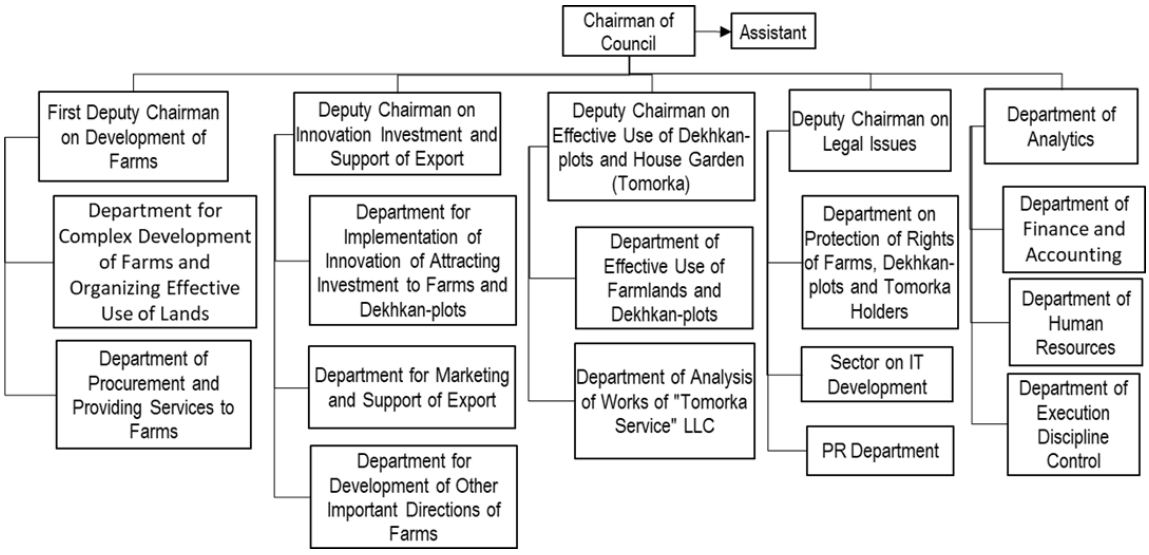


Figure 2-8-1 Organization Structure of Council of Farmers, Dekhkan Farms and Owners of Homestead Lands

2.9 Fermer Association

Fermer Association is a national level organization established by GOUand has lower organizations such as regional and district level also. It is operated by the membership fee, aiming at support for effective farming management by the members. Main activities of the Association are giving advices including organization of seminars, providing loan and services of agricultural machines and so on. The Fermer Association was replaced by the Council of Farmers, Dekhkan Farms and Owners of Homestead Lands mentioned above. Former targets only Fermer, while latter do not only Femer but also Dehkhans and owners of private land and provide the extension services for them.

2.10 Scientific Research Institutes

(1) Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician Makhmud Mirzaev

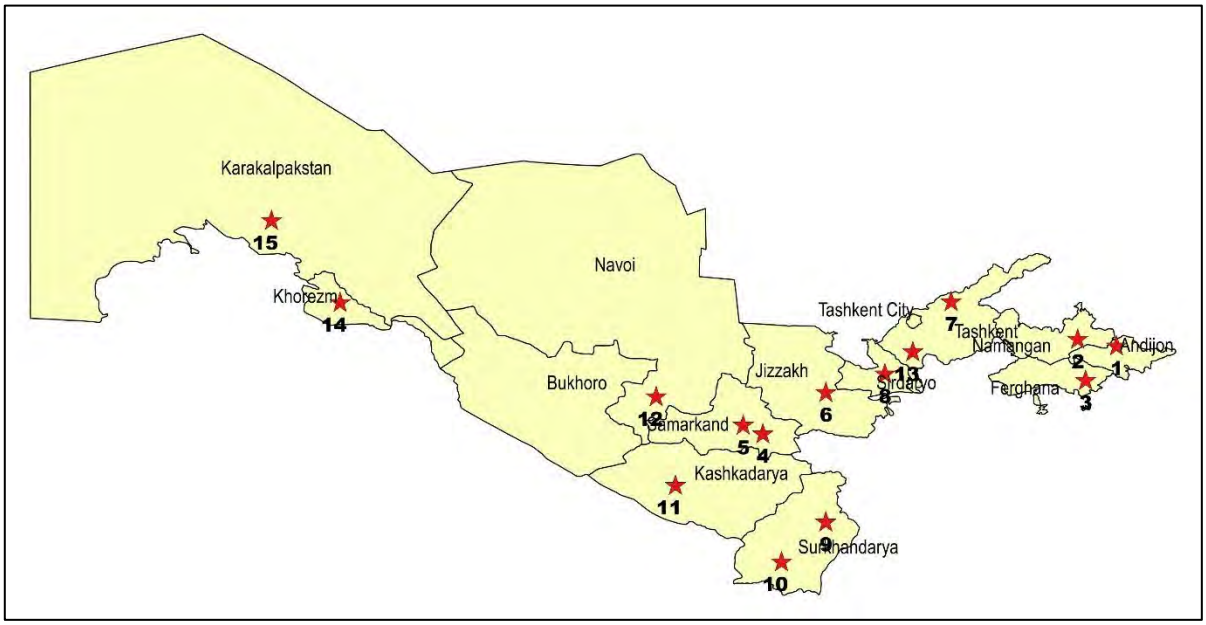
Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician Makhmud Mirzaev was established in 1898. It is under MOA and has 15 branches including head institutes in each region except Syrdarya Region. Main tasks of the institute are breeding and research of cultivation techniques, and it keeps 200 varieties of fruits, grapes and nuts. It has experiences to collaborate with oversee agents for research and technical cooperation, especially, established a demonstration farm of *Mutsu* (one of Japanese apple varieties) to attract growers and organize technical seminars. Following table shows number of staff, location and farmland area of each branch of the institute.

Table 2-10-1 Number of Staff, Location and Farmland Area of each Branch of the Institute of Horticulture, Viticulture and Wine Making

No.	Name of Scientific Experiment Stations (SES)	No. of general employees	No. of Researchers	Total Area (ha)	Land for horticulture and viticulture (ha)
1.	Andijan SES	77	-	180.0	152.7
2.	Namangan SES	60	-	-	-
3.	Fergana SES	34	4	302.5	257.8
4.	Samarkand SES	30	3	257.7	200.0
5.	Charkhin SES (Samarkand region)	60	-	127.0	110.0
6.	Jizzakh SES	7	5	33.6	31.7
7.	Bustonlik (Tashkent region)SES	19	2	114.7	107.6
8.	Tashkent SES*	57	53	342.3	261.3
9.	Surkhandarya SES	33	4	137.7	109.9
10.	Bandikhon SES	35	-	-	-
11.	Kashkadarya SES	13	-	-	-
12.	Navoi SES	6	-	-	-
13.	Bukhoro SES	30	-	184.3	162.2
14.	Khorezm SES	18	-	124,4	95,8
15.	Karakalpak SES	6	-	272,7	209,3
16.	Republican School of Gardeners*	5	-	-	-
	Total	490	71	1679.8	1393.2

*The main office of the institutes, branch in Tashkent Region and Republic School of Garden are located on the same site, Kibray District, Tashkent Region.

Source: Scientific Research Institute of Horticulture, Viticulture and Winemaking named after Academician Makhmud Mirzaev



* The numbers of the figure correspond to those in Table 3-10-1.

(Source: JICA Survey Team, based on the address of the branches)

Figure 2-10-1 Location of Branch of the Scientific Research Institute of Horticulture, Viticulture and Wine Making

(2) Scientific Research Institute of Vegetable, Melon and Potato

Scientific Research Institute of Vegetable, Melon and Potato was established in 1933. It has six branches including head institute across the county and keeps 50 varieties of vegetables. The institute has experiences to organize field seminars and technical exchanges among crop growers. Also, it established a demonstration farm with Korea Plant Industries Association. Number of staff, location and farmland area of each branch of the institute is as shown below:

Table 2-10-2 Number of Staff, Location and Farmland Area of each Branch of the Institute of Vegetable, Melon and Potato

No.	Stations	No. of total workers	No. of researchers	Land Area (ha)
1	Tashkent	29	-	129.04
2	Samarkand	12	4	100.00
3	Andijan	11	4	109.70
4	Kashkadarya	2	1	17.00
5	Khorezm	14	2	104.00
6	Surkhandarya	12	3	36.00
7	Research Institute of vegetables, melon and potato (Tashkent, located on the same place of No. 1)	92	31	-
	Total	172	45	495.74

Source: Scientific Research Institute of Vegetable, Melon and Potato

Source: Scientific Research Institute of Vegetable, Melon and Potato

Figure 2-10-2 Location of Scientific Research Institute of Vegetable, Melon and Potato

(3) Tashkent State Agrarian University

Tashkent State Agrarian University has three branch schools, in Nukus (republic of Karakarupakstan), Termez (Surhondarya Region) and Andijan (Andijan Region), apart from head institute. In 2014, the JICA grass route technical cooperation for apple production organized a series of technical training of *Fuji* (a variety of apple) in Aomori Prefecture, Japan targeting growers from Uzbekistan. In Tashkent Region, it owns 40ha of farmland, which enables to organize training sessions. When the university holds such technical training for growers, Council of Fermers, Dekhkan Farms and Owners of Homestead Lands supported the university to identify the training topics. Farmer's school is opened 6-8 times per year.

2.11 Challenges in Agriculture

Uzbekistan agriculture moved into a new age after the change of the agricultural development policy heavily concentrated on cotton and wheat to crop diversification in recent years. Nevertheless, the fact remains that the agriculture still has a lot of issues to be addressed. A task team led by a World Bank specialist suggested[20] the following areas for further improvements in the agricultural sector.

[20] Farm Restructuring in Uzbekistan: How Did It Go and What is Next? ASA "Support to Agriculture Modernization in Uzbekistan", January 15, 2019

1) GOU has maintained a strict control of the entire production chain, with only few exceptions in horticulture and livestock productions
2) Strategic crops, cotton and wheat, continue to dominate the sown area of *Fermers* and the land allocation to these crops are not driven by signals
3) *Dekhkans* are disconnected from food value chains and agribusiness. Large farms do not work as core farms for *Dekhkans*
4) Farm restructuring by decrees and weak property rights in land use curtail management and investment incentives and raise issues of access-to-farmland for the rural population
5) A limited fodder base constrains livestock expansion. Crop and livestock production are decupled. As a result, both sub-sectors do not enjoy any synergy
6) *Fermers* producing high-value crop are constrained in their access to fertilizers, fuel, machinery, credit, value chains, and export channels
7) Problems pertaining to the stability and distribution of irrigation water supply have not been resolved in a satisfactory manner

3. Horticulture Value Chain

3.1 Horticultural Crops Production

Table 3-1-1 shows outline of horticultural crops production in 2017 in Uzbekistan.

Table 3-1-1 Horticultural Crops Production in 2017

Crop	Harvested/Productive Area (ha)				Production (ton)				Yield (ton/ha)			
	Fermer	*Dehkhan*	Others	Total	*Fermer*	*Dehkhan*	Others	Total	*Fermer*	*Dehkhan*	Others	Total
Potatoes	9,119	67,969	1,071	78,159	429,220	2,347,571	16,591	2,793,382	47.07	34.54	15.49	35.74
	(11.7%)	(87.0%)	(1.4%)	(100.0%)	(15.4%)	(84.0%)	(0.6%)	(100.0%)	-	-	-	-
Vegetables (open field)	54,235	129,691	4,554	188,480	2,972,750	6,905,997	102,881	9,981,628	54.81	53.25	22.59	52.96
	(28.8%)	(68.8%)	(2.4%)	(100.0%)	(29.8.%)	(69.2%)	(1.0%)	(100.0%)	-	-	-	-
Melons	20,501	24,870	2,359	47,730	932,826	1,031,711	18,327	1,982,864	45.50	41.48	7.77	41.54
	(43.0%)	(52.1%)	(4.9%)	(100.0%)	(47.0%)	(52.0%)	(0.9%)	(100.0%)	-	-	-	-
Fruits	120,835	80,813	9,646	211,294	947,368	1,603,535	34,952	2,585,855	7.84	19.84	3.62	12.24
	(57.2%)	(38.2%)	(4.6%)	(100.0%)	(36.6%)	(62.0%)	(1.4%)	(100.0%)	-	-	-	-
Grapes	58,734	37,891	3,512	100,137	724,684	860,425	22,480	1,607,589	12.34	22.71	6.40	16.05
	(58.7%)	(37.8%)	(3.5%)	(100.0%)	(45.1%)	(53.5%)	(1.4%)	(100.0%)	-	-	-	-

Source: Ministry of Agriculture, Republic of Uzbekistan

Production of horticultural crops from *Dekhkan* sector is larger than the production from *Fermer* sector. Cotton and wheat are still major part of farming and the percentage of horticultural crops area is still limited in *Fermer* sector, while the Government promotes crop diversification policies in recent years. On the other hand, *Dekhkans* commonly grow horticultural crops mainly for their own consumption. The dominance of *Dekhkan* sector in horticultural crops production has resulted from the extreme difference in the number between *Dekhkans,* about 4,556 thousand in total, and horticulture related *Fermers,* only about 3.5 thousand in total, although the average cropped area of *Dekhkan* is very small.

A picture of the production differs from crops to crops. *Dehkhan* sector exceeds *Fermer* sector in potato and vegetables production in terms of the harvested area and the production amount. The both sectors almost balance in the production of melons. In case of fruits and grapes, the production amount from *Dekhkan* sector is larger than the amount from *Fermer* sector, though the harvested area of *Fermer* sector is larger than the area of *Dekhkan* sector. The yield productivity in *Dekhkan* sector is much higher than that in *Fermer* sector for fruits and grapes.

It is commonly understood that crop productivity in *Dekhkan* sector is better than the productivity in *Fermer* sector. The productivity in terms of ton/ha in *Fermer* sector is higher than the productivity in *Dekhkan* sector in case of potato, vegetables and melons. As *Fermer* sector should grow mainly cotton and wheat, which have a cheaper unit price, with the Government instruction, the average value of produced crops per unit area in *Fermer* sector is lower than the value in *Dekhkan* sector. It is true that *Dekhkan* sector is always in advantageous position to *Fermer* sector in terms of the average production value per unit area. However, the above common understanding on the crop proactivity is not correct at least for vegetables as shown in Table 3-1-1.

Fermers grow crops mainly for marketing to relatively extensive areas including export. On the contrary, *Dekhkans* usually grow crops for own consumption, while they often sell the surplus to markets within their reach. Produce from *Dekhkan* sector is usually disconnected from food value chains after the production and regional marketing. Consequently, *Fermer* sector has a bigger presence than *Dekhkan* sector in total horticulture value chain.

3.1.1 Vegetables (including potato and melons)

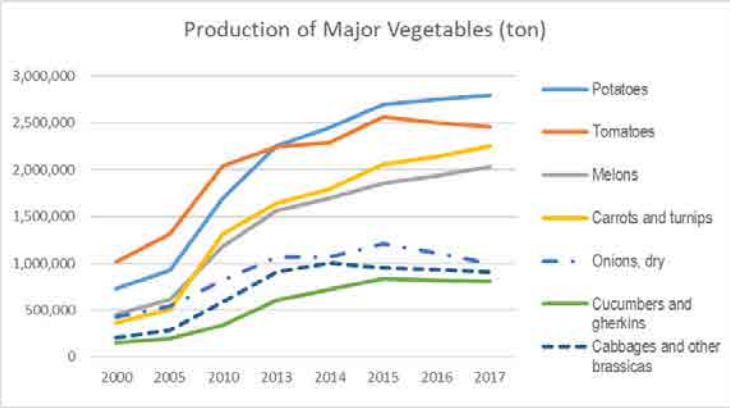
Major vegetables produced in Uzbekistan are potato, tomato, melons, carrot & turnip, onion, cucumber and brassica crops, mainly cabbage. As shown in Table 3-1-2, the major crops account for the total harvested area about 86% and for the total production about 88% in 2017.

Table 3-1-2 Production of Major Vegetables in Uzbekistan in 2017

Crop	Area (ha)	Yield (ton/ha)	Production (ton)
Potatoes	78,251	35.70	2,793,689
Tomatoes	60,486	40.59	2,455,125
Melons	51,007	39.82	2,030,992
Carrots and turnips	30,978	72.62	2,249,733
Onions, dry	28,063	35.46	995,131
Cucumbers and gherkins	19,537	41.64	813,591
Cabbages and other brassicas	11,429	79.14	904,488
Others	44,937	-	1,707,024
Total	**324,688**	**-**	**13,949,773**

Source: JICA Survey Team made from FAOSTAT

Figure 3-1-1 shows change of the production of major 7 vegetables after 2000. All crops show a steady increase in the production, especially during about 10 years after 2005. The top 4 crops, potato, tomato, melons and carrot & turnip have a remarkable increase comparing to other crops. However, the production increase has been on a plateau except for potato, melons and carrot & turnip since 2015.



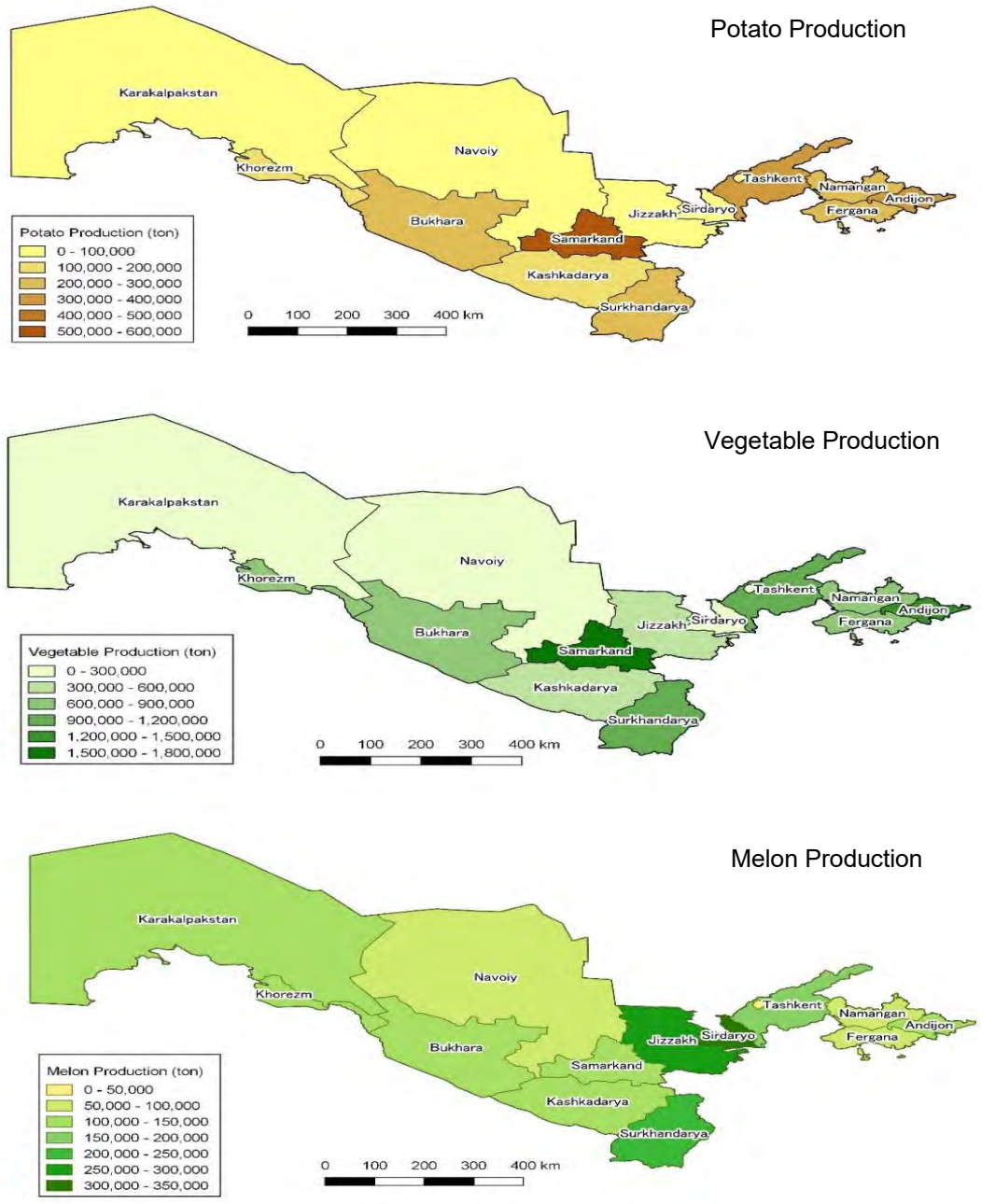
Source: JICA Survey Team made from FAOSTAT

Figure 3-1-1 Production of Major Vegetables in 2000 – 2017

Figure 3-1-2 shows production of potato, vegetables and melons by regions including Karakalpakstan in 2017. Samarkand stands out for potato production, followed by Tashkent, Bukhara,

Fergana-valley regions and Surkhandarya. In case of vegetables (open filed production only), the major production areas are almost as same as potato. While melons are evenly grown throughout the country, different from potato and vegetables, the production is relatively high in Syrdarya, Jizzakh and Surkhandarya. On the whole, vegetables including potato and melons are mainly grown in;

(1) Tashkent, Samarkand and Bukhara: having or close to big cities
(2) Fergana-valley regions: Traditional production area blessed with a good weather condition, and
(3) Surkhandarya: the southernmost region blessed with warm weather



Source: JICA Survey Team made from statistical data of MOA, the Republic of Uzbekistan

Figure 3-1-2 Production of Potato, Vegetables and Melons by Regions in 2017

3.1.2 Fruits (including Grape)

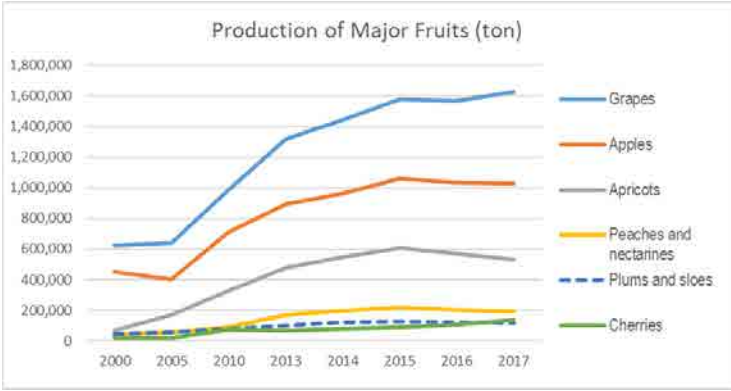
Major fruits produced in Uzbekistan are grape, apple, apricot, peach & nectarine and cherry. As shown in Table 3-1-3, the major crops account for the total harvested area about 84% and for the total production about 85% in 2017

Table 3-1-3 Production of major Crops in Uzbekistan in 2017

Crop	Area (ha)	Yield (ton/ha)	Production (ton)
Grapes	103,552	15.70	1,625,511
Apples	94,517	10.88	1,028,796
Apricots	41,711	12.77	532,565
Peaches and nectarines	16,835	11.48	193,326
Cherries (inc. sour)	15,079	12.84	193,678
Plums and sloes	12,279	9.44	115,966
Others	55,112	-	658,208
Total	**339,085**	**-**	**4,348,050**

Source: JICA Survey Team made from FAOSTAT

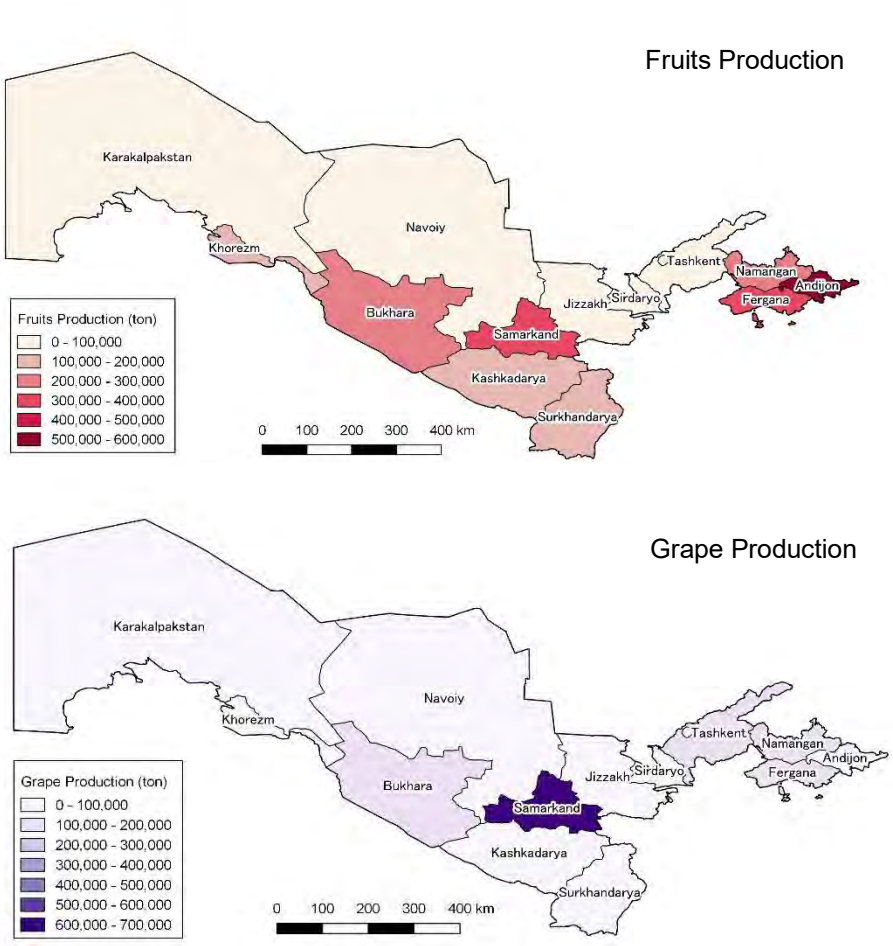
Figure 3-1-3 shows change of the production of major 6 fruits after 2000. As same as vegetables, all crops show a steady increase in the production, especially during about 10 years after 2005. Among 6 crops, grape, apple and apricot have a remarkable increase comparing to others. The production increase has been on a plateau except for cherry since 2015, as same as vegetables.



Source: JICA Survey Team made from FAOSTAT

Figure 3-1-3 Production of Major Fruits in 2000 – 2017

Figure 3-1-4 shows production of fruits and grape by regions including Karakalpakstan in 2017. Main fruits production regions are Fergana-valley regions, Samarkand and Bukhara. In case of grape, Samarkand stands out, followed by Bukhara, Fergana-valley regions and Tashkent. As same as the vegetables sub-sector, the major production regions are in the southern part of the country. Considering farming environmental conditions, e.g. weather, irrigation, etc. and marketing conditions, it is expected that the horticulture farming will be developed mainly in and around the present major production regions.



Source: JICA Survey Team made from statistical data of MOA, the Republic of Uzbekistan

Figure 3-1-4 Production of Fruits and Grape by Regions in 2017

3.1.3 Greenhouse Production

Greenhouse farming is becoming popular year by year in Uzbekistan. However, the cropped area and the production from greenhouses are still very limited. Table 3-1-4 shows production of vegetables from open field farming and from greenhouse farming in 2017.

Table 3-1-4 Production of Vegetables by Open filed and Greenhouse in 2017

Sector	unit	Open	Green H	Total
Fermer	ton	2,972,750	21,387	2,994,137
	(%)	(99.3)	(0.7)	(100.0)
Dekhkan	ton	6,905,997	184,858	7,090,855
	(%)	(97.4)	(2.6)	(100.0)
Others	ton	102,881	20,619	123,500
	(%)	(83.3)	(16.7)	(100.0)
Total	ton	9,981,628	226,864	10,208,492
	(%)	(97.8)	(2.2)	(100.0)

Source: Ministry of Agriculture, the Republic of Uzbekistan

Only 2.2 % of the total production of vegetables are from greenhouse farming. Comparing *Fermer* sector and *Dekhkan* sector, the % is much higher in *Dekhkan* sector. The reason why is assumed that the majority of popular greenhouses are simple structured constructed by *Dekhkan* growers in their *Dekhkan*-plot. The relatively high %, 16.7 %, in others should represent an aggressive investment of Agri-firms to greenhouses in recent years. The greenhouses constructed by Agri-firms are relatively large scale and have high productivity with sophisticated facilities.

