THE REPUBLIC OF UZBEKISTAN

THE DATA COLLECTION SURVEY ON AGRICULTURE SECTOR IN REPUBLIC OF UZBEKISTAN

Final Report

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Japan International Cooperation Agency (JICA)

Hokkaido Intellect Tank

NTC International Co. Ltd.

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List of Abbreviations

Abbreviation	Full name
ADB	Asian Development Bank
AK	Aksiyadorlik Kompaniyasi
BISM	Basin Irrigation Systems Management
C/P	Counter part
CA	Controlled Atmosphere
CGIAR	Consultative Group on International Agricultural Research
CIS	Commonwealth of Independent States
DFR	Draft Final Report
EEU	Eurasian Economic Union
EU	European Union
F/S	Feasibility Study
FAO	Food and Agriculture Organization
FAOSTAT	FAO Statistical Databases
FEZ	Free Economic Zone
FR	Final Report
FSSC	Food Safety System Certification
FVC	Food Value Chain
GAP	Good Agricultural Practice
GDF	Gold Dried Fruits Export
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit
Gosarkhitektstroy	the State Committee for Architecture and Construction
GOST	GOSSTANDART
HACCP	Hazard Analysis and Critical Control Points
HC	Holding Company
HGME	Hydro-geological Melioration Expedition
IBRD	International Bank for Reconstruction and Development
ICR	Inception Report
ICWC	Interstate Coordination Water Commision of Central Asia
IDB	Islamic Development bank
IFAD	International Fund for Agricultural Development
IFAS	International Fund for Saving the Aral Sea
IMF	International Monetary Fund
IRR	Internal Rate of Return
ISO	International Organization for Standardization
JA	Japan Agricultural Cooperatives
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency

Abbreviation	Full name
JIRCAS	The Japan International Research Center for Agricultural Sciences
JSC	Joint Stock Company
KOICA	Korean International Cooperation Agency
LC	Logistics Center
LCC	Life Cycle Cost
MAWR	Ministry of Agriculture and Water Resources of the Republic of Uzbekistan
NBU	National Bank for Foreign Economic Activity of Uzbekistan
ODA	Official Development Assistance
PEST	Political, Economic, Social and Technological
PP	Presidential Proclamation
PSA	Production Sharing Contract
RIIWP	Research Institute of Irrigation and Water Problem
RRA	Rural Restructuring Agency
SDC	Swiss Agency for Development and Cooperation
SNS	Social Network Service
SRTM	Shuttle Radar Topography. Mission
SS	Speed Sprayer
STEP	Special Terms for Economic Partnership
SVTK	Specializirovannaja vneshnetorgovaja kompanija
TA	Technical Assistance
TIIM	Tashkent Institute of Irrigation and Melioration
TSAU	Tashkent State Agrarian University
UAE	United Arab Emirates
UJC	The Uzbekistan - Japan Center
UNDP	The United Nations Development Programme
UP	Ukase of the President
USAID	United States Agency for International Development
USD	US Dollar
USDA	United States Department of Agriculture
UZS	Uzbekistan Sum
WB	World Bank
WCA	Water Consumers' Association
WFP	World Food Programme
WUA	Water User Association
Zahira	Uzbekozikovaktzahira

I. Survey concept

(1) Research objective

This research is aimed at collecting and analyzing necessary information to develop a medium- and long-term cooperative program, considering Japan's development cooperative policy for the Republic of Uzbekistan (Uzbekistan), which is "The realization of support to promote economic growth and rectify disparities", as well as policies adopted at the "Central Asia plus Japan" Dialogue. Besides, identification of the current status and analysis of: A. system of support for the country's agricultural strategy and assistance to the workers involved in this sector, B. status of logistics taking into account agrarian production and export, C. operations of other organizations that provide assistance as well as structure of privet business.

(2) Regions to be researched

Major data about agricultural production and amount of harvest for agro crops were collected for all land resources in Uzbekistan on province -by-province basis. In addition, a detailed study was conducted in Samarkand, Fergana, Namangan and Navoi province to consider future proposals for assistance with following reasons.

- Samarkand Province has the largest production of fruit trees, vegetables and other horticultural crops in the country, but improvements are required for the whole FVC such as logistics and storage.
- In Fergana state there are many farmers with relatively small cultivated land area, in the mountainous area .As these conditions are similar many with in Japan in there is a high possibility that Japan's technology and experience can be utilized.
- In Namangan province, support from other donors is not sufficient.
- Navoi province is a dairy farming area, but agriculture diversification is promoted with expanding production of horticultural crops.

(3) Structure of projects

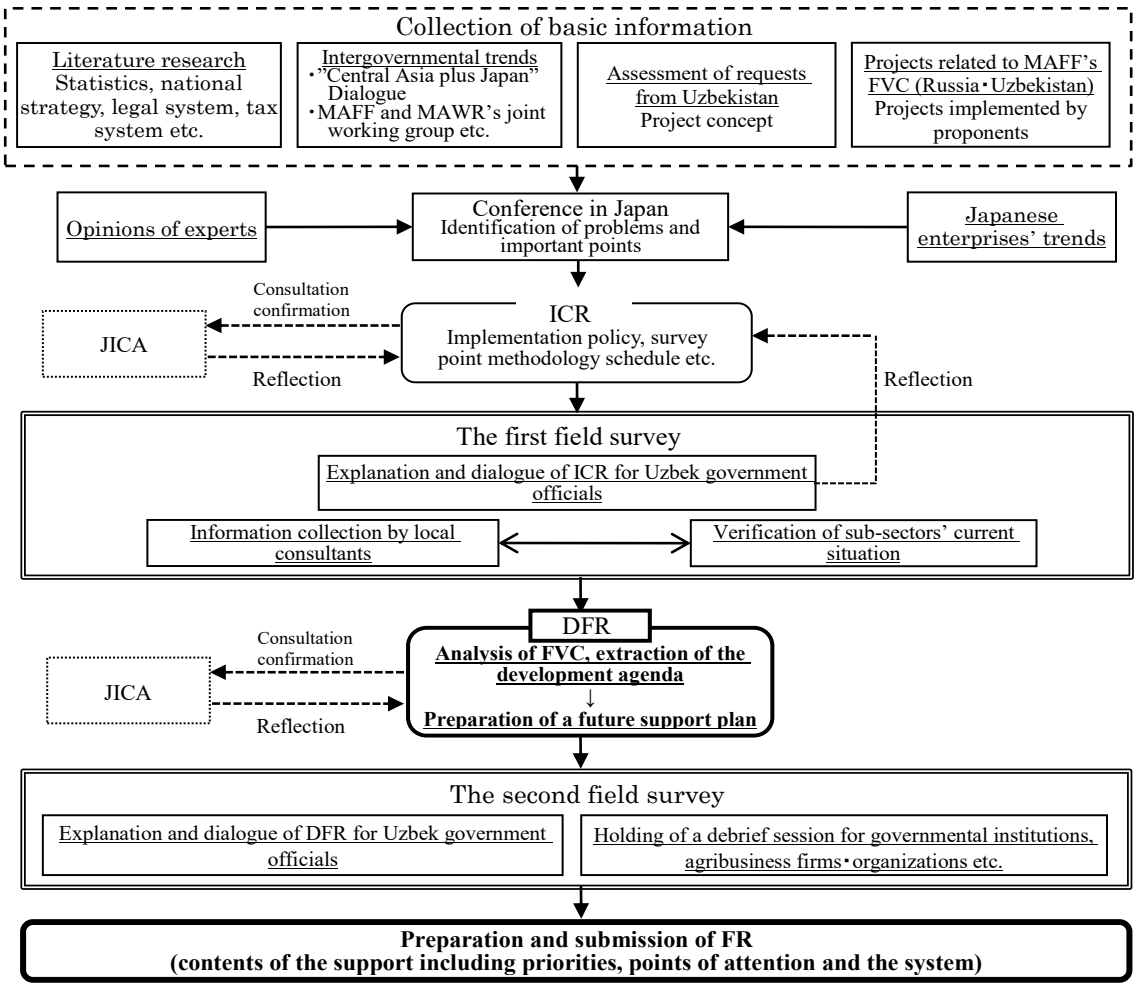


Figure 1-1: Flowchart of proposals identifying development issues and support contents

II. Research contents

(1) Preparations and holding the conference in Japan

A. Preparations

1. Organization of existing documents and reports

   Identified current conditions and issues based on the reports of relevant Japanese organizations such as JICA and other assistance agencies.

2. Identification of trends between governments

   Organization of contents of the discussion based on the second Uzbekistan and Japan's working group on the agriculture sector, which was hosted in February 2017.

3. Evaluation of requests from Uzbekistan

   Evaluation of contents of the project concept submitted in January 2006 "Horticulture Development Project in the Republic of Uzbekistan" and extraction of key points from field research.

B. Conference held in Japan

A conference was held on February 17, 2017 in which outside intellectuals who have project experience in Uzbekistan participated was held in Japan in order to organize issues based on A. (above) and to prepare for the field research. In the conference, identification of current issues and validity of future projects, as well as points to note about promotion of research were discussed.

C. Collection of literature, published information and data on the agriculture sector

Although as much information as possible about sub-sectors will be collected during the preparations period, documents and data obtained from the first and second field research were updated with the latest information in cooperation with domestic backup staff (Russian available) before the submission of the DFR. Througy the survey, official statistics issued by national statistics committee ought to be acquired.

(2) Identification of current issues in appropriate sub-sectors at the first field research

Current issues were identified at the first field research based on the contents of (1). The research method used A. research by local consultants, and B. an on-site field hearing survey by a major research group. The following table shows research contents of the analysis of current conditions.

Table 2-1: Research contents of the analysis of current conditions

Areas	Contents
A. The current situation and issues in the agriculture sector of Uzbekistan	(a) Agricultural production situation (Research on the whole country and each region. Assumed target crops are grain (wheat, barley etc.), cotton, vegetables, beans, orchards, nuts, meat (beef, lamb, chicken), eggs, milk, fishery products, beekeeping etc.) (b) Production input materials (Agricultural machinery, seeds/pesticides/fertilizers) (c) Issues in production (soil degradation, water resource constraint etc.) (d) Agricultural infrastructure/usage condition of farmlands, cultivated acreage situations (e) Agricultural workers (number of workers, a form/rate of agriculture including farmer farms) (f) Irrigation/water resource management and activities of irrigation associations/issues in production base (g) Agricultural and livestock products processing/the amount of processed production/export volume 【Industrial crops】Cotton, oil crops, tobacco, pasture 【Processed agricultural products】Processed vegetables/orchards, processed meat, dairy products (h) Issues in agricultural and livestock products processing
B. National strategy for the agriculture sector in Uzbekistan	(a) Position of the agriculture sector in the state program (including presidential decree) (b) The national policy and development plan for agricultural development (c) Legal systems in the agriculture sector (d) Major tax systems in the agriculture sector (business investment tax, farmland tax, export and import taxes on agricultural products etc.) (e) MAWR, the Ministry of Agricultural Reconstruction, a system and policy on irrigation funds/personnel and organizational structures (including regional organization)/authority and budget allocations of each department/developing plans, implementation, evaluation process (f) The national policy and legal systems governing cotton and wheat
C. The current situation and issues of agricultural and livestock	(a) Domestic consumption / the current distribution/the division of roles for distribution workers (pickup services, wholesale, retail, exporter), roles in

Areas	Contents
products distribution in Uzbekistan	distribution of farmers' organizations (agricultural cooperatives), infrastructure condition of agricultural and livestock products distribution (b) Trends in agricultural and livestock products' domestic and foreign prices, consumption as well as market (c) Import and export trends of agricultural and livestock products (for the last 10 years) (d) Identification of domestic price differences (and quality difference) of agricultural and livestock products (e) Evaluation on major export destinations' markets (f) Quarantine/inspection system for imports and exports (g) Issues on agricultural and livestock products distribution
D. The current condition of support measures for agricultural workers in Uzbekistan	(a) Systems for spreading agricultural technologies (b) Research and development (breed improvement, livestock sanitary improvement etc.) (c) Agricultural subsidy system/financing system (types of agricultural banks, the current situation and issues, loan methods, interest, loan caps, target projects for loans etc.) (d) Human development in the agriculture sector (e) Issues of the support program for agricultural workers
E. Trends among major assistance agencies in regard to the agriculture sector in Uzbekistan	(a) International organizations (FAO、WFP、UNDP、WB、ADB, IFAD) (b) Bilateral assistance (U.S., Germany, Switzerland, South Korea etc.) ※Contents: the activity situation (basic policies, contents, target areas, budget scale etc. of ongoing and future projects)
F. Private investment in the agriculture sector in Uzbekistan	(a) The current condition of activities and investment by foreign and domestic private enterprises (b) The government's investment promotion policy for foreign and domestic private enterprises, investment situation and case examples, as well as the economic effects (c) Expected agricultural and livestock products from private enterprises in investment, fields, target areas, project scales, merits, risks, constraining factors and solutions
G. Addressing issues of the Food Value Chains	Issues and measures at every stage from agricultural production, processing, distribution to consumption

A. Information collection through local consultants

Although some existing documents and data on the Uzbek agriculture sector have been acquired, the published information alone is not adequate to research specific data. For example, data on crops such as a melons and cherries is not available, while piecemeal data on grapes is published. In addition, country-by-country export and import products are divided into a major category "grocery", which is not a detailed classification. Therefore, necessary information was collected through the field hearing survey and local consultants.

B. Implementation of the interviews

Interviews were held during the first field research based on the existing research and literature research as the following table shows. Before the interview, the Uzbekistan government needs to review the survey points with JICA. Documents (in Russian) were sent to object institutions to inform those to be interviewed beforehand of the purpose and contents of the survey. Contact with government organizations and government-related institutions had to be made through the relevant government ministry or agency such as the Ministry of Agriculture and Water Resources.