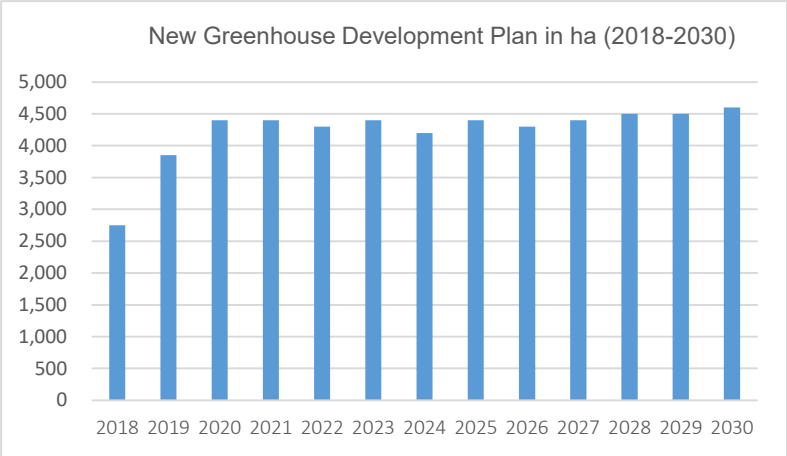
Table 4-1-5 shows number of greenhouse sites and their total area in 2018. While the number is about 57,000, the total area is a little bit over 8,000 ha. The average greenhouse seize per site is only 0.14 ha. And plastic-sheet greenhouses are overwhelmingly majority among the greenhouses. The figures support the hypothesis that the popular greenhouses are simple structured mainly constructed by *Dekhkan* growers. The most popular crop grown in greenhouses is tomato which counts for the planted area more than 50 % of the total, followed by cucumber (about 29 %) and citrus and others. While crop diversification in greenhouses shall progress along with the development of greenhouse farming, tomato and cucumber are major crops planted in greenhouses at present. The average productivity (ton/ha) of tomato and cucumber are still at the lower level even though they are grown in greenhouses. This must be a proof of the above hypothesis. The major greenhouse farming regions in terms of number of greenhouse sites and planted area are Tashkent, Samarkand and Fergana. A small-scale greenhouse farming is prevailing in Fergana, as Fergana is the largest in terms of number of the sites while the smallest in terms of the area among the 3 regions.

Table 3-1-5 Number of Greenhouse Sites, the Planted Area and the Production in 2018

No	Crop	Number			Area		Production		Yield
		Glass	Plastic	Total	(ha)	(%)	(ton)	(%)	(ton/ha)
1	Tomato	-	-	-	4,561	(55.3)	263,002	(54.4)	57.66
2	Cucumber	-	-	-	2,397	(29.1)	117,083	(24.2)	48.85
3	Citrus & others	-	-	-	1,283	(15.6)	103,295	(21.4)	80.51
	Total	123	56,965	57,088	8,241	(100.0)	483,380	(100.0)	-

Source: Ministry of Agriculture, the Republic of Uzbekistan

The construction of greenhouses was controlled by the Government at some time in the past, as development of necessary infrastructures such as gas supply, electric supply, etc. didn't catch up with the demand for greenhouses. Now, the Government actively promotes the construction according to MOA. The Ministry has a plan to increase the area under greenhouse farming by about 200 % by constructing new greenhouses with 55,000 ha in 2018 – 2013 (see Figure 3-1-5)



Source: Ministry of Agriculture, the Republic of Uzbekistan

Figure 3-1-5 Greenhouse Development Plan in ha (2018-2030)

3.1.4 Production Technique

Uzbekistan was a center of agricultural production as well as agricultural research in the Central Asia in the Soviet Union. It is, therefore, generally considered that a level of crop production technique in Uzbekistan is beyond a basic stage and relatively progressed compare to neighboring countries. As productivity (ton/ha) is an objective indicator to judge the progress of production technique, the productivity of major horticultural crops in Uzbekistan are analyzed here (see Table 3-1-6 and 3-1-7).

Table 3-1-6 Mean Productivity (ton/ha) of Major Vegetables in Uzbekistan and other Countries (2013-17)

Country	Cabbages and other brassicas	Carrots and turnips	Cucumbers and gherkins	Onions, dry	Potatoes	Tomatoes	Melons
Uzbekistan	**25.64**	**65.61**	**40.54**	**36.75**	**19.50**	**38.68**	**35.31**
Japan	41.52	33.32	50.42	46.68	30.18	61.17	32.66
Turkey	25.16	54.20	47.27	31.01	19.53	65.49	41.03
Russia	25.85	25.60	27.56	23.74	15.27	24.69	11.28
Kazakhstan	25.81	26.46	22.45	27.26	18.72	24.17	22.75
Kyrgyzstan	21.53	21.94	19.49	21.47	16.80	19.89	21.92
Tajikistan	25.18	41.03	28.76	27.11	22.47	28.76	29.06
Turkmenistan	25.34	33.41	25.19	26.75	19.57	39.08	10.03
World (Ave.)	30.17	39.16	40.81	19.19	19.23	39.43	35.90

Source: JICA Survey Team made from FAOSTAT

Table 3-1-7 Mean Productivity (ton/ha) of Major Fruits in Uzbekistan and other Countries (2013-17)

Country	Apples	Apricots	Cherries	Grapes	Peaches and nectarines	Plums and sloes
Uzbekistan	**10.54**	**11.71**	**11.24**	**13.33**	**10.85**	**10.31**
Japan	20.96	6.47	4.25	10.67	13.02	7.51
Turkey	16.34	5.71	6.62	8.93	14.87	14.07
Russia	8.62	5.53	4.50	8.36	5.99	4.04
Kazakhstan	5.18	5.29	4.05	4.94	4.08	4.83

Country	Apples	Apricots	Cherries	Grapes	Peaches and nectarines	Plums and sloes
Kyrgyzstan	5.16	3.11	4.57	1.43	4.59	6.39
Tajikistan	5.31	2.83	-	5.98	2.55	0.35
Turkmenistan	13.87	14.01	-	14.71	18.16	24.91
World (Ave.)	16.79	7.08	5.55	11.31	15.73	4.00

Source: JICA Survey Team made from FAOSTAT

The crop productivity in Uzbekistan is substantially evaluated as shown below;

(1) Higher than the neighboring countries in general
(2) Almost equal to the world average, even higher in several crops
(3) Higher than Japan in some crops

The above analysis implies that the production technique of horticultural crops in Uzbekistan has been advanced to a certain level of stage and the growers don't need a simple package of standardized technologies from outside of the century. Instead, the growers need a modification in the technologies in order to optimize them in accordance with local needs, as well as with personal needs which are becoming more sophisticated and diversified.

3.2 Marketing and Processing of Horticultural Produce

3.2.1 Scale of Distribution

The distribution quantity of horticultural produce was 25.7 million tons in 2017. Of which, 67.0%, 6.4%, 3.6% and 12.7% were for regional consumption, urban consumption at Tashkent City, export of fresh produce and processing materials, respectively. Out of 12.7% mentioned above, export and local market accounted for 3.5% and 9.2%, respectively. Regarding processed products, dried vegetables/ spice powders, dried fruits and frozen vegetables /fruits are mainly exported, while fruits juice are used for domestic consumption.

Regarding processing, the export quantity consists of 85% by fresh products and 15% by processing products on shipping weight base, while they are 51% by fresh products and 49% by processing products in input weight base. Because dried products, main exports from Uzbekistan, have only 16% recovery on average, which leads to low percentage on shipping weight base. The shipping amounts in value consist 73% by fresh products and 27% by processing products.

The production of horticultural crops is increasing despite influences of climate changes. But, rapid increase of domestic consumption cannot be expected, due to the limited population growth ratio at 1.56% (IMF prediction, 2019). Therefore, export and processing of horticultural crops are significant measures to increase incomes and sales for farmers, traders, exporters and processing companies. But the ratio of export, including fresh and processed ones, is only 7.1% of total amount, and further increase can be expected due to huge demands in Russia and neighboring countries. The distributing quantities of horticultural crops by the marketing channel are shown in Table 3-2-1.

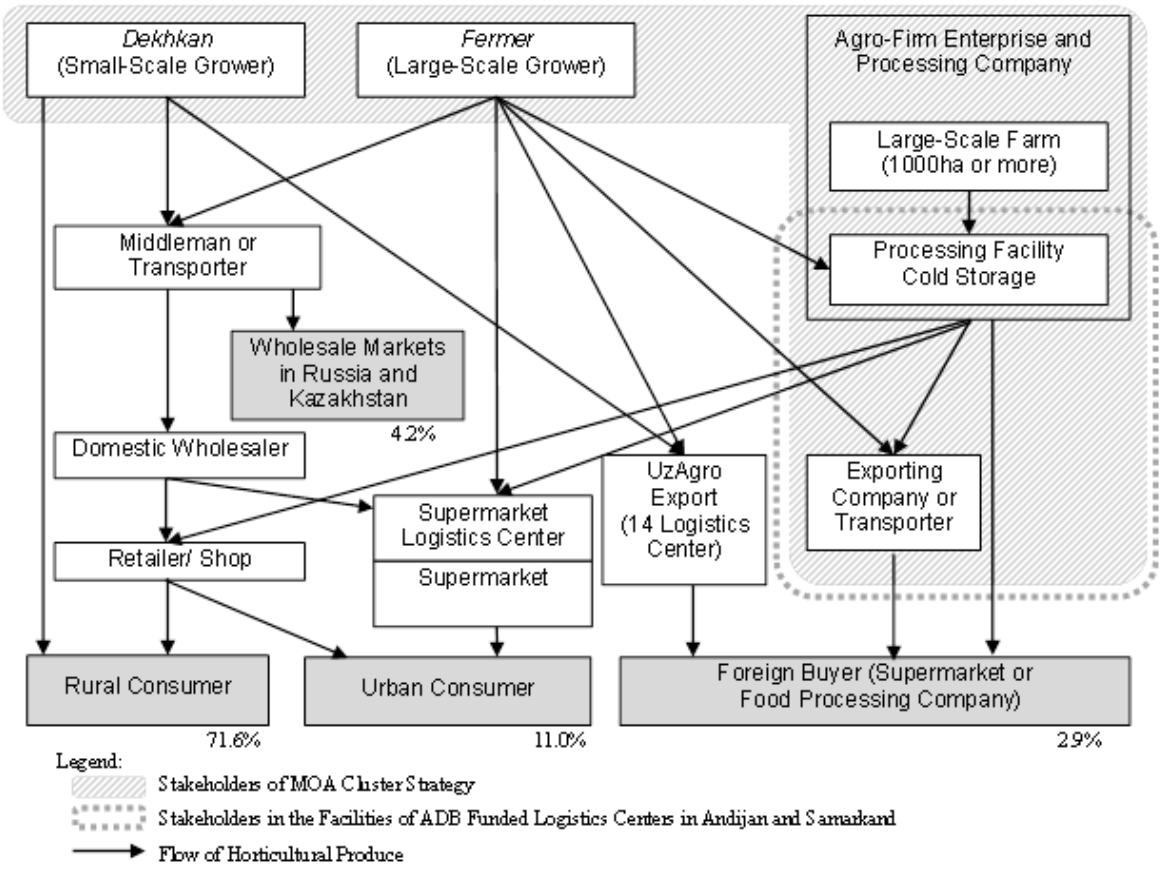
Table 3-2-1 Distributing Quantities of Horticultural Crops by Marketing Channel (unit:ton)

Crops	Total Distribution of Horticultural Produce	Fresh, Regional Consumption（out of Tashkent City）	Fresh, Urban Consumption in Tashkent City	Fresh, Export	Processing Materials	Stock（Selling in the next season）	Public Organizations	Seeds
Total & Percentage	25,664,918	17,199,644	1,647,111	918,111	3,262,825	743,951	1,097,369	795,907
	(100%)	（67.0%）	（6.4%）	（3.6%）	（12.7%）(Export 3.5%/ Local 9.2%)	（2.9%）	（4.3%）	（3.1%）
Fruits	3,380,240	2,090,921	177,515	231,277	693,281	101,066	86,180	
Vegetables	12,962,574	8,637,011	883,882	243,275	1,991,839	320,648	642,502	243,417
Potatoes	3,665,161	2,432,389	357,250	-	-	212,493	209,831	453,198
Melons	2,423,116	2,025,528	113,544	28,485	10,917	75,740	84,597	84,305
Grapes	1,884,157	1,090,793	91,364	136,067	490,335	9,529	66,069	
Legume	237,526	87,760	3,100	130,920	366	9,782	1,827	3,771
Nuts & Others	1,112,144	835,270	20,456	148,059	76,087	14,693	6,363	11,216

Source: Estimated by UzbekOzikovkatho Xolding JVC, April 2019

3.2.2 Marketing Channel and Aspect

In the past, horticultural produce used to be sold from farmers to middlemen, wholesale markets and retailer markets/ grocery stores, but, in the recent decade, channels of horticulture crops through supermarkets have been developed in urban areas. For export, the routes are to Russian supermarkets by UzAgroExport purchased from farmers, to wholesale markets in Kazakhstan and Russia by exporters, and to foreign food processing companies by Uzbek processing companies based on supply contracts for dried vegetables, concentrated fruit juice, frozen vegetables/fruits, and nuts. The marketing channels for horticultural produce in Uzbekistan are shown in Figure 3-2-1.



Sources: JICA Survey Team, Note: The figures are calculated from the data of MIFT and UzbekOzikovkatho JSC.

Figure 3-2-1 Marketing Channels for Horticultural Produce

(1) Horticultural crops are produced by *Dekhkan*, *Fermer* and horticultural related companies. 70% of horticultural crop production depends on *Dekhkan*, but the distributed crops in wide areas are produced by *Fermer* and horticultural related companies. Dekhkan generally sell products to middlemen at farm gate, while Fermer sell products to middlemen, to wholesalers as middlemen by Fermer themselves, and to supermarket chain, processing companies and exporting companies in contract base. About 70% of products are for self-consumption and shipped to rural comsumers. According to the results of Rural Socio-Eonomic Surrvey, the price formation for fruits and vegetables is 225 for urban consumers and 300-500 for export sales, assuming the farm-gate price is 100.

Sources: JICA Survey Team

Figure 3-2-1 Price Formation of Horticultural Crops

(2) Currently, the fresh vegetables such as tomatoes and cucumbers cultivated in greenhouses are exported to wholesale markets in Moscow, St. Petersburg and Novosibirsk. The preserved vegetables with huge demands in Russia such as Irish potatoes, onions, carrots and cabbages are shipped in winter seasons. Transport modes are mainly by on-road trucks. The sweet cherries as a high value product are carried by air cargoes. Cotton has been transported through "Trans-Aral route", namely, Tashkent→Samarkand→Nukus→(Western Kazakhstan)→Orenburg (Russia)→ Moscow. At that time, railway sidings in production areas of Uzbekistan was used for cotton collection, and collected products were transported to textile factories located in Moscow suburbs. In the current operation, it takes 82 hours to connect Moscow and Tashikent by the passenger trains. In December, 2018, the express passenger trains called 'Uzbekistan' have been operated weekly between Moscow and Tashkent, taking 62 hours using the route of Tashkent→(Southern and Western Kazakhstan)→Orenburg (Russia)→Moscow. On the other hand, cargo trains are used for transport of horticultural produce mainly to Kazakhstan, because of slow speeds, taking for one week to Moscow, and additional works of on- and off-loading at terminal stations.

(3) Out of the horticulture related companies, there are agro-processing companies (575), exporters (1,293) and traders. Some of large-scale exporters hold the integrated supply chain, consisting of growing section, processing section and exporting section. Also, agro-machinery leasing companies, the agro-machinery dealers, the agro-input dealers and supermarkets support the horticultural sector. Some of founders and directors of the horticulture related companies possess the right of *Fermer*, and the companies can operate own-farm or collect crops from out-growers on contract basis. The activities of the processing companies impact on marketing of horticultural crops as well rural economy. In total, there are 575 processing companies for fruits, vegetables, grapes, melons and potatoes in Uzbekistan (MOA data 2018). The processing companies cultivate in own-farms or collect from out-growers under contract basis. Most of dried vegetables are supplied directly to foreign food processing companies under the contracts. Dried fruits and nuts including raisin, apricot, almond, walnut and peanuts are for both export and local consumption. Concentrated juices are sold in the local markets and retailers. The limited quantities of processing products such as pickled, frozen and jam are forwarding for export and local consumption. Since 2017, the bottles of pickled capers have been exported to Turkey, Italy and Spain.

(4) The Department for Supporting Entrepreneurs and Clusters, newly established in MOA in 2019, is planning to support private sectors by the integration of crop production, processing and marketing. The conceptual direction of clusters assumes a group of facilities where many companies and farmer groups operate grading, sorting, processing, refrigerating, and cargo handling. It is also being considered to support the establishment and operation of facilities that are jointly invested by *Fermer* and managed by agricultural cooperatives such as Japan Agricultural Cooperatives (JA). However, in reality, horticultural produce processing and logistics centers managed by domestic investors, companies and foreign companies have been established.

(5) The farmers are grading their horticultural crops in terms of crop size and extent of damages, and ship high quality crops for export and ship low quality crops to local markets. Middlemen decide selling destinations considering better market prices. Middlemen enter directly into wholesale

markets by owning 3-6 ton trucks, and sell crops to wholesalers or retailers. Some of them cross the borders into Kazakhstan and Kyrgyz for the sale. The border market is operated at the border of Afghanistan, and foodstuffs the market including horticultural products are traded by Tajik merchants in their business networks.

(6) The President Order No. 2603 (19 September, 2016) advocates the export promotion of horticultural produce. The processing companies have invested in processing plant/machinery and facilities by own capitals and bank loans, and have made efforts to upgrade sanitary environment by means of obtaining international food sanitary certificates such as ISO22000, HACCP and Global GAP. It is common to obtain the certification from any organizations specified by the foreign food processing companies. Total 1,293 export companies, including processing companies, have been registered as partners with UzAgroExport JSC as of the end of 2018. For the fresh products, the export to the neighboring countries, namely, Kazakhstan, Afghanistan and Kyrgyz, which do not require strict sanitary requirements, is still major marketing channels. Since 2017, any companies and *Fermer*, which have registered on local administration, can export horticultural crops, and they are exempted from custom duties for export. It leads to motivation increase of such companies. State owned UzAgroExport JSC has been established to promote export of horticultural produce and it had controlled export business earning handling charges and facility utilization charges from exporters, operation of 'Trading Houses' at Moscow and Novosibirsk, selling package materials by the affiliated factories, and transport services by the affiliated company in the past. But the President Resolution dated 26 June, 2017 titled 'On measures to further support local exporting companies and boost foreign economic activity' has supported enterprises and *Fermer* registered on local administrations are permitted for direct export of horticultural produce. Currently, UzAgroExport JSC progresses the supply contract with the Russian supermarket chain with cooperation of local companies.

Description of UzAgroExport JSC

Legal Status: President Order 7/4/2016 No.2515
Organization : Agency in the Former Ministry of Agriculture and Water Resources was changing to the group company under UzbekOzikovkatha Xolding JSC
Business Description :

1) Marketing research in export potential countries and neighboring countries
2) Introduction of new varieties to farmers to meet foreign markets and support on increase of competitive horticultural crops
3) Construction of continuing business relationships with foreign buyers based on supply contract
4) Conduction of horticultural exhibitions
5) Construction, rehabilitation and modernization of cold storage for vegetables and fruits and improvement of packages
6) Operation of modern logistics center
7) Fostering of senior experts on modern management and marketing skills

(7) Under the ADB Horticulture Value Chain Infrastructure Project, two large-scale logistics centers will be constructed at Andijan and Samarkand with the costs of approximately 200 million US$. The centers will furnish service railway, container yard, grading warehouse, processing factory, cold storage, freezing stores, quarantine laboratory, and offices for certification, custom clearance, banks and trading companies. The local private sector has intension to operate the facilities, and the centers will contribute to export promotion of horticultural produce. The management body will be dispatched from MIFT and MOF to the new company, and issues related to supporting measures and government guarantee for the loan should be fixed. Both of two sites are located in connection to railways, but, the feasibility of the cold chain transportation by railway should be examined in terms of economic rationality.

3.2.3 Export and Import of Horticultural Products

Uzbekistan government has been promoting export of horticultural produce instead of cotton. As analyzed information by MIFT based on data collected by the State Committee of Statistics, exporting quantities and amount of value are shown in Table 3-2-2 by crop and Table 3-2-3 by country, respectively. The export was increased from 2017 to 2018 by 38% in both quantity and amount of value. The amount in FOB price base was 890 million US$ and the quantity in weight base was 1.2 million tons. The data before 2016 would be inaccurate, and the decrease of export amount from 2016 to 2017 would be caused by change of legal framework of UzAgroExport JSC and currency devaluation of UZS against US$. Since the quantity in weight base has been increased gradually, the policies of export promotion of horticultural produce to mobilize private sector have been effective.

The fruits export was increased in 2017/2018 by 60% in amount base. Especially, sweet cherries shall be paid attention as an advantaged crop for export due to low transportation costs per weight and high unit price. As for fresh vegetables, onions, carrots and eggplants have been shipped properly. Export of dried vegetables and fruits also has been continuously increasing. The processing companies have started renewal of the equipment and facilities to expand production volume and upgrade quality. The *Fermer* and companies, who have acquired the loans under ADB and IBRD projects for TSL, have invested for the introduction of new varieties and dwarfing intensive cultivation of fruit trees, therefore, it is expected that production and export quantities by them will be increased from 2022.

The main destination of export in 2018 was Kazakhstan with 47.8% and 44.1% in terms of quantity and amount, respectively. More than a half of export quantity to Kazakhstan is re-exported to Russia. The statistical data of export to Russia shows 19.1% and 19.7% in quantity and amount respectively, and it is presumed that more than double of horticultural produce is exported finally to Russia as the best export partner. Following Russia, the exporting destinations are Kyrgyz at 7.2% and 9.0%, and Afghanistan at 5.9% and 6.0%, in quantity and amount, respectively. The exports to such neighboring counties are critically important.

The import of horticultural produce was 525.0 thousand tons and 135.7 million US$ in 2018. Of which, the percentages of import amount by crop are 40.0%, 31.8%, 10.0% for sunflower seeds, Irish potatoes and Bananas, respectively. Sunflower seeds can be used for processing of cooking oil and imported from Kazakhstan. Irish potatoes are imported from Kazakhstan and the Netherland, while bananas are imported from Ecuador.

Table 3-2-2 Exporting Quantity and Amount of Horticultural Produce by Crop

No.	Horticultural Products	2015		2016		2017		2018		
		Weight (ton)	Amount (1000USD)	Weight (ton)	Amount (1000USD)	Weight (ton)	Amount (1000USD)	Weight (ton)	Amount (1000USD)	Unit Price (US$/kg)
TOTAL:		591,779	1,193,562	796,387	929,283	904,123	645,514	1,251,732	889,693	
Vegetables		216,425	297,019	218,002	191,459	226,298	106,654	441,586	145,845	
1	Tomato, Fresh	38,210	100,302	41,403	63,737	52,026	40,228	61,611	46,802	0.76
2	Green Leaf Veg., Fresh	34,204	74,319	36,427	52,510	44,043	30,365	51,531	31,053	0.60
3	Onion, Fresh	54,519	27,158	70,535	18,701	27,247	5,350	100,373	13,627	0.14
4	Cabbage, Fresh	43,019	21,700	31,998	24,822	35,815	6,877	84,394	13,000	0.15
5	Carrot, Fresh	21,193	14,684	11,630	2,561	27,165	3,989	63,458	9,740	0.15
6	Cucumber, Fresh	6,414	22,713	6,938	10,055	8,842	4,465	16,710	7,692	0.46
7	Eggplant, Fresh	1,447	5,536	1,408	2,783	2,749	1,427	13,755	4,517	0.33
8	Sweet Pepper, Fresh	3,496	12,536	2,897	4,410	6,336	3,209	6,849	4,517	0.66
9	Garlic, Fresh	394	1,570	1,274	2,516	4,049	3,635	5,202	4,056	0.78
10	Veg, Frozen	630	938	1,890	1,880	3,793	2,130	3,707	2,385	0.64
11	Cauliflower, Fresh	1,457	1,489	1,434	2,339	2,215	1,365	4,050	2,244	0.55
12	Beet, Fresh	3,595	3,522	4,421	1,149	4,671	969	16,088	2,230	0.14
13	Radish, Fresh	5,625	6,510	3,360	1,755	4,269	1,173	8,207	1,857	0.23
14	Leek, Fresh	645	2,034	597	1,033	712	447	1,569	785	0.50
15	Chilli, Fresh	411	669	201	419	503	524	837	646	0.77
16	Turnip, Fresh	492	470	1,003	254	1,525	289	2,606	466	0.18
17	Lettuce, Fresh	282	529	402	394	260	176	281	155	0.55
18	Potato, Fresh	249	138	17	10	20	13	315	55	0.17
19	Quince, Fresh	64	103	167	129	39	17	11	6	0.57
20	Tomato, Frozen	79	99	0	0	14	6	15	6	0.43
21	Other Vegetables (Chard)			0	0	4	1	16	5	0.31
Fruits		60,853	191,607	229,535	329,249	225,902	197,020	249,803	314,414	
22	Sweet Cherry, Fresh	5,421	42,709	29,170	133,675	30,609	67,026	33,811	141,044	4.17
23	Apricot, Fresh	5,114	29,158	49,653	70,924	22,801	20,308	42,666	48,355	1.13
24	Nectarine, Fresh	12,220	32,178	45,041	38,201	43,108	24,066	65,147	42,098	0.65
25	Persimmon, Fresh	20,896	28,471	65,123	36,839	73,006	43,283	55,024	34,078	0.62
26	Plum, Fresh	6,356	9,586	26,417	25,931	30,481	14,300	28,113	20,306	0.72
27	Pomegranate, Fresh	2,743	11,209	3,521	6,279	7,800	7,732	9,733	9,724	1.00
28	Caper, Processed	2,392	15,508	2,668	7,521	3,279	7,204	3,549	7,168	2.02
29	Apple, Fresh	2,379	11,862	4,413	4,554	8,212	5,014	7,478	6,606	0.88
30	Lemmon, Fresh	3,105	10,475	2,432	4,354	3,957	5,150	2,024	3,103	1.53
31	Cherry, Frozen	0	0	29	43	912	1,567	542	703	1.30
32	Pear, Fresh	17	45	795	519	822	460	656	378	0.58
33	Apricot, Frozen	66	174	193	325	426	413	343	325	0.95
34	Quince, Fresh	71	103	27	10	315	307	265	213	0.81
35	Fig, Fresh			21	20	56	49	236	161	0.68
36	Strawberry, Fresh	23	49	13	32	85	122	136	91	0.67
37	Raspberry, Fresh & Frozen	16	52					34	37	1.08
38	Sour Cherry, Fresh	15	28	19	21	30	18	47	24	0.52
39	Other Fruits (Tangerine)	21	1			1	1	0	0	
Melons		7,962	5,346	6,889	3,166	28,521	3,388	33,737	10,004	
40	Melon, Fresh	7,727	5,123	6,446	2,915	27,393	3,211	14,840	5,711	0.38
41	Pumpkin, Fresh	211	214	172	102	436	57	17,217	3,483	0.20
42	Watermelon, Fresh	24	10	271	149	692	119	1,681	811	0.48
Grape		186,903	350,011	171,131	188,916	213,910	159,502	206,813	179,701	
43	Grape, Fresh	106,412	168,910	96,357	70,341	136,012	97,939	137,925	120,890	0.88
44	Grape, Dried	80,491	181,102	74,775	118,575	77,898	61,563	68,888	58,811	0.85
Legumes		67,237	158,402	122,303	125,972	130,740	98,687	203,212	143,403	
45	Bean	45,504	104,647	52,782	60,456	56,498	46,447	87,754	66,222	0.75
46	Mung bean	21,285	52,633	67,717	64,219	63,588	41,166	109,255	70,843	0.65
47	Pea	449	1,122	1,805	1,298	10,654	11,074	6,204	6,338	1.02
Dried Fruits and Vegetables		52,399	191,177	48,526	90,520	78,751	80,264	116,581	96,326	
48	Peanut, Dried	15,365	38,015	9,422	14,166	13,502	10,624	29,275	22,850	0.78
49	Plums, Dried	8,421	23,385	7,991	13,761	24,138	17,783	24,644	17,095	0.69
50	Walnut, Dried	4,629	58,366	2,602	15,422	7,699	23,984	4,499	12,534	2.79
51	Pepper, Dried							18,340	11,208	0.61
52	Apricot, Dried	5,845	23,371	10,586	17,639	10,889	10,494	7,453	7,383	0.99
54	Vegetables, Dried	1,704	6,648	2,622	8,446	2,734	4,263	3,915	6,893	1.76
53	Mixed Fruits, Dried	14,026	26,917	11,461	12,646	14,803	5,960	13,599	5,649	0.42
55	Sesame, Dried							2,801	4,023	1.44
56	Almond, Dried	143	1,686	205	1,594	720	2,976	720	2,058	2.86
57	Apple, Dried	323	840	373	480	418	236	5,251	1,358	0.26
63	Pistachio, Dried	0	0	23	61	33	156	184	671	3.64
58	Carrot, Dried	125	473	262	711	511	651	482	473	0.98
61	Onion, Dried	5	17	195	771	17	20	161	342	2.13
60	Pea, Dried	59	305	138	225	130	96	193	107	0.55
62	Tomato, Dried	194	688	55	144	47	25	300	83	0.28
64	Peach, Dried	12	64	1	4	5	4	19	16	0.87
59	Potato, Dried	80	397	104	185	85	92	5	4	0.71
65	Fig, Dried	4	11	1	2	0	0	1	1	0.92
66	Lentil, Dried					5	3	0	0	
67	Other Fruits & Vegetables, Dried	1,464	9,994	2,486	4,264	3,016	2,895	4,740	3,578	