Table 2-2: Interviews in the first field research

Survey points	Object institutions etc.	Contents of the hearing survey
The current situation and issues of the agriculture sector	Central government ministries including MAWR, municipalities, each working group, university, research institutions, producers, Chambers of commerce and industries and etc.	・Important budget allocation fields ・The current situation and issues of private enterprises ・Determination of current conditions in regard to agricultural production ・ Issues of the production environment (irrigation and land degradation etc.)
National policy on the agriculture sector	Central government	・ Expense items, prices and term of agriculture-related budget ・Agricultural basic policy ・Ongoing agricultural policy
The current situation and issues in agricultural distribution	(mainly MAWR)	・Major products (fresh products, processed food) ・Market, customers (country, city, category of business) ・Sanitary management, product tampering management, temperature control, humidity control ・ Infrastructure related to storage, preservation and transport such as storage of both frozen and refrigerated products as well as trucks
The current situation and issues with the support plan for agricultural workers	Administrative organizations related to trade promotion, private enterprises, JETRO, Japanese-affiliated distribution companies	・ Procurement of necessary resources for agriculture such as farmland, farm equipment, agricultural technology, agricultural loans etc. ・Necessary terms and conditions to improve production efficiency and sophistication
Major assistance agencies' trends in the agriculture sector	Central government, agriculture-related organizations, academic institutions, producers, etc.	・Support conditions for assistance in farmers' access to the market etc. ・Support trends in production, processing and distribution
The current situation and FVC issues	International organizations such as FAO, WFP and UNDP	・Bottlenecks in the value chain ・Addressing quality and standards (HACCP、FSSC、ISO22000 etc.) required by markets and customers ・Pricing perspective, cost reduction measures

(3) Proposal of development agenda on the agriculture sector and the support from Japan

The following A. and B. are assumed for inclusion in this project's proposal. The consideration of the contents assumed a synergistic effect with JICA and other assistance agencies' projects based on examples of past success and failure. In addition, clarification of priorities, points to note and assumed resources are required at the time of the proposal. While the Uzbekistan government has developed an agricultural diversification strategy, cotton and wheat cultivation industries as well as the industrial structure of the conventional agriculture need to be considered.

A. A support program related to the project concept submitted in January 2016
B. A support program based on advanced highly-competitive Japanese systems except programs related to the project concept noted above

(4) The on-site debriefing session

An on-site debriefing session was held in order to share the DFR which organized research results of (1) – (3) noted above with Uzbek government officers, implementing agencies for the agriculture sector and international assistance agencies. In regard to planning and preparing the session, management and contact such as the distribution of invitations to related parties was conducted after discussion with JICA. As to preparing for a conference in Uzbekistan, pre-confirmation of members and contents with the Uzbek government was required.

Table 2-3: Implementation outline of the debriefing session

Points	Contents of each point
Objectives	・Sharing of contents of the DFR ・Understanding of comments about future support contents with Japan etc.
Term	May 26, 2017
Place	Tashkent city, the Republic of Uzbekistan
Participants	Expected 50 participants from local government officers, international organizations, private enterprises etc.
Publicity/Attracting customers	・Checking a list of destinations with the Uzbek government and considering publicity activities such as the use of the government's official website ・Attracting customers by taking advantage of local cooperative institutions, each country's cooperative organizations and a list of JICA's trainees
Contents	・Greetings from the Uzbek government, JICA and the Japanese Embassy ・Explanation of the DFR ・A question and answer session

III. Present State of the Agricultural Sector

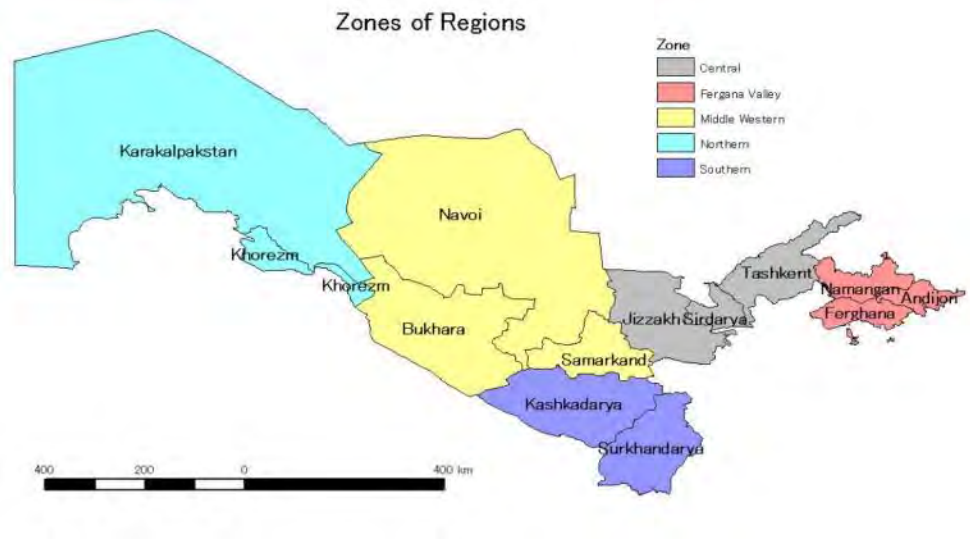
(1) Agricultural Production and Processing: Present State and Issues

A. Agricultural Production Infrastructure

1. Administrative Divisions and Natural Conditions in Uzbekistan

(a) Administrative Divisions

Uzbekistan comprises 12 regions (Andijan Region, Bukhara Region, Jizzakh Region, Qashqadaryo Region, Navoiy Region, Namangan Region, Samarqand Region, Surxondaryo Region, Sirdaryo Region, Tashkent Region, Fergana Region and Khorezm Region) and one autonomous republic (Republic of Karakalpakstan) (Figure 3-1). The figure also shows that the country is divided into five zones (from east to west, Fergana Valley, Central, Southern, Middle Western, and Northern).



Source: Zakir Khalikulov etc., The History of Wheat Breeding in Uzbekistan, 2015

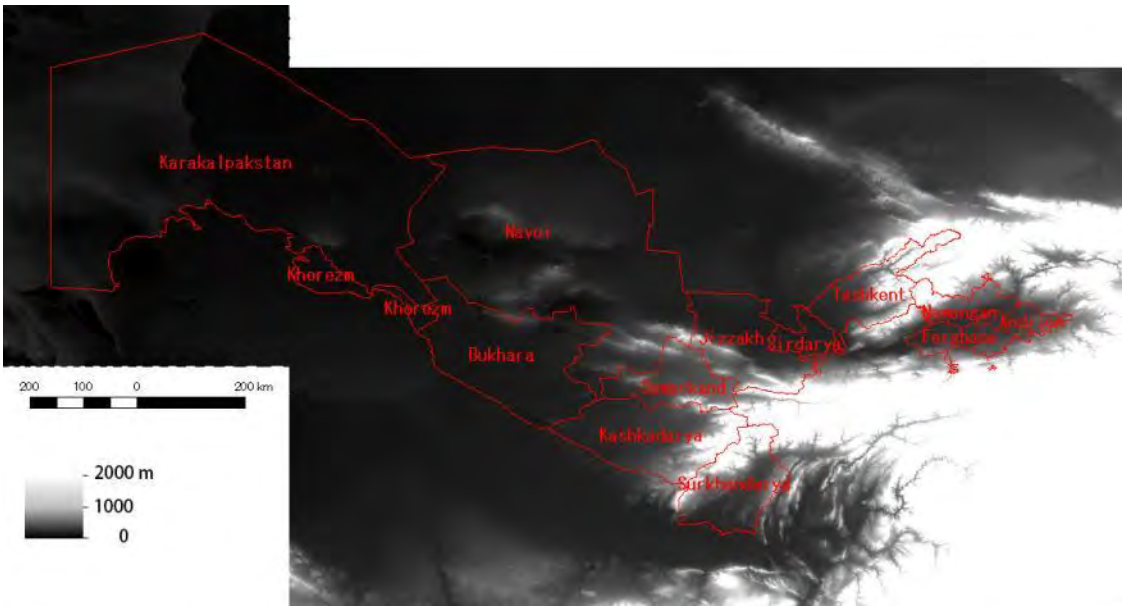
Figure 3-1: Zones and Administrative Divisions

(b) Geography and Water Management

Uzbekistan is located in the middle of the vast Eurasian continent. Its land area is 450,000 km^2 (roughly 1.2 times the size of Japan). Figure 3-2 is a map of the country's administrative divisions and elevation. High mountains extend across the border zones in the eastern and southern parts of the country, and the Fergana and other valleys sit between those mountains. A network of irrigation channels that draw from the Amu Darya and Syr Darya rivers and other rivers and their tributaries shown in Figure 3-3 has been developed in Uzbekistan. In particular, irrigation channels cover nearly the entire Fergana Valley. Uzbekistan is a double-landlocked country; none

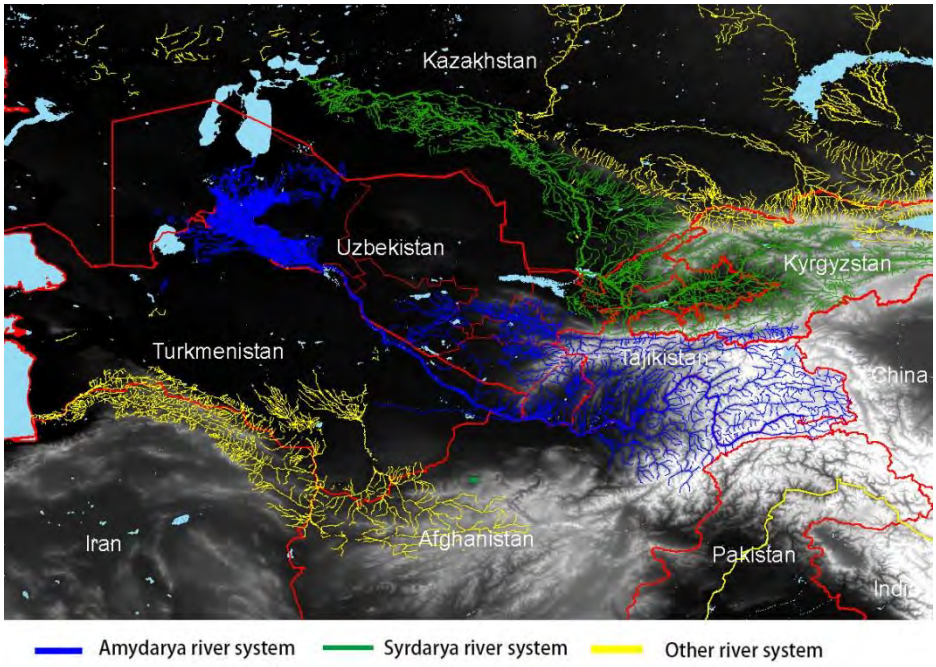
of the countries it borders touches an ocean. In addition, the western part of Uzbekistan comprises the Republic of Karakalpakstan, which is mostly desert and lowlands that border the Aral Sea, and this republic accounts for 37% of the land area of Uzbekistan.

The main sources of water for Uzbekistan are the Amu Darya and the Syr Darya, which are both international rivers. The Amu Darya watershed covers 81.5% of Uzbekistan. The discharge rate of the Amu Darya watershed is 78.46 km^3/year. The amount of inflow from within Uzbekistan is 4.7 km^3/year. Discharge is highest from April to September, accounting for 77% to 80% of the total annual discharge; discharge from October to March accounts for 20% to 23% of the total. The Syr Darya watershed covers 13.5% of Uzbekistan. The discharge rate of the Syr Darya watershed is 36.57 km^3/year, and the amount of inflow from within Uzbekistan is 4.84 km^3/year. The Amu Darya supplies 63% of surface water in Uzbekistan, while the Syr Darya contributes 37%. The total available supply of surface water is 42.1 km^3/year, of which 9.5 km^3/year comes from within Uzbekistan, and 32.6 km^3/year flows in from outside the country. In other words, roughly 80% of the country's main water source, surface water, originates from other countries.