Source：Ministry of Investment and Foreign Trade, June 2019

Table 3-2-3 Exporting Quantity and Amount of Horticultural Produce by Country (more than 1milion USD)

No.	Exporting Country	2015		2016		2017		2018			Remarks
		Weight (ton)	Amount (1000 USD)	Weight (ton)	Amount (1000 USD)	Weight (ton)	Amount (1000 USD)	Weight (ton)	Amount (1000 USD)	Unit Price (USD/ton)	
Total:		591,779	1,193,563	796,387	929,282	904,122	645,514	1,251,732	889,693	711	
1	Kazakhstan	393,166	740,569	462,614	529,353	471,974	315,039	598,039	392,286	656	
2	Russia	47,058	79,498	119,664	147,417	165,165	113,791	238,904	166,239	696	
3	Kyrgyzstan	3,931	10,838	14,431	9,635	52,944	29,314	89,921	80,333	893	
4	Afghanistan	34,709	78,314	77,585	71,817	52,723	43,770	73,439	53,222	725	
5	China	23,938	57,939	24,676	38,648	21,916	17,367	66,853	46,192	691	
6	Turkey	14,853	48,392	16,808	27,297	27,694	31,529	23,594	25,198	1,068	
7	Pakistan	69	135	1,799	2,185	6,190	4,365	29,761	22,197	746	
8	Vietnam			706	514	12,428	8,259	22,478	14,606	650	Raisin
9	Iran	8,136	41,288	10,925	15,365	12,617	10,804	13,127	10,070	767	
10	Iraq	1,900	8,081	4,867	11,137	8,693	10,978	8,701	9,893	1,137	
11	Ukraine	3,028	7,833	3,039	4,393	7,282	5,276	15,052	8,982	597	
12	Belarus	2,028	5,687	2,050	3,294	4,513	4,620	8,501	7,716	908	
13	UAE	4,129	11,589	7,752	7,237	10,622	8,584	9,513	7,485	787	
14	Turkmenistan	21,768	24,770	15,886	13,413	11,098	8,519	11,556	5,655	489	
15	Germany	1,187	2,970	1,347	3,120	1,472	1,434	2,715	5,575	2,053	
16	Azerbaijan	3,063	10,049	3,393	6,920	4,271	4,510	4,357	4,944	1,135	
17	Latvia	6,916	15,605	4,287	6,751	4,693	3,622	6,152	4,566	742	
18	Tajikistan	102	204	231	280	832	623	5,847	3,640	623	
19	Georgia	3,520	7,939	3,825	6,456	1,995	1,980	4,916	3,203	652	
20	India	13,418	31,676	17,549	17,974	15,051	9,704	4,654	3,075	661	Dried beans
21	USA	290	1,031	257	957	657	1,068	1,270	2,338	1,842	
22	South Korea	1,898	1,132	365	949	889	934	943	2,243	2,378	
23	Saudi Arabia	137	540	146	322	836	833	1,090	1,178	1,081	

Source: Ministry of Investment and Foreign Trade, June 2019

Regarding export status of horticultural crops, according to the export statistics of State Customs Committee, the main exporting countries based on export applications are Kazakhstan, Russia, Kyrgyz, China, Turkey, Iran, Turkmenistan, Iran, and India,. The export value includes the value of domestic products, packaging costs, transportation costs to the border, and border prices including insurance premiums, and caliculated by the exchange rate at border crossing, which are slightly different from the data of the Ministry of Investment and Foreign Trade. 0.01% of this amount is levied as customs clearance fees, but export duties are zero. The total exports of the nine major countries are growing steadily to 493.3 million USD (2016), 576.6 million USD (2017) and 767.8 million USD (2018) (referring to Table 3-2-5). Export means are 80.0% for trucks, 19.8% for railways, 0.2% for air transportation, and the ratio of truck transportation is increasing year by year. In addition, air transportation is increasing although the amount is small (referring to Table 3-2-6).

(1) Kazakhstan

The export value is 389 million USD (2018), which has been growing steadily for the past three years. The handling items are various fruits and vegetables, and the sales of fruits occupy the top in terms of value. Products include cherries, grapes, apricots, tomatoes, dried fruits, persimons, nectarines, leaf vegetables, and plums, which are more than 10 million USD. In 2017/2018, cherries (219%), apricots (226%), onions (199%), peanuts (208%), and eggplants (418%) are showing strong growth. It is presumed that growth of fruits has been attributed to the introduction of new varieties and improved quality, and that vegetables have been introduced by the introduction of quality seeds from abroad. Processed products of dried fruits, dried vegetables and frozen fruits are 5.2%. There are manyly destinating to the wholesale market, and it is important to sell at low prices and at the timing of shipment. Transportation means are 46.0% by truck and 54.0% by railway on a weight basis, and 71.1% by truck and 28.9% by railway on a value basis.

As freshness-keeping of horticultural crops is important for Kazakh market, the proportion of truck transport is increasing.

(2) Russia

The export value is 169 million USD (2018), which has been growing steadily for the past three years. The handling products are a variety of fruits and vegetables, and the best selling exporting country of dried vegetables. Among the products, grapes, tomatoes, nectarines, leaf vegetables, apricots, cherries and persimons are over 10 million USD. In 2017/2018, cherries (219%), apricots (226%), onions (199%), peanuts (208%), and eggplants (418%) are showing strong growth. The growth is caused by the introduction of new varieties for fruits with improved quality and the installation of greenhouses for vegetables. Processed products such as dried fruits and dried vegetables account for 2.2%. In terms of exports to Russia, UzAgroExport JSC has many shipments to Trading House and wholesale markets, but shipments to supermarkets have also begun. One of the strengths in Russian market of Uzbek products is that fruits and field vegetables can be shipped 2-3 weeks earlier than other competitors. Relatively high-quality products are being shipped. Exported products to Kadakhstan may be re-exported to Russia. The means of transportation are 80.1% by trucks, 19.7% by railways, and 0.2% by aircargo in a weight basis, and by 83.0% by trucks, 16.1% by railways, and 0.9% by aircargo in a value basis. Export of horticultural crops to Russia is overwhelmingly transported by trucks

(3) Kyrgyz

The export value is 69 million USD (2018). Exports including horticultural crops were suspended in 2010 due to the closure of the borders by the internal conflicts in Kyrgyzstan, but exports have increased rapidly over the past three years. The products being dealt are a variety of fresh fruits and vegetables. Among the products, values of cherry and grapes are over 10 million USD. Although the unit price is low, the shipment volume of carrots is large at 15,000 tons. In 2017/2018, watermelon (2,378%), cucumber (999%), cherry (413%), and apricot (312%) show the highest growth rates. Exports of vegetables are increasing, and this is due to the improvement of purchasing power on the Kyrgyz side. Processed products such as dried fruits and dried vegetables are less than 1%. As for the evaluation of Uzbek products in Kyrgyz, it has the advantage in better quality and cheaper pricing than the Kyrgyz products. Transportation means are 94.3% by trucks and 5.7% by railways, and 93.2% by trucks and 6.8% by railways. The export of horticultural crops to Kyrgyz is overwhelmingly transported by truck.

(4) Afghanistan

The export value is 53 million USD (2018), which has been growing steadily for the past three years. The dealing products are mainly pulses, and kidney beans, peanuts, chickpeas, mungbeans, and onions are over 1 million USD. In 2017/2018, onion (5,840%), cherry (594%), and peanuts (206%) show the highest growth rates compared to the previous year. Fruits and vegetables other than legumes have also appeared in customs statistics since 2018, and Afghan market is expanding demands for horticultural crops, depending on the security situation in Afghanistan. Transportation means are 97.7% by trucks and 5.7% by railways on a weight basis, and 93.2% by

trucks and 6.8% by railways on a value basis. The export of horticultural crops to Afghanistan is overwhelmingly transported by truck.

(5) China

The export value is 46 million USD (2018), which has increased rapidly since 2018. The dealing products are over 1 million USD for mungbean and raisin. In 2017/2018, mungbeans which are the raw materials for sprouts and cherries show the highest growth rate in the previous fiscal year, which whould be affected by recent international trade friction for China. Many exporting companies expect rapid export growth in Chinese markets. Transportation means are 90.3% by truck, 9.5% by railway and 0.2% by aircargo on a weight basis, and 88.8% by truck, 9.8% by railway and 1.4% by aircargo on a value basis. Horticultural crops for China are overwhelmingly transported by truck, and some cherries are transported by aircargo.

(6) Other Countries

The export value to Turkey is 22 million USD (2018), and the main items are mungbeans, capers, raisins, walnuts, dried fruits and pepper powders. Truck transportation is 99.7% on a value basis. The export value to Iran is 9.8 million USD (2018), and the main item is kidney beans. Truck transport is 85.5% on a value basis. The export value to Turkmenistan is 5.6 million USD (2018), and the main items are persimons and peanuts. Truck transport is 92.1% on a value basis. The export value to India is 3.1 million USD (2018), and the main product is mungbeans. Truck transport is 51.1% on a value basis and rail transport is 46.5%. These four exporting countries are on a slightly downward trend.

Table 3-2-4 Export of Horticultital Produce,

by Country, by Year, by Product more than 1 million USD

Year	2016		2017		2018	
Counry / Produce	Weight (ton)	Value (1000USD)	Weight (ton)	Value (1000USD)	Weight (ton)	Value (1000USD)
Kazakhstan	466,176.2	295,836.2	478,358.8	315,266.9	597,318.0	389,235.4
Cherry	23,512.1	41,482.0	21,535.6	47,081.7	24,679.1	102,971.6
Grapes	70,240.0	51,123.5	88,242.9	63,242.6	65,964.0	59,210.2
Apricot	32,180.4	18,583.7	15,077.8	13,363.9	25,345.3	30,252.4
Tomato	35,032.2	23,353.5	39,433.1	30,349.7	31,889.5	24,684.2
Dried fruits	23,534.3	18,639.2	41,633.6	26,387.7	39,242.3	20,006.8
Persimmon	48,363.3	27,401.7	48,539.1	28,985.1	30,173.1	19,145.8
Nectarine	19,524.7	12,159.8	13,839.8	7,957.6	20,953.1	15,247.1
Greeneries	16,367.2	12,467.0	19,968.9	13,451.8	25,991.9	13,976.1
Plums	20,795.9	10,489.2	20,150.7	9,676.7	18,481.4	13,590.2
Onion	45,395.2	3,141.6	24,905.4	4,728.0	71,894.9	9,415.3
Cabbage	27,976.6	8,458.2	27,817.4	4,868.2	61,889.9	9,130.4
Raisin	34,922.0	27,935.4	26,589.2	19,408.3	12,415.7	8,359.1
Peanut	4,397.4	4,269.9	3,932.3	3,166.2	8,200.4	6,571.1
Carrot	9,011.7	882.7	19,837.4	2,922.1	42,091.1	5,568.4
Apple	2,988.5	1,683.7	5,784.8	3,454.8	5,529.9	4,916.7
Peach	8,767.1	5,389.7	6,184.2	3,157.4	7,578.9	4,618.4
Cucumber	6,111.0	4,446.0	5,592.9	3,535.1	10,316.1	4,244.1
Pomegranate	2,516.1	3,251.0	4,488.3	4,444.7	3,983.4	4,242.4
Eggplant	1,285.6	1,038.4	2,113.8	1,008.1	13,460.5	4,214.5
Chili pepper	3,649.3	2,038.6	6,352.6	2,370.0	13,382.1	3,696.7
Pumpkin	171.7	42.5	258.2	31.8	15,349.4	3,241.0
Paprika	2,699.9	1,816.8	5,416.9	2,547.7	5,244.9	3,031.7
Bean	7,437.5	4,593.2	4,186.0	3,382.1	4,808.4	3,013.1
Mung bean	2,204.7	1,353.5	2,047.4	1,329.7	4,070.4	2,165.1
Walnut	320.7	1,123.2	881.2	2,672.8	950.2	2,059.1
Garlic	962.3	1,054.5	1,895.9	1,738.0	2,362.2	1,947.5
Lemon	2,029.4	2,299.0	2,996.9	3,830.8	946.0	1,560.2
Radish	2,989.8	712.5	3,120.7	785.4	6,406.4	1,358.4
Beet	3,507.5	410.1	2,014.3	466.9	10,800.5	1,307.5
Cauliflower	1,284.9	912.4	1,270.5	754.2	2,036.6	1,013.2
Russia	119,998.9	85,076.3	165,604.9	114,714.2	238,895.2	168,906.6
Grapes	24,567.7	16,595.0	38,272.2	27,327.7	47,981.4	36,657.0
Tomato	5,210.7	3,922.0	7,817.7	6,816.6	25,443.7	18,809.8
Nectarine	10,898.6	6,529.2	15,129.2	8,241.1	20,551.9	12,986.8
Greeneries	16,864.1	12,902.8	18,734.8	13,097.0	18,082.3	12,125.0
Apricot	16,755.2	9,971.3	5,655.2	4,764.2	11,991.0	11,895.8
Cherry	5,463.6	9,425.6	6,315.6	13,229.2	2,899.8	11,554.5
Persimmon	12,101.5	6,611.8	19,041.8	10,814.1	18,357.7	10,736.9
Raisin	828.6	776.2	2,170.8	1,922.4	4,150.9	4,752.1
Plums	4,828.2	2,481.2	7,855.3	3,468.2	6,400.1	4,542.4
Dried fruit	824.4	680.4	2,094.4	1,697.9	4,469.8	4,485.3
Dried veg.	1,708.2	3,610.4	1,492.8	2,806.2	1,752.0	3,932.0
Peach	2,415.9	1,497.7	2,921.4	1,539.0	5,120.2	3,265.0
Cabbage	3,767.4	1,227.1	6,818.5	1,381.4	19,582.6	3,179.4
Salad iceberg	2,067.7	1,122.1	3,809.9	2,709.8	4,185.9	3,134.5
Cucumber	446.0	414.4	879.7	256.1	4,847.1	2,560.1
Peanut	436.4	396.9	373.0	314.4	2,606.8	2,270.2

Year	2016		2017		2018	
Counry / Produce	Weight (ton)	Value (1000USD)	Weight (ton)	Value (1000USD)	Weight (ton)	Value (1000USD)
(continued)						
Pomegranate	670.9	672.7	1,801.7	1,871.2	1,924.7	2,115.0
Walnut	1.6	9.6	157.8	650.1	494.8	1,967.6
Frozen veg.	169.0	137.9	1,800.5	1,127.5	2,900.2	1,872.1
Garlic	245.9	244.8	1,282.7	1,199.2	2,358.2	1,843.1
Chili pepper	334.9	835.9	440.4	1,061.2	752.5	1,458.1
Onion	790.5	127.0	403.4	95.9	8,248.7	1,336.1
Paprika	147.1	117.9	579.9	390.4	1,246.4	1,289.8
Cauliflower	137.1	145.8	910.7	567.8	1,864.2	1,195.5
Lemon	244.1	254.2	602.8	826.0	773.7	1,153.7
Melon	1,951.3	688.4	9,569.1	1,159.5	2,106.5	1,151.7
Frozen fruits	154.1	188.4	1,343.4	2,107.3	923.2	1,151.5
Kyrgyz	14,614.8	7,179.5	53,922.0	28,867.5	88,985.8	69,250.0
Cherry			2,430.8	5,596.3	5,475.5	23,160.7
Grapes	1,456.0	1,246.0	9,122.5	6,435.9	21,616.5	16,423.4
Apricot	497.2	275.7	2,033.5	1,843.7	4,995.0	5,756.2
Nectarine	1,988.3	1,210.9	2,950.4	1,671.3	6,705.7	3,963.9
Tomato	1,152.4	622.2	4,586.2	2,991.3	3,977.3	3,134.3
Plums	786.2	368.4	2,352.5	941.4	3,113.3	2,050.2
Carrot	1,935.8	84.4	6,444.2	823.0	15,432.2	1,925.0
Peaches	1,424.8	839.9	1,977.4	982.7	3,738.5	1,911.0
Pomegranate	328.8	329.2	1,056.2	963.7	1,794.4	1,547.1
Persimmon	1,312.3	713.0	1,286.1	716.2	1,878.4	1,361.0
Melon	811.0	161.4	8,908.2	910.2	4,735.3	1,238.8
Peanut	221.0	148.7	633.6	478.1	1,773.7	1,082.0
Afganistan	77,585.5	44,852.5	52,723.0	43,753.1	73,411.3	53,190.8
Bean	34,227.8	22,983.6	38,960.7	31,928.8	48,786.9	37,672.0
Peanut	2,125.5	1,673.1	5,548.6	4,058.3	11,238.7	8,360.1
Chick pea	1,321.1	799.6	5,487.9	5,618.3	3,858.7	4,142.4
Mung bean	25,647.0	15,921.4	2,260.9	1,471.8	2,569.3	1,643.5
Onion	13,138.5	2,449.7	99.0	18.3	6,693.1	1,069.5
China	24,676.2	19,216.0	21,915.9	17,066.4	66,853.2	46,129.3
Mung bean			0.0	0.0	38,422.1	24,515.5
Raisin	24,346.4	18,836.7	21,108.2	16,063.0	27,474.1	20,344.9
Turkey	16,843.6	14,461.0	28,259.4	28,158.9	23,484.5	22,626.3
Mung bean	7,881.7	4,802.9	13,332.5	8,446.6	11,052.3	6,682.6
Caper	2,479.3	2,906.8	2,833.9	3,119.0	2,787.2	4,276.1
Raisin	3,149.1	2,789.9	5,147.7	4,247.3	4,246.0	3,858.4
Walnut	286.0	1,166.3	2,562.6	7,700.5	926.6	2,705.9
Dried fruits	2,225.2	2,259.1	1,449.0	1,315.5	2,606.0	1,999.0
Chili pepper	36.1	14.8	565.1	269.4	497.9	1,588.4
Iran	10,924.5	7,997.2	12,641.3	10,729.7	13,031.4	9,793.0
Bean	4,601.6	2,969.2	9,868.4	8,074.6	11,383.5	8,350.9
Turkmenistan	15,901.2	7,235.9	11,098.2	8,260.1	11,553.9	5,607.2
Persimmon	3,152.5	1,684.9	3,594.6	2,301.7	3,158.8	2,171.9
Peanut	1,788.6	1,595.2	2,112.4	1,734.5	2,001.1	1,370.6
India	17,548.9	11,463.0	15,051.4	9,756.9	4,653.6	3,080.1
Mung bean	17,460.8	11,363.6	14,525.4	9,161.3	4,541.4	2,883.8

Source：State Customs Committee, unofficial data, Aug 2019

Table 3-2-5 Transporting Means, by Country, by Year, and by Mean

Year		2016		2017		2018			
Country / Transportation Mode		Weight (ton)	Value (1000 USD)	Weight (ton)	Value (1000 USD)	Weight (ton)	Value (1000 USD)	Percentage	
								Weight	Value
Kazakhstan		466,176.2	295,836.2	478,358.8	315,266.9	597,318.0	389,235.4		
	By Truck	174,218.7	135,921.6	209,905.4	165,739.2	274,599.9	276,921.3	46.0%	71.1%
	By Train	291,957.5	159,914.5	268,453.4	149,527.6	322,718.1	112,314.1	54.0%	28.9%
	By Air			0.0	0.1				
Russia		119,998.9	85,076.3	165,604.9	114,714.2	238,895.2	168,906.6		
	By Truck	62,975.2	44,107.2	112,485.9	83,526.8	191,248.0	140,149.9	80.1%	83.0%
	By Train	56,284.4	39,504.0	52,446.8	29,762.7	47,103.3	27,259.5	19.7%	16.1%
	By Air	739.3	1,465.1	672.3	1,424.7	543.9	1,497.2	0.2%	0.9%
Kyrgyzstan		14,614.8	7,179.5	53,922.0	28,867.5	88,985.8	69,250.0		
	By Truck	14,614.8	7,179.5	53,922.0	28,867.5	86,895.7	68,639.5	97.7%	99.1%
	By Train					2,090.1	610.5	2.3%	0.9%
Afganistan		77,585.5	44,852.5	52,723.0	43,753.1	73,411.3	53,190.8		
	By Truck	72,245.5	42,322.0	51,645.5	42,879.0	69,241.8	49,590.9	94.3%	93.2%
	By Train	5,339.9	2,530.5	1,077.5	874.1	4,169.6	3,600.0	5.7%	6.8%
China		24,676.2	19,216.0	21,915.9	17,066.4	66,853.2	46,129.3		
	By Truck	24,168.2	18,644.4	19,862.2	15,442.1	60,346.6	40,982.7	90.3%	88.8%
	By Train	508.0	571.6	2,053.6	1,623.9	6,358.7	4,517.5	9.5%	9.8%
	By Air			0.1	0.3	147.9	629.1	0.2%	1.4%
Turkey		16,843.6	14,461.0	28,259.4	28,158.9	23,484.5	22,626.3		
	By Truck	16,843.6	14,461.0	28,259.1	28,158.0	23,413.8	22,560.6	99.7%	99.7%
	By Train					70.5	65.3	0.3%	0.3%
	By Air			0.3	0.9	0.1	0.5	0.0%	0.0%
Iran		10,924.5	7,997.2	12,641.3	10,729.7	13,031.4	9,793.0		
	By Truck	8,861.4	6,624.7	9,045.2	7,865.9	11,358.4	8,376.2	87.2%	85.5%
	By Train	2,063.1	1,372.4	3,595.9	2,863.3	1,673.0	1,416.8	12.8%	14.5%
	By Air			0.2	0.5				
Turkmenistan		15,901.2	7,235.9	11,098.2	8,260.1	11,553.9	5,607.2		
	By Truck	7,154.6	5,737.0	10,976.2	8,204.0	8,209.9	5,165.5	71.1%	92.1%
	By Train	8,746.6	1,498.9	122.1	56.1	3,343.9	441.8	28.9%	7.9%
India		17,548.9	11,463.0	15,051.4	9,756.9	4,653.6	3,080.1		
	By Truck	8,034.0	4,600.7	12,562.9	7,918.7	2,409.9	1,575.0	51.8%	51.1%
	By Train	9,513.9	6,855.4	2,479.4	1,800.8	2,225.5	1,431.6	47.8%	46.5%
	By Air	1.0	6.9	9.0	37.4	18.2	73.5	0.4%	2.4%
Total		764,269.8	493,317.5	839,574.9	576,573.7	1,118,186.7	767,818.9		
	By Truck	389,115.9	279,598.3	508,664.4	388,601.3	727,724.0	613,961.6	65.1%	80.0%
	By Train	374,413.5	212,247.3	330,228.7	186,508.5	389,752.7	151,657.1	34.9%	19.8%
	By Air	740.3	1,472.0	681.9	1,463.8	2,800.1	2,810.8	0.3%	0.2%

Source：State Customs Committee, unofficial data, Aug 2019

3.2.4 Domestic Distribution of Horticultural Produce

The products from *Dekhkan*, relatively small-scale farmers, are sold in retail markets called *Dekhkan Bazaar* in district levels or wholesale markets in regional levels. In this decade, the marketing channels though supermarkets have been developed in urban areas; which are local capital company 'Krozinka' and Kazakh-Uzbek capital company 'Makro.' The percentage of fresh horticultural crops though supermarket in domestic consumption is estimated at 2.2% in nationwide[21],

[21] JICA Survey Team estimated by Data from UzbekOzikovkatho Xolding and interview to marketing directors of supermarkets

but the ratio within Tashkent City is 12%[22]. The trading ratio is increased by 10-15% annually by two supermarket chains due to increase of stores to be opened and customers. It is expected the marketing channel through supermarkets will be expand.

Table 3-2-6 Business Operation by Supermarkets

Name of Brand	korzinka.uz	makro supermarket
Management Body	Anglesey Food LLC (Uzbek capital)	Orient Group ― Darvoza Savdo LLC (Kazakh-Uzbek capital)
Established Year of Supermarket Section	2006	2009
No. of Stores as of June, 2019	Nationwide 48 stores, planning to open total 120 stores in a few years, relatively concentrated in Tashkent City	Nationwide 53 stores, planning to open new11stores in 2019, relatively spreading to regional cities
Kinds of Stores in Tashkent City	26 Super, 1 Diskont and 4 Smart	3 Hyper and 20 Super
Daily Trading Quantity of Fresh Vegetables and Fruits	50～60tons/day (as of June, 2019)	20～22ton/day (as of June, 2019)
Logistics Center	Adjacent area of Qoiliq Wholesale Market and Samarkand	Tashkent Ring Rd. and Samarkand
Sources of Procurement	Contract Farmers 40%, Dekhkan 10%, Wholesalers 50%	Contract Farmers 60%, Wholesalers 40%
Major Trading Products	Irish Potato, Carrot, Tomato, Cucumber, Onion, Eggplant, Capsicum, Cabbage, Chinese Cabbage, Apple, Citrus, Seasonal Vegetable & Fruits, Imported Fruits such as Banana	

Source: JICA Survey Team based on Interview to the supermarkets

As the forecast of domestic marketing channels, supermarket routes will be increased. On the other hand, the wholesale system currently accounts for 80% or more and will keep a constant function due to advantages such as low pricing.

Table 3-2-7 Comparison between Wholesale Market System and Supermarket Marketing

Aspect of Marketing	Through wholesale markets	Through supermarkets
Quality	Vary difference in quality	Keeping constant quality
Price Fluctuation	Sharp	Stable except bargaining days
Prices indication	Price indications are limited.	Price tags are attached.
Sanitary Conditions	Not controlled for general bacteria and E.coli	Controlled by inspectors
Layer of Costumers	All layers, food business operators and restaurants	Middle and high income layers
Advantages	Low prices depending on negotiation Freshness for leaf vegetables and root crops Possible to purchase in large quantity in kg unit	Cashless with points by cash cards Possible to buy during 18:00-22:00 after office working Possible to buy in small quantity Keeping safety of foods
Issues	・ Congestion of traffic and people ・ Improvement of sanitary conditions ・ Invest on cold storages for joint uses ・ Targeting of terrorism	・ Lands or buildings for opening new stores ・ Reduction of logistics costs and effective collection of products ・ Capacity building on grading for contract farmers ・ Keeping freshness

Source: JICA Survey Team based on Interview

3.2.5 Processing

While domestic processing companies are generally concentrated and located in Tashkent and Samarkand regions, processing business has been started in other regions also. There are many cases that large-scale processing companies operate their own-farms. Major processing methods of

[22] Information from marketing directors of supermarkets

horticultural crops are by traditional solar drying or steam heat drying using energy taken from coals or natural gas. The latest drying methods like freeze dry to keep nutrients such as Vitamin C are not prevailed. For juice processing, the companies installed TETRA PAK plants for sterilization and filling after extraction, therefore, the packaging styles are similar among the juice production companies. The frozen fruits are done by the leading company, Gold Dried Fruits LLC (Tashkent), which exports cherry and raspberry and ship them to group company, Makro Supermarket also. This company installs IQF (Independent Quick Freezing) plant and has newly constructed big-scale freezers. Other companies also plan to introduce IQF products depending on needs from buyers. The processing methods are shown in Table 3-2-8.