Source: Prepared by the JICA Study Team based on SRTM

Figure 3-2: Administrative Divisions and Elevation Map



Source: Central Asia GIS Database, The University of Texas at Austin

Figure 3-3: River Systems in Uzbekistan

Table 3-1: Watersheds and Surface Water Volume in Uzbekistan

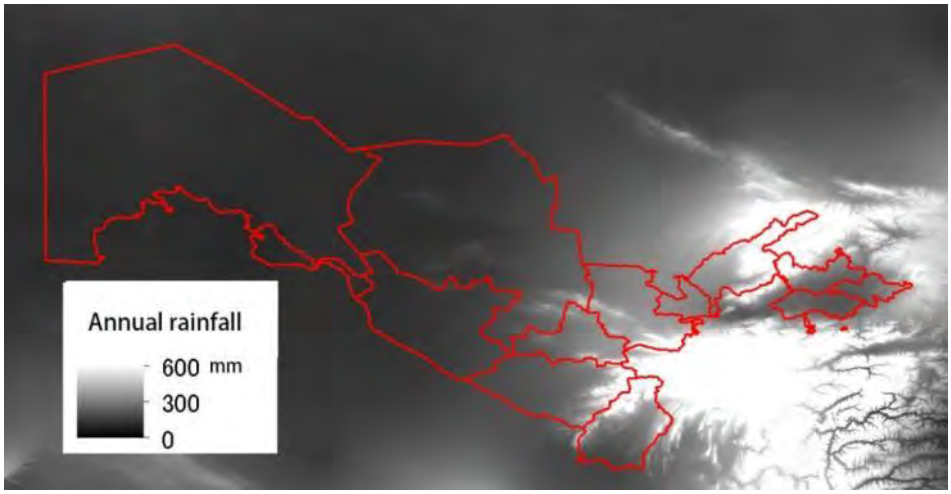
Watershed	Domestic Surface Water	Inflow			Outflow			Available Supply of Surface Water
		Overall	Amounts Guaranteed in Agreements		Overall	Amounts Guaranteed in Agreements		
	km^3/year	km^3/year		Upstream Country	km^3/year		Downstream Country	km^3/year
Amu Darya	4.7	73.8	43.3	Tajikistan	66.1	21.3	Turkmenistan	26.7
Syr Darya	4.8	28.4	22.3	Kyrgyzstan	33.3	11.8	Tajikistan	15.4
Total	9.5a	102.2	65.7b		99.4	33.1c		42.1d

Note: The following formula was used to calculate the available supply of surface water:
Available supply of surface water *d* = Domestic surface water *a* + (Amount guaranteed to upstream country *b* - Amount guaranteed to downstream country *c*)

Source: Irrigation in Central Asia in figures - AQUASTAT Survey - 2012, FAO Water Reports No. 39

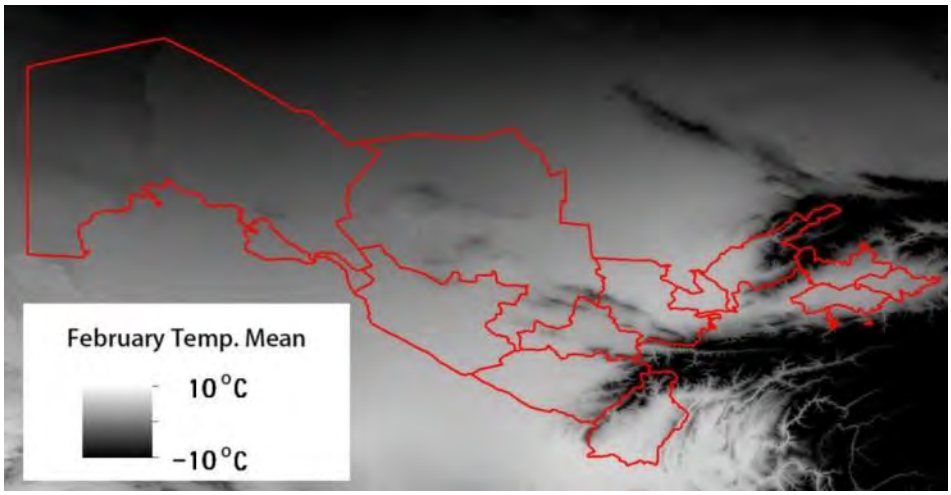
(c) Weather Conditions

Figure 3-4 is a map of annual rainfall, Figure 3-5 is a map of mean temperatures in February, and Figure 3-6 is a map of mean temperatures in August. Annual rainfall is less than 300 mm in most locations, and farming is nearly impossible in places with no irrigation system. The temperature falls below 8°C in the winter throughout most of the country, which makes it difficult to grow anything but winter wheat. In the summer, the temperature exceeds 25°C in most places, which makes them well suited for growing crops.



Source: Prepared by the JICA Study Team based on WorldClim data

Figure 3-4: Annual Rainfall



Source: Prepared by the JICA Study Team based on WorldClim data

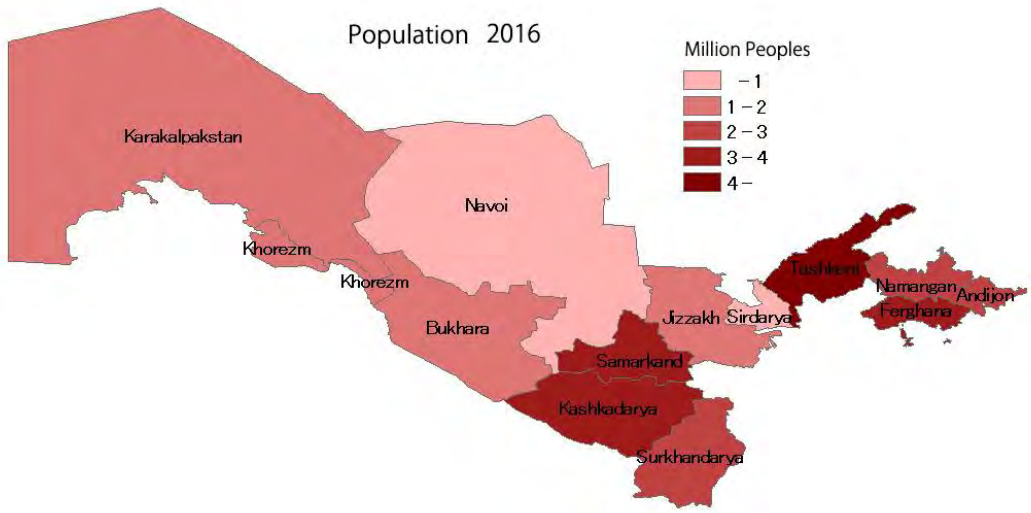
Figure 3-5: Mean Temperature in February

Source: Prepared by the JICA Study Team based on WorldClim data

Figure 3-6: Mean Temperature in August

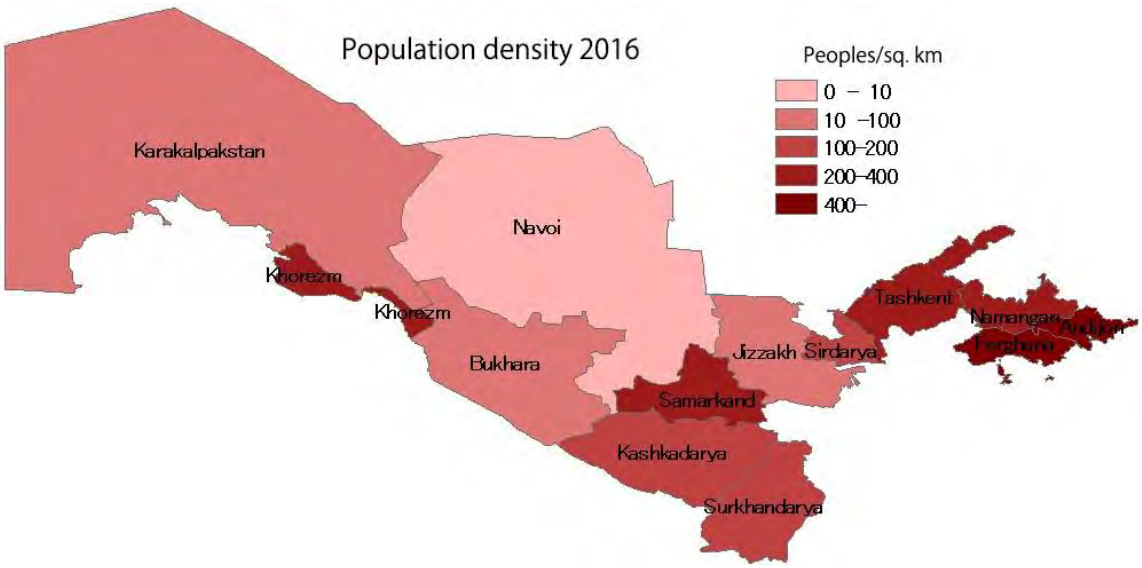
(d) Population Distribution

Figure 3-7 shows the population in each administrative division, and Figure 3-8 shows the population density. The population is by far the highest in the Tashkent Region, including the city of Tashkent. Other than Tashkent Region, the population is high in Samarkand Region, Fergana Region, Kashkadarya Region, Andijan Region, and in Surkhandarya Region. The population is concentrated in the Fergana Valley (Fergana Region, Andijan Region, Namangan Region), Tashkent Region, and in KhorezmKhorezm Region.



Source: Prepared by the JICA Study Team based on The State Committee of the Republic of Uzbekistan on Statistics "Population statistical yearbook in 2016"

Figure 3-7: Population (2016)



Source: Prepared by the JICA Study Team based on The State Committee of the Republic of Uzbekistan on Statistics "Population statistical yearbook in 2016"

Figure 3-8: Population Density (2016)

2. Current agricultural land use and cultivated area

The total land area of Uzbekistan is 44.74 milion ha. Although the land is relatively flat, due to the limitation of water resource, agriculture land and irrigated land are only 8.2% and 7.5% of land in Uzbekitan respectively.

Table 3-2: Landuse in Uzbekistan

Total area	Land area	Water body area	Agriculture land area	Irrigated area
(1,000 ha)	(1,000 ha)	(1,000 ha)	(1,000 ha)	(1,000 ha)
44,740	42,540	2,200	3,677	3,357

Source: Prepared by the JICA Study Team

The table below showing the total area of each province, agricultural land, ratio of agricultural land and total area, irrigated land and ratio of irrigated land and agricultural land respectively. Most of agricultural lands are irrigated in Andejan, Namangan, Syrdarya, Fergana, Khorezm province, while irrigated land is small in The Republic of Karakalpakstan, Bukhara, Jizzakh, Kashkadarya, Navoi, Samarkand, and Surkhandarya.

Table 3-3: Area and ratio of agricultural land and irrigated land in 2016

Region	Total Area (1,000 ha)	Agricultural land (1,000 ha)	Agricultural land/ Total area (%)	Irrigated land (1,000 ha)	Irrigated land / Agricultural land (%)
The Republic of Karakalpakstan	16,000	2,088.6	13.1	470.7	22.5
Andijan	420	254.6	60.6	233.5	91.7
Bukhara	3,940	2,551.7	64.8	226.4	8.9
Jizzakh	2,050	1,183.3	57.7	276.5	23.4
Kashkadarya	2,840	1,984.8	69.9	458.0	23.1
Navoi	11,080	3,596.4	32.5	107.0	3.0
Namangan	790	284.1	36.0	234.7	82.6
Samarkand	1,640	1,227.9	74.9	309.5	25.2
Surkhandarya	2,080	1,009.6	48.5	270.2	26.8
Syrdarya	510	285.0	55.9	265.9	93.3
Tashkent	1,530	580.3	37.9	339.1	58.4
Fergana	680	314.8	46.3	299.3	95.1
Khorezm	630	229.9	36.5	220.9	96.1
Tashkent city	34	0.4	1.2	0.4	100.0
Total	**44,224**	**15,591.4**	**35.3**	**3,712.1**	**23.8**

Source: The State Committee of the Republic of Uzbekistan on Statistics “Agricultural statistics in 2016”

The composition of the cultivated land excluding orchar is shown below. The total cultivated land is slightly increased from 2012 to 2015. For example, it seems that the area of the cotton field decreased, while the area of vegitable and potato incleased.

Table 3-4: Composition of cultivated land in All category of farmer (Unit: 1,000 ha)

	2012	2013	2014	2015
Total cultivated land	**3,628.1**	**3,658.6**	**3,678.2**	**3,694.2**
Grain	1,628.1	1,643.9	1,655.6	1,671.1
Cereals	1,489.5	1,540.8	1,547.1	1,539.1
Among them, wheat	1,440.0	1,449.6	1,454.8	1,445.9
Corn	40.9	34.1	35.6	37.3
Rice	76.3	44.9	48.8	70.5
Legumes	17.1	20.1	19.6	19.9
Industrial crops	1,372.4	1,380.1	1,372.3	1,368.7
Among them, cotton	1,308.3	1,308.8	1,301.5	1,298.1
Potato	76.1	78.3	80.3	80.6
Vegetables	183.8	189.4	192.0	194.0
Edible cucurbitaceous crops	53.7	50.6	51.5	52.0
Forage	313.9	315.7	325.7	327.1

Source: The State Committee of the Republic of Uzbekistan on Statistics “Agricultural statistics in 2016”

In Fergana Valley area such as Andijan and Fergana province, ratio of land use for kichen garden and orchard are higher than other provinces.

Table 3-5: Land area composition used by land users conducting agriculture in 2016[1)]

Region	Total area (1,000 ha)	Breakdown		
		Farmland	Kichen garden and orchard	Others (afforestation, etc)
The Republic of Karakalpakstan	3,218.8	65%	1%	34%
Andijan	371.1	69%	11%	20%
Bukhara	3,380.9	75%	2%	23%
Jizzakh	1,446.8	82%	2%	16%
Kashkadarya	2,370.4	84%	3%	13%
Navoi	4,103.5	88%	0%	12%
Namangan	499.3	57%	8%	35%
Samarkand	1,505.3	82%	5%	13%
Surkhandarya	1,367.4	74%	4%	22%
Syrdarya	373.7	76%	5%	19%
Tashkent	778.2	75%	7%	19%
Fergana	563.9	56%	11%	33%
Khorezm	409.1	56%	12%	32%
Tashkent city	0.4	100%	-	-
Total	**20,388.8**	**15,591.4** [2)]	**618.0** [2)]	**4,179.4** [2)]

[1)] Data from State committee of land resource, geodesic, mapping and database

[2)] Unit: 1,000 ha

Source: The State Committee of the Republic of Uzbekistan on Statistics “Agricultural statistics in 2016”

Cultivated land for each province is shown in table below. The cultivated land per fermer is the largest in Jizzakh province, 62ha/ fermer, and the minimum is in Fergana province, which is about 28ha per fermer and it’s about half of the Jizzakh province. Also in Namangan province and Andijan

province located in the Fergana Valley area, cultivated land per fermer tends to be small compare to other province.