Table 3-2-8 Processing Methods for Horticultural Crops

Kinds	Process	Target Crops	Usage
Drying for Fruits	Pre-cleaning→Washing→Grading→Peering →Slicing→Drying→Mixing→Cleaning→ Scaling/Packaging	Apricot,, Plum, Cherry, Peach, etc.	Dried Fruits
Drying for Grapes	Solar Drying in general	Special Variety of Grapes for Raisin	Raisin
Drying for Leaf Vegetables and Root Crops	Pre-cleaning→Washing→Grading→Peering →Slicing→Steam Cooking→Drying→Mixing →Cleaning→Scaling/Packaging	Pumpkin, Beet, Carrot, Onion, Turnip, etc.	Materials for making Granola
drying for Tomatoes	Solar Drying in general	Cooking Variety of Tomato	For cooking
Drying for Herbs and Spices	Pre-cleaning→Washing→Grading→Drying→ Cleaning→Milling→Scaling/Packaging	Chili, Coriander, Dill, Spring Onion, Leek, Capsicum, Eggplant, etc.	For cooking
Drying for Irish Potatoes	Pre-cleaning→Washing→Grading→Peering →Slicing→Boiling→Drying→Cooling→ Molding→Scaling/Packaging	Irish Potato	Potato flake, Instant potage soup
Concentrated Fruit Juice	Pre-cleaning→Washing→Grading→ Extracting→Sterilizing→Cooling→ Sweetening→Scaling/Packaging	Apple, Pear, Apricot, Grape, Nectarine, Cherry, Lemon, etc.	Concentrated fruit juice
Sweetening Fruit Juice	Pre-cleaning→Washing→Grading→Filling Sweetening Water→Scaling/Bottling	Apple, Pear, Apricot, Grape, Nectarine, Cherry, Lemon, etc.	Comport
Vegetable Pickles	Pre-cleaning→Washing→Grading→Peering →Slicing→Steam Cooking→Filling Seasoning Water→Scaling/Bottling	Caper, Cucumber, Onion, Garlic, Carrot, Cabbage, etc.	Pickles, Sauerkraut
Freezing for Fruits	Pre-cleaning→Washing→Grading→Quick Freezing→Cleaning→Scaling/Packaging	Strawberry, Cherry, Raspberry, Mulberry, etc.	For sweets making
Freezing for Potatoes	Pre-cleaning→Washing→Grading→Peering →Slicing→Steam Cooking→Quick Freezing →Cleaning→Scaling/Packaging	Irish Potato	Fried potato
Drying for Nuts	Solar Drying in general	Peanut, Almond (Apricot seed), Pistachio, Walnut, etc.	Dried nuts

Source: JICA Survey Team based on Interview

When the directors of processing companies prepare business plans for loan application, they collect technical information from SMS using 'Telegram' of the smart phone application or internet web sites and contact manufactures of equipment. Some manufactures contract with local agents in Tashkent, and processing companies invite the experts of manufactures. The processing companies procure special equipment and plants for processing from Germany, Italy and Switzerland, while they procure general machineries from Turkey and China.

3.2.6 Loan Demand of Horticulture Related Companies

According to UZAIFSA and interview results with horticulture related companies, the needs of companies and individuals relating to all stages of production, processing, storage and marketing as well as companies of agricultural inputs supplies and agricultural services are identified. Financial needs by stakeholders are summarized in Table 3-2-9. In the Table, Eligibility in TSL is proposed by Study Team.)

Table 3-2-9 Financial Needs by Stakeholders

Stakeholder	Financial Needs	Purposes	Factors to Improve Supply Chain	Eligibility in TSL
Individual Farmer	Construction of Cold Storage Facilities	Installation of small refrigerator including warehouse	Preservation of product quality for short period	Eligible
	Construction of Greenhouse	Installation of temperature-controlled vinyl house, drip irrigation system, heating system, etc.	Whole year production and upgrading of product	Eligible
	Improvement on Intensive Orchard	Installation of drip irrigation system and cultivating structure, Procurement of sapling, Improvement soil conditions	Increase of quality product and yield	Eligible
	Procurement of Agricultural Machinery	Procurement of tractor, tractor attachments, harvester, speed sprayer, etc.	Reduce of labor costs	Eligible
	Rehabilitation of irrigation system	Improvement of intake, gate, canal, pump station, reservoir, etc.	Efficient water use	Eligible
	Operation Cost	Purchase of farm inputs	Increase of quality product and yield	Non-eligible
Agro-Farm Enterprise	Construction of Cold Storage Facilities	Installation of large refrigerator including warehouse	Preservation of product quality for long period	Eligible
	Construction of Greenhouse	Installation of temperature-controlled vinyl house, drip irrigation system, heating system, etc.	Whole year production and upgrading of product	Eligible
	Improvement on Intensive Orchard	Installation of drip irrigation system and cultivating structure, Procurement of sapling, Improvement soil conditions	Increase of quality product and yield	Eligible
	Procurement of Agricultural Machinery	Procurement of tractor, tractor attachments, harvester, speed sprayer, etc.	Reduce of labor costs	Eligible
	Rehabilitation of irrigation system	Improvement of intake, gate, canal, pump station, reservoir, etc.	Efficient water use	Eligible
	Operation Cost	Purchase of farm inputs	Increase of quality product and yield	Non-eligible
Processing Business	Hire of Professional Consultant	Plan and design of processing facility	Efficient processing	Eligible
	Construction of Cold Storage Facilities	Installation of large refrigerator including warehouse	Preservation for unification of input volume	Eligible
	Procurement of Processing Machines	Installation of processing machines for drying, freezing, juicing, bottling, etc. including hygiene controlled warehouse	Increase of product value, Acquisition of certificate (ISO22000, Halal, UzStandard, etc.)	Eligible
	Procurement of Packaging Machines	Installation of machines for packaging, Procurement of materials	Preservation of product, Increase of product branding	Eligible
	Procurement of Handling Equipment	Procurement of forklift and conveyor	Reduce of labor costs	Eligible
	Operation Cost	Purchase of raw materials	Quick payment to farmers	Non-eligible
Marketing Business (Middlemen, Wholesalers, Exporters, Supermarkets)	Construction of Cold Storage Facilities	Installation of refrigerator	Preservation of product quality for short and long periods	Eligible
	Procurement of Refrigerated Truck	Procurement of truck or CA (Controlled-Atmosphere) container with trailer	Preservation of product quality for long distance	Eligible
	Expansion of Contract Farm	Support of contracted farmers	Stable supply of products to meet consumer's demands	Eligible
Farm Input Business (Chemical Fertilizer, Pesticide/ Fungicide/ Herbicide. Certified	Construction of Factory for Localized Inputs	Installation of processing machines	Decrease of costs of farm inputs	Eligible
	Provision of Agricultural Consulting Services	Advice of timely appropriate farming technology	Increase of quality product and yield	Non-eligible (TA)

Stakeholder	Financial Needs	Purposes	Factors to Improve Supply Chain	Eligibility in TSL
Seed, Compost, Tools)				
Agricultural Machinery and Storing Business	Procurement of Agricultural Machinery for Leasing	Leasing of tractor and harvester	Reduce of initial farming costs	Eligible
	Construction of Cold Storage Facilities	Leasing of cold storage room	Preservation of product quality for short and long periods	Eligible
	Procurement of Agricultural Machinery for Sales Stock	Mechanization on farm	Reduce of labor costs	Non-eligible

4. Current Status of the Banking Sector

4.1 Overview of Banking Sector

In Uzbekistan, the level of financial intermediation had been historically lower, as shown in the 'credit to the economy' (21.8% of GDP in 2016) compared with other transitional economies in the central Asia (cf. In 2016, the ratios range approximately between 30% and 50% for those countries). However, in 2017, the President of Uzbekistan issued a decree on liberalizing the currency exchange market and unifying the multiple exchange rates, and thus the Central Bank of Uzbekistan (CBU) devaluated national currency Uzbek Sum in a single day to 8,100 sums per USD and introduced a new system of setting market-based exchange rates (At that time, the CBU official rate was 4,210 sums per USD). Thanks to the significant progress in financial liberalization, the ratio of 'credit to the economy' significantly reached at 39.7% in 2018 (IMF est.) from 21.8% in 2016.

This currency liberalization resulted in devaluation of the Uzbek Sum, and thus motivated exporters to increase their overseas sales (The exports increased to US$13.9 billion (14.1% year-on-year increase) in 2017). Also, together with the new government's efforts for improving the investment environment in Uzbekistan, the unification of exchange rates attracted foreign investors so that the total investments jumped by 7.1% to US$14.9 billion in 2017, including US$3.2 billion in foreign direct investments & loans. Uzbekistan moved up 13 positions to 74th in the World Bank's Ease of Doing Business in 2018. To the contrary, such a sudden devaluation of the Uzbek Sum has seemed to decrease the people's confidence in the banking sector and national currency Uzbek Sum. This may be a hidden, fundamental problem behind the Uzbek banking sector.

Currently, with the assistance of World Bank, the government is making progress of banking sector restructuring in Uzbekistan. The central issue is on the privatization of the state-owned banks and the banks with state ownership. IMF Uzbekistan Country Report No. 19/129 (2019) indicates that a strategy for restructuring the banking system is urgently needed. Indeed, CBU has continued to upgrade its supervisory capacity and prudential regulatory tools (e.g., CAMELS evaluation system, stress test). But as IMF (2019) also indicates that there are limitations to the effects of macroeconomic policies and prudential regulations in the largely state-owned banking system and we shouldn't underestimate risks given by such a system. Furthermore, from a long-term point of view, CBU is required to mobilize domestic savings and attract more private participation into the banking sector though keeping the banking sector's soundness for gaining the trust of the private sector. Also, given a FX liberalization, there is another issue that there have been banks' balance sheet issues caused from large state-owned enterprises with unhedged FX credits. Based on previous policy discussions, the State-Owned Assets Management Agency has seemed to receive an instruction from the government and prepare for selling out part of government stakes in banks (Aloqabank, Turonbank, Asaka Bank, Asia Alliance Bank, and SQB). It is recognized that the privatization of banking sector may lead to public trust on the banking sector and eventually mobilization of more deposits in the country.

As of 1 May 2019, in Uzbekistan the banking sector dominates the financial market with the total bank assets of 248.4 trillion sums, which are owned by 13 banks with state ownership (85% of the total bank assets) and other 16 banks (15%). If we look at the long-term financial markets such as stock

and bond market in Uzbekistan, they are in an early period of development. The stock market is still developing with limited instruments such as corporate stocks and bonds. The number of listed companies in the Tashkent Stock Exchange is only 182, while the market cap totaled about US$1.8 billion (5% of GDP, end-2017). Likewise, the bond market remains small. There was a peak in corporate bond issuance in 2004 with 23 issues equivalent to US$26 million (0.2% of GDP). But since several corporate bond issuers defaulted in 2005, the issuance had declined rapidly. There had been no government bonds and derivatives in the market. In 2018, the government firstly issued approximately 600 billion sums (US$70 million) worth sovereign bonds. In February 2019, the government firstly issued US$1 billion worth Eurobonds in USD (US$0.5 billion for 5 years: 4.7%; and US$0.5 billion for 10 years: 5.3%). IFC issued the first Uzbek Sum bonds 'SamarkandBonds' of 80 billion sums (US$10 million) for Hamkorbank with maturity of 2 years and 9.5% coupon rate.

The banking sector's financial indicators show that the banking system is sound. Regulatory capital to risk-weighted assets is relatively high at 15.3%, while the banking sector's profitability is also high with ROE of 17.2%. This imply that CBU has appropriately regulated and supervised the banking sector through its on- and off-site supervision. In addition, the Uzbek government and CBU agreed on Basel III (2015-2019) in 2015, and thus they have gradually worked on strengthening of banks' capital positions, introduction of liquidity regulation, review of risk measurement method, etc.

In recent years, due mainly to the increasing financial demand in Uzbekistan, the total bank loans have reached 193.2 trillion sums (approximately US$22.8 billion, as of 1 May 2019) annually increased by 51.8%. However, if we take a general view of Uzbek banking sector's fund-raising and bank operations, firstly the following numerical data explains that the banks have difficulty in fund-raising, particularly mid-to-long-term fund-raising in Uzbekistan. The background for the insufficient mobilization of deposits is that there has been an issue on the people's low confidence in the Uzbek banking sector, as mentioned earlier.

i) The share of deposits in the total liabilities is low at 37%; and

ii) The share of more than one year deposits in the total deposits is low at 34%.

Under such a situation, in order to deal with robust medium-to-long-term financial demand for capital investments, the banks have covered the funding gap by getting long-term borrowings (55% of the total liabilities) from the government (i.e., MOF, State-Owned Assets Management Agency, State Fund for Reconstruction and Development) and overseas development partners (DPs)/ international finance institutions (IFIs), etc. As a result, the ratio of loans to deposits is extremely high at 236% for all the banks in the country. If the ratio is beyond 100%, it is generally recognized as overbanking. The ratio of loans to deposits is 294% for the banks with state ownership (13 banks) and 91% for smaller private banks (16 banks). This imply that the banks with state ownership can get long-term borrowings more easily from the government and overseas institutions.

On the other hand, if we look at the bank operations, the share of long-term loans in the total bank loans is extremely high at 94%, while the share of loans in foreign currencies is 56% in the total bank loans. This is because the banks have covered the funding gap by obtaining long-term borrowings (including foreign currency-dominated borrowings) from the government and DPs/IFIs.

Regarding the interest rate level, the CBU's refinance rate has been 16% (since 25 September 2018), and the average deposit rate is 15.4% for short-term deposits (maturity of one year or less) and 16.5% for long-term deposits, while the average loan rates range between 19% and 26% for loans in sums, between 4% and 11% for loans in foreign currencies, and between 5% and 11% for preferential loans in sums.

Table 4-1-1 Banking Sector's Fund-raising and Bank Operations

Fund-raising	(in billion sums, %)	
Deposits (in sums)	81,700	100%
Demand	30,566	37%
1-30 days	3,333	4%
31-180 days	8,692	11%
181-365 days	11,539	14%
1 year -	27,570	34%
Credit and leasing operations payable	121,458	
Other liabilities	15,711	
Total Liabilities	**218,869**	
Capital	**29,543**	
Total Assets	**248,412**	
* Deposits / Total Liabilities = 37.3%		
Interest Rates on Deposits		
By maturity		
1 year or less	15.4%	
Over 1 year	16.5%	
By customers & maturity		
Household (~30 days)	15.9%	
Household (31~90 days)	15.8%	
Household (91~180 days)	15.7%	
Household (181~365 days)	18.1%	
Household (1 year ~)	19.0%	
Corporate (~30 days)	11.1%	
Corporate (31~90 days)	14.3%	
Corporate (91~180 days)	13.7%	
Corporate (181~365 days)	15.4%	
Household (1 year ~)	14.6%	

< Ratio of Loans to Deposits: 236% >

Bank Operations	(in billion sums, %)	
Loans	193,170	100%
By loan maturity		
Short-term loans	12,208	6%
Long-term Loans	180,962	94%
By loan currency		
Loans in sums	84,563	44%
Loans in foreign currencies	108,607	56%
By customer types		
Individuals	28,206	15%
Legal entities	164,964	85%
By customer sectors		
Industry	68,436	35%
Agriculture	14,406	7%
Construction	5,058	3%
Trade and public catering	11,275	6%
Transportation and communication	22,346	12%
Logistics supply and sales	3,026	2%
Housing and community services	2,095	1%
Individuals	28,206	15%
Other sectors	38,322	19%
Interest Rates on Loans		
In sums		
Total	23.8%	
Short-term	22.5%	
Long-term	24.5%	
1~ 2 years	23.6%	
2~3	26.4%	
3~4	24.1%	
4~5	21.7%	
5~10	19.7%	
10 ~	18.9%	
In foreign currencies		
Total	6.3%	
Short-term	8.0%	
Long-term	6.1%	
1~ 2 years	7.7%	
2~3	10.5%	
3~4	9.3%	
4~5	7.8%	
5~10	5.5%	
10 ~	4.4%	
In sums only for preferntial loans		
Total	6.2%	
Short-term	5.4%	
Long-term	6.4%	
1~ 2 years	5.4%	
2~3	7.8%	
3~4	10.8%	
4~5	10.0%	
5~10	7.2%	
10 ~	6.5%	

Note 1: Consumer Price Inflation 14.3% (2018 est, IMF)
2: CBU's Refinance Rate 16% (as of end-July 2019)
Source: CBU Statistics (as of 1 May 2019)

In reality, the banking sector is highly concentrated by 3 large state-owned banks (NBU, Asaka Bank, Xalq Bank) with 45.8% of the total bank assets, and thus banks' lending activities seem to be

largely state-driven. According to IMF Uzbekistan Country Report No.18/177 (2018), the preferential loans extend to state enterprises accounting for more than half of all preferential loans; SOEs & JV 56%, private corporations 23%, individuals 12%, and others 9%. As a result, there seems to be an imminent problem described as 'credit misallocation' for private sector and smaller farmers/ agri-firms. According to IFC (2018) MSME Finance Gap 2017, there is a MSME finance gap (including farmers and agriculture-related businesses) of US$11.8 billion (18% of GDP) (i.e., Potential Demand for MSME US$13.5 billion - Current Supply for MSME US$1.7 billion).

In response to such an imminent financial problem, since January 2018 the government has operated the State Fund for Entrepreneurship Activity Development Support. In partnership with 25 banks, the Fund has provided individual/micro/small businesses (including farmers) with credit guarantee services as well as interest subsidies.[23]

Currently, in terms of individual/micro/small business finance development, the credit guarantee services via the State Fund for Entrepreneurship Activity Development Support is the main policy-based financing menu by the Uzbek government. This policy design is quite understandable because unlike policy-based direct loans the credit guarantee system can realize outreach leverage by using limited government budget. As of the end of FY2018, the total guaranteed loans are 599.2 billion sums or US$ 70.9 million. Judging from the guaranteed average loan amount of 0.7 billion sums or US$82,000 per a loan, the credit guarantee services seem to focus on relatively smaller capital investment loans for smaller farmers, agri-firms and other businesses. Because the internal regulation of the State Fund allows to give credit guarantee amount of up to 10 times of the fund's paid-up capital (i.e., US$740 million), the State Fund would be able to cover approximately 3.3% of the total bank loans (US$22.8 billion). This coverage ratio is extremely low as of today. But it is politically significant that the State Fund for for Entrepreneurship Activity Development Support has started the operations as the implementation agency of credit guarantee services. This is expected to be further improved by the government's and/or DPs' assistances for the purpose of responding to the existing financial demands of individual/micro/small businesses.

Table 4-1-2 Outline of State Fund for Entrepreneurship Activity Development Support

Establishment year/month	August 2017
Legal ground	President Resolution No. 3225 on establishment of the state fund for development of entrepreneurship activities support (18 August 2017); Resolution No. 704 of the Cabinet of Ministers on measures on the organization of the fund activity of development of entrepreneurship activity support at the Cabinet of Ministries (8 September 2017)
Supervisory body	Cabinet of Ministers
Paid-up capital (fully funded by the government)	US$ 50 million + 200 billion sums (US$24 million) = US$ 74 million *1)
Maximum ratio of guaranteed loan	10 times (i.e., US$740 million)

[23] Previously, among 8 funds the government had operated, 2 funds (the Guarantee Fund of Small Industrial Zones in Tashkent City (US$50 million) and the Guarantee Fund for Small Business Development (100 billion sums)) provided entrepreneurs with credit guarantee services and loans partially. They were transferred to the State Fund for Entrepreneurship Activity Development Support by the initial capital contribution.

outstanding to the fund capital	
Staff & organization	Executive Director (1), Deputy Executive Director (1), Head of Department for Guarantee (1), Head of Department for Interest Subsidies (1), other staff (11), 15 in total.
Launch of operations	January 2018
Main services	Credit guarantee (50% guarantee for a loan of up to 2 billion sums, guarantee charge of 1%); and Subsidies *2)
Eligible users for loan guarantee	Individual/micro/small businesses (in comply with the legal definition of individual/micro/small business in Uzbekistan; Article 5 of Law No. 69-II, enacted on 25 May 2000 and amended in 2003 and 2012) *3)
Ineligible projects to be excluded	Repayment of previously received loans; production of alcohol and tobacco products; gambling and other games; construction of shopping and catering facilities; and formation of working capital for trade and intermediary organizations.
Business performance and types of users in FY2018	[Credit guarantee] 823 projects, 599.2 billion sums (@0.7 billion sums): Livestock 24%, Greenhouse 16%, Equipment 15%, Pre-school educational institutions 15%, Construction material 8%, others 6%, Fridge 4%, Fish farming 4%, Poultry farming 4%, Processing of agricultural products 2%, Intensive gardens 2% (on a project number basis) [Subsidies] 1,273 projects, 147.5 billion sums (@0.1 billion sums): Youth Union 40%, Housing association 24%, Livestock 11%, Interest subsidies 7%, Greenhouse 5%, Fish farming 4%, Poultry farming 4%, others 3%, Fridge 2% (on a project number basis)

Note 1: According to the interview with the State Fund management team (April 2019), the World Bank plans to provide the Fund with loans of US$20 million (focusing only on livestock sector) without interest rates, and also the French government plans to provide with a grant of €50 million.
Note 2: Those interest subsidies cover 5-10% of loan interests in sum to be paid, and 40% of loan interests in USD to be paid (but the celling of coverage ratio is up to 3% of interest rate).
Note 3: Because the definition of SME was abolished in the amendment in 2003, the current regulation has defined 'a micro/small business' by the number of employees, depending on types of business. Regarding small business, the number of employees is less than 100 for manufacture, less than 50 for agriculture and other industry, less than 25 for service and others. Regarding micro business, the number of employees is less than 20 for manufacturer, and less than 10 for non-manufacturer.
Sources: Interview with the State Fund for Entrepreneurship Activity Development Support (April 2019), and Management Presentation prepared by the Fund management team.

If we take a quick look at the Uzbek SME-related policies, the pillar is the improvement of business environment. The SME-related laws including the Law on Business Activities (1991), etc. were enacted, which have established institutional frameworks on the definition of SME, entrepreneurs' right and their protection, guarantee of free economic activity, tax system, SME loans, and others. Also, for the purpose of enhancing private SMEs' economic activity, company registration, licensing regime, etc. have become legislated. In addition, in terms of SME supporting measures, there have been credit guarantee services and loan interest subsidies for financial support via the above-mentioned State Fund for Entrepreneurship Activity Development Support, while the tax system has adopted a SME-focused simplified scheme and tax reduction of income tax, value-added tax and property tax, as well as the exemption of export duty for export-oriented SMEs.

With regard to the agricultural finance policy, MOA has prepared 'Uzbekistan Agri-food Development Strategy 2019 – 2030' and its 10 basic strategies as a fundamental framework, where concrete supporting measures backed by public expenditure are supposed to include loan interest subsidies, subsidies, technical guidance, information services, etc. In terms of financial support, CBU has Agriculture Financing Monitoring Division (10 staff) in the Department for Monitoring of

Activities of the Commercial Banks on Financial Support of the Entrepreneurship that monitors the trends of loans to agricultural sector, but banks such as Agrobank are generally entrusted to implement agricultural policy-based loan programs.

On the other hand, non-bank financing channels are absolutely small in the Uzbekistan's financial market. For example, the total assets of leasing industry are approximately 5.0 trillion sums (1.6% of GDP). From the long-term policy perspective for enhancing agriculture and private small business financing, it may be correct to say that the government should reconsider about fostering non-bank financial options such as leasing in Uzbekistan.

Also, there are 37 microcredit organizations under the current legal frameworks such as the Civil Code, the Laws on Microfinancing and Microcredit Organizations and the CBU regulations. The total loans of microcredit organizations reached 321.9 billion sums (0.1% of GDP) as of 1 January 2019, increased annually by 53.5%.

The required minimum authorized capital for a microcredit organization is currently 2.0 billion sums. They have provided individuals and microbusinesses with the short-term business loans for capital investment (approximately 40% of total loans) as well as short-term working capital (approximately 60%). The interest rates range between 36% and 60% per annum. The upper limit of a loan is 20 million sums for an individual and 200 million sums for a business. However, according to the National Association of MFIs (NAMI), due mainly to the limit of their fund-raising and lack of their branches, microcredit organizations cannot take ample lending opportunities for the farmers and microbusiness in rural areas.

4.2 Banks' Internal Problems Inherently Associated with Agri-Lending

If we look into the lending practice within Uzbek banks, the banks' appraisal systems are conventional and standard, and they have common features as the following table shows. A lending practice of requiring 125%-130% of real estate collateral to the loan amount has been widely established. This practice is reasonable for the commercial lending.

Table 4-2-1 Appraisal System within Uzbek Banks

Organizational Structure:	Head Office: Credit & Investment Department or Finance Department, Credit Committee Branches: Loan officers in charge of Retail (personal loans, auto loans, housing loans, short-term working capital loans), Loan officers in charge of Investment Loan (mid-to-long-term loans for capital investment). Loan officers make the credit appraisal and do the follow-ups in post-lending, while back office does the monitoring mainliy including loan repayment procedure and legal department takes actions for collecting overdue loans.
Appraisal Method:	Orthodox method on appraisal: 1) Consider about the repayment ability based on the comprehensive evaluation on both financial factors (on excel sheet) and non-financial factors; 2) Check with credit history; and 3) Collateral evaluation (A lending practice of requiring 125%-130% of collateral to the loan amount has been widely established. The objectives of collateral include land use right, buildings, bank deposits, etc.). In case of lending for capital investment, the banks require 30% or more of self-financing portion in the total investment project costs.
Appraisal	1)basic information on a customer; 2) credit history (obtained from KATM); 3)

Documents:	financial information (B/S, P/L, scoring: 10 evaluation items such as current ratio, profitability, etc. Customers are divided into three categories of approval process); 4) history of transactions with the bank; 5) outline of investment plan; 6) future cash flow forecast (up to about 5 years in accordance with the project); 7) environmental assessment; and 8) collateral/guarantor(s), etc.
KYC:	The unified code of an individual/corporate given by the government is practically used for the KYC (i.e., know your customer) process when receiving a new loan application from a new customer.
Credit Scoring:	The progress of introducing credit scoring system has been different among banks, for example, a bank has just introduced credit scoring for personal loans only. But comprehensive evaluation (100 points) based on financial factors (70 points) and non-financial factors (30 points) is common. Common challenge for the banks is to establish the linkage between the given score and other system such as interest rates setting, credit judgement, portfolio management.
Manuals for agri-lending:	There are no booklets/ manuals for loan officers in charge of agricultural lending within banks including the agriculture-specialized Agrobank. Although manuals are necessary for improving the bank officers' knowledge on agriculture and agri-related customers, it would be difficult for a bank to prepare it due to each bank's limited budget and human resources.

Source: Interview with 7 PFI candidate banks (April – June 2019)

Although there is a remaining slight concern that CBU's direct intervention in pricing loans and providing with policy-based loan programs has damaged banks' risk management practices, there is no evidence that the current relevant regulatory framework significantly impedes the bank lending practice.

According to the World Bank's Doing Business (2019), Uzbekistan is ranked at 60th in terms of 'Getting Credit'. Uzbekistan is rated at 65 points out of 100 and can compare with the regional average (68.7 points) in the Europe & Central Asia. This proves that Uzbekistan government has made efforts to establish and implement such financial basic frameworks as legal rights of borrowers and lenders through collateral laws (Civil Law 1996, Collateral Law 1992 (revision in 1998 and 2007)), protection of secured creditors' rights through bankruptcy laws, distribution of credit information, and credit bureau coverage (42.7% of adults, cf. 19.4% in 2016, 43.4% in Europe & Central Asia in 2019).

However, from what JICA Survey Team has discussed with PFI candidate banks in this survey, it seems that the banks cannot satisfy the actual financial demand for horticultural value chain sector as well as farmers & private agri-firms. According to the interviews with CBU and DPs, there is no statistical data specifically on financial gap of agricultural sector as well as horticulture value chain sector, but only 7.5% of total bank loans goes to the agricultural sector (28.8% of GDP) in Uzbekistan.

That is due mainly to two significant limitations on the supply side. Firstly, because of the banks' difficulty in mobilizing deposits and the undeveloped long-term financial markets in Uzbekistan, domestic funding resources, particularly mid-to-long-term funding resources are not sufficient for the banks. Secondly, the banks face with practical challenges inherently associated with agri-lending.

The interview survey with banks imply that there are inherent risks on agriculture such as market volatility risk, production risk and operational risk. In lending practices, the banks face with many challenges for agricultural lending. They are all specific problems associated with agricultural lending, which are different from the general lending problems.

Table 4-2-2 Practical Issues and Key to Success in Agri-Lending

Problem Domains	Practical Challenges	Key Factors to Success
Difficulty in collecting data	- Lack of reliable data necessary for a loan-decision making - Poor practices of land record keepers, agents and bank officers	- Automation of data collection (e.g., production, market price, agricultural data, weather prediction)
Higher credit risks	- Higher credit risks caused by the nature of the agricultural risks (e.g., production risk, price fluctuation risk) - Lack of collateral	- Bank officers' knowledge of farmers and agriculture-related business customers - cashflow-based lending method - AI-backed credit scoring & accurate cash flow analysis/prediction - Tailored loan products (e.g., loan maturity, grace period, repayment schedules) - Diversified risk management tactics (e.g., field-based client monitoring, portfolio diversification, credit scoring) - inventory collateral - Incentive systems for loan officers with agricultural expertise
Higher transaction costs	- High costs to reach remote rural customers - Time-consuming for assisting agricultural customers for loan application documents preparation, confirmation of loaned equipment, loan repayment, etc.	- Automation of lending process (e.g., mobile banking) - Incentive systems for loan officers to deal with more agricultural customers

Source: Interview with 7 PFI candidate banks (May-June 2019).