Table 3-6: Area of cultivated land for each category of farmer in 2014

Region	Total area of cultivated land for all category of fermar (ha)	Breakdown			Agricultural land per Fermer (ha)	No. of Fermer
		Fermer (ha)	Dehkahn (ha)	Organizations carrying out agricultural activities (ha)		
Total	**3,677,928**	**3,114,310**	**474,344**	**89,274**	**42**	**73,831**
The Republic of Karakalpakstan	229,761	191,051	32,086	6,624	56	3,395
Andijan	230,079	196,549	28,453	5,077	30	6,590
Bukhara	240,569	199,456	39,205	1,908	50	4,007
Jizzakh	396,000	361,095	24,161	10,744	62	5,846
Kashkadarya	500,347	417,459	68,147	14,741	52	8,100
Navoi	102,911	79,491	16,889	6,531	46	1,746
Namangan	223,673	191,736	29,634	2,303	36	5,355
Samarkand	364,223	303,392	56,447	4,384	36	8,388
Surkhandarya	283,189	236,003	43,469	3,717	46	5,155
Syrdarya	232,850	211,310	14,794	6,746	40	5,330
Tashkent	353,157	297,735	40,759	14,663	47	6,359
Fergana	289,522	243,102	41,071	5,349	28	8,695
Khorezm	231,647	185,931	39,229	6,487	38	4,865

Source: RRA "Project concept" p.44-45

The one of the critical issue of agriculture in Uzbekistan is salinization. Mechanism of salinization is follows. Ground water lavel rises due to excessive irrigation and unsufficient land leveling, deterioration of drainage facility. That ground water including salinity is supplied on the soil surface by capillary action and salinity is left behind on the soil surface after evaporation of it. The table below shows the area and share of salinized soils in each province in 2011. The silinaization is serious in The Republic of Karakalpakstan, Bukhara, Jizzakh, Navoi, Syrdarya, and Khorezm.

Table 3-7: Salinization in Uzbekistan in 2011

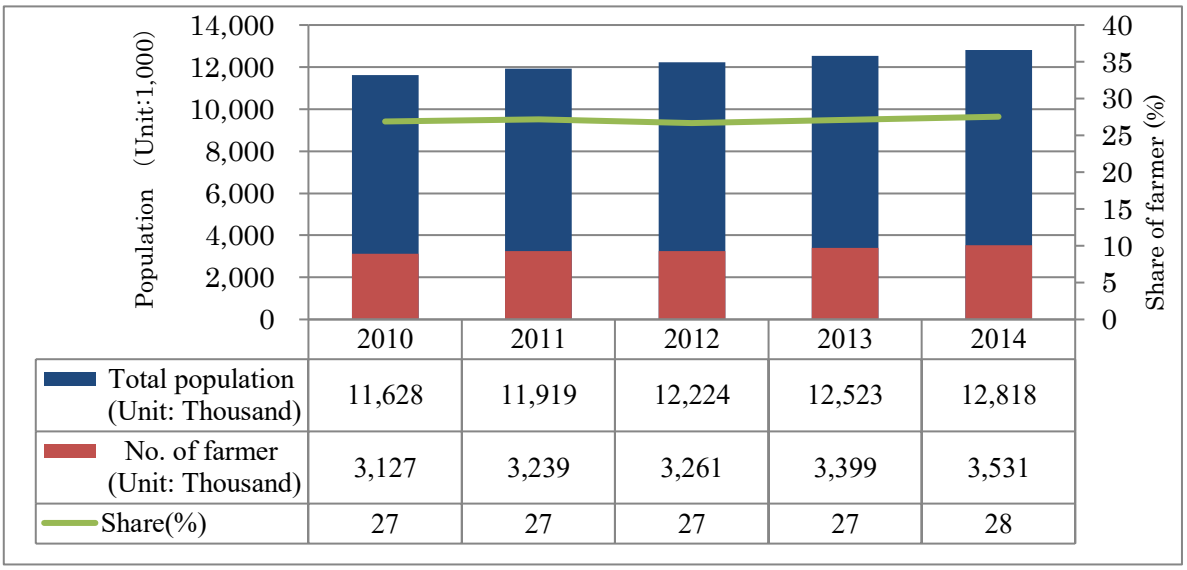
Region	**Irrigate**	**Non**		**Soil salinity**							
				Low		**Middle**		**High**		**Total**	
	100 ha	100 ha	**%**	100 ha	**%**	100 ha	**%**	100 ha	**%**	100 ha	**%**
The Republic of Karakalpakstan	515.2	116.8	22.7%	148.8	28.9%	200.5	38.9%	49.1	9.5%	398	77.3%
Andijan	265.4	253.8	95.6%	6.2	2.3%	5.4	2.0%	0.0	0.0%	12	4.4%
Bukhara	274.9	36.7	13.4%	164.4	59.8%	64.5	23.5%	9.3	3.4%	238	86.6%
Jizzakh	300.1	63.4	21.1%	157.3	52.4%	73.3	24.4%	6.1	2.0%	237	78.9%
Kashkadarya	515.7	272.9	52.9%	182.1	35.3%	47.9	9.3%	12.8	2.5%	243	47.1%
Navoi	131.8	16.8	12.7%	93.8	71.2%	18.4	14.0%	2.8	2.1%	115	87.3%
Namangan	282.5	256.9	90.9%	17.6	6.2%	7.1	2.5%	0.9	0.3%	26	9.1%
Samarkand	379.2	373.4	98.5%	5.4	1.4%	0.4	0.1%	0.0	0.0%	6	1.5%
Surkhandarya	325.8	223.0	68.4%	70.6	21.7%	31.3	9.6%	0.9	0.3%	103	31.6%
Syrdarya	287.0	4.6	1.6%	231.7	80.7%	47.1	16.4%	3.6	1.3%	282	98.4%
Tashkent	395.2	386.1	97.7%	7.5	1.9%	1.6	0.4%	0.0	0.0%	9	2.3%
Fergana	366.1	191.1	52.2%	131.7	36.0%	39.1	10.7%	4.2	1.1%	175	47.8%
Khorezm	266.2	0.0	0.0%	143.9	54.1%	88.0	33.1%	34.3	12.9%	266	100.0%
Total	**4,305.1**	**2,195.5**	**51.0%**	**1,361.0**	**31.6%**	**6,24.6**	**14.5%**	**124.00**	**2.9%**	**2,110**	**49.0%**

Source: JIRCAS

The Japan International Research Center for Agricultural Sciences (JIRCAS) conduct “research on measures against salinization” that is fourcusing on salinaization by groundwater rise due to artificial factor and they are focusing on countermeasures to mitigate mild and moderate salinaization that can be handled at the farmer level.

3. Agricultural producer

Uzbekistan is a country where agricultural activity is active. Therefore, its tomato paste is the fifth largest, cotton production is sixth largest, cocoon is the third largest in the world and dry fruit produc is the tenth largest er in the world. Agriculture sector, which holds 23% of GDP of the country in 2010, and the proportion of the agricultural population in the total population had remained 28% in the past few years. Agriculture is the most important industry for Uzbekistan, and the sustainable development of agriculture sector is related to measures to the poor in rural areas and it is the most important issue for social and economic stability.



	2010	2011	2012	2013	2014
Total population (Unit: Thousand)	11,628	11,919	12,224	12,523	12,818
No. of farmer (Unit: Thousand)	3,127	3,239	3,261	3,399	3,531
Share(%)	27	27	27	27	28

Source: 2015 Uzbekistan Statistical Yearbook (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-9: Population and share of farmer

Category of farmer is classified into two categorys such as Fermer and Dehkan. Fermer lease their land from government for agricultural actity. Dehkan is smll scale farmer and they mainly forcussing on their selfconsumption purpose and sales of surplus. The differences between Fermer and Dehkan are shown in the table below. Because Fermel has an obligation, called state order, to cultivate wheat and cotton based on the planting area of those crops, it is under the limitation of cropping. In recent years, state order has been relaxed in some province and districts, and type of crops is becoming diversified.

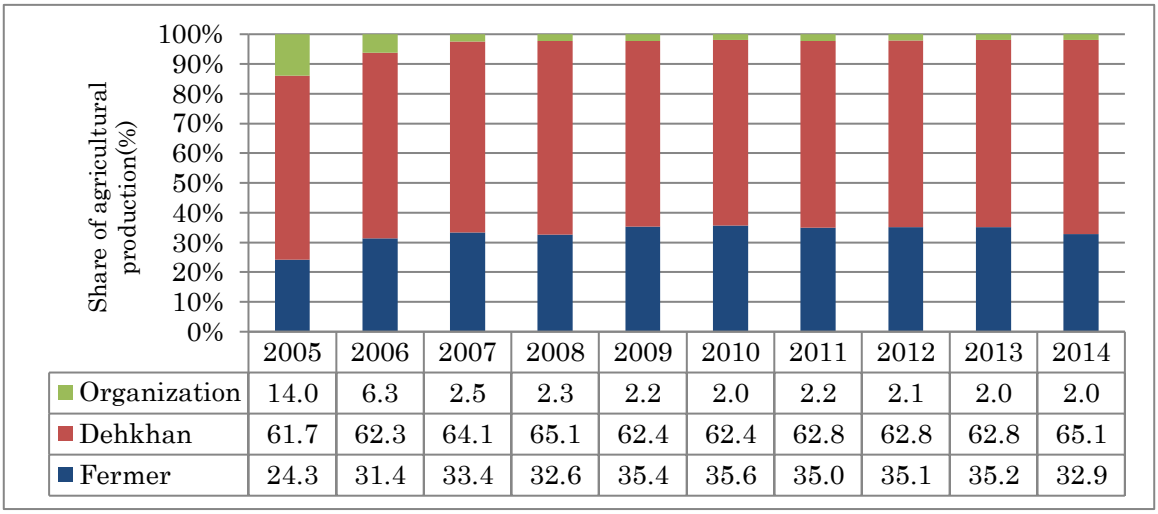
Dehkan s’ Agliculture is mainly aimed at self-consumption, and they sells surplus in the market. There is no obligation such as cultivating area and type of crops is freely select and cultivated based on the preference of each farmer and market needs.

Table 3-8: Differences between Fermer and Dehkan

	Fermers	Dehkans
General definition	A farm is an independent economic entity, leading a commodity agricultural production using leased land plots.	Dehkan farming is a family small-scale farm that produces and sells agricultural products on the basis of the personal labor of family members on the personal plot of land given to the head of the family for a lifetime inheritable possession.
Legal entity	Registered as a leading entity	Dehkans may register themselves as a legal entity (in order to have stamp and account in a bank) or to choose not to be registered as a legal entity. But the latter will be registered as dehkans by the fact of issuing a land plot to dehkans what will be considered in the statistics.
Allocation of land	To conduct farming, land plots are leased on the basis of an open tender for a period of up to fifty years, but not less than thirty years.	The personal land plot is allocated in accordance with the procedure and in the amounts established by law to lifetime inheritable possession to the head of the family for the production of agricultural products for both sale and own consumption of the family, as well as for individual housing construction and maintenance of a residential house.
Size of land plot	For farms specializing in the production of crop production, the minimum size of land provided for rent for cotton growing and grain production is at least 30 hectares, for horticulture, viticulture, vegetable growing and cultivation of other crops - at least 5 hectares. The farm, specializing in the production of livestock products, is created under the condition that there are at least 30 conventional animals with cattle. The minimum size of land leased to a farmer is at least 0.3 hectares per one conventional head of livestock in the irrigated lands of the Andijan, Namangan, Samarkand, Tashkent, Ferghana and Khorezm regions, at least 0.45 hectares of irrigated land in other areas And the Republic of Karakalpakstan, and on non-irrigated (rainfed) lands - no less than 2 hectares per one conventional head of livestock.	Citizens who have a family and reside in the countryside for at least three years are granted a perpetual inheritable possession of a personal plot of land for dehkan farming in the amount of no more than 0.35 hectares for irrigated and not more than 0.5 hectares for rain-fed (rain-fed) Lands, and in the steppe and desert zone, no more than 1 hectare of irrigated pastures.
Hiring outside labor	Farmers may hire workers both permanent employees and temporarily seasonal workers.	The dehkan farm can not use hired labor in its activity on an ongoing basis. Mainly they might use personal labor of family members. But they are allowed to attract temporarily workers seasonal labor intensive works.
Taxation	Agricultural commodity producers (farmers are among them) are payers of the unified land tax, which is a form of simplified taxation.	Dehkans are paid all taxes provided for individual taxpayers, which are mainly: ・ Land tax for individual taxpayers ・ Tax on property (real estate tax) – mainly for their own house ・ Water use tax.
Use of land and selection of crop	The farmer is obliged: ・ To maintain specialization of the land plot in accordance with the lease agreement ・ To organize (taking into account specialization) the production of products purchased for state needs; Contracts for the purchase of agricultural products for state needs also state: Grade and quantity purchased for government needs and the products remaining at the disposal of farms;	Dehkan independently determines the direction of its activities, structure and production volumes. It has the right to engage in any kind of agricultural production, not prohibited by legislative acts, as well as processing and sale of agricultural products.

Source: Prepared by the JICA Study Team

Uzbekistan's agricultural products have been produced from Dehkan farm and about 30% from Fermeld farm since 2007. The agricultural form of Uzbekistan has been restructured from classic collective farms and state farms to shirkats (agricultural production cooperatives) by agricultural reform after independence from the Soviet Union in 1991. After that, a new land law was established in 1998, farm structure was arranged into three forms of Fermel, shirkats, and dehkan. However, most of shirkats, a-large schale corporate farms based on membership shares[1], operated in the red and low profitability became problematic, and the division from Silcutto to Fermel, which began with the presidential decree in 2003, the agricultural production ratio, has been at a nearly constant level since 2007. As a result, the agricultural production ratio has been at a nearly constant level since 2007. As of 2008, the number of Fermel and dehkhan is 105,000 and 4,703,100 respectively.[2]



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Organization	14.0	6.3	2.5	2.3	2.2	2.0	2.2	2.1	2.0	2.0
Dehkhan	61.7	62.3	64.1	65.1	62.4	62.4	62.8	62.8	62.8	65.1
Fermer	24.3	31.4	33.4	32.6	35.4	35.6	35.0	35.1	35.2	32.9

Source: 2015 Uzbekistan Statistical Yearbook (The State Committee of the Republic of Uzbekistan on Statistics)[3]

Figure 3-10: Share of agricultural production from 2005 to 2014

Production of wheat and cotton are mainly produced by fermer, while vegitable and potato are produced by defkhan. Although, recently one third of the vegetables are produced by fermer.