In recent years, by taking the most use of DP-funded financial schemes, the Uzbek banks have learned that the agricultural loan products require a flexible design of loan maturity, grace period, repayment schedule, etc. They have much experienced of relevant lending practices in IBRD's and ADB's similar projects for example, which is described as loan maturity of 3-10 years, grace period of 1-2 years, interest rates of 5-6% (in US$), collateral requirement of 125%, and preparation of repayment schedule fitting into the reality of end-users. In particular, Agrobank started hiring 'agronomists' (agriculture experts) since FY2018, and the bank has dispatched 150 agronomists to the branches all over the country for the purpose of strengthening the monitoring of loan customers.

However, for the purpose of drastically improving the financial access for smaller farmers and private agri-firms in the future, it is desirable to improve each bank's operational efficiency by making the most use of techniques such as credit scoring and any other tools for automating lending operations within each bank. Also, it may be necessary for each bank to reconsider about agriculture-focused business model in terms of customer segment, loan products, lending model, competitive advantage, and internal human resource development. Furthermore, it is extremely important to educate the bank officers in terms of the basic knowledge on agriculture customers.

At the same time, given the high loan dollarization where the loans in dollars and other foreign currencies are larger than the loans in sums due to the domestic companies' high demand of US$-dominated loans for importing overseas machinery, when the banks make loans to farmers and agri-firms that have revenues primarily in sums as well as FX loans, they will need to keep paying

careful attentions to those customers' excessive FX loans and its risks of possibly increasing repayment burden due to weakening sum in the future.

4.3 Policy Recommendations for Agricultural & Rural Development Finance

In order to accelerate the banks' improvement of agriculture-focused credit activities, the government is highly expected to play a role of further improving the relevant environment on agricultural and rural development finance in Uzbekistan.

1) Strengthen Credit Bureau (KATM)

In Uzbekistan, there is KATM as the only public credit bureau that collects and provides credit information. This organization was established in 2012 by the banks' joint investment, and it has assisted financial institutions for their credit information collection through providing them with credit information such as individual/corporate record on borrowings.

Currently, KATM is trying to improve the database and service menus. By taking this chance, it is highly recommended to establish the following: i) Data service dedicated to agricultural lending (e.g., meteorological data, agronomic and crop stage data, vegetation index, farm inputs, reference data, agricultural statistics), ii) AI-backed credit scoring & portfolio management support service, and iii) agricultural customers' platform for accounting and cash flow management. Thanks to this, it is also expected that the banks' collection of agriculture-related information and agricultural credit appraisal will be much more proper and efficient in the JICA-TSL Project.

In order to enhance agricultural lending, each bank would need to reconsider about business model and introduce IT solutions. But still, it would be difficult for banks to collect and analyze the agricultural data due to the limited budget and human resources. Also, when doing statistical processing, it would be difficult for banks to collect enough number of sample data and craft a data analytics-based credit scoring model for agricultural lending.

Therefore, in such a field, a public organization such as KATM is highly expected to establish a platform where the banks will be able to collect the necessary data for agricultural lending and utilize the credit scoring and other support services.

2) Create agricultural lending manuals

In order to enhance bank officers' knowledge on agriculture and agriculture-related customers, it is desirable to create agricultural lending manuals in Uzbekistan.

The background is that a bank had difficulty in creating such a lending guidebook due to each bank's limited budget and human resources. The interview with PFI candidate banks suggested that the banks highly expected the preparation of such a guidebook.

So, the JICA Survey Team would recommend the Uzbekistan Banking Association (UBA) to prepare a lending guidebook which is divided by types of agriculture/agri-business and comprehensively includes the following: i) Basic knowledge of the agricultural sub-sector (scope, history, characteristics of market, market size, No. of business entities, profitability, market share by

region); ii) Trends (demand & supply, consumers, suppliers, prices, management challenges), iii) Business (characteristics of products, manufacturing process, distribution channels, exports); iv) Check points to be examined (conditions of business transaction, financial demands and its timing, average financial indicators, cash flow); v) Management advises; vi) Relevant laws/regulations; and vii) Business association (contact information). Also, it would be helpful to prepare a guidebook on advanced techniques such as inventory collateral, cashflow-based lending, etc.

5. Gender Mainstreaming

5.1 Current Gender Conditions

In Uzbekistan, gender equality is advocated in the Constitution, and there is no legal discrimination by sex. Educational level is sufficient high, and the literate rates of men and women have achieved almost 100%[24]. Nowadays, it is general for women to work for salary, taking care of children is still considered as women's duty, though. It is noted that women's jobs in Uzbekistan are predominantly education sector and health sector, and female workers account for more than 70% in those sectors, while they do only around 10% in traffic sector and construction sector. Concerning agricultural sector, percentage of male workers is slightly more than that of female (ADB, 2018[25]). Agriculture is traditionally regarded as a work of men, however, the situation is changing at this moment.

Horticulture is the sector that women are most interested in[26]. According to the result of the Rural Social Socio-economic Survey implemented in 2019 by the JICA Team, following roles & reponsibilit in horticulture value chain of men & women are identified in generall:

Men: irrigation management/canal cleaning, member of water user's association, land prepareation, inter-tillage, application of chemical and fertilizer, water resource management, pruning, business plan preparation, selection of crops, storage of harveste crops, sale of crop to exporters/central market, management and operation of agricultural machines

Women: weeding, sorting, packing and sale of crops to neighboring wholesalers

Both men and women are involved in farming activities, however, the works are different depending on sex. For example, at the survey mentioned above, men and women said, "women cannot drive vehicles" and "women cannot operate agricultural machines"[27]. Men tend to think that women don't have enough experiences of farming, however, they know that it is due to many works shouldered by women at home. Crop selection based on the market analysis is done by men generally, however men consult the matter with their wives prior to the final decision. It is noted that many men work away home recently[28], which lets women to shoulder traditional men's works. Even if women are farm managers, who don't know how to operate agricultural machines, they can fix the issue by hiring male labors.

Gender issues resulting from cultural background are also identified. According to the Rural Socio-economic Survey, land ownerships belong to husbands generally, and if husbands passed away or couples divorced, women can become decision makers. Moreover, only sons inherit asset from their parents traditionally, which makes difficult for daughters to access the assets. Still, if all children

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[24] http://uis.unesco.org/country/UZ

[25] ADB, 2018, Horticulture Value Chain Infrastructure Project (RRP UZB 51041), Supplemental Document 17: Detailed Social and Gender Assessment

[26] Project paper on a Proposed Additional Loan (WB, 2018, Report No. PAD 2583)

[27] Even though a woman knows how to operate farming machines, she would be condemned if she does (woman's opinion).

[28] Number of labor permissions issued for Uzbekistan workers by the Government fo Russia has been increased from 69 thousand in 2006 to 1.25 million in 2013. (Source: Population and migration in the Russian Federation. Statistical Yearbook. Moscow)

are female, they can inherit assets of their parents. General assets, namely, vehicles, machines, and livestock are purchased by men and registered in men's names. When men and women get cash income by their works, the cash is regarded as family's assets, which cannot be handled by women.

Regardless of sex, the interviewees of the Rural Socio-economic Survey pointed out difficulty to access to loan. For instance, interest rate of Agrobank is 8%, which is high for the growers. They want to get loan with low interest, namely, less than 3%. Furthermore, many of them said that they don't know how to apply for loan or they don't have collateral for loan. On the other hand, when some growers got loan from banks and Khokimiyat, they have experiences to be enforced to plant certain crops by banks and Khokimiyat against their will, which brought about less profits than expected in harvest season.

If a farm manager is female, all kinds of works as a manager including trade with exports, arrangement of labors, book keeping are done by her. However, women's active participation in farm management is still limited, such women account for only 5-10% of whole farm managers, according to the bankers[29]. However, it is fact that such situation has been changing gradually. Amount of loan for small- and middle-scale female entrepreneurs (not limited to agricultural sector) by the commercial banks has been rapidly increased, from 90.1 billion SUM in 2007 to 1,646.7 billion SUM in 2016 (2018, ADB)[30], which implies women's penetration to business management.

Actually, even in agricultural sector, female farm managers in Tashkent Regions established an informal group, and they organize monthly meetings to exchange agricultural knowledges, their experiences, such as access to loan or business plan making, and so on. Moreover, in Andijan Region, one female owner of a tile production company realized that horticulture cold storage business is profitable, and she started construction of the cold storages and a processing factory. It means that even though female farm managers are minority, they try to expand their business taking advantage of chances.

In Uzbekistan, the Women's Committee is the responsible governmental organization for gender mainstreaming. It formulates and promotes policies/programs for gender mainstreaming in any sectors, however, it does not implement projects by itself. On the other hand, Business Women Association (BWA), a NGO, supports women's businesses. It has 16,000 members, and 68 offices, including head office, regional and district offices, in nationwide (see following figure). It is noted that BWA's financial resources depend on membership fee, and sometimes rely on DP's project budget.

[29] Female owners of Fermer account for 7.1% of all of Fermer (Ministry of Agriculture, 2019).

[30] ADB, 2018, Uzbekistan Country Gender Assessment Update

Source: Homepage of BWA

Figure 5-1-1 Structure of Business Women Association

5.2 Attempts for Gender Mainstreaming by PFIs and DPs

ADB has formulated the Project Manual for the Horticulture Value Chain Development Project, and the manual sets indicators for gender mainstreaming, e.g., establishment of 5 women's associations, securement of women's employment, dissemination of women's success stories, set-up of women's groups for agri-business promotion and so on. In addition, it stipulates that at least 20% of sub-borrowers should be female. However, there is a case that the nominal applicant for loans is a wife, while practical farming management is shouldered by her husband only, and provision of loan to women does not necessarily promote women's active participation in farm management.

In general, banks hesitate to provide loans to ultra-small-scale crop growers such as *Dekhkan*, who do not have collateral, especially, female growers. Moreover, some informal money lending systems with lower interest rates based on mutual cooperation is operated in the rural areas, which keeps such growers off access to loan of banks officially. Consequently, those who can get fund from DPs through banks, are manager class only including women who have sufficient assets as collateral.

Recently, one of requirements for commercial banks to obtain loans from ADB and WB is gender consideration, therefore, the banks which have experiences to work with those DPs have already established their own gender action plans or gender policies. For instance, Ipak Yuli has set an

indicator, namely, “female sub-borrowers should be 20% and more”, and paid additional bonus to bankers, who gain female customers. Such attempt contributed to achieve 23.8% of female sub-borrowers as of 2018. In case of Ipoteka and SQB, they asked BWA’s cooperation to invite more women at the loan seminars, for promotion of women’s interest in the loan.

It is noted that even PFIs, which do not have experiences to work with DPs, understand that it is needed to promote gender mainstreaming to gain loans from DPs. They said that they are ready to do that, if it is one of requirements by JICA to gain loan.

5.3 Gender Mainstreaming in the Project

As mentioned before, it is very difficult for PFIs to provide loans to ultra-small-scale crop growers, since they do not have properties as collateral for loan. It means that it is not practical to target them of the Project. Therefore, the targets of the gender mainstreaming of the Project is female farm managers, instead of female labors or growers, and the purpose is to grow model managers for other women, which can change men’s way of thinking in the long run.

At the TA for PFIs, one session of gender consideration is to be included, and participants from PFIs are requested to prepare draft gender policies. The result of Rural Socio-economic Survey will be introduced at the session, which enhances their understanding about gender issues in horticulture value chain. They can refer to the results for the gender policy preparation. For instance, it is possible to involve Business Women Association when the bankers will organize loan seminar to promote women’s participation. Moreover, the banks could request the end-users to hire more female workers, set preference loan for women, identify excellent female farm mangers and publicize them in the banks and so on.

Some PFIs have already developed their own gender policies, which makes it possible for the TA participants to share the policies and lessons learnt[31]. They can examine to revise existing policies or formulate new ones based on the discussion among them. Each bank is expected to develop each policy, instead of uniformed policy for the TSL Project, since their customers are various sectors. For the purpose of gender mainstreaming in loan, they are requested to consider effective policies and realistic indicators to assess achievement. Some banks will set such indicators, while other will not do that. Each decision has to be made by each bank. In the long run, they are expected to provide loan to the end-users based on the policies.

It is planned to establish demonstration plots as TA agriculture component. It targets not only the end-users but also other growers. According to the Council of Farmers, Dekhkan Farms and Owners of Homestead, it is possible to promote women’s participation in technical training, namely, 30-40% by informing them of the training beforehand. Therefore, it is proposed to ask the Council and Khokimiyat for their support to increase participation rate of women, when the training is planned to be organized. It is needed to set training time and date, which is available for female growers.

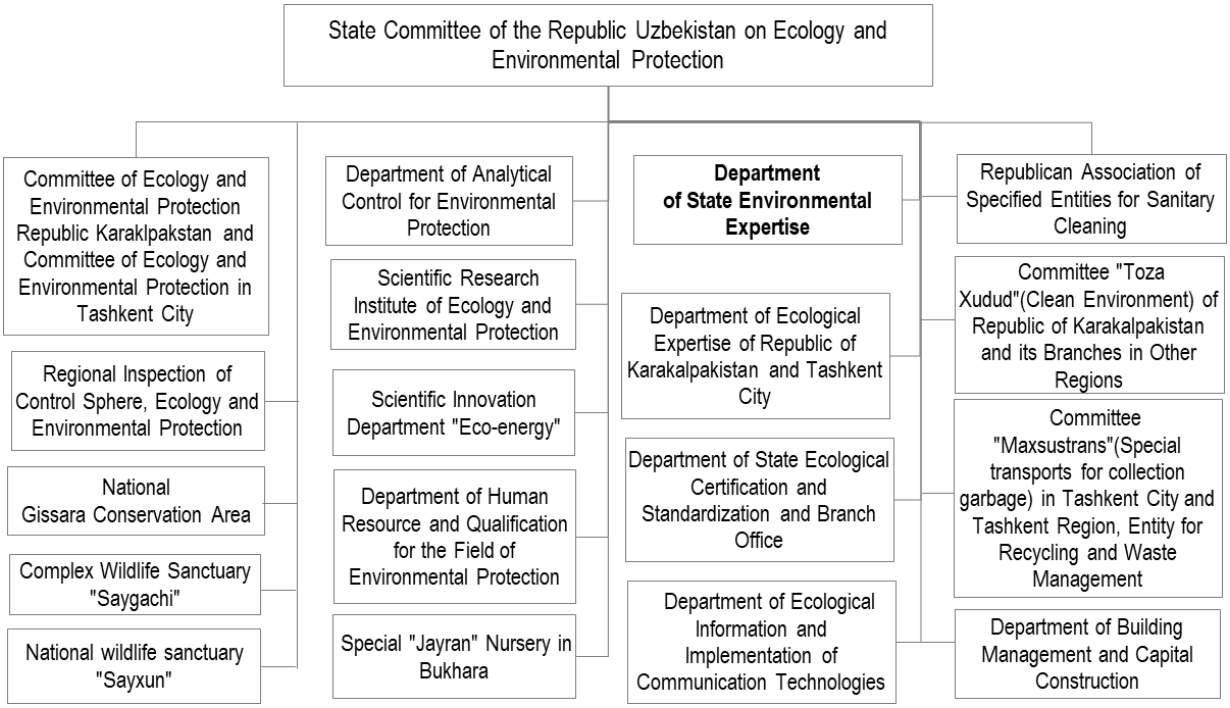
[31] According to the Ipoteka Bank staff, bankers have shared information related to gender mainstreaming individual basis, they did not have official meetings to do that.

6. Environmental and Social Considerations

6.1 Legal and Intuitional Framework

1) The State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection

The State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection (the Committee) is responsible for review of Environmental Impact Assessment (EIA) reports, environmental protection, and proper utilization of natural resources in Uzbekistan. In 2017, the Committee's name was changed from old one, the State Committee for Natural Protection, to current one, without any structural changes. As in the past, the Department for State Environmental Expertise, under the Committee, is in charge of examination of a series of environmental documents, such as an EIA report. Following figure shows the structure of the Committee.



Source: Homepage of the Committee

Figure 6-1-1 Structure of the State Committee on Ecology and Environmental Protection

2) Protected Area in Uzbekistan

Around 2 million ha of the land are specified as the protected areas in Uzbekistan in terms of environmental importance, which are classified into 7 categories such as national park and wildlife sanctuary as shown below. It is regulated to develop within such protected areas in Uzbekistan. Appendix 8 illustrates the locations and distributions of reserved areas in the country by category.

Table 6-1-1 Protected Areas in Uzbekistan

Category of Protected Areas		Area (ha)
Category I	National Reserved Area	184,397
Category II	Complex Wildlife Sanctuary	628,300
Category III	National Park	558,206
Category IV	Natural Memorials/Monuments	3,760
Category V	Wildlife Sanctuaries	572,404
Category VI	National Biosphere Reserve	111,671
Category VII	Specified Nursery "Jayran" in Bukhara	16,522
Total		2,075,260

Source: the State Committee on Ecology and Environmental Protection

3) Regulation on Environmental Impact Assessment

The regulation stipulating the EIA procedure was also updated. Previously, EIA has been done based on the Regulation on State Environmental Expertise (Cabinet Ministers' Decree of the Republic of Uzbekistan No. 491, 2001), and it was revised as No. 949 in November 2018. Due to the revision, categorization method was partly changed, and numbers of projects listed in Category II, III and IV were decreased or increased. Consequently, "Exploitation new lands of over 100 hectares" was listed in Category II before, however, it was excluded from the new regulation. However, there is no change in categorization of projects related to agriculture.

Any proposed projects in Uzbekistan are classified into four categories, namely, Category I (high risk), Category II (moderate risk), Category III (low risk) and Category IV (limited risk) in terms of project locations, scale of projects, extent of expected impacts and so on. The project list by category is attached in Appendix 9. Necessary environmental documents vary according to the category. The procedures of EIA in Uzbekistan are as follows:

(i) Stage I: Preparation of EIA Draft (PZVOS)

In the initial project planning stage, EIA Drafts (called as "PZVOS" in Russian abbreviation) are to be prepared and submitted to the Committee. The EIA Drafts should describe general information of the proposed project, for instance, location of the proposed project, geographical conditions, population in and around the project site and so on, instead of detail information and quantitative data, which are necessary for EIA reports after-mentioned.

(ii) Stage II: Preparation of EIA report (ZVOS)

Any projects, which are classified into Category I, II and III, require EIA reports (called as "ZVOS" in Russian abbreviation). In case of Category IV projects, preparation of EIA report is not needed[32]. The proponents of the projects, judged as Category I, II and III, should implement data collection, field survey, simulation and data analysis, and examine expected environmental impacts, and mitigation measures. The proponents have to explain the outline of the EIA reports at the consultation meetings and submit the reports to the Committee to get positive conclusion.

[32] Some of Category IV projects are re-classified into Category III, depending on the project scales, since the classification in the Regulation is not quantitative but qualitative. Category determination is done in consultation with the SC staff and case-by-case.

Responsible organizations for the review of environmental documents vary according to the classified categories. Headquarter of the Committee is in charge of Category I and II projects, while respective regional offices of the Committee cover Category III and IV projects. Positive conclusion of EIA report is effective for 3 years. It is noted that the Stage I and Stage II, which have to be completed within project planning period can be regarded as EIA process.

(iii) Stage III: Statement of Environmental Consequences (ZEP)

In Stage III, which corresponds to project pre-operation stage (after completion of construction works), Statements of Environmental Consequence (called as "ZEP" in Russian abbreviation) should be prepared. Constructed buildings/systems are compared with the planned design, to find out any changes. If constructed ones are not as designed[33], the project proponents have to modify the existing EIA reports by re-examination of environmental impacts. In addition, expected composition and quantity of emission gasses, drainage volume from proposed projects, environmental standards to be referred, any other environmental considerations in operation, implementation structure, etc. have to be compiled as ZEP and submitted to the Committee.

The Committee examines the ZEP and makes decision for giving positive conclusion or not. The periods for the examination for both ZVOS and ZEP are identical, depending on category, as shown in Table 6-1-2. The effectiveness of the positive conclusion is for 3 years. If any projects are classified into Category IV, ZEP preparation is not necessary. Following table shows the EIA procedures in Uzbekistan.

Table 6-1-2 EIA Procedures by Category

Category	Category I	Category II	Category III	Category IV
Necessary documents	Stage I. EIA Draft Stage II EIA Stage III Statement of Environmental Consequence Monitoring report	Stage I. EIA Draft Stage II EIA Stage III Statement of Environmental Consequence Monitoring report	Stage I. EIA Draft Stage II EIA Stage II Statement of Environmental Consequence Monitoring report	EIA Draft
Responsible authorities	the Committee	the Committee	Regional office of the Committee	Regional office of the Committee
Examination period	20 days	15 days	10 days	5 days

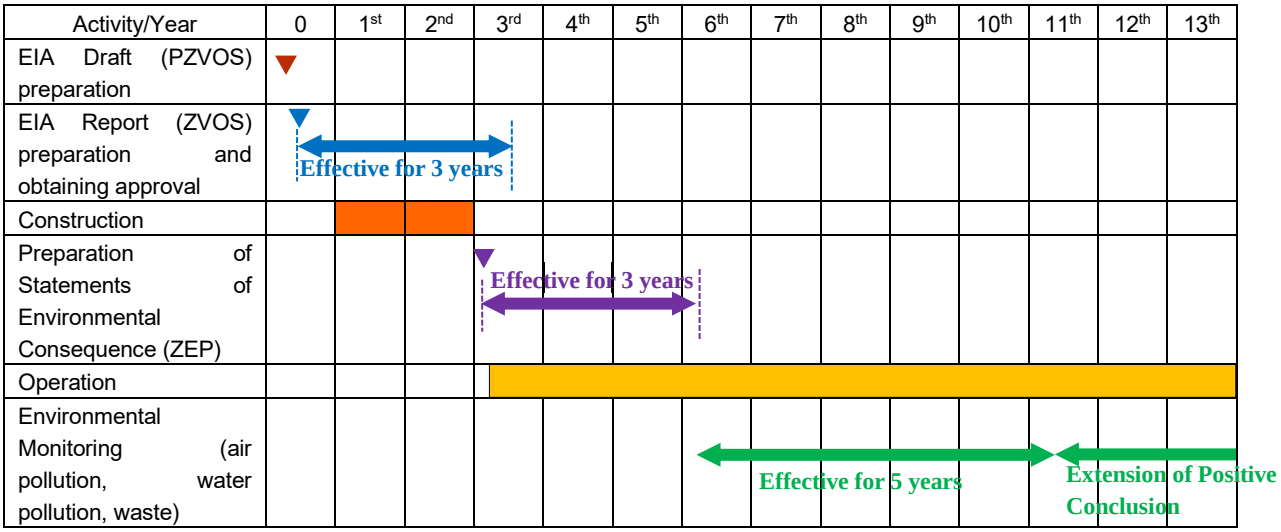
Source: JICA Survey Team

During construction stage, monitoring is not required in Uzbekistan. On the other hand, three years after commencement of operation, environmental monitoring, for instance, air pollution, solid and liquid waste should be implemented annually[34]. The measured values of those parameters are examined whether they are within the permissible level specified in Uzbekistan, and they are acceptable, permission for the continuous operation would be obtained. It is needed to update the permission for the operation every 5 years. The time frame of EIA procedure is as shown below:

[33] According to the officer of the Committee, such cases are sometimes observed in Uzbekistan.

[34] It is premised that facilities to mitigate environmental issues will work without problems for initial 3 years (hearing from an officer of the Committee).

Table 6-1-3 Time Frame of EIA Procedure



Source: JICA Survey Team

4) Environmental Standards/Permissible Values

In Uzbekistan, environmental standards related to air pollution, water quality, noise/vibration have been established. On the other hand, effluent water standard has not been established, it is, thus, recommended to refer to the international standards such as IFC's one. Following tables show environmental standards in Uzbekistan.

Table 6-1-4 Permissible Air Emission

Category	Permissible Level (mg/m^3) in Uzbekistan *1	IFC standard(mg/m^3) *2
Nitrogen dioxide (NO_2)	0.085 (30 min) 0.06 (daily average) 2.0 (work zone)	0.2 (1-hour) 0.04 (1-year)
Nitrogen oxide (NO)	0.6 (30 min) 0.25 (daily average)	-
Sulphur dioxide (SO_2)	0.5 (30 min) 0.2 (daily average) 10.0 (work zone)	0.5 (10 min) 0.02 (24-hour, guideline) 0.125 (24-hour, interim target-1) 0.05 (24-hour, interim target-2)
Carbon oxide (CO)	5.0 (30 min) 5.0 (daily average) 20.0 (work zone)	-
Suspended particle	0.15 (30 min) 0.1 (daily average)	-

Sources*1: List of Maximum Allowable Concentrations (MACs) of pollutants in ambient air of communities in the Republic of Uzbekistan including Annex 1. SanR & N RUz No.0179-04.
*2: WHO Ambient Air Quality Guidelines (IFC Guidelines, 2007)

Table 6-1-5 Water Quality Standard for Surface Water

Unit: mg/l

Parameters	Fishery	Communal	Household-Drinking	Irrigation	WHO* (Drinking)	FAO* (Irrigation)
COD	15	40	30	40	-	-
BOD, 20 (mg/l)	3	3-6	3-7	10	-	-
pH	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-9.5	6.5-8.4
Suspended Solid	15	30	30	50	-	-
Salinity (mineralization)	1000	1000	1000-1500	1000	-	0-2000
Sulfate	100	500	400-500	-	-	800
Chloride	300	350	250-350	-		1065
Ca	190	-	-	-	-	400
Mg	40	-	-	-	-	60
Ammonium nitrogen (NH^4-N)	0.5	2	0.5	1.5	0.2	5
Nitrite	0.08	3.3	3	-	3	-
Nitrate	40	45	45	-	50	44
Phosphate (PO^4)	0.3	1	3.5	1	-	0.77
Ether- soluble	0.05	0.8	0.8	0.8	-	-
Oil products	0.05	0.3	0.1	0.3	-	-
Synthetic surface active agents	0.1	0.5	0.5	0.5	-	-
Phenol	0.001	0.001	0.001-0.1	0.001	-	-
Fluorine (F)	0.05	1.5	0.7	1	-	-
Arsenic (As)	0.05	0.05	0.05	0.1	0.01	-
Iron (Fe)	0.05	0.5	0.3-3	5	-	-
Chrome (Cr^{6+})	0.001	0.1	0.05	0.1	0.05	-
Copper (Cu)	0.001	1	1	1	2	-
Zinc (Zn)	0.01	1	3	5	-	-
Cyanides	0.05	0.1	-	-	-	-
Lead (Pb)	0.03	0.1	0.03	0.2	0.01	-
Nickel (Ni)	0.01	0.1	0.1	-	0.07	-
Cadmium (Cd)	0.005	0.01	-	-	0.003	-
Cobalt (Co)	0.1	1	-	-	-	-
Molybdenum (Mo)	0.0012	0.5	0.25	-	-	-
Strontium (St)	-	2	7	-	-	-
Selenium (Se)	0.001	-	0.01	-	0.04	-
Thiocyanates	0.1	-	-	-	-	-
Mercury (Hg)	-	0.005	0.0005	-	0.006	-

Sources: San Pin No. 0172-04, "Hygienic requirements for the protection of surface waters in the territory of the Republic of Uzbekistan"

*FAO, 1994, Water quality for agriculture (referred as international guidelines)

*WHO, 2011, Guidelines for Drinking-water Quality, ANNEX 3 Chemical summary tables (referred as international guidelines)

Table 6-1-6 Standard of Noise Pollution Control

Category	Permissible Level (dB) in Uzbekistan *1	IFC standard(dB) *2
Residential area	55dB (day-time) 45dB (night-time)	55dB (day-time) 45dB (night-time)
Working area	80 dB	-

Sources

*1: KMK 2.01.08-96 “protection against noise. (The State Committee of the Republic of Uzbekistan for architecture and construction, Tashkent, 1996); Sanitary code no. 0175-04” health standards for noise levels in the workplace

*2: WHO Ambient Air Quality Guidelines (IFC Guidelines, 2007)

5) Gap Analysis

The Project refers to the JICA Guidelines for Environmental and Social Consideration (the JICA Guidelines, 2010) for environmental examination of the sub-projects. When the JICA Guidelines and the regulation/law in Uzbekistan are compared, some gaps can be identified, and it is needed to take measures to compensate for the gaps. Noted that UZAIFSA has worked with DPs such as ADB and WB, which enables UZAIFSA to comply with the JICA Guidelines by taking necessary measures. The identified gaps and measures to be taken are illustrated in following table:

Table 6-1-7 Gap Analysis

Items	JICA Guidelines	Laws in Uzbekistan	GAP	Measures to be taken at the Project
1 Basic point	For project implementation, alternatives and mitigation measures must be examined to avoid or minimize development projects' impacts on the environment and local communities by implementation of environmental studies at early stage of the project planning. The examination results are to be reflected in the project plan.	Prior to a project implementation, screening is to be implemented. If project is sorted to either of Category I, II, III and IV, the project proponent shall prepare an EIA draft and/or an EIA report.	None	
2 Information disclosure	EIA reports must be written in the official language or in a language widely used in the country. When explaining projects to local residents, written materials must be provided in a language and form understandable to them. EIA reports are required to be made available to the local residents. The EIA reports are always required to be available for perusal by project stakeholders such as local residents and copying must be permitted.	Disclosure of EIA report and language are not stipulated. Note that official documents are prepared in Russian in general. UZAIFSA prepares environmental framework when it is supported by DPs and uploads it in the HP of UZAIFSA (in Russian).	There is no mention to language of EIA report.	After confirmation of understandable languages of the residents, if necessary, their language will be used for oral explanation and EIA report.
3 Public consultation	For projects with a potentially large environmental impact, sufficient consultations with local stakeholders, such as local residents, must be conducted via disclosure of information at an early stage, at which time alternatives for project plans may be examined. The outcome of such consultations must be incorporated into the contents of project plans. In preparing EIA reports, consultations with stakeholders, such as local residents, must take place after sufficient information has been disclosed. Records of such consultations must be prepared. Consultations with relevant stakeholders, such as local residents, should take place if necessary, throughout the preparation and implementation stages of a project. Holding consultations is highly desirable, especially when the items to be considered in the EIA are being selected, and when the draft report is being prepared.	According to the Regulation on State Environmental Expertise, public consultation is to be organized to explain project components and environmental impacts after preparation of an EIA report. The records of public consultation meetings have to be attached in the final EIA report. Still, timing of the meeting organization is not stipulated.	Timing for public consultation is not stipulated.	According to sub-projects and their impacts, at scoping timing and after an EIA report preparation, public consultation meeting is to be organized.
4 Items for environmental examination	The impacts to be assessed with regard to environmental and social considerations include impacts on human health and safety, as well as on the natural environment, that are transmitted through air, water, soil, waste, accidents, water usage, climate change, ecosystems, fauna and flora, including trans-boundary or global scale	The Regulation on State Environmental Expertise states that counter measures against expected environmental impacts, namely, air pollution, waste, effluent	There is no mention to social environmental aspects	According to project components and their environmental impacts, social impacts are to be

Items	JICA Guidelines	Laws in Uzbekistan	GAP	Measures to be taken at the Project
	impacts. These also include social impacts, including migration of population and involuntary resettlement, local economy such as employment and livelihood, utilization of land and local resources, social institutions such as social capital and local decision-making institutions, existing social infrastructures and services, vulnerable social groups such as poor and indigenous peoples, equality of benefits and losses and equality in the development process, gender, children's rights, cultural heritage, local conflicts of interest, infectious diseases such as HIV/AIDS, and working conditions including occupational safety. In addition to the direct and immediate impacts of projects, the derivative, secondary, and cumulative impacts as well as impacts associated with indivisible projects will also be assessed regarding environmental and social considerations, so far as it is rational. The life cycle impact of a project period is also considered.	water and other environmental issues by any projects have to be described in EIA reports.	by any projects.	identified, and countermeasures against the impacts have to be examined, if necessary.
5 Monitoring and grievance handling	Project proponents etc. should make efforts to make the results of the monitoring process available to local project stakeholders. When third parties request further information, JICA discloses it, subject to approval by project proponents etc. When third parties point out, in concrete terms, that environmental and social considerations are not being fully undertaken, forums for discussion and examination of countermeasures are established based on sufficient information disclosure, including stakeholders' participation in relevant projects. Project proponents etc. should make efforts to reach an agreement on procedures to be adopted with a view to resolving problems.	There is no regulation related to concrete monitoring methods. Monitoring during construction stage is not a must. But, in the TSL for horticulture development project funded by ADB, the PFI staff conduct monitoring quarterly, and they submit the monitoring reports to organizations concerned.	There is no regulation related to concrete monitoring method.	Quarterly monitoring is to be organized, and the monitoring reports are to be submitted to JICA from the PIU.
6 Eco-system, fauna and flora	Projects must not involve significant conversion or significant degradation of critical natural habitats and critical forests.	Development in the specified Protected Areas such as wildlife sanctuary and national park, is not permitted.	None	
7 Exploitation of new land over 100ha	If any projects exploit new farmland over 100ha, they are classified into Category A. Thus, any sub-projects which exploit farmland over 100ha will not be funded by the TSL.	There is no mention to scale of new farmland exploitation.	There is no mention to scale of new farmland exploitation.	Projects which exploit farmland over 100ha will not be funded by the TSL Project.
8 Mitigation measures	Mitigation measures against expected impacts should be described in detail.	Mitigation measures shall be described, but there is no mention to concrete mitigation measures.	There is no mention how to describe mitigation measures	Detailed mitigation measures have to be described.
9 Indigenous people	Any adverse impacts that a project may have on indigenous peoples are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved	In Uzbekistan, there is no indigenous people. Noted that ethnic minority people stay in	None	

Items	JICA Guidelines	Laws in Uzbekistan	GAP	Measures to be taken at the Project
	unfeasible, effective measures must be taken to minimize impacts and to compensate indigenous peoples for their losses.	Uzbekistan. Thus, there is no law related to indigenous people.		

Source: JICA Survey Team

6.2 Environmental and Social Management System of the PFIs

Out of the 7 PFI candidates of the Project, 5 PFIs except Mikrokreditbank and Agrobank have experiences to work with DPs, and they have already established Environmental and Social Management System (ESMS). Also, they implement monitoring of the sub-projects supported by the DPs every three months and prepare monitoring reports. Moreover, reporting systems have been developed, monitoring reports are submitted to high level of the banks, PIU and the donors. It is planned to target all the candidate PFIs in the TA of the Project regardless of their working experiences with DPs.

Mikrokreditbank and Agrobank are aware that ESMS is necessary to gain loan from DPs, and they are ready to prepare ESMS, if it is one of requirements to apply for the TSL by JICA. So far, those two banks have provided loans to small- or medium-scale businesses, and they have not funded for any large-scale projects, which can cause negative environmental impacts. ESMS checklists of the 7 PFI candidates are attached in Appendix 10.

6.3 Outline of Environmental Assessment and Review Framework (Draft)

A. Introduction

The Survey is to examine conditions related to TSL in horticulture value chain development in Uzbekistan. The PFI candidates are 7 commercial banks within Uzbekistan, and the end users are farmers and companies related to agri-business across the State. Expected sub-projects of the TSL are construction of facilities such as cold storage, processing factory, introduction of agricultural machines and so on. However, concrete structures, scales, locations, sizes of those facilities, number of machines have yet to be fixed at this moment.

B. Assessment of Legal Framework and Institutional Capacity

As mention before, environmental standards, namely, permissible air emission, water quality, noise/vibration, have been developed. Compared with international standards, some parameters are exact, while others are not, thus, it can be said that there is no big gap between them. Since there is no wastewater standard in Uzbekistan, it is recommended to apply the IFC standard, if monitoring of effluent water from the facilities is necessary.

Concerning the law and regulation on EIA, they have been developed in 2000, the regulation on EIA was revised in 2018. Depending on project scale, location, size, kind of business, all projects in Uzbekistan are classified into either of four environmental categories, I, II, III and IV. According to the ADB categorization, Category A and Category B correspond to Category I & II and III& IV in Uzbekistan, respectively. Category C in ADB correspond to other projects, which are not classified

into either of Category I, II, III and IV in Uzbekistan. JICA also has three categories, namely, Category A, B and C in the JICA Environmental and Social Guidelines (the JICA Guidelines) as well as ADB. Thus, it is thought that JICA's Category A, B and C correspond to I & II, III & IV and other projects in Uzbekistan.

The executing agency of the Project in Uzbekistan, UZAIFSA, has various experiences to implement projects with DPs, such as the horticulture value chain development project by ADB. There are five and four environmental experts, at the headquarters and the regional offices, respectively. It is noted that they are not permanent officers of UZAIFSA but employed on project basis. Moreover, they are very busy for current works, and it is necessary to hire additional environmental officers for the JICA Project.

Out of 7 PFIs, 5 PFIs have experiences to be funded by DPs, and they have already established ESMS. They implement a series of monitoring at the project sites of the sub-borrowers quarterly. Such PFIs have held seminar of ESMS by themselves, or they dispatched their staff for ESMS training organized by ADB, which means that the staff members have already learned ESMS. In those PFIs, some bankers are assigned to ESMS, however, most of them hold concurrent post, which means that the ESMS work is extra one for such staff.

Remaining 2 PFIs, namely, Agrobank and Mikrokreditbank understand that it is needed to establish ESMS, and they are ready to do that. Therefore, at the TA for PFI, it is necessary to organize one session to explain the concept and procedures of the JICA Guidelines, including scoping and monitoring system.

C. Anticipated Environmental Impacts

Expected sub-projects of the Project are construction of facilities related to horticulture value chain, and introduction of processing & agricultural machines. Probable facilities to be constructed are cold storage /storage warehouse, greenhouse with heater, processing places, installation of drip irrigation system and so on, and they will be relatively small-scale ones, thus, negative impacts on surrounding environment will be limited. Moreover, such facilities will be constructed within sub-borrower's places, and involuntary resettlement and land acquisition will not be caused. Any projects which cause resettlement and land acquisition will be funded by the TSL Project. Still, if juice or canning factories are constructed, waste management, waste water treatment and safety securement of labors will be necessary, and in such case, the sub-project can be sorted to Category B according to the JICA Guidelines.

D. Environmental Assessment for Subprojects and/or Components

When any applicants apply the loan to the PFIs, they are requested to fill the form for environmental screening with the support of the bank staff. If propose proponent are categorized into Category III, which requires EIA report preparation, the applicants have to prepare EIA reports with assistance of officers of local governments and gain positive conclusion from the Committee. If the sub-project is sorted as Category I and II (Category A in case of the JICA Guidelines), it is not funded by JICA.

E. Consultation, Information Disclosure, and Grievance Redress Mechanism

After the final decision of the loan by JICA, public consultation will be held to explain the TSL with support of staff of UZAIFSA regional office. The minutes of the consultation are uploaded at HP of UZAIFSA. Moreover, the Environmental Assessment and Review Framework of WB project and Environmental and Social Management Arrangement of ADB project are posted at the homepage of USAIFSA. Those procedures can be regarded as a process of consultation and information disclosure.

Concerning grievance redress mechanism, all PFIs have to develop ESMS including the mechanism, it is noted that 5 PFIs have already done. SQB has set an item of "Mechanism of complaint administration" in the bank ESMS policy, and it says that if any complaints are presented, (1) Receipt of the complaint at legal department of the bank, (2) Determination of eligibility, (3) Examination and evaluation of the application including detailed study such as field visits, interviews; meetings with the applicants, and (4) Decision making, monitoring, preparation of monitoring report. Such example can be referred for other PFIs to develop grievance redress mechanism.

F. Institutional Arrangement and Responsibilities

The executing agency of the Project is UZAIFSA, and the PIU will be established at the agency. When some end-users apply for the loan, staff of the PFIs supports application form filling. As required, the bankers of regional branches and the local government officers assist the applicants to delegate the EIA reports preparation to environmental consultants. During operation of the sub-projects, the branch office staff monitors the situations, and submit monitoring reports to the PIU and headquarters of the bank. PFIs are requested to assign at least one staff member for ESMS. The PIU will submit the monitoring report to JICA regularly, and in case of any problems, they will be fixed by the PIU.

G. Monitoring and Reporting

Some of the PFIs have already established monitoring and reporting system. In the Project, it is recommended to implement regular monitoring by the bank staff and to report the results to senior staff of the PFIs as well as 5 PFIs are doing at this moment. Moreover, annual reporting system from the PFIs to PIU, and from PIU to the JICA office has to be developed. Furthermore, the PIU will submit annual monitoring report to JICA.

6.4 Sub-loan Criteria

Principally, the TSL Project will not provide financial support to sub-projects, which are sorted to Category A according to the JICA Guidelines. In view of environmental and social considerations, following criteria of sub-loan selection are suggested:

- ✓ All sub-projects comply with Uzbekistan national regulations;
- ✓ All sub-borrowers have (i) no past and ongoing environmental liabilities such as non-compliance with environmental, worker health and safety issues, any liens, fines or penalties and (ii) adequate capacity for environmental management (staff and staff capacity);

- ✓ All sub-projects falling under Category A (according to ADB's ESMS arrangement[35], 2016) or Classes I and Class II (Uzbekistan's categorization by Decree No.949) are excluded from financing under the JICA TSL.
- ✓ If a sub-project's investment cost is more than 1 million US$, it is needed to get approval by JICA for each. All sub-projects causing involuntary resettlement and land acquisition are excluded from the financing under the JICA TSL.
- ✓ All sub-projects using JICA funds with potential environmental and/or social impacts are reviewed and evaluated to comply with the relevant Laws and nature protection normative documents of Uzbekistan. However, as far as environmental permissible standards, such as wastewater limitation standard, have yet to be established, international standards such as the IFC standards, are to be applied.

6.5 Expected Environmental Impacts and Procedures of Environmental and Social Consideration

The Project provides TSL for horticulture value chain development in Uzbekistan, and the expected activities by means of the loan are greenhouse establishment, introduction of cold storage facility or processing facility, utilization of agricultural machines and so on. Probably, they would be classified into Category IV, which can cause very minor environmental issues, and preparation of an EIA report is not needed. Still, it is noted that construction of green houses with heating system can be sorted into Category III, which require preparation of an EIA report.

When end-users apply for the bank loan, they are requested to fill the form including the environmental screening form. The bank staff is supposed to support them for filling the form. If an applied project is sorted to Category I or II, it is not targeted by the TSL. When a project is classified into Category III, EIA report preparation is necessary, and the applicant will delegate the task to a local environmental consultant with the support of the local government. The procedure is not very complicated for the applicants, and such situations are observed generally, according to the environmental experts of ADB in Uzbekistan.

The procedures of ESMS for the Project follow the ADB's ESMS Arrangement as shown below. The screening format for categorization in the Arrangement also is to be applied.

i) The first screening for eligibility of a sub-project will be done referring to 1) Government of Uzbekistan exclusion list for banks and 2) project's prohibited investment activities list by ADB (see Appendix 11);

ii) Once it is confirmed that the project is not in the exclusion list mentioned above, the ESMS Manager will work with the sub-project owners to conduct rapid environmental assessment by using Screening Checklist and Screening Form (see Appendix 12). It is noted that PFIs support for the screening by the end-users. Definition of each category based on the ESMS Arrangement by ADB is as shown below. Categorization in Uzbekistan is also to be referred.

[35] ADB, 2016, Financial Intermediary: Environmental and Social Management System Arrangement, UZB: Horiticulture Value Chain Development Project

Category A Sub-project: Large-scale agriculture and food processing industries

- Agriculture, horticulture, vineyards and orchards; (medium scale intensive operations >500 ha),
- Re-cultivation of resting land (greater than 1,000 hectares);
- Utilization of agricultural land (over 50 hectares) for nonagricultural (commercial or industrial) purposes; and
- Canning industry (annually processing over 20,000 tons of output)

Category B Sub-project: Medium-scale agriculture and food processing industries

- Agriculture, horticulture, vineyards and orchards (medium scale intensive operations from 50 to 500 ha);
- Re-cultivation of resting land (up to 1,000 hectares);
- Utilization of agricultural land (from 30 to 50 hectares) for nonagricultural commercial purposes;
- Utilization of virgin soils and unbroken expanses for intensive agriculture;
- Construction of buildings to store agriculture goods and agricultural products;
- Agro-processing factories, foods, beverages, seeds, fibers (medium scale from 1,000 to 5,000 tons/year of output);
- Canning industry (annually processing from 10,000 to 20,000 tons of output); and
- Construction of agricultural products process buildings, facilities and enterprises.

Category C Sub-project: Small-scale agriculture and food processing industries

- Agriculture, horticulture, vineyards and orchards (small scale <50ha);
- Construction of glasshouses or poly-tunnels;
- Utilization of agricultural land (20 to 30 hectares) for non-agricultural purposes;
- Acquisition of tractors and other farm equipment;
- Agro-tourism;
- Canning industry (processing <3,000 tons/year of raw materials);
- Collection of medicinal herbs;
- Construction of a roasting enterprise (sunflower etc.) ;
- Establishment of semi-finished food factories (capacity up to 1000 tons/year); and
- Production of non-alcoholic beverages

iii) Once the checklists and the verification work are reviewed by the ESMS Manager, the sub-project will be classified into one of following categories: category A (with potentially significant environmental and/or social impacts); category B (with less significant environmental and/or social impacts), and category C (with minimal or no impacts). Only sub-projects classified as Category III or IV (low risk)" and others, which are equal to Category B and Category C, can be funded. Moreover, no sub-project requiring land

acquisition can be funded;

iv) The ESMS Manager of PFI will indicate the applicable environmental safeguard requirements, which are stipulated by the relevant UZB national regulations, for the sub-project. The credit assessment team of the PFIs will assure that the sub-project owners are fully aware of following requirements:

- ✓ To obtain the environmental clearance from the Committee prior to requesting funding from the PFIs for Category B (Category III and IV);
- ✓ To obtain environmental certificate for equipment and technology and permission from quarantine inspection for imposed seeds and plants for Category C projects;
- ✓ To obtain the compliance permits or certificates from the Committee as required by the national regulations applied for the existing facilities for expansion projects;
- ✓ To follow the national regulations for Category III and IV (Category B) and monitoring and reporting based on the ADB Safeguard policy (2009)[36]
- ✓ To submit: (i) evidence that there is no past and present claim on the ownership of land that has been used for current activities, and (ii) submit certificate from local government on granting the use of land for current activities

v) Regarding Category III and IV (=Category B) projects, credit officers are required to ensure that an EIA Report has been developed and environmental clearance has been received. It is highly recommended that credit officers conduct site visits, followed by a due diligence brief note (Appendix 13) submitted to the ESMS Manager. On the other hand, the proponents of the sub-project have to submit environmental certificate and quarantine permission for all sub-projects, including purchase of imported equipment and seeds. The proponents also must provide all requested information to the credit officers and demonstrate responsiveness regarding the applicable environmental and social safeguard requirements.

vi) The PFIs will ensure that all investment agreements for sub-projects contain adequate environmental and social protection covenants requirements. Particularly sub-borrowers comply with: (i) all applicable laws and regulations of Uzbekistan relating to environment; (ii) core labor standards and the applicable laws and regulations of Uzbekistan, including, but not limited to, the requirements relating to (a) workplace occupational safety norms; (b) no use of child labor; (c) no discrimination against workers in respect of employment and occupation; and (d) no use of forced labor. The PFIS will also ensure that the workers engaged by sub-borrowers for the sub-projects are not restricted from developing legally permissible means of expressing their grievances and protecting their rights regarding conditions and terms of employment.

vii) After approval of the sub-projects, regarding Category III and IV, the ESMS Manager of PFI will communicate with the end-user to confirm quarterly basis monitoring report in compliance with all applicable environmental safeguard requirements. The Manager gets

[36] ADB Safeguard Policy can be regarded to have same functions as well as the JICA Guidelines (2010), considering the contents

copies of the monitoring reports that the sub-project owners submit to the local environmental authorities, and he/she conducts site visits to prepare site inspection reports and monitor the compliance with national regulations. The PFIs will promptly report to PIU, and PIU will report to JICA, for any actual or potential breach of the compliance requirements.

viii) During the project operation, the PFIs ensure that the mitigation measures are implemented. In the case of non-compliance, the PFIs will investigate the nature and reason(s) for non-compliance and take necessary measures. Sometimes, the PFIs should determine whether financing should be suspended. Mitigation measures will be done under the responsibility of the proponents, however, PFIs shall ensure that mitigation measures are implemented as planned. Proposed monitoring checklist is provided in Appendix 14.

ix) The ESMS Manager will evaluate environmental and social performance of sub-projects annually. The PFIs will ensure that the proponent of Category III and IV (=Category B) sub-projects prepares and submits an annual environmental and social monitoring report. Based on these reports and the quarterly site visits, the ESMS Manager will review and assess the sub-project's environmental and social safeguard performance.

x) Based on the sub-project's environmental and social safeguard performance, the ESMS Manager will prepare an annual environmental and social performance report of PFIs (see Appendix 15) and submit it to the PFI management for endorsement before submission to the PIU in UZAIFSA.

xi) Based on the PFIs' environmental and social performance reports, UZAIFSA will submit an annual project safeguard monitoring report (see Appendix 16) to JICA.

xii) The PFIs will ensure that the banks have division dealing with complaints and non-compliance in accordance with national regulations and the ADB Accountability Mechanism Policy (2012)[37]. The ESMS manager will keep records of following matters:

- ✓ Complaints, grievances, or protests received from local communities, recording dates and organizations involved, actions taken to resolve grievances, any outstanding issues, and proposed measures for resolution;
- ✓ Details of information disclosure and consultations, if any, with affected people, local communities, civil society groups, and other stakeholders; and

✓ Details of approach/methodology on addressing the concerns and issues raised at consultations.

[37] In 2003, ADB established "Accountability Mechamism Policy" to enhance ADB's development effectiveness and project quality, and to be responsive to the concerns of project-affected people and fair to all stakeholders. In 2012, ADB revised the 2003 version based on some studies.

7. Rural Socio-economic Survey

7.1 Purpose of the Rural Socio-economic Survey

The Rural Socio-economic Surveywas implemented to identify and issues and training needs for the technical assistance (TA) for the Project, targeting horticulture crop growers and agricultural related companies. The Survey covers small, medium, and large-scale growers and companies, and probably includes some of the end-users of the Project. It means that the survey mentioned above can identify general conditions of horticulture value chain in Uzbekistan, instead of focusing on the candidates of end-users of the Project. The Survey consist of three components, namely, 1) interview to horticulture crop growers, 2) gender workshop study, and 3) interview to agricultural related companies.

7.2 Target Area of the Rual Socio-eonomic Survey

The target areas of the Rural Socio-economic Survey were examined in terms of three points as shown below:

1) High horticulture crop production (tons) by Dehkhan;

2) Highly development of value chain, having high cold-storage capacity, and

3) High potential of horticulture, indicating increase of horticulture crop planting area.

Andijan Region has the highest production by *Dekhkan*, and the region was selected one of target regions. In view of value chain development, Tashkent Regions has the largest capacity of cold storage. Concerning the potential, horticulture crop planting area of Jizzakh Region shows remarkable increase recently. Thus, those three regions were selected as the target of the rural socio-economic survey.

After the selection of target regions, UZAIFSA and the regional officers discussed the selection of target districts. They made a decision to pick up average level of districts, instead of highly developed ones in those regions, and finally selected six districts are as shown below:

Andijan Region: Shahrihon District and Kurgantepa District

Tashkent Region: Kibray District and Urta-Chirchik District

Jizzakh Region: Bakhmal District and Gallaorol District

Locations of the target areas of the rural socio-economic survey are following 6 districts in 3 regions area as illustrated in following figure.

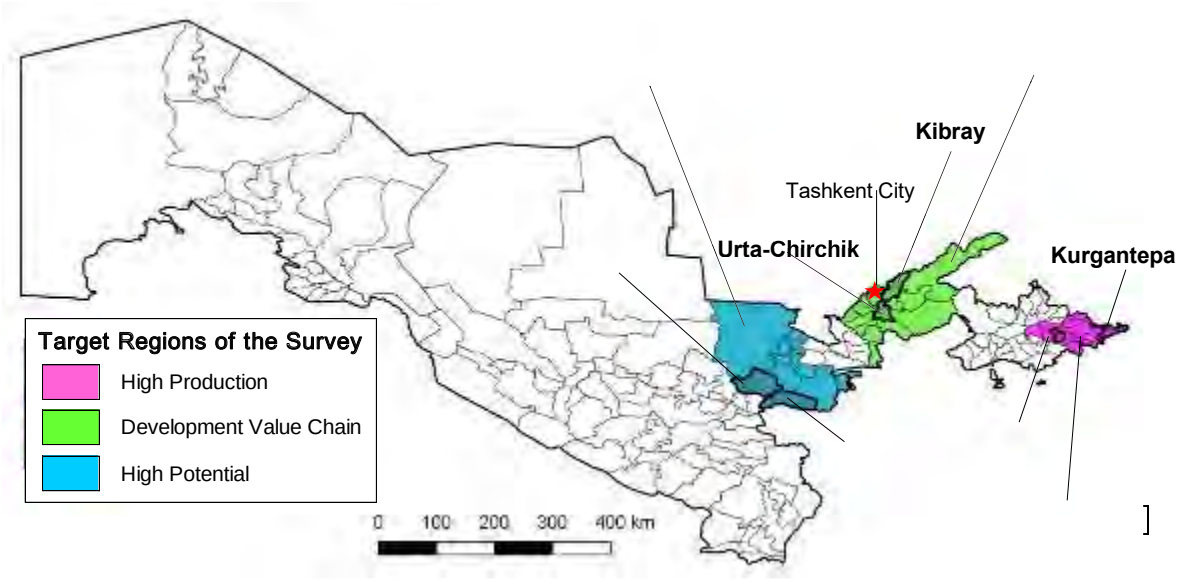


Figure7-2-1 Location of the Target Regions/Districts of the Rural Socio-economic Survey

7.3 Survey Results

A series of questionnaires of the Rural Socio-eonomic Sruvey, detail description of the study results, participant list of the Gender Study and Gender Workshop Study results are attached as Appendix A, B, C and D, respectrvely.

7.3.1 Horticultural Growers and Agricultural Related Companies

(1) Survey Results of the Horticultural Crop Growers

The average farmland area of the target growers is 11 ha/household. Income from sales of farm products accounts for approximately 80% of their total household income, while annual gross income per household is 114.3 million UZS on average. Their farmland areas and gross incomes are almost proportional, it is estimated that one-hectare farmland brings about 10 million UZS. In rural areas, transaction modes are made at farm-gate, while only growers in Tashkent Region transport their products to the wholesale markets. The target growers don't have experience to process harvested products.

Improvement of irrigation infrastructure is a key issue in crop production, but most growers depend on gravity irrigation, and water-saving system by using sprinklers and drip irrigation has not been introduced by the target growers. In particular, water shortage is a core problem in Jizzakh Region. Seeds (open pollinated seeds) or seedlings are rarely produced by the growers, and they are procured from private companies. Still, the growers in Jizzakh Region only procure them from the state company. As for fertilizers, compost is often applied in combination with chemical fertilizers. Pesticides are procured from both private companies and the state company. For agricultural machinery, the growers often access to tillage services from private companies and individuals.

Agricultural technical information can be obtained from the Fermer Association, neighboring advanced farmers, state agencies, and various seminars, and half of the growers employ individual

agricultural specialists. They don't establish any groups for crop production. However, for marketing, grower' groups are formed by processing companies.

Growers have many common problems, namely, crop damages due to pests and diseases, high labor costs, expensive agricultural input (chemical fertilizers, pesticides, and agricultural machinery), and low selling prices. In short, many growers are worried about "high production costs and low selling prices". Overall, the growers pay more attention issues related to sales and marketing compared with those of crop production.

As a means of income increase, many growers consider strengthening production of vegetables and fruits, but they are also interested in expanding business of agricultural processing, distribution, and agricultural machinery services. Further, there are more growers who are willing to shift to fruits production than those who want to shift to vegetable production, because it is generally recognized that fruits production is more profitable than that of vegetables. While vegetable growers tend to work concurrently with processing and marketing, fruit producers are interested in improving water-saving technologies, new varieties, biological pesticides/ integrated pest management (IPM), and so on.