Table 3-9: Composition of major agricultural products production in 2015 (Unit: %)

	Fermer	Dehkan	Organization
Cereals and legumes	**80.6**	18.1	1.3
Raw cotton	**99.5**	-	0.5
Potato	23.4	**75.8**	0.8
Vegetables	34.1	**65.0**	0.9
Meat (Fresh weight)	2.9	94.4	2.7
Raw milk	3.6	95.7	0.7
Egg	11.1	56.1	32.8
Wool	8.0	85.5	6.5
Karakul type sheepskin	5.4	83.4	11.2
Cocoon	93.6	-	6.4

Source: 2016 Uzbekistan Statistical Yearbook (The State Committee of the Republic of Uzbekistan on Statistics)

[1] Source: The Hebrew University of Juerusalem “Agricultural Development in Uzbekistan: The Effect of Ongoing Reforms”
[2] Source: JICA”Detailed planning survey on The Project for Water Management Improvement (2012)”
[3] Farmers organization: A corporation that owns land under management control and other independent assets, performs production of agricultural and livestock products and provide services related to agricultural production. It is seemes that the ratio of Silkut is also included in Farmers Organizaion until 2008,.

Table 3-10: Agroculturap production data in 2015

	Fermer	Dehkan	Organization
Crops (actual price) (1 billion UZS)	13,801.1	27,650.9	828.4
Agricultural land (1,000 ha)	5,819.7	500.6	-
Cultivated area (1,000 ha)	3,129.1	477.2	88.0
Grain	1,423.6	211.8	35.7
Industrial crops	1,346.1	6.2	16.5
Among them, cotton	1,285.8	-	12.3
Potato	15.3	64.5	0.9
Vegetables	66.5	125.0	2.5
Edible cucurbitaceous crops	25.5	25.4	1.1
Forage	251.7	44.2	31.1
Agricultural products (thousand tons)			
Cereals and legumes	6,588.3	1,482.9	102.3
Potato	632.1	2,043.2	21.6
Vegetables	3,458.5	6,584.7	86.2
Edible cucurbitaceous crops	907.2	915.3	31.1
Fruit and berry	1,260.1	1,429.4	56.6
Grape	843.8	711.1	24.5
Meat (Fresh weight)	58.3	1,920.7	54.4
Raw milk	328.4	8,635.3	64.1
Egg	613.6	3,105.5	1,816.3
Fur (t)	2,871.0	30,813.0	2,345.0
Harvest rate (%)			
Cereals and legumes	44.2	56.0	27.2
Potato	201.0	223.9	189.0
Vegetables	261.7	277.3	196.2
Edible cucurbitaceous crops	192.0	217.2	155.2
Number of head (year-end) (thousand head)			
Number of cow	557.3	10,953.2	130.8
cow	187.9	3,948.5	37.1
Number of sheep / goat	-	15,994.7	1,718.5

Source: 2016 Uzbekistan Statistical Yearbook (The State Committee of the Republic of Uzbekistan on Statistics)

4. Roll of water consumers association

Regarding the disbanded of the shirkats which was responsible for water management, the necessity of water management by Fermel has increased. Voluntary water management organization centered on fermel began to be formed around 1998. As of 2008, 1,693 WCAs were established over the country, and almost all of the irrigated land in Uzbekistan is managed under WCA[4]. As a result of the amendment of the Water Law, WUA (Water Users' Association), which was previously a voluntary organization registerd at the local government, became a legal entity registered as WCA at ministry of Justice. In Uzbekistan, WCA are registered as non-profit organizations.

The WCA consists of Fermel and the defkhan within the area. Fermel is supplied with irrigation water under the conditions to pay the membership fees of WCA based on crops and their irrigation area. According to the interview with the WCA, irrigation water for dehkan is distributed without paying

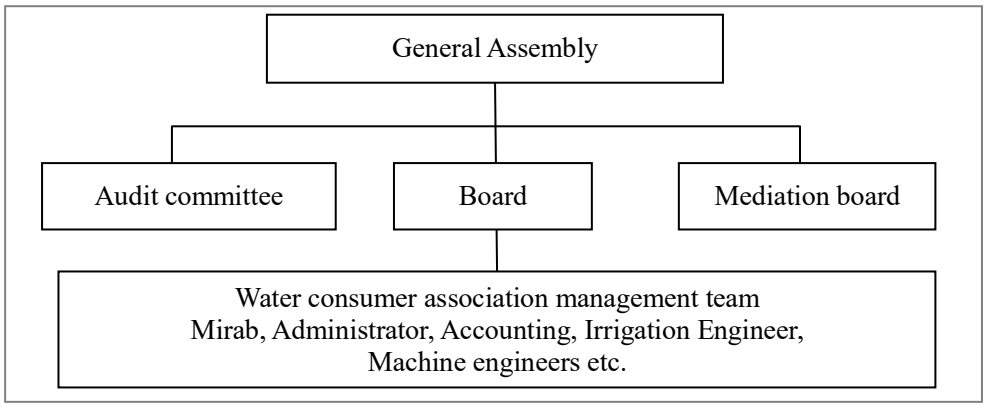
[4] Source: JICA "Detailed planning survey on The Project for Water Management Improvement (2012)"

of membership fee by ceatain WCA in Fergana province since the propotion of irrigated land of the dehkan is small compare to total irrigated land. However, dehkan also pays membership fee based on the area for irrigation and irrespective of type of cultivated crops in one WCA in Samarkand province. Therefore, the necessity of paying for membership fee is different for WCA. The main roles of WCA are as follows.

A. Preparation and management of water use plan,
B. Maintenance and management of irrigation facilities,
C. Rehabilitation and improvement of irrigation facilities,
D. Implimentation of land improvement work,
E. Introduction and dissemination of water saving and irrigation technologies.

A typical organizational chart is shown below.

There are several officials who are responsible for distributing of irrigation water at the on firm level called Mirab.



Source：Based on JIRCAS Report 2009

Figure 3-11: Tipical organization chart of Water Consumers Association

The hiring was conduted dring the field survey about issues on operation and maintenace by WCA. The results are follows,

- In many WCA, the collection rate of the membership fee is low. Therefore there are number of problem that the tertiary and field canals are not fully maintainted and repaired.
- Despite the escalation in prices, some WCA can't secure a sufficient budget due to difficulty to approve the price increase of the membership fee.
- For this reason, there were some WCA that most of the membership expenses were allocated to personnel expenses of WCA staff.

5. Activity on Irrgation and Water resource management

The main water sources for irrigation in Uzbekistan are the international river Amudarya River system and the Syrdarya River system. After the collapse of the former Soviet Union, International Fund for Saving the Aral Sea (IFAS) for the Aral Sea Relief was established in 1991 in order to prevent conflict in the Aral Sea and solve the water conflict among the 6 countiries. An agreement about the amount of abstraction from these rivers among 6 contries has been signed in February 1992. Contents of this agreement are the agreed on the allocation amount based on the water allocation amount of the former Soviet era. However, more than 25 years have passed since the sining of the agreement, the supply amount below is not stable due to the situation changed in each country.

Based on the agreement, consultation is held every year to consider the fluctuation of demand for earch year, and discussion of planned amount of water intake and report on actual water intake amount. The plan and actual amount of intake water for 2016 are as shown in the table below. The actual availability of water varies with indivisual countries, and it seems that this difference cause unfairness.

Table 3-11: Amount of plaed and actual amount of intake discharge of Syrdarya and Amudarya River in growing season in 2016

	Water user	Water volume (km^3)		Water availability (%)	Deficit (-), Surplus (+) (km^3)
		Limit / schedule	Actual	Season	Season
Syrdarya River basin countries	**Total water withdrawal up to Shardara reservoir**	**11.65**	**8.82**	**76**	**-2.8**
	Kyrgyz Republic	0.25	0.19	78	-0.1
	Uzbekistan	8.80	6.64	75	-2.2
	Tajikistan	1.91	1.55	81	-0.4
	Kazakhstan	0.70	0.44	63	-0.3
Amudarya River Basin countries	**Total water withdrawal**	**39.7**	**35.4**	**89**	**-4.3**
	Kyrgyz Republic	-	-	-	-
	Republic of Tajikistan	7.0	5.8	83	-1.2
	Turkmenistan	15.5	14.2	91	-1.3
	Republic of Uzbekistan	17.2	15.4	89	-1.8

Source：Analysis of Hydrological Conditions in The Syrdarya Andamudarya Basins over The Growing Season (ICWC SIC)

In the case of Uzbekistan, this amount of planned water intake is estimated at the WCA level based on the farmering plan of each Fermel. Then, the demand for each WCA is totaled. The calculated demnd for each WCA level accumulated for each level such as district level and BISM (Basin Irrigation Systems Management) level, then, total demand for water intake in Uzbekistan is estimated. Also, as a result of consultation at ICWC, each country's intake limit is decided, and when the upper limit of the water intake is set. MAWR allocates Limit with reference to the demand amount of each BISM. On the basis of the Limit allocated in the same way, the district level, WCA level Limit is determined, this amount is used as the standard and water allocation is done.

BISM in each basin is responsible for river intake facilities, main canals, and secondary canals. Each WCA is responsible for tertialy canals to field canals. Hydropost is installed in various places at the main canal and secondary canal level, and BISM allocates amounts based on the limits of each district. In the tertiary canal and the field canal level, WCA's Mirrorb consider the water distribution schedule based on applications from each Fermel and is responsible for operation of water distribution. BISM also manages reservoirs and pumping stations and electric expence for operation of pump station is fully spent by BISM. Water distribution to Dekkan fermar is incharge of Mahara, which is traditional mutual assistance organization in Uzbekistan in each village, and the mirrorb within Mahara is responsible for water distribution within the dehkan farmer.

Officialy, the drainage canal around the agricultural land is to be managed by the WCA. However, WCA does not have enough budget and heavy machinery for maintenance and repairing, Hydro-geological Melioration Expedition (HGME) maintain from the field drainage to the main drainage by using the funds from the irrigation fund.

6. Challenge on production infrastructure

- 95% of irrigation water resources in Uzbekistan account for water intake from Amdariya and Sildariaa rivers. But they have reached the limit of water intake agreed in related countries. Since Uzbekistan is dependent on overseas for about 80% of the water source, it is susceptible to the influence of the wateruse on the upstream countries.
- Due to climatic factor such as higher evaporation amount than rainfall and salt inflow from irrigation water to agricultural land, salinization has occurred in many parts of Uzbekistan. Therefore, it is restricted to cultivate some kind of crops and productivity is decreased due to soil salinization in many part of Uzbekistan.
- Irrigation and drainage facilities have not been sufficiently maintained due to insufficient funds and it causes deterioration of the functions remarkably. As a result, it causes problems such as loss of irrigation water, excessive water distribution to the field, water shortage at the field canal, salinization due to drainage failure. The WCA which manages those facilities is vulnerable as an organization and does not have sufficient capability and funds to conduct maintenance work.
- It is a critical challenge to control overexploitation of water resource, effective utilization of irrigated areas, renewal and maintenance of degraded irrigation facilities and development of technology for water saving culure.

B. State of Agricultural Production

1. State of Agricultural Production

Agricultural statistics in Uzbekistan are categorized in ways that connect to their food culture and agricultural production; the categories are cereals, wheat, cotton, potatoes, vegetables, melons (honeydew melons, watermelons, and pumpkins), fruits, grapes and meat (Table 3-12). There are two separate categories for cereals and wheat; wheat is the main cereal crop. In Uzbekistan, potatoes occupy a separate category from vegetables because they are considered more of a cereal crop. In addition, grapes occupy a separate category from fruits because of their importance as the main ingredient of wine and raisins.

The Study Team used ArcMap to create a map of production volumes by region as set out in the project concept indicated by the Uzbekistan side, and used FAOSTAT, USDA and other sources to gather data for the period from 1992, when Uzbekistan gained independence, to as recently as possible, and created maps that show how production volumes, cultivation areas and yields throughout Uzbekistan have changed over the years. In addition, Ukase of the President set out cultivation areas for cereal crops, wheat and cotton from 2016 to 2020; thus, projected production volumes are also included for those crops.

There were slight differences between the sources of data: agricultural statistics in Uzbekistan denote “cultivation areas,” which refer to crop acreage, while FAOSTAT uses “harvest area,” which does not include land that has been abandoned and does not produce any harvest to speak of.