19.4% of the target growers have accessed to loans, and 9.7% of them has gotten services from institutional finance (banks/ non-banks). Interest rates of the loans range from 9 to 24% per year, collateral varies from 60 to 150% of the loan amounts, and the repayment period is within 5 years. Only one grower has received guarantee from the government. The purposes of financing are various and complex, namely, irrigation facilities, greenhouse facilities, cold storage facilities, seedling purchases, agricultural machinery, warehouses, and farmer inputs. Loans are mostly used for low-temperature storage facilities, agricultural processing equipment, greenhouse facilities, seedling purchases, and irrigation facilities in order. Non-institutional financing is due to "mutual aid financing[38]". According to the inexperienced respondents, the reason for not receiving the loan is that the collateral property cannot be set (46.4%). However, 72.2% of the respondents answered that they want to access to loan if the loan conditions are preferable, since the demands for loan are high.

(2) Survey Results of Processing Companies and Export Companies

The horticultural crop processing companies and export companies hire 13.4 full-time employees and 50.6 seasonal employees on average. The mean sale amount per company is 545,000 USD, and the handling volume per company is 468 tons (2019 forecast). The sales amount and handling volume are increasing year by year. The rates of return are polarized to 1) more than 30% and 2) 10-20%. This is because that the profit rate in processing industry is higher than that of sale of fresh vegetables/fruits.

As for the shipping destination, 62.5 % of the companies answered that they sell crops for domestic (31.3% are for supermarkets), while 37.5% of the companies said that the destinations of sale are foreign counties. As export counterparts are Russia, Kazakhstan, Afghanistan, Kyrgyz, and Korea, and they account for 50%, 12.5%, 12.5%, 6.3% and 6.3%, respectively. Concerning mode of

[38] Some friends or relatives pay a certain amount of money and they lend the money to one of members according to necessity without interest.

transportation, regular trucks, refrigerated trucks, air cargo, railways accounts for 87.5%, 31.3%, 12.5%, and 12.5%, respectively (multiple answers available).

Raw materials are harvested all year round, but amount of harvest is increased in April and reaches to peak during June-October. Processing is suspended in April for maintenance of the processing lines and reaches to peak from June to November. The major processing method of horticultural crops is to dry fruits and vegetables, except for simple sorting, packaging and low-temperature storage.

Information sources for production and processing technologies are internet such as web site and specialized SMS, business peers and friends, and foreign company's experts, and they account for 50%, 31.3% and 25%, respectively (multiple answers available). They do not receive specialized information from government agencies.

Out of the target 16 companies, eight have accessed to bank loans, and three utilize government's guarantees. There is no commission or interest subsidy from the government. The purposes of the loan were purchase of processing equipment, construction of warehouse, purchase of saplings, purchase of agricultural machinery, greenhouse construction, and cold storage construction, and they account for 75.0%, 62.5%, 50.0%, 37.5%, 37.5% and 37.5%, respectively (Multiple answers available). If the loan is available, they want to spend the money for multiple purposes.

Main issues for loan are business planning, preparation of necessary documents, and collateral setting. 62.5% of the companies have new plans to get loan for purchase of processing machines, warehouses, greenhouse, agricultural machinery, procurement of saplings, cold storage, agricultural inputs and labor (multiple answers available). They account for 50%, 50%, 50%, 40%, 30%, 20%, 20% and 20%, respectively.

The following items are regarded as core issues in the horticulture value chain by the processing and export companies (60% of the respondents raised them as the most important issue).

① Production stage: Improvement of cultivation technology and agricultural mechanization
② Processing stage: Introduction or replacement of processing machines to improve hygiene and processing capacity, upgrading packaging materials and design
③ Storage/ Logistics stage: Expansion of refrigerated storage capacity, expansion of logistics centers, introduction of refrigeration/ freezing trucks by transport companies, and increase of volume in distributing lots
④ Sales/ Marketing stage: Creation of opportunities for business negotiations through agricultural expositions, building and continuing of good relationships with buyers

(3) Survey Results of Wholesalers and Middlemen

Horticultural wholesalers/middlemen hire 6.6 full-time employees and 50.6 seasonal employees on average. Mean sales amount per company is 16,250 USD, and handling volume per company is 197 tons/company (2019 forecast). All middlemen are also engaged in farming.

Wholesalers/middlemen sell crops to local retailers, local consumers/ groups directly, and local supermarkets, and they account for 83.3%, 26.7% and 10.0% of total amount of sold crops,

respectively. As for the modes of transportation, wholesalers/middlemen use ordinary trucks, refrigerated trucks, and railways, and they account for 93.3%, 6.7% and 3.3% of total amount (multiple answers available).

Information sources of production and processing technologies are internet such as web site and specialized SMS, business peers and friends, equipment manufacturers, engineering companies, traders, and agribusiness companies, and they account for 70%, 63.3%, 16.7%, 3.3%, 3.3% and 3.3%, respectively (multiple answers available). They do not access to specialized information from government agencies.

Seven companies out of the target 30 companies have accessed to bank loan. 70.0% of the surveyed respondents have plans to get new loans, and the purposes of the loan are purchase of saplings, greenhouse facilities, cold storage, processing machinery, irrigation systems, and agricultural machinery, and they account for 62.5%, 60%, 57.9%, 55%, 53.3%, 43.8%, respectively (multiple answers available). If loan is available, they wish improving on multiple purposes.

Following items are raised as core issues in horticulture value chain of horticultural crops (50% or more of respondents answered that they are as the most important issues).

① Production stage: Introduction of market-oriented new varieties, improvement of agricultural tools, agricultural mechanization, biological control of pest and disease
② Processing stage: Introduction of processing machines to improve hygiene and processing capacity
③ Storage / Logistics stage: Expansion of refrigerated storage capacity and expansion of logistics center
④ Sales / Marketing Stage: Branding, building and continuing of good relationships with buyers

(4) Utilization of Surveys Results of Production, Processing and Marketing

Demands of finance in all stages of the horticulture crop value chain are identified. In order to increase unit prices of crops, the growers want to promote shipping in winter season or earlier than usual, to introduce new varieties, to improve cultivation techniques, and to introduce greenhouse and cold storages. Agricultural related companies, which are involved in processing and marketing, also have their own farmlands, and they wish to introduce the latest processing equipment and agricultural mechanization, and to improve irrigation system.

In horticultural crop production, the growers want to learn new cultivation techniques, but they have few opportunities to access to technical training from the government and research institutes, thus, it is needed to provide such opportunities to them. Small-scale processing technologies, water-saving technologies, introduction of new varieties, and biological pesticides/ IPM are attracting the growers. Considering the situations, it is proposed to establish demonstration plots to present advanced techniques for the growers.

Processing and marketing agriculture-related companies want to visit horticultural expositions and food processing machines factories, take technical training for business negotiation. Desirable destinations to visit for the companies are Russia and Japan. TA for the companies will be organized

based on such needs. It is noted that the establishment of food safety certification (UzStandard Agency) and capacity development of the research institutes (fruits, vegetables, plant protection, and phytosanitary/ quarantine) will be implemented by the IBRD project, therefore, it is needed to cooperate with the activity.

7.3.2 Gender Mainstreaming

(1) Results of Gender Study

Women are very busy for household affairs and caring children, which leads to difficult for them to work outside as paid labors, and sometimes they have to manage both works. Farming has been traditionally regarded as men's work, and it has not been appropriate job for women, which have limited women's opportunities to engage in farming. Consequently, women have insufficient experiences in terms of agricultural techniques and management skill. On the other hand, both male and female groups raised common gender issues, and there is no big difference between their opinions very much. Apart from gender issues, some common issues for both men and women were raised, for instance, "Interest rate of loan is high", or "Khokimiyat enforced some growers to plant specified crops". It is noted that such issues can give severe impacts on women more than men, since women are more vulnerable.

As mentioned before, there are no big difference of gender issues between male and female group. Followings are main gender issues raised by both men and women at the gender workshop study:

- ✓ It is difficult handle both home affairs and agricultural works;
- ✓ Women do not have enough fund;
- ✓ Women cannot join in meetings organized during night-time;
- ✓ Traditional way of thinking prohibits women to be engaged in farming activities;
- ✓ Women are lack of knowledge of agricultural techniques, and information of agricultural inputs such as seeds, seedlings, fertilizer and chemicals;
- ✓ Women cannot drive vehicles and agricultural machines, since they don't have driving licenses, or even if they can do, they are condemned for driving;
- ✓ Women do not have enough marketing knowledge and information, which makes it difficult for them to negotiate with buyers;
- ✓ Women have difficulties to access to loan, since they don't have assets for collaterals, which are registered in their names; and
- ✓ Transportation cost is high, and it is difficult to find out transportation dealers, those issues are common for both men and women, though.

Women face various constraints for farming due to cultural/traditional background and shortage of technical and management skill. However, they are interested in income generation through horticulture crop production, process and sale. It is noted that both men and women have difficulties for access to loan, since they don't have enough collaterals, or they cannot pay for the high interest of

the loan. They want to know how to apply for loan and get loan with lower interests. Moreover, married women don't have their assets registered in their names as collateral to access to loan. The participants of the survey proposed some countermeasures against those issues, for instance, information exchange among crop growers, organization of agricultural training, collection of gender good practices and public relation of such successful cases and so on.

(2) Utilization of the Gender Study Results

It is very difficult for the Project to fix all the issues raised at the gender study. Any commercial banks have to secure credit by setting collateral as 125-130% of loan amount. Such situation causes difficult situations for crop growers, who do not have enough collateral, to access to loan. Thus, the credit guarantee service system through the Entrepreneurship Development Support Fund has been established by the Government and it has started operation since 2018. However, the balance of secured loan is only 599.2 billion SUM (=70.9 million US$), therefore, it is requested to expand the fund and functions to meet the needs of loan.

However, it is planned to establish demonstration farms for vegetable and fruits cultivation as TA during the Project implementation, which make it possible for growers to learn agricultural techniques, even though they are not the end-users. The trainers can facilitate the participants to exchange their experiences related to crop production and sale. The Project will be able to request Khokimiyat and "Council of Farmers, Dekhkan Farms and Owners Homestead Land" to invite farmers to the training, especially, female farmers. It is needed to consider women's available time and places for participation in the training when the training sessions are organized.

Through the Project, it is proposed to collect some successful case of female loan applicants by the Project and to propagate such cases among PFIs. Actually, a woman in Urta Chirchik District, Tashkent Region presented that her good works were introduced in a newspaper (see photo right). By using the results of gender study for the TA targeting PFIs, the bankers can understand gender issues in horticultur crop value chain and take any measures for gender mainstreaming in the loan.

One woman presented the newspaper article introducing her activity at the workshop in Urta-Chrchik District, Tashkent Region.

8. Similar Supporting Activities of Other Development Partners

8.1 Outline of TSL Projects Supported by DPs

As mentioned in previous section, DPs have been providing TSL to crop growers and agriculture-related companies through intermediate financial institutions in Uzbekistan, in order to

develop a horticulture value chain promotion from production to selling. This section shows overview of TSLs (or credit lines) and TA implemented by DP.

8.1.1 Assistance for Banks' Fund-raising

As mentioned earlier, there are insufficient funding resources, particularly long-term funding resources for the Uzbek banks due to their difficulty in mobilizing deposits caused by the remaining problem on public's confidence in banks and the underdeveloped long-term financial markets such as stock and bond market in Uzbekistan.

Under such a financial environment, in order to expand their mid-to-long-term loan portfolio to potential targets such as horticulture value chain sector, the banks have no choice but to get the long-term funding from DPs as well as IFIs.

If we focus on the horticulture sector, there have been recently several assistance projects funded by DPs. In particular, the on-going financial schemes similar with the JICA-TSL include IBRD's Horticultural Development Project (project loan amount: US$650 million), ADB's Horticulture Value Chain Project (US$352 million), and IFAD's Horticultural Support Project (US$28.3 million).

Both IBRD and ADB recognized a certain level of potential financial demand for horticultural value chain sector, and then decided on additional funds for Phase II. Judging from the overall loan market described by the total bank loans of US$22.8 billion, MSME finance gap of US$11.8 billion and US$0.74 billion of the maximum amount of the State Fund's credit guarantee services, we may say that the additional fund of approximately US$0.7 billion financed by both IBRD and ADB is still not enough to satisfy the actual financial demand for horticultural value chain sector. Although there is no available statistics on financial gap specifically for horticultural value chain sector, the interview survey with 7 PFI candidate banks (June 2019) shows that those banks expect financial demand of US$170 million – 200 million for the JICA Project (i.e., a conservative level of banks' estimate for achievable sub-loan disbursement during the initial two years in 2020-2021) besides IBRD's and ADB's Phase II projects. According to the UZAIFSA's survey (July 2019), the financial demand for those 7 banks in the Project is conservatively foreacted to be US$220 million in 2020-2025.

Table 8-1-1 Similar Projects with JICA-TSL Project

	DP	Project	Year	Project Amount (in mil US$)	Project Outline	Target Areas	PFIs
1	IBRD & SDC	Rural Enterprise Support Project	2009-15	120	570 projects; US$ 92.9 mil of loan disbursement	7 regions (including 88 cities)	4 (Hamkor, Mikrokreditbank, QQB, Turon)
2	IFAD	Horticultural Support Project	2013-19	28.3	TSL for garden crop and livestock via a commercial bank in Surxondaryo viloyati state	Surxondaryo viloyati state	7 (Turon, Mikrokreditbank, QQB, SQB, Hamkor, Ipoteka, Xalq)
3	IBRD	Horticultural Development Project	2015-23 2019-	Phase I: 150; Phase II: 500	TSL for farmers and agriculture-related SMEs via a commercial bank	All regions except Surxondaryo viloyati state	Phase I: 9 (Ipak Yuli, Turon, QQB, Ipoteka, NUB, Hamkor, SQB, Xalq, Asaka)

	DP	Project	Year	Project Amount (in mil US$)	Project Outline	Target Areas	PFIs
							Phase II: 10 (Among 9 PFIs, Hamkor withdrew from the Project, while Aloqa and Asia Alliance joined the Project)
4	ADB	Horticulture Value Chain Project	2017 -22 2018-22	Phase I: 154; Phase II: 198	TSL for farmers and agriculture-related enterprises via a commercial bank	All regions	Phase I: 8 (NBU, Asaka, Ipoteka, Hamkor, Davr, Ipak Yuli, Turon, SQB) Phase II: 7 (Among 8 PFIs, Hamkor withdrew from the Project)
5	IDB	Horticultural Development in Aral Sea Region	2016	78.8	TSL for value chain development including refrigerators	4 regions incl. Qaraqalpaqstan Respublikası, Navoiy, etc.	2 (Agrobank, Mikrokreditbank)
6	EU	Sustainable Development in Rural Areas of Uzbekistan	2015-17	10.1	Grant aid for value chain development in garden crop and livestock	6 regions including Andijan, Namangan, Syrdaria, etc.	-
7	GIZ	Sustainable Economic Development in Selected Regions of Uzbekistan	2009-13, 2014-16	5.5	Grant aid for garden crop, fishery, diary, agriculture business and green economy	4 regions including Surxondaryo viloyati state, Qaraqalpaqstan Respublikası,etc.	-

Sources: Relevant project documents prepared and disclosed by each DP.

Table 8-1-2 Sub-Loan Conditions of Three Similar On-going Financial Schemes

	ADB	IBRD	IFAD
Project goal	To improve access to market-based bank finance for farmers, agro-processing enterprises, owners and operators of cold storage facilities, trading and logistics service suppliers involved in the horticulture value chain. The project will help increase farm productivity, processing and storage capacity, and reduce post-harvest losses through upgrading and setting up intensive orchards, modern and efficient greenhouses, processing, storage and refrigeration facilities. This will in turn promote long-term economic and environmental sustainability and enhance profitability for farmers and agribusiness enterprises.	To increase the productivity and financial and environmental sustainability of agriculture and the profitability of agribusiness in the Project Area.	To increase the incomes and assets of smallholder farmers, processors and service providers within the horticultural sub-sector. The outcomes would be: 1) creation of a viable horticultural sub-sector with modern farming techniques, backward linkages to poor rural smallholders and improved access to domestic and international markets; 2) increased investments by producers, processors and service providers into productive assets in horticulture; and 3) improved farming efficiency and mobility of productive assets and produce.
Target areas	All regions	Phase I: 8 regions, Phase II: All regions except Surxondaryo viloyati state	Surxondaryo viloyati state

	ADB	IBRD	IFAD
Target sub-sector /products	1) the manufacture and/or supply of farm technology, machinery, and infrastructure, and the supply of farm inputs and services appropriate to the production of horticultural produce, 2) the production of horticultural produce, and 3) the post-harvest handling, storage, processing and marketing of horticultural products	Crops (50%), Agricultural extension and research (50%). Horticulture subsector.	1) small-scale, private sector, actual or potential horticulture producers operating up to a maximum of 5 hectares, with special provision for those, including Dekhkan farmers, operating less than 2 hectares; 2) horticulture-related small-scale market services providers; and 3) the rural unemployed.
Eligibility of sub-borrower	1) Be an entity of entrepreneurial activities established and registered in accordance with applicable laws of Uzbekistan and be in compliance with all laws and regulations of Uzbekistan; and 2) Not be a related party with respect to the PFI under the laws of Uzbekistan and the regulations of CBU.	Any types of legal form of enterprises and individual in Uzbekistan	-
Loan purpose (equipment &/or working capital)	Investment purposes (purchase of capital assets) only	Investment in cold storages and agro-processing equipment, as well as to support entire value chain development. Sub-loans cannot be used to finance activities that involve land acquisition or resettlement of people or loss of assets or income. * As a result, 30% was for cold storage, and others such as fruit processing facilities, irrigation, greenhouse.	New investment
Loan maturity (grace period)	A maximum tenor of 10 years with a grace period to be negotiated between the PFI and the sub-borrower	Not exceed 10 years or the amortization period of the asset, whichever is shorter. Working capital loans will be up to 18 months	Maximum duration of 6 years (grace period of up to 2 years)
Maximum loan amount per sub-loan project	US$5.0 million	US$2.0 million, Working capital loans will be up to US$200,000	US$ 600,000 (including loans and grant) for agri-businesses, US$100,000 for small-scale farmers (group lending: US$500,000), US$20,000 for Dekhkan farmers
Maximum financing share to total sub-project investment costs	75%	The project will finance up to 100% of the sub-loans/ leases in US Dollars, while requiring 20% co-financing from the PFIs for UZ Sum sub-loans/leases. The sub-borrowers will be required to contribute 20% of the sub-project financing for both USD and UZ Sums.	80% (* Co-financing would be a maximum of 20% of the total new investment cost. Beneficiary contribution would be a minimum of at least 20% of the total new investment cost.)
Lending rate	Normally 5-6% (US$). A rate of interest determined by each PFI based on its prevailing credit and risk management policies and procedures (including the cost for i) loan origination, ii) the provision of foreign exchange to service the ADB loan, and iii) credit risk and related capital charges.)	Normally 5.5% (US$) and 15-16% (Uzbek Sum), which is determined by each PFI	Normally 4.9-5.5% (US$), which is determined by each PFI

	ADB	IBRD	IFAD
Currency of sub-loans	US$, Uzbek Sum (no applications of loan in sum)	US$, Uzbek Sum (about 10% of total disbursed sub-loans as of now)	US$, Uzbek Sum (no applications of loan in sum)
Repayment schedule	Determined by PFI	Determined by PFI	monthly repayments
Guarantor	n.a. * PFI will be responsible for conducting due diligence on prospective sub-borrowers in accordance with the PFI's prevailing credit and risk management policies and procedures.	Determined by PFI	Determined by PFI
Collateral requirement	Collateral in the form of realizable, unencumbered assets equivalent to 125% of the value of the sub-loan	125% of the value of the sub-loan is required by PFI, which is a common banking practice in Uzbekistan	Determined by PFI
Other lending conditions	Maintain a debt-service coverage ratio in relation to the subproject/ sub-loan financing of 1.2	A sub-loan of more than US$1.0 mil requires the approval from PIU	-

Sources: Interview with each DP (April 2019), and relevant project documents prepared and disclosed by each DP.

8.1.2 Fund flow of credit lines implemented by DPs

(1) Disbursement of donor funds

There are two ways to disburse funds from DPs to PFIs.

One is ADB procedure, disbursing fund to PFIs based on the 6-month financial forecast and collect information about actual disbursement from PFIs after the fund disbursement. PFIs report financial forecast to UZAIFSA, by total amount and breakdown of the funding needs by the demand list (sub-loan basis). After checking the documents by UZAIFSA, UZAIFSA submits a funding request to ADB and ADB directly disburse fund to each PFI. This method looks like JICA's "Advance Procedure" but the big difference is that DP (ADB) sends money directly to PFIs.

Another procedure is applied by IBRD and IFAD. UZAIFSA saves a certain amount of fund disbursed from DP and UZAIFSA disburses a fund to PFIs based on the actual sub-loan applications. UZAIFSA keeps a certain amount of money in their bank account, disbursed from DPs in advance, and UZAIFSA sends funds to PFIs based on the requested amount submitted from PFIs. In IBRD case, if the requested sub-loan amount is USD 1 million or more, IBRD checks the sub-loan purpose and validity of the sub-loan amount after checking eligibilities by UZAIFSA. When IBRD approves the request, UZAIFSA disburses the fund to the PFI. To verify the requested sub-loan amount, end-users are supposed to attach cost estimation documents from 3 companies to the sub-loan application. The disbursement procedure from the executing agency to PFIs looks like JICA's "Special Account Procedure".

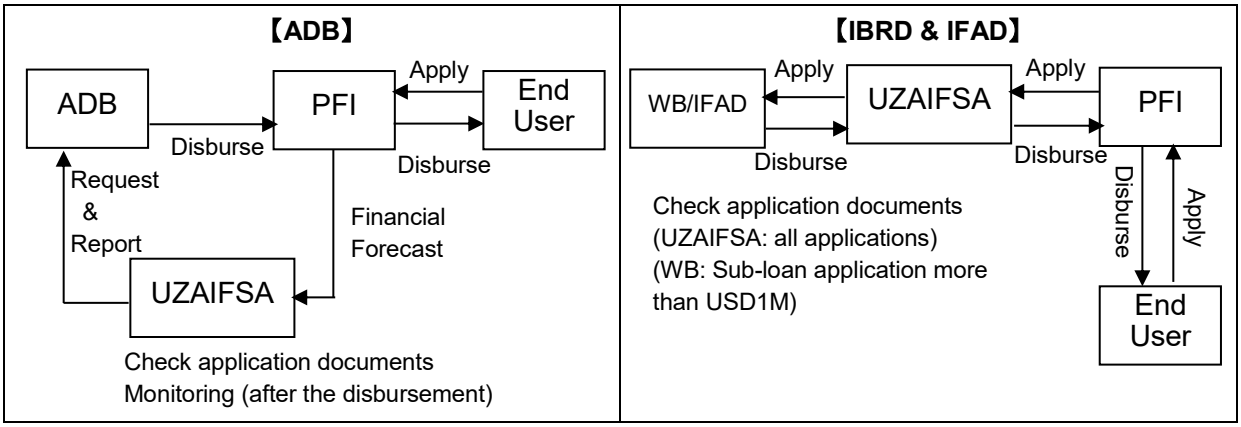


Figure 8-1-1 Fund Flow

While ADB disbusrses fund to PFIs based on the potential funding needs, IBRD disburses PFIs based on the actual funding needs. To confirm the loan purpose, IBRD project is effective, however, the processing time from application from PFI to disbursement by UZAIFSA takes much longer than the ADB process. Therefore, some banks requested JICA to make the processing time as short as possible because the most important for customers especially crop growers and agro-related businesses was timely loan provision. Some banks which involved in both ADB and IBRD credit lines commented in the interview that ADB procedure usually took for 2 – 3 weeks while IBRD took about 2 months, sometimes 6 months at the longest case, in the case that IBRD involved in the eligibility check. For IFAD case, receiving fund request based on the actual funding needs like IBRD, the processing time is 7 – 10 days in average, which is also shorter than the IBRD credit line. From IBRD side, they recognize the matter and are trying to make the process shorter by reviewing and optimizing the document requirements.

To make better design for funding process, one of the PIU members from ADB project advised that it could be effecticve if JICA checked eligibility and disbursement process by picking up first few sub-loan documents from PFIs as a pilot disbursement.

(2) Bank account for project management

UZAIFSA creates a bank account for each donor project to manage the fund. UZSIFSA manages the fund in USD account for sub-loan disbursement and also have UZS account as administration costs should be needed in the local currency. UZAIFSA can select any national or private bank which provides the best service to UZAIFSA at the time of selecting bank account, which means that it is not necessary to select the bank from PFIs. Also, they can change the bank during the project implementation if the DP approves for the change.

Table 8-1-3 Bank Account at UZAIFSA

Project	Name of the project account [currency]	Purpose of use of the bank account	Bank name	Ceiling amount of the account
ADB HVP	Special Account [USD][UZS]	Project operating cost for PIU (administration cost, etc.)	Ravnak Bank	Project cost for 6 months
IBRD HDP	Designated Account	1) Sub-loan disbursement	Turkiston Bank	USD20M

Project	Name of the project account [currency]	Purpose of use of the bank account	Bank name	Ceiling amount of the account
	[USD][UZS]	2) Project operating cost for PIU (administration cost, etc.)		
IFAD HSP	Designated Account [USD][UZS]	1) Sub-loan disbursement 2) Project operating cost for PIU (administration cost, etc.)	Ravnak Bank	USD2M

After the commencement of the project, UZAIFSA receives the fund from each DP. In the case of ADB project, UZAIFSA requests ADB for the fund up to 6-months forecast of the sub-loan requested from PFIs and the project management cost. ADB disburses project cost portion to UZAIFSA's bank account (Special Account) in USD and the sub-loan portion to each PFI. In the case of IBRD and IFAD, UZAIFSA requests each DP for a maximum amount of the Designated Account in USD and after the first disbursement, UZAIFSA sends a request for replenishment based on the actual amount used in the project.

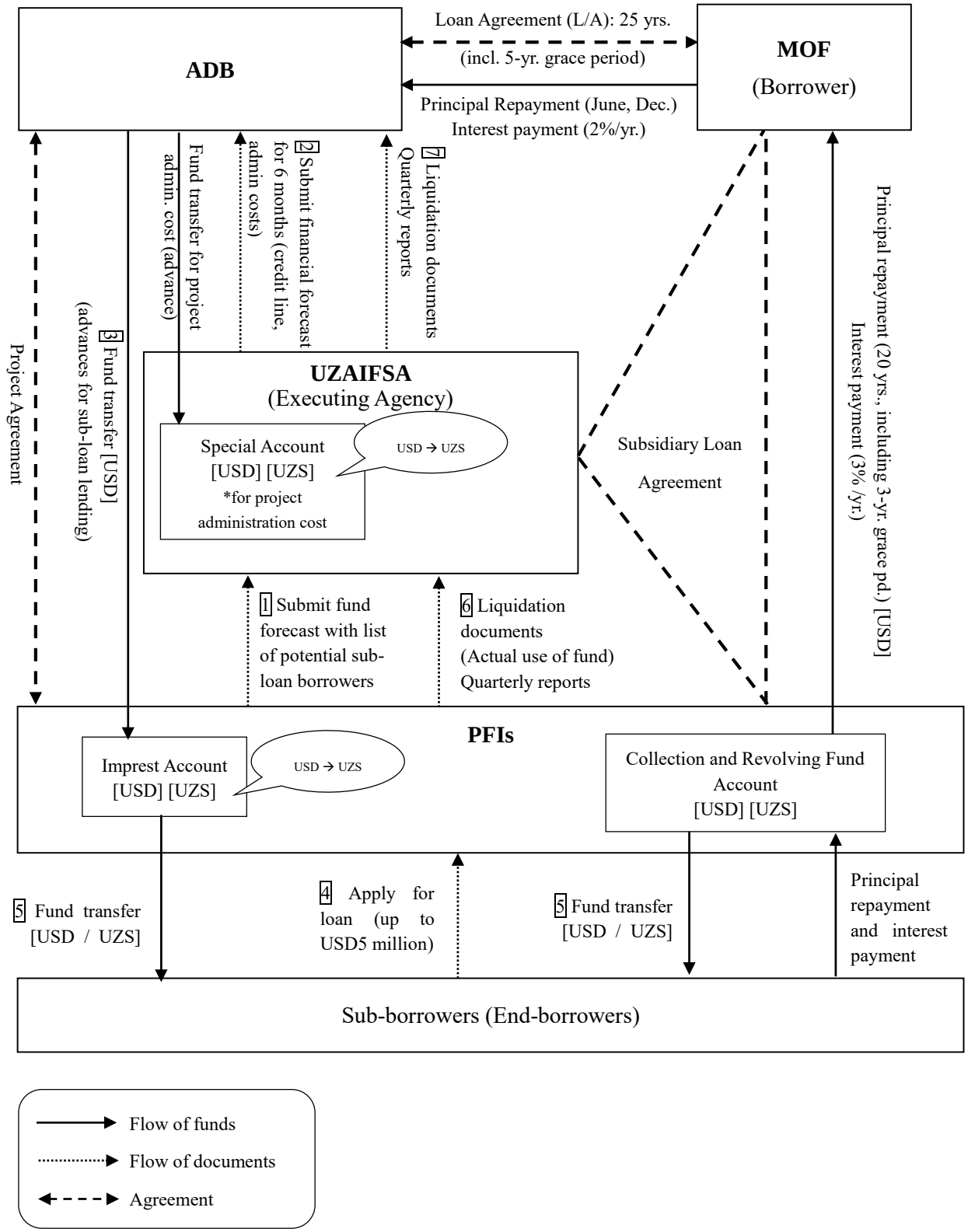
Basically, UZAIFSA manages fund disbursement, and reporting and monitoring of the project, and MOF receives principal and interest directly from PFIs. Therefore, UZAIFSA does not create bank accounts for collecting principal and interest from PFIs. Also, as for revolving fund management, since each PFI collects and reallocates to PFIs until the fund is returned to the government, there is no need to open "Revolving Fund Account" in UZAIFSA.

(3) Fees (IBRD)

Besides interest rate mentioned in the previous section, in the case of IBRD project, GOU pays Front-end Fee to IBRD with 0.25% of total loan amount at the beginning of the project, and also 0.25% of Commitment Charge for undrawn loan amount every year. MOF also charges PFIs these fees accordingly.

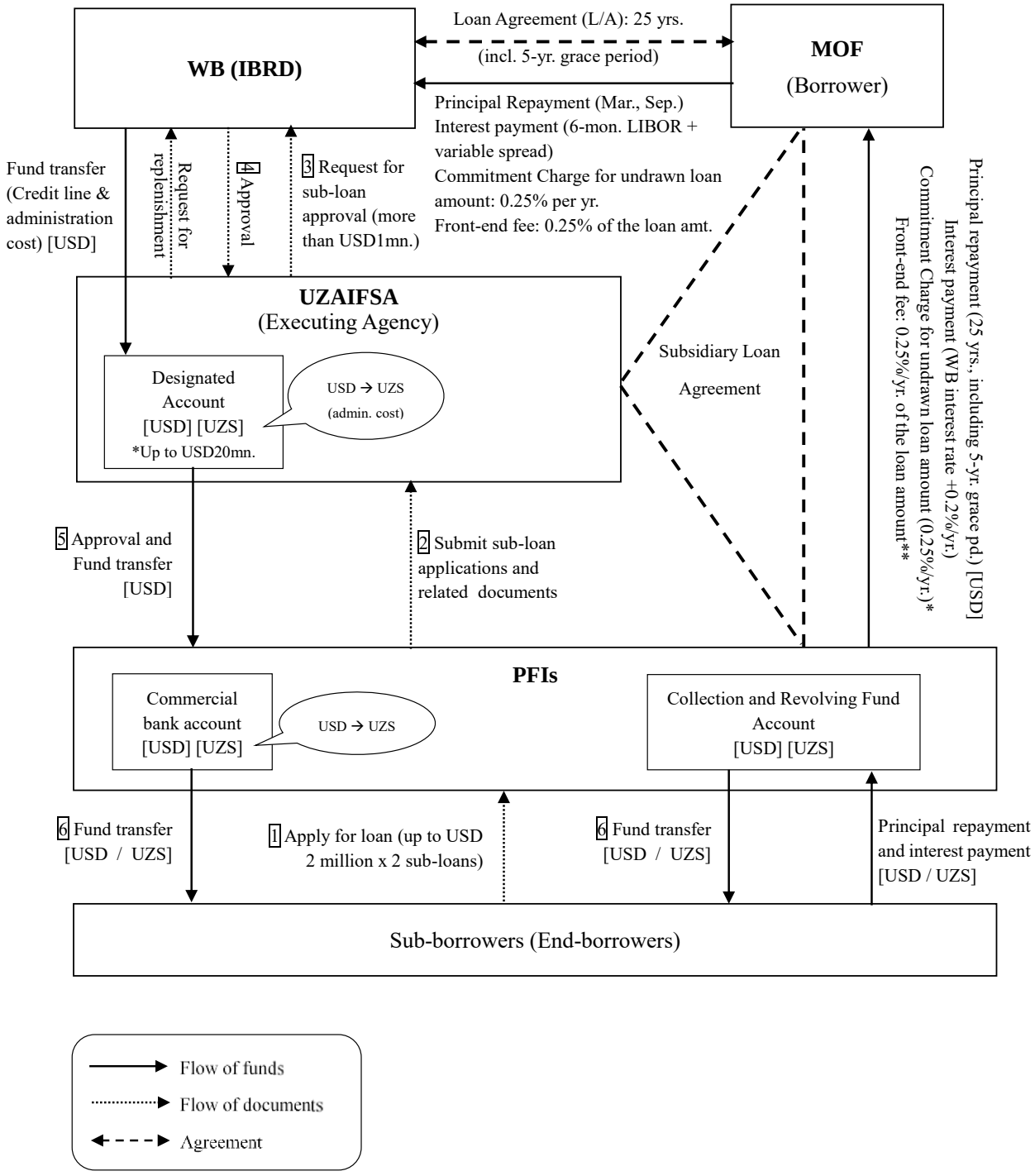
The detailed fund flow for ADB and IBRD are shown in the next pages.

Figure 8-1-2 Detailed Fund Flow (ADB: Horticulture Value Chain Project)



(Created from ADB Administration Manual and interviews with PIU)

Figure 8-1-3 Detailed Fund Flow (IBRD: Horticulture Development Project)



*Commitment Charge: pay annually for undisbursed loan amounts (0.25% of undisbursed loan amount)

**Front-end Fee: pay one time only, at the time of loan effectiveness (0.25% of total loan amount)

Note: The fund flow of IFAD is basically the same as WB fund flow.

(Created from IBRD HDP Administration Manual and interviews with PIU)

8.1.3 TSL Target and Loan Amount (ADB and IBRD TSLs)

According to UZAIFSA which is the implementation agency of ADB-TSL and IBRD-TSL, ADB-TSL sub-loaned 150.8 million US$ to 162 borrowers in total as shown in Table 8-1-4 and IBRD-TSL sub-loaned 144.0 million US$ to 233 borrowers in total as shown in Table 8-1-5 as of June 2019.

Table 8-1-4 Outline of ADB-TSL (as of June 2019)

Types		No of Borrower	Area/Capacity			Investment (x 1000 US$)			Ave. Investment (x 1000 US$)		
			unit	Total	Ave.	TSL	Own	Total	TSL	Own	Total
1	Greenhouse	53	ha	127.6	2.4	60,690.2	32,244.1	92,934.3	1,145.1	608.4	1,753.5
2	Intensive Orchard	10	ha	3,033.0	303.3	12,719.4	6,871.5	19,590.9	1,271.9	687.2	1,959.1
3	Cold Storage	59	ton	50,700.0	859.3	18,603.3	12,491.5	31094.8	315.3	211.7	527.0
4	Processing	21	ton	90,531.0	4,311.0	26,358.8	39,049.9	65,408.7	1,255.2	1,859.5	3,114.7
5	Complex & Others	19	-	-	-	32,396.7	26,358.7	58,755.3	1,705.1	1,387.3	3,092.4
	Total	162	-	-	-	150,768.4	117,015.6	267,784.0	930.7	722.3	1,653.0

Source: JICA Survey Team made from UZAIFSA's Information

Table 8-1-5 Outline of IBRD-TSL (as of June 2019)

Types		No of Borrower	Area/Capacity			Investment (x 1000 US$)			Ave. Investment (x 1000 US$)		
			unit	Total	Ave.	TSL	Own	Total	TSL	Own	Total
1	Greenhouse	47	ha	66.1	1.4	34,315.8	12,374.0	46,689.8	730.1	263.3	993.4
2	Intensive Orchard	29	ha	4,527.2	156.1	26,267.4	11,625.7	37,893.1	905.8	400.9	1,306.7
3	Cold Storage	104	ton	101,638.0	2,162.5	40,280.3	19,812.2	60,092.5	857.0	421.5	1,278.6
4	Processing	38	ton	136,178.0	3,583.6	32,241.7	16,625.1	48,866.8	848.5	437.5	1,286.0
5	Complex & Others	15	-	-	-	10,935.3	4,738.7	15,674.0	729.0	315.9	1,044.9
	Total	233	-	-	-	144,040.5	65,175.7	209,216.2	618.2	279.7	897.9

Source: JICA Survey Team made from UZAIFSA's Information

ADB-TSL has firstly financed greenhouse facilities in terms of sub-loan amount, followed by complex facilities & others and processing facilities. While cold storage facilities are the largest in terms of number of borrowers, the average amount of the sub-loans is small in accordance with relatively small capacity of the storage facilities. The average sub-loan amount is 930.7 thousand US$ while the average total investment amount to a project is 1,653.0 thousand US$. The borrowers manage more than 40 % of the total investment amount or 722.3 thousand US$ from their own resources in average.

IBRD-TSL has evenly financed facilities in the whole value chain in terms of sub-loan amount. Cold storage facilities stand out for the number of borrowers and the average capacity of the storage facilities is bigger than that of ADB-TSL. On the contrary, the average area or capacity of other facilities covered by IBRD-TSL are smaller than those of ADB-TSL. The average sub-loan amount is 618.2 thousand US$ that is only about 2/3 of the amount of ADB-TSL. The average total investment amount to a project, 897.9 thousand US$, is also smaller than the amount of ADB-TSL. The borrowers manage about 30 % of the total investment amount or 279.7 thousand US$ from their own resources in average.

8.1.4 End-Users (ADB and IBRD TSLs)

According to Table 8-1-6 and 8-1-7, there are a small number of *Fermers* as the TSL end-users in the both TSLs. While the end-users are dominated by Non-*Fermers*, LLCs (Limited Liability Companies) have an extreme large portion of the Non-*Fermers*. The situation is same even among borrowers for investing crop production facilities, i.e. greenhouse facilities and intensive orchards which are expected to be managed mainly by *Fermers*.

Table 8-1-6 End-Users of ADB-TSL (as of June 2019)

Types		*Fermer*	Non-*Fermers*					Total
			Limited Liability Company	Private Enterprise	Joint Stock Company	Others	Total	
1	Greenhouse	4	46	2	1	0	49	53
2	Intensive Orchard	1	9	0	0	0	9	10
3	Cold Storage	8	40	9	1	1	51	59
4	Processing	1	17	2	1	0	20	21
5	Complex & Others	3	14	2	0	0	16	19
Total		17	126	15	3	1	145	162

Source: JICA Survey Team made from UZAIFSA's Information

Table 8-1-7 End-Users of IBRD-TSL (as of June 2019)

Types		*Fermer*	Non-*Fermers*					Total
			Limited Liability Company	Private Enterprise	Joint Stock Company	Others	Total	
1	Greenhouse	6	30	9	1	1	41	47
2	Intensive Orchard	8	19	2	0	0	21	29
3	Cold Storage	18	57	25	1	3	86	104
4	Processing	5	22	11	0	0	33	38
5	Complex & Others	0	11	3	0	1	15	15
Total		37	139	50	2	5	196	233

Source: JICA Survey Team made from UZAIFSA's Information

The Government of Uzbekistan has a policy to promote relatively large-scale agricultural producers as examined in "2.5 Agrarian System". Investors tend to make large investment in developing agricultural value chains according to the Government policy. As shown in Tables 8-1-4 and 8-1-5, borrowers of ADB-TSL and IBRD-TSL spend a certain big amount of own fund to their invested projects in addition to the sub-loaned fund. Moreover, they need to arrange a collateral for the sub-loan. ADB-TSL and IBRD-TSL mighty be an unaffordable loan scheme for common *Fermers* who run a family farming business. There are not a small number of *Fermers* investing Agri-firms. Some of them have established a new Agri-firms together with fellows in order to make a large amount of fund for new investment. In any case, the above tables suggest a high possibility that wealthy individuals succeeded in some business are major part of the management of Agri-firms.

8.1.5 Situation of Loan to Horticulture Related Companies (ADB and IBRD TSLs)

Under the ADB project of Horticulture Value Chain Project Phase-1 with additional loan (2017-present), total 162 sub-projects have been implemented. Out of them, LLC (Limited Liability Company), farm enterprises (including *Fermer*) and individual enterprise account for 78%, 11%, and 9%, respectively. The purposes of loans are for cold storage, greenhouse, processing equipment, intensive fruit garden, for agri-machinery, and percentages of them are 39%, 32%, 17%, 7% and 6%, respectively. The maxim loan amount is 5 million US$, 90% of borrowers are less than 2 million US$, while 50% of borrowers are less than 0.5 million US$. Beneficial areas are nationwide, but the loan amounts are relatively larger in Tashkent, Samarkand, Syrdarya and Fergana Regions. Cold storage construction is concentrated in Fergana and Surkhandarya Regions. The sub-projects are invested by using loan and own fund, they account for 56.3% and 43.7%, respectively. The average loan amount per sub-project is 930.7 thousand US$.

Table 8-1-8 Loan Beneficiaries and Loan Purposes funded by ADB

Region	No. of Borrower	Type of Organization					Project Cost			Type of Investment					
		Limited Liliability Company	Farm Enterprise	Private Enterprise	Joint Stock Company	Family Enterprise	Loan Amount	Private Fund	Total Cost	Cold Storage	Process -ing	Packag -ing	Green House	Intensive Orchard	Agri-Machinery
							1000 US$	1000 US$	1000 US$						
Karakalpakistan	5	5	0	0	0	0	1,823.0	1,180.6	3,003.6	3			2		
Andijan	12	9	1	2	0	0	7,177.3	4,819.2	11,996.4	4	6		3	1	
Bukhara	15	14	1	0	0	0	8,743.5	3,834.4	12,577.9	5	1		9	1	
Jizzakh	5	5	0	0	0	0	7,208.3	5,225.0	12,433.3	3	1		2	1	
Kashkadarya	11	10	0	1	0	0	5,553.9	4,006.0	9,559.9	8		1	2		
Navoi	6	5	0	1	0	0	8,703.2	4,244.7	12,947.9				6		
Namangan	7	6	1	0	0	0	8,629.2	4,817.3	13,446.4	3	2		1	2	
Samarkand	22	15	4	2	1	0	21,461.6	16,272.0	37,733.6	6	6		7	5	
Syrdarya	8	6	0	1	1	0	16,198.6	12,188.6	28,387.2	2	1		6		
Surkhandarya	19	12	3	4	0	0	15,209.5	11,433.5	26,643.0	13	5		2		3
Tashkent	21	18	2	1	0	0	29,585.2	36,263.1	65,848.3	3	4	1	8	3	2
Fergana	20	14	2	3	0	1	14,019.8	8,476.6	22,496.3	16	2		3		
Khorezm	11	7	3	1	0	0	6,455.4	4,254.7	10,710.1	3	2		6		
Total	162	126	17	16	2	1	150,768.4	117,015.6	267,784.0	69	30	2	57	13	5
Prcentage	100.0%	77.8%	10.5%	9.9%	1.2%	0.6%	56.3%	43.7%	100.0%	39.2%	17.0%	1.1%	32.4%	7.4%	2.8%

Source: UZAIFSA, as of June, 2019

Table 8-1-9 Scale of Loan Amounts funded by ADB

Region	No. of Borrower	Loan Amount (US$)														
		from	100,001	200,001	300,001	400,001	500,001	600,001	700,001	800,001	900,001	1,000,001	1,500,001	2,000,001	3,000,001	4,000,001
		to 100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000	1,000,000	1,500,000	2,000,000	3,000,000	4,000,000	5,000,000
Karakalpakistan	5		2		1	1		1								
Andijan	12		2	2	1	2		2				2	1			
Bukhara	15	1	4		2	5						1	2			
Jizzakh	5			1			2		1							1
Kashkadarya	11		4	2	1	1	2						1			
Navoi	6		1		1	1						1	1			1
Namangan	7		1	3							1		1			1
Samarkand	22	3	1	1	2	2	2	2	1		3	1	2		1	1
Syrdarya	8						1	1			3		1			2
Surkhandarya	19	1	4	6	1	1		1	1			1	1		1	1
Tashkent	21	1	2	1	3		2	1		1	2	2	1	2	1	2
Fergana	20		6	1	1	5	2		2		1				2	
Khorezm	11	1	1	1		1	2	2			1	2				
Total	162	7	28	18	13	19	13	10	5	1	11	10	11	2	5	9
Percentage by loan amount		4.3%	17.3%	11.1%	8.0%	11.7%	8.0%	6.2%	3.1%	0.6%	6.8%	6.2%	6.8%	1.2%	3.1%	5.6%
Percentage by accumlated amount		4.3%	21.6%	32.7%	40.7%	52.5%	60.5%	66.7%	69.8%	70.4%	77.2%	83.3%	90.1%	91.4%	94.4%	100.0%

Source: UZAIFSA, as of June, 2019

Under the IBRD project of Horticultural Development Project Phase-1 (2017-2021), total 233 sub-projects have been implemented. The borrowers are LLC (Limited Liability Company), individual enterprise and farm enterprises (including *Fermer*), and the percentages are 60%, 22% and 16%, respectively. The purposes of loans are installation of cold storage, greenhouse, processing equipment, intensive fruit garden, packaging machine, and they account for 45%, 20%, 16%, 12% and 6%, respectively. The maxim loan amount is 2 million US$, 85% of borrowers are less than 1 million US$, while 50% of borrowers are less than 0.5 million US$. Beneficial areas are nine regions, but the loan amounts are relatively larger in Samarkand and Tashkent Regions. The loan amounts are concentrated for cold storage in Tashkent and Kashkadarya Regions and for greenhouse in Samarkand and Tashkent Regions. The investments were done by using loan and private fund, and they account for 68.8% and 31.2%. The average loan amount per sub-project is 618.2 thousand US$.

Table 8-1-10 Loan Beneficiaries and Loan Purposes funded by IBRD

Region	No. of Borrower	Type of Organization							Project Cost			Type of Investment				
		Limited Liliability Company	Farm Enterprise	Private Enterprise	Joint Stock Company	Indivisual Entreprenaur	Family Enterprise	Unitary Enterprise	Loan Amount 1000 US$	Private Fund 1000 US$	Total Cost 1000 US$	Cold Storage	Process -ing	Packag -ing	Green House	Intensive Orchard
Karakalpakstan	3	1	1	0	0	1	0	0	1,985.1	839.1	2,824.2	1	0	0	2	0
Andijan	17	7	3	5	0	0	0	0	10,509.6	5,765.6	16,275.2	7	5	0	3	2
Bukhara	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0	0	0	0	0
Jizzakh	11	9	1	1	0	0	0	0	4,835.2	2,463.4	7,298.6	1	2	1	2	5
Kashkadarya	21	10	4	7	0	0	0	0	7,909.9	3,366.4	11,276.3	15	3	1	2	0
Navoi	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0	0	0	0	0
Namangan	19	10	0	9	0	0	0	0	8,287.7	4,347.7	12,635.4	13	4	0	1	1
Samarkand	60	38	13	9	0	0	0	0	54,834.8	23,717.4	78,552.2	15	12	4	17	12
Syrdarya	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0	0	0	0	0
Surkhandarya	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0	0	0	0	0
Tashkent	49	38	7	2	0	1	0	1	37,631.8	15,041.9	52,673.7	15	8	7	11	8
Fergana	31	12	6	11	1	0	1	0	10,675.7	6,484.5	17,160.2	23	3	2	2	1
Khorezm	22	14	1	6	0	1	0	0	7,370.6	3,149.7	10,520.3	14	1	0	7	0
Total	233	139	36	50	1	3	1	1	144,040.5	65,175.7	209,216.1	104	38	15	47	29
Prcentage	100.0%	59.7%	15.5%	21.5%	0.4%	1.3%	0.4%	0.4%	68.8%	31.2%	100.0%	44.6%	16.3%	6.4%	20.2%	12.4%

Source: UZAIFSA, as of June, 2019

Table 8-1-11 Scale of Loan Amounts funded by IBRD

Region	No. of Borrower	Loan Amount (US$)														
		from 1 to 100,000	100,001 200,000	200,001 300,000	300,001 400,000	400,001 500,000	500,001 600,000	600,001 700,000	700,001 800,000	800,001 900,000	900,001 1,000,000	1,000,001 1,500,000	1,500,001 2,000,000	2,000,001 3,000,000	3,000,001 4,000,000	4,000,001 5,000,000
Karakalpakstan	3				1		1				1					
Andijan	17	4	2	0	2	1	1		2	2	1		2			
Bukhara	0															
Jizzakh	11	1	2	4	1		1				1		1			
Kashkadarya	21	5	6	4		2	2						2			
Navoi	0															
Namangan	19	2	3	3	5	2			1	1	1	1				
Samarkand	60	1	5	2	3	10	8	5			9	5	12			
Syrdarya	0															
Surkhandarya	0															
Tashkent	49	4	4	3	4	9	2	3	2	1	6	3	8			
Fergana	31	5	12	4	2	2	1	2			2		1			
Khorezm	22	2	3	6	3	3	1	3	1							
Total	233	24	37	26	21	29	17	13	6	4	21	9	26	0	0	0
Percentage by loan amount		10.3%	15.9%	11.2%	9.0%	12.4%	7.3%	5.6%	2.6%	1.7%	9.0%	3.9%	11.2%	0.0%	0.0%	0.0%
Percentage by accumlated amount		10.3%	26.2%	37.3%	46.4%	58.8%	66.1%	71.7%	74.2%	76.0%	85.0%	88.8%	100.0%	100.0%	100.0%	100.0%

Source: UZAIFSA, as of June, 2019

8.2 Overview of Technical Assistance

8.2.1 TA on Credit Appraisal

Among the above-mentioned financial schemes, both IBRD's Horticultural Development Project and ADB's Horticulture Value Chain Project have provided technical assistance with PFIs.

IBRD provided PFIs with capacity building services to improve their skills in appraising agriculture-related investment loans and developing new financial products for value chain development though: i) 5-day-training program for loan officers and branch managers of PFIs in terms of value chain financing products and tree-crop financing methodologies; and ii) a long-term TA to ensure that PFIs can appropriately manage the risks in collaboration with IFC. On the other hand, ADB facilitated training seminars for 265 PFI staff in total in terms of environmental safeguards.

Besides those capacity building services and training seminars, IFC has developed and introduced a web-based CLARA (Cash-flow-Linked Agri-Risk Assessment) risk assessment system in such countries as Kyrgyz, Tajikistan, Azerbaijan, Ukraine, Bosnia, Kosovo and Srbia. Since 2017, IFC has started to introduce it within such Uzbek banks as Hamkorbank, Ipak Yuli Bank, Ipoteka Bank, Xalq Bank, Savdogarbank, QQB, Madad Invest Bank, Orient Finans Bank, and Turonbank. (cf. Mikrokreditbank has just signed a contract with IFC in terms of the introduction of CLARA, but it has not yet been introduced within the bank.)

The CLARA system is a web-based tool, which uses MySQL as a database server designed for financial intermediaries to check with credit requirments, payment periods, and revenue generation of the business to repay the loan. Given a situation where cash flow-based lending is not realistic at the moment generally in Uzbekistan, this IT solution can standardize and streamline cash flow management of agricultural borrowers, and thus assist financial institutions for undertaking effective credit assessment and monitoring.

This solution doesn't give a credit decision, nor it provides non-financial factor assessment, and even credit score on each loan application of farmer customers. Yet, it provides bank officers with the necessary quantatitative data for credit decision and monthly cash flow monitoring on farmer customers.

As indicated by some Uzbek banks, the CLARA tool is useful for analysing risks on each farmer's loan project through the following: i) preparing future cash flow projection for the entire loan tenor, ii) preparing monthly and detailed cash flow projections, iii) comparing available data for similar businesses and projects, and iv) identifying the financial needs for working capital requirement as well as agricultural equipment, etc.

In addition, the significant feature of the CLARA tool is that the database within the system includes production flow charts and market prices of various agricultural products (updated on a quarterly basis). So, for example, Ipak Yuli Bank uses the system as a tool for feasibility study on their sensitivity to changes in the loan project's initial parameters. Also, IFAD has recently required partner financial institutions to adopt the CLARA system within the IFAD-sponsored agricultural development projects in Uzbekistan.

8.2.2 TA to accelerate the Value Chain Development

ADB, IBRD and IFAD have provided TA component to accelerate the development in addition to TSL sub-loans as shown in Table 8-2-1.

Table 8-2-1 TA to accelerate the Value Chain Development in Similar Projects (ADB, IBRD & IFAD)

Sector	ADB	IBRD	IFAD
Project	Horticulture Value Chain Development Project	Horticulture Development Project	Horticulture Support Project
Target Area	Throughout the country	8 Regions (Andijan, Jizzak, Ferghana, Kashkadarya, Karakalpakstan, Namangan, Samarkand, and Tashkent)	Surkhandarya Region
Research & Development	None	● Provision of research equipment & facilities and training ➢ Shredder Institute for Fruit Growing, Viticulture and Winemaking (Mirzayev Institute) ➢ Uzbek Research Institute for Vegetables Melons and Potato (RIVMP) ➢ Uzbek Scientific Plant Protection Institute ● Research cooperation and development of research manuals for "Uzglavgoskarantin; Laboratory Research Center for Plant Quarantine"	● Capacity building to produce seedlings and saplings in "Denau branch of the Mirzayev Fruit-growing Institute ➢ Renovation of buildings & facilities ➢ Provision of equipment ➢ Introduction of promising varieties ➢ International technical cooperation
Producers	● Training on "Production and growing of fruits and vegetables" and associated gender development and main streaming	● Demonstration plot & farmers training for production and post-harvest handling for vegetables & fruits in every target region* (manage jointly by core farmers, local specialists & IBRD experts) ● Promoting participation in agriculture fairs & events in and out of Uzbekistan	● Training seminars by international and local specialists in 7 places in Surkhandarya Region (production & post-harvest handling technology)
Marketing, Processing & Agribusiness	● Training on "Storage and processing of fruits and vegetables" and associated gender development and main streaming ● Training on "Delivery of fruit and vegetable products to the consumer and exporting" and associated gender development and main streaming	● Promoting agribusinesses to participate in the above-mentioned demonstration plot and training ● Promoting agribusinesses to participate in agricultural fairs & events in and out of Uzbekistan	● Capacity building of agribusinesses for business planning ● Promoting agribusinesses to participate in agricultural fairs ● Supporting representatives of agribusinesses to participate in international agricultural exhibitions ● Organizing study tours to advanced areas in and out of Uzbekistan (agribusiness, growers and local government) ● Training seminars by international specialists (post-harvest handling technology)
Supporting System & Organization	None	● Establishment and management of "Knowledge Management and Market Information System (web-based)" ● Establishment of "Fruits and Vegetable Industry Association of Uzbekistan" ● Suggestions to the national policy for international and domestic marketing	● Development of seminar textbooks ➢ Fruits production ➢ Vegetables production ➢ Storage, distribution and processing

*Actually, extension activities by using demonstration plots have been rarely organized according to the WB personnel. It is difficult to implement extension in Uzbekistan due to budget shortage.

Source: JICA Survey Team made from related Information

Though contents of TA components in the above projects are not same, every project doesn't include TA contents concentrating on only sub-loan borrowers. Instead, all projects rather organize various kinds of seminars and workshops targeting wide range of candidate borrowers who are many and unspecified growers or agribusinesses in target areas. Also, all projects hire many local resource people, e.g. research staff of local institutes, agronomists in regions, agribusiness, etc. for instructors/speakers of the seminars and the workshops. While IBRD and IFAD projects are more generous than ADB project in TA support, their assistance covers not only growers and agribusinesses who are expected to be sub-loan borrowers, but also research institutes and organizations who are playing a role in backup the whole horticulture value chain.

Due to nature of TSL schemes, it is impossible to identify a specific borrower until just before a sub-loan commitment. This limitation must be the main reason why the all projects have designed TA components targeting a wider range of stakeholders in terms of area and in terms of number. In addition, it is considered that un-developed public agricultural extension system in Uzbekistan hampers the TA components to take careful and detailed approach to specific individual borrowers. From a viewpoint of TA impact, it is concerned that the TA components only provide a standardized cursory information mainly through classroom lectures and seminars. To the contrary, it is better to narrow down object person for TA with clear criteria in order to achieve an expected impact. However, a large number of borrowers of TSL sub-loan spread through a wide area in general. It is, therefore, difficult to achieve a good balance between the efficient implementation of TSL and the effective implementation of TA. It seems that each of the project designs a realistic TA plan covering wider areas and wider beneficiaries considering the difficulty.