Table 3-12: Actual Figures Used to Create Production Volumes by Region (2014, Unit: tonnes)

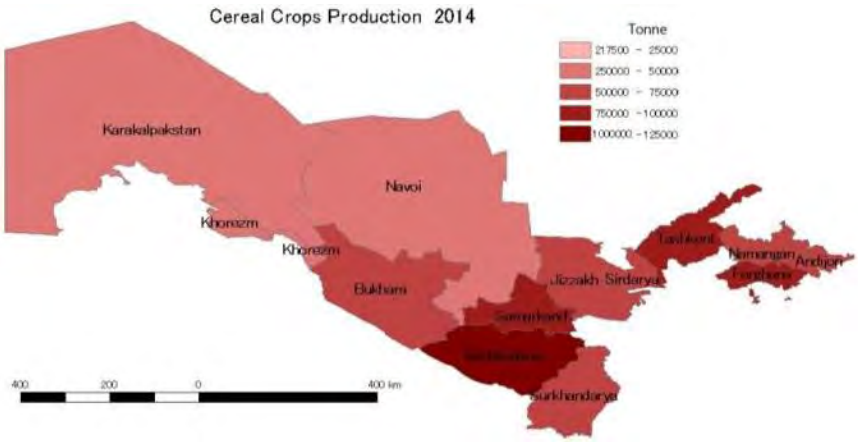
Province	Cereals	Wheat	Cotton	Potatoes	Vegetables	Melons	Fruits	Grapes	Meat
Republic of Karakalpakstan	217,500	161,700	203,200	44,700	227,500	106,000	36,800	5,300	82,700
Andijan Region	669,600	557,700	283,700	253,800	1,308,900	92,700	522,900	63,400	119,900
Bukhara Region	679,600	556,500	348,400	175,300	520,000	114,100	217,200	154,600	182,700
Jizzakh Region	544,600	450,100	229,100	55,900	341,200	236,700	82,000	28,500	162,800
Qashqadaryo Region	1,035,400	986,400	421,500	150,100	467,300	130,600	110,700	88,900	233,200
Navoiy Region	266,900	245,800	107,500	62,700	215,200	60,900	95,700	64,900	125,400
Namangan Region	544,800	474,400	230,000	227,000	622,500	68,100	203,500	114,200	106,500
Samarqand Region	848,600	806,600	223,200	526,800	1,457,700	97,200	341,700	497,300	230,000
Surxondaryo Region	655,800	606,400	335,100	194,000	807,000	169,900	124,800	115,700	146,400
Sirdaryo Region	579,900	494,900	243,100	40,200	263,800	285,300	29,500	12,100	52,800
Tashkent Region	771,800	636,100	237,100	361,400	1,841,700	144,800	188,500	155,900	212,500
Fergana Region	790,300	756,000	280,100	252,100	712,100	64,200	375,900	103,600	130,500
Khorezm Region	445,700	223,400	258,200	108,400	501,800	125,600	161,400	36,800	120,900
Total	**8,050,500**	**6,956,000**	**3,400,200**	**3,011,300**	**2,452,400**	**9,286,700**	**1,696,100**	**1,441,200**	**1,906,300**

Source: Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

(a) Cereal Crops

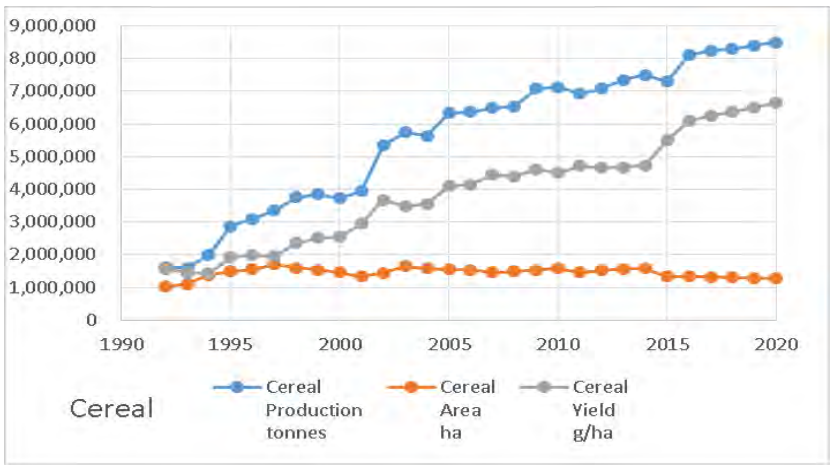
The narrow definition of "cereal crops" includes barley, rice, corn and sorghum. In a broader sense, legumes are also included, and Uzbekistan's agricultural statistics include beans as cereal crops. The main cereal crops in Uzbekistan are wheat, barley, corn and rice. Oats, sorghum and beans are grown in Uzbekistan and counted as cereal crops, but they were excluded from these considerations because they are grown in small volumes.

Figure 3-12 shows production volumes in 2014, which were high in the Fergana Valley and in the Central and Southern zones. Figure 3-13 shows how the harvest volume, cultivation area and yield have changed since 1992, when Uzbekistan gained independence. Cultivation area peaked in 1998, decreased from then until 2001, but recovered in 2003 and has held steady since then. Despite plans under Ukase of the President calling for a reduction of cultivation area over the five-year period starting in 2015, yield per unit of area is scheduled to increase each year, and harvest volume is also expected to increase each year.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-12: Cereal Crop Production Volume by Region (2014)

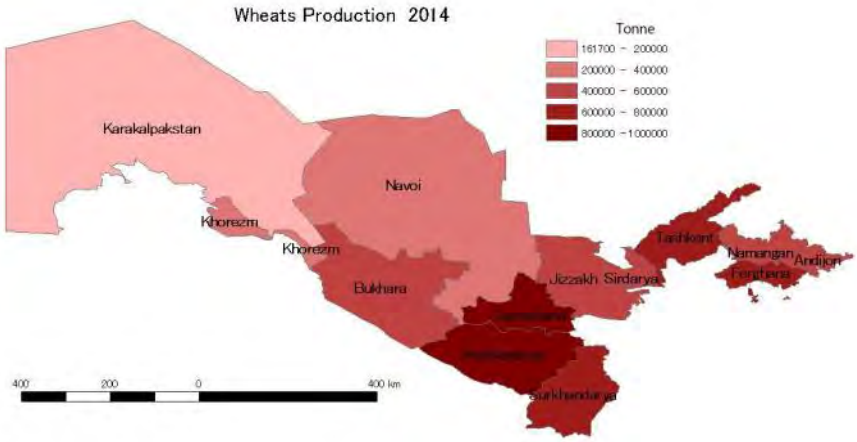


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-13: Changes in Cereal Crop Production Volume, Cultivation Area and Yield

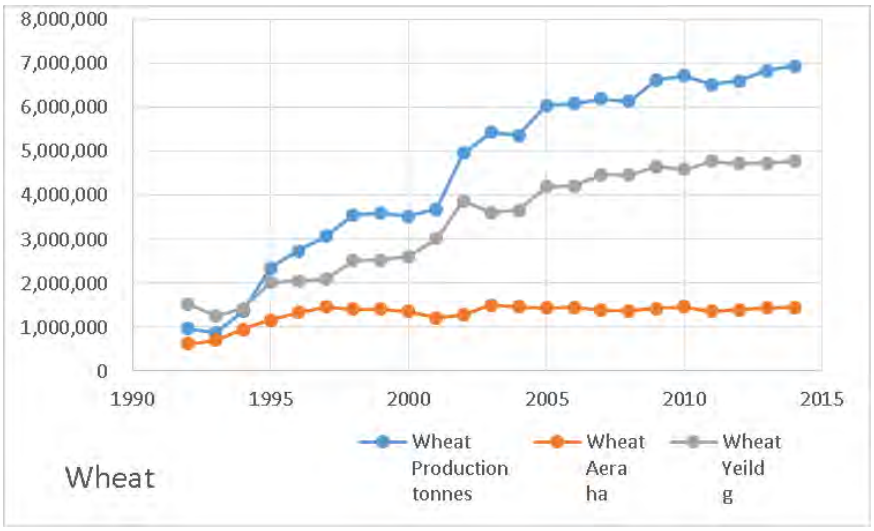
(i) Wheat

Figure 3-14 is a map of wheat production volumes for each region in Uzbekistan. As explained previously, it is virtually the same as the cereal crop map. Data on changes in production volume, cultivation area and yield for wheat (Figure 3-15) extends through 2014. In comparison to the figure for cereal crops, the numbers for wheat increased overall, but began to level off toward 2014. This is likely because the data does not reflect the impact of disruption due to barley, corn and rice.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-14: Wheat Production Volume by Region (2014)

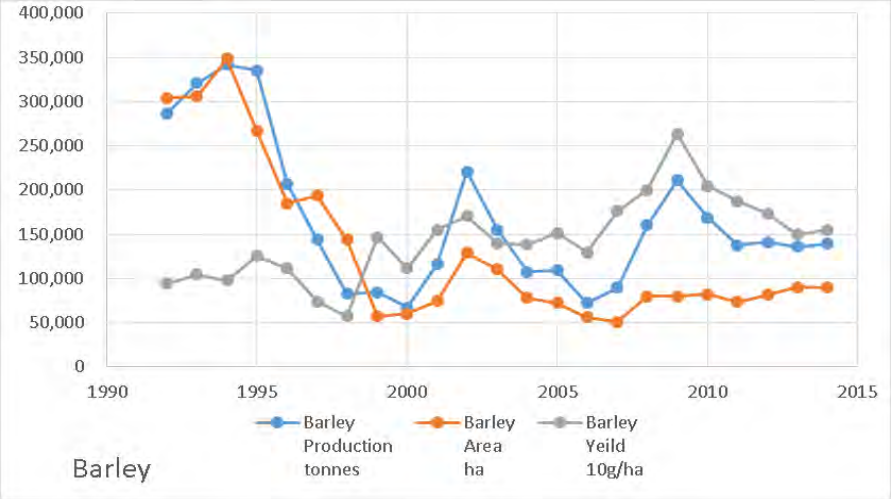


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-15: Changes in Wheat Production Volume, Cultivation Area and Yield

(ii) Barley

Figure 3-16 shows how the harvest volume, cultivation area and yield for wheat have changed from 1992 to 2014. The cultivation area was high until 1994, when it began to fluctuate dramatically. As a result, the production volume has also varied widely. In recent years, the cultivation area and production volume have both settled at around 40% of the levels directly following Uzbekistan's independence.

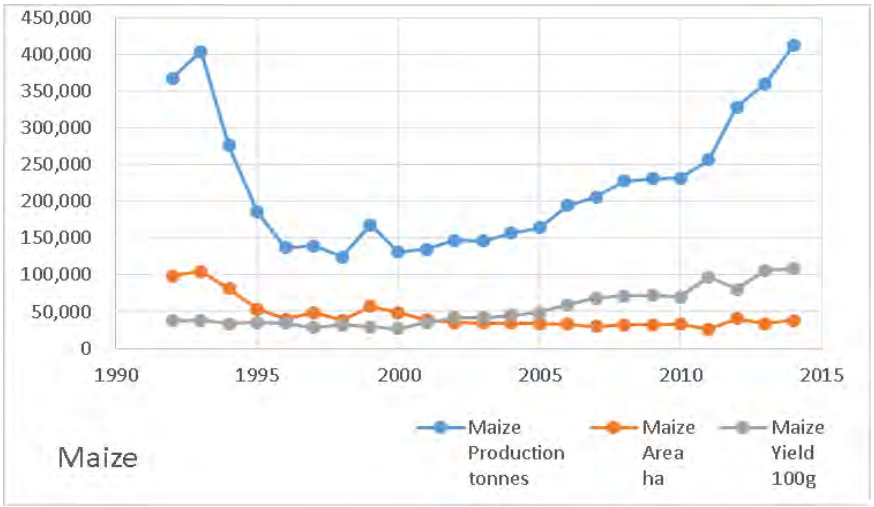


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-16: Changes in Barley Production Volume, Cultivation Area and Yield

(iii) Corn

Figure 3-17 shows how the harvest volume, cultivation area and yield for corn have changed from 1992 to 2014. The harvest volume has decreased to roughly one-third the level directly following Uzbekistan's independence, but the production volume has recovered to its independence-era level. This is due to a substantial increase in the yield.

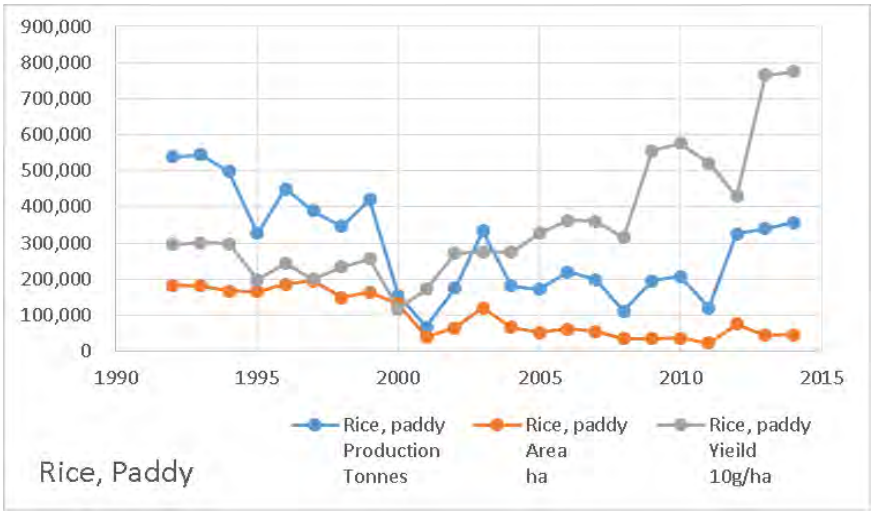


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-17: Changes in Corn Production Volume, Cultivation Area and Yield

(iv) Rice

Figure 3-18 shows how the harvest volume, cultivation area and yield for rice have changed from 1992 to 2014. The crop acreage of rice paddies has continued to decline since 1992 due to water supply problems, but the yield has increased noticeably in recent years, and the production volume has held steady since around 2000.



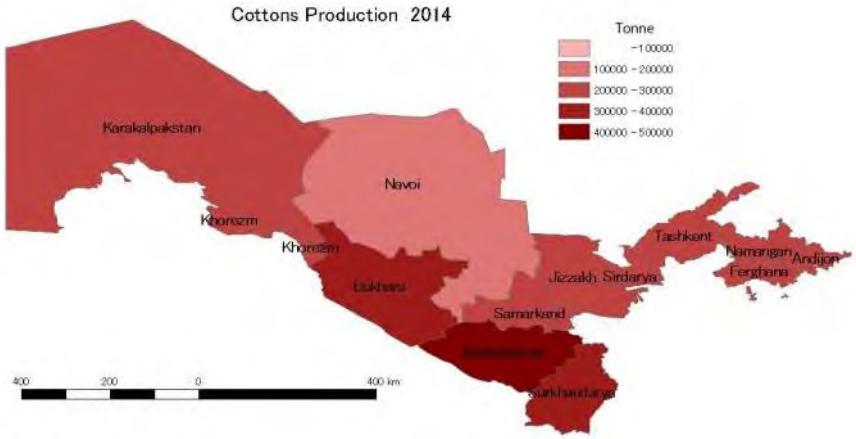
Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-18: Changes in Rice Production Volume, Cultivation Area and Yield

(b) Cotton

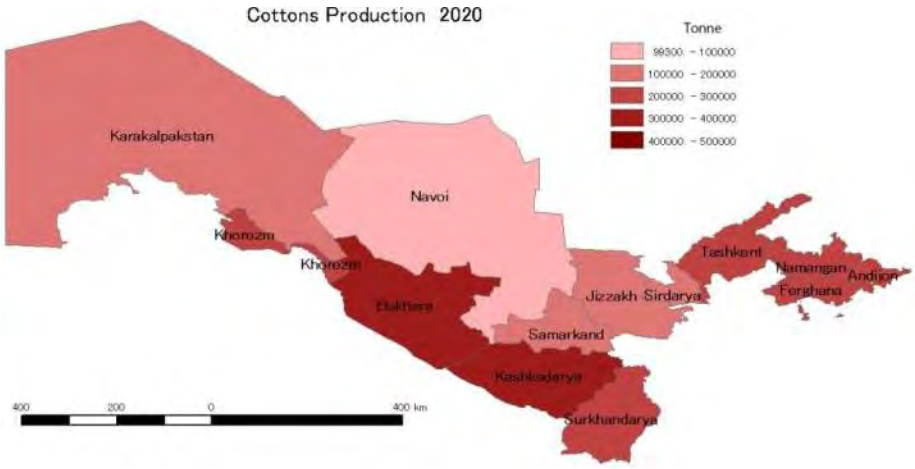
Figure 3-19 is a map of cotton production volumes in 2015 for each region in Uzbekistan. The production volume for the Southern zone region of Qashqadaryo is the highest, followed by the Southern zone region of Surxondaryo, and then the Middle Western zone region of Bukhara. Figure 3-20 is a map that shows planned cotton production volumes for each region in 2020 based on the Republic of Uzbekistan Presidential Proclamation dated December 2015. This figure shows that harvest volumes drop one level from Figure 3-20 in most regions, which demonstrates plans to reduce crop acreage around the same amount in each region.

Figure 3-21 shows how the harvest volume, cultivation area and yield for cotton fibers have changed from 1987 to 2020. Uzbekistan Agricultural Statistical Data 2016 contains cotton flower yield, but FAO and USDA agricultural statistics contain data on cotton fiber yield; therefore, cotton fiber yield was used in Figure 3-21. In addition, the FAO and USDA statistics for harvest volumes were quite different. The FAO data contained no figures for cultivation area; thus, the figures from USDA agricultural statistics were used. Cotton weight figures for 2015 to 2020 from Uzbekistan Presidential Proclamation, Addendum No. 1-a were converted to cotton fiber weights. The yield for cotton fibers has held steady over the past 30 years, but the production volume has fallen along with the decrease of the cultivation area.



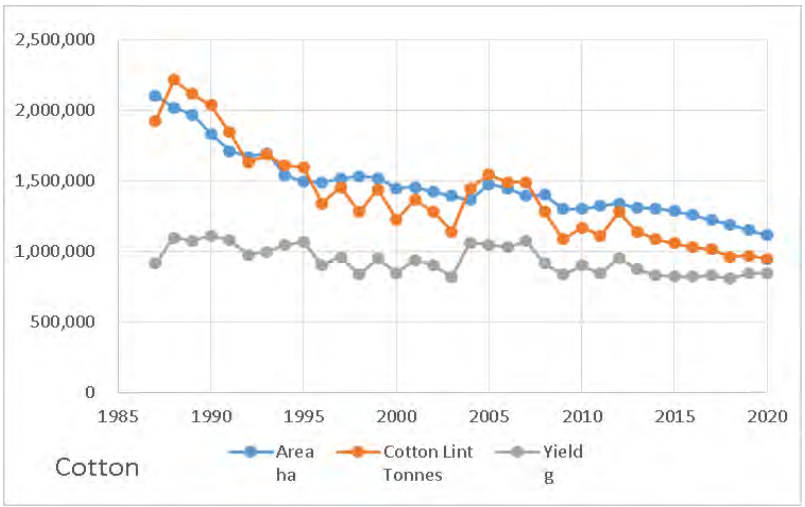
Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-19: Cotton Production Volume by Region (2014)



Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation dated December 2015, Addendum No. 1-a

Figure 3-20: Cotton Production Volume by Region (2020)



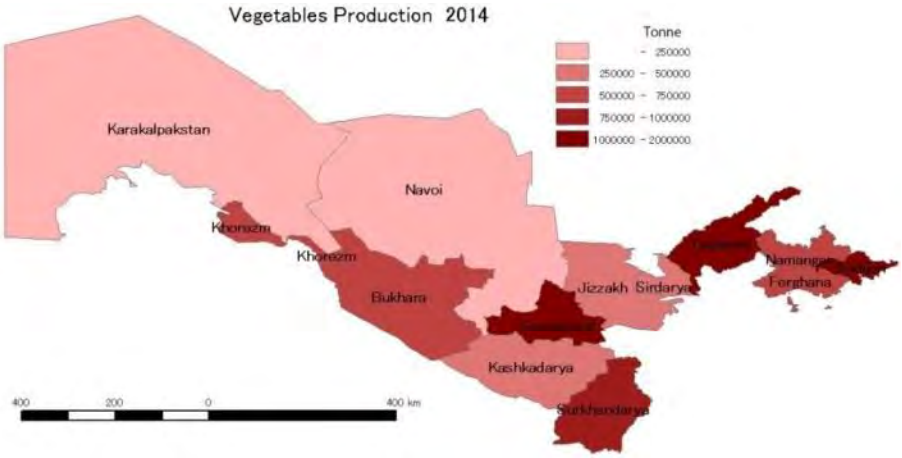
Source: Prepared by the JICA Study Team based on USDA agricultural statistics, Uzbekistan Presidential Proclamation Addenda, etc.

Figure 3-21: Changes in Cotton Fiber Production Volume, Cultivation Area and Yield

(c) Vegetables

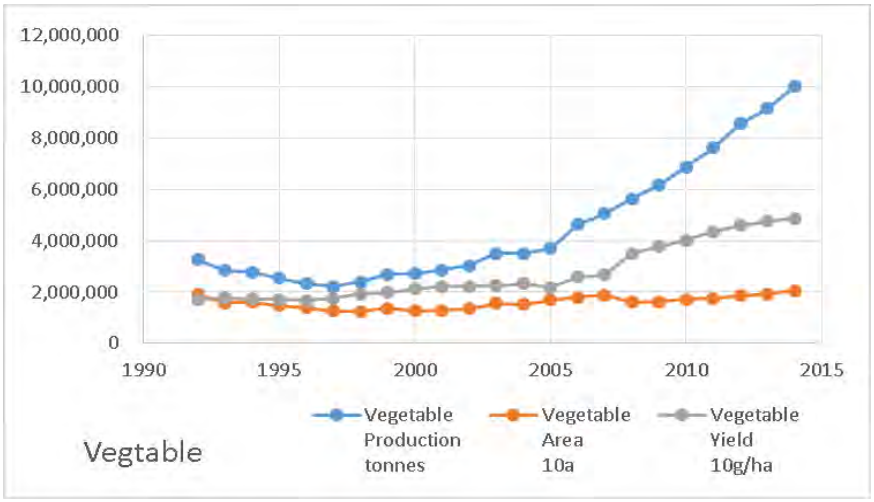
In Japan, potatoes are recognized as a typical vegetable. However, in regions where potatoes are a staple, such as Uzbekistan, they are not counted as vegetables, and occupy their own category. Uzbekistan's statistics for vegetables are matched by official FAOSTAT data for Tomatoes, Cucumbers, Dry Onions, Cabbages and Other Brassicas, Eggplants, Garlic, Carrots and Turnips, Leguminous Vegetables, Green Beans, Cabbages, Lettuce and Chicory, Leeks and Other Alliaceous Vegetables, and Other Fresh Vegetables NES such as beets, celery, parsley and watercress.

Figure 3-22 is a map of vegetable production volumes for each region in Uzbekistan. Production volumes are particularly large for the high-consumption regions of Tashkent and Samarqand. Figure 3-23 shows how the harvest volume, cultivation area and yield for vegetables have changed from 1992 to 2014. The cultivation area has remained essentially the same, but the production volume has increased remarkably due to an increase in the yield. This is likely due to the increase in facilities (greenhouses) for growing tomatoes, cucumbers and the like.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-22: Vegetable Production Volume by Region (2014)

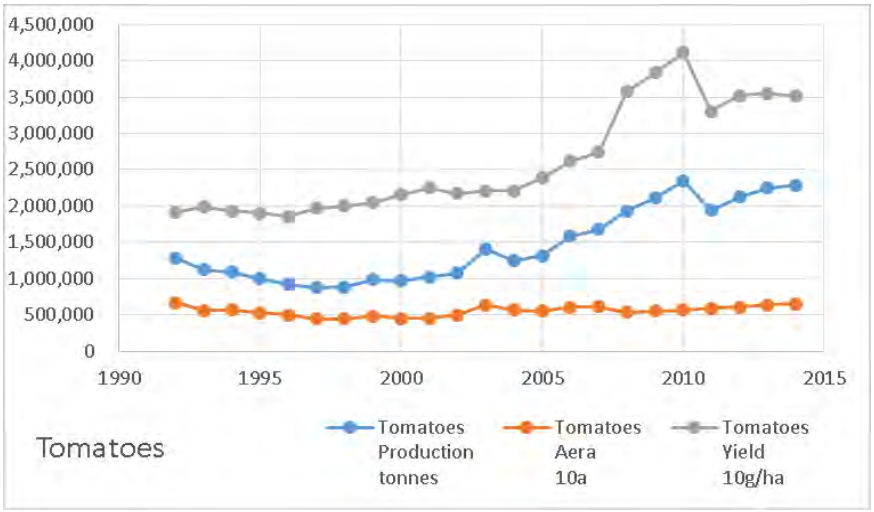


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-23: Changes in Vegetable Production Volume, Cultivation Area and Yield

(i) Tomatoes

Figure 3-24 shows how the harvest volume, cultivation area and yield for tomatoes have changed from 1992 to 2014. As with vegetables overall, the cultivation area for tomatoes has remained essentially the same. The yield increased until it hit a peak in 2010. The production volume has followed the same trend as the yield. The yield decreased rapidly in 2011, which in turn caused the production volume to decrease.

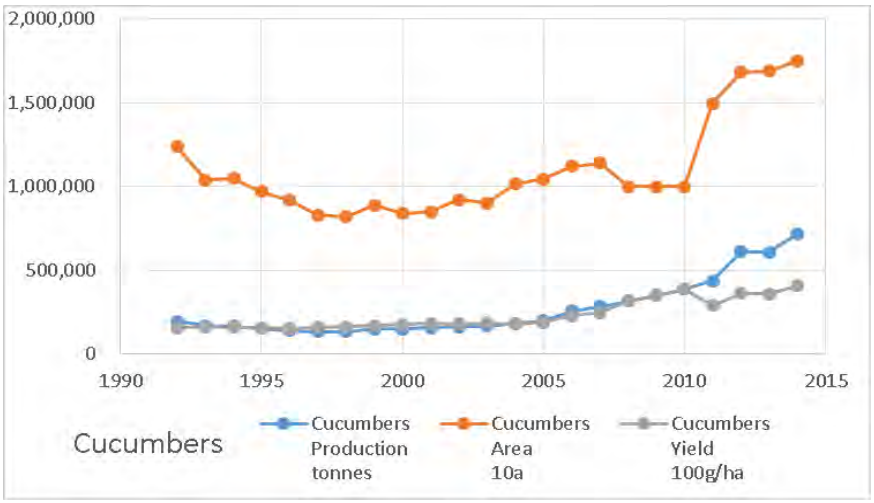


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-24: Changes in Tomato Production Volume, Cultivation Area and Yield

(ii) Cucumbers

Figure 3-25 shows how the harvest volume, cultivation area and yield for cucumbers have changed from 1992 to 2014. The production volume held steady from 1992 to 2005, and increased after that point. The cultivation area increased in 2011, but the yield decreased around that time.

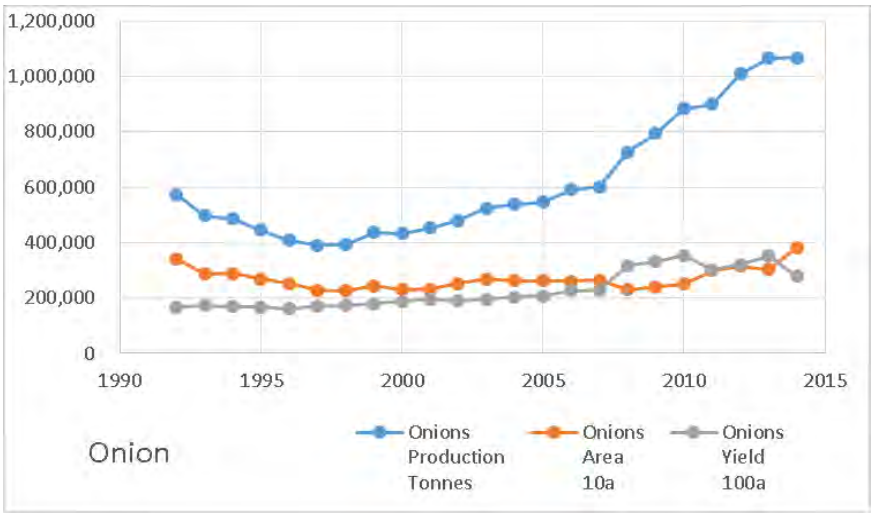


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-25: Changes in Cucumber Production Volume, Cultivation Area and Yield

(iii) Onions

Figure 3-26 shows how the harvest volume, cultivation area and yield for onions have changed from 1992 to 2014. The harvest volume decreased between 1992 and 1998, but has increased every year since then. The cultivation area showed a downward trend through 2010, but increased after that. The yield has increased in recent years, but decreased in 2014.

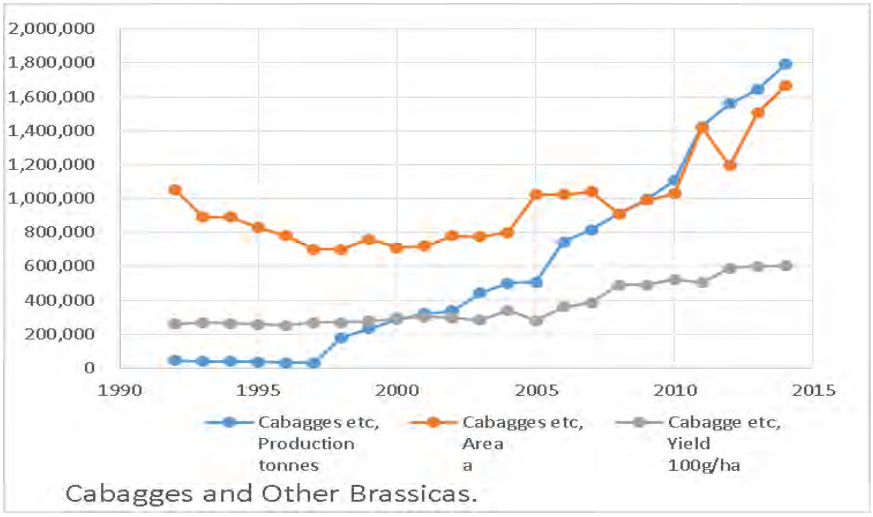


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-26: Changes in Onion Production Volume, Cultivation Area and Yield

(iv) Cabbages and Other Brassicas

Figure 3-27 shows how the harvest volume, cultivation area and yield for cabbages and other brassicas have changed from 1992 to 2014. The yield and crop acreage generally increased starting in the late 1990s, and the production volume has increased vigorously.

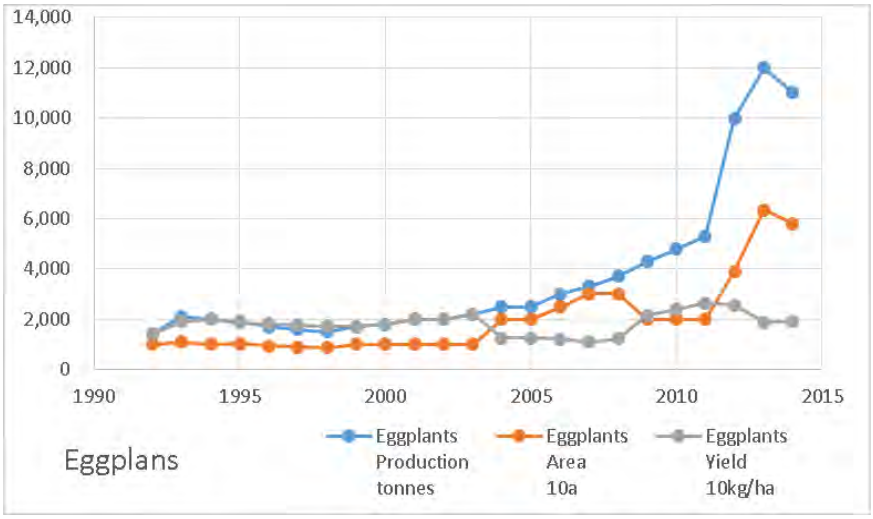


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-27: Changes in Cabbage and Other Brassica Production Volume, Cultivation Area and Yield

(v) Eggplants

Figure 3-28 shows how the harvest volume, cultivation area and yield for eggplants have changed from 1992 to 2014. The production volume soared in the early 2000s, but hit a peak in 2013 and decreased in 2014. This is due to a decrease in yield.

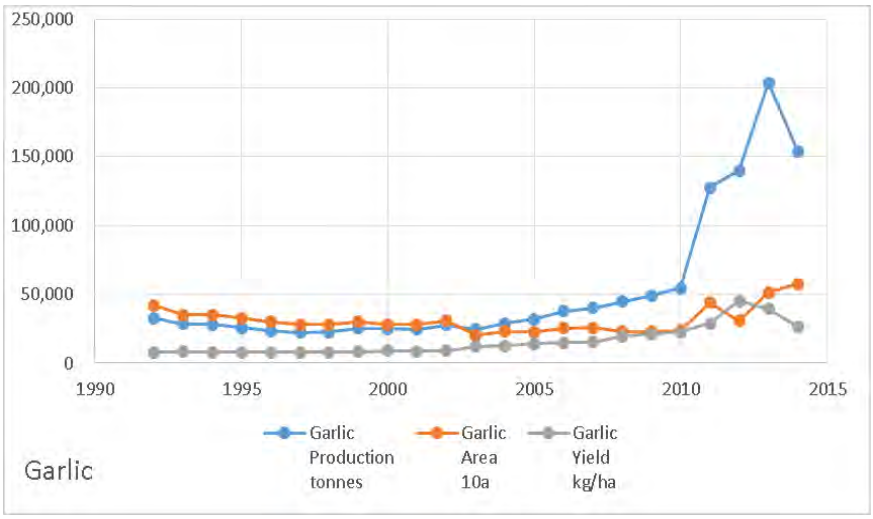


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-28: Changes in Eggplant Production Volume, Cultivation Area and Yield

(vi) Garlic

Figure 3-29 shows how the harvest volume, cultivation area and yield for garlic have changed from 1992 to 2014. Garlic traced the same trend as eggplants, with the production volume soaring in the early 2000s, but coming down from a peak in 2014. The reason for this is the same as for eggplants; the yield decreased.

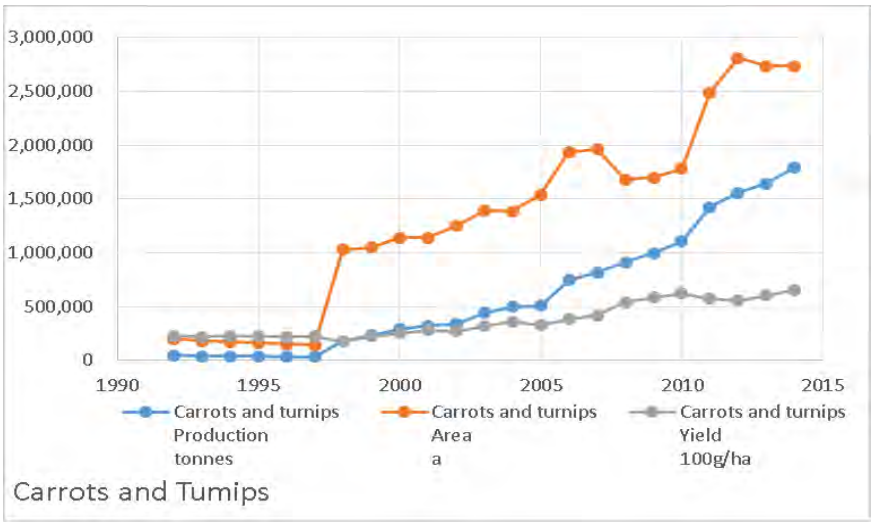


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-29: Changes in Garlic Production Volume, Cultivation Area and Yield

(vii) Carrots and Turnips

Figure 3-30 shows how the harvest volume, cultivation area and yield for carrots and turnips have changed from 1992 to 2014. The production volume has increased rapidly since the late 1990s. This increase is mainly due to an increase in the cultivation area.

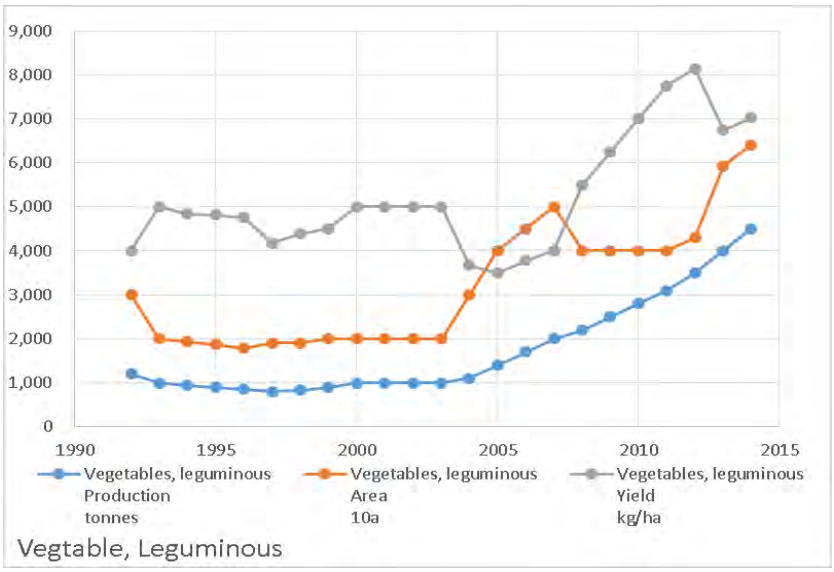


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-30: Changes in Carrot and Turnip Production Volume, Cultivation Area and Yield

(viii) Leguminous Vegetables

Figure 3-31 shows how the harvest volume, cultivation area and yield for leguminous vegetables have changed from 1992 to 2014. The production volume has increased vigorously since the early 2000s. This is due to increases in the yield and the cultivation area.

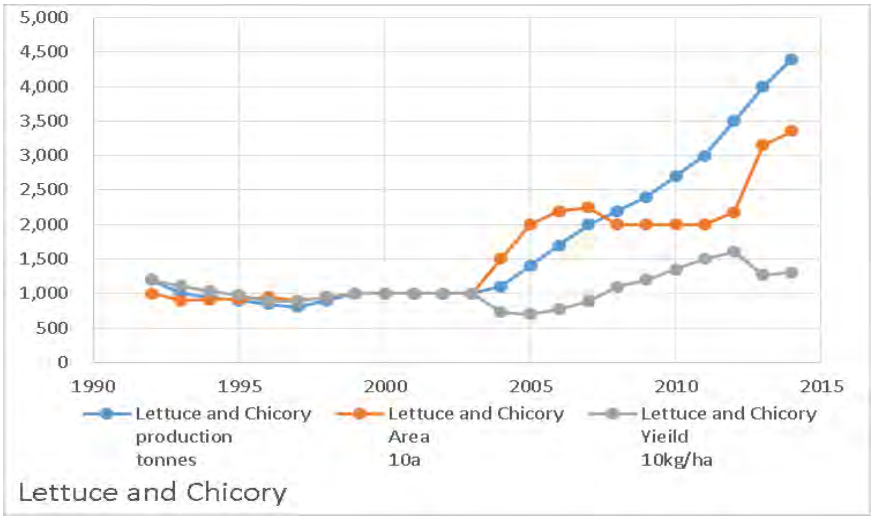


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-31: Changes in Leguminous Vegetable Production Volume, Cultivation Area and Yield

(ix) Lettuce and Chicory

Figure 3-32 shows how the harvest volume, cultivation area and yield for lettuce and chicory have changed from 1992 to 2014. The harvest volume, cultivation area and yield all held steady from 1992 to 2003, but the production volume has increased vigorously since 2004. This is due to increases in both the yield and the cultivation area.

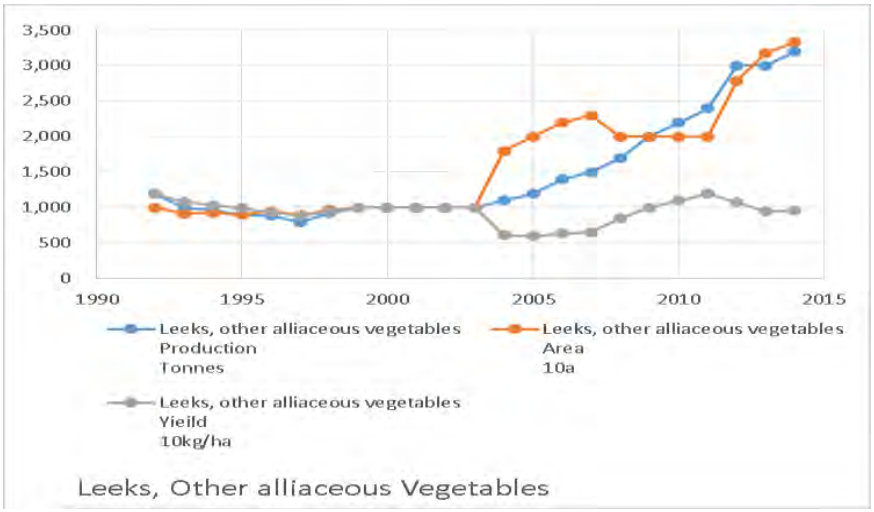


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-32: Changes in Lettuce and Chicory Production Volume, Cultivation Area and Yield

(x) Leeks and Other Alliaceous Vegetables

Figure 3-33 shows how the harvest volume, cultivation area and yield for leeks and other alliaceous vegetables have changed from 1992 to 2014. Leeks and other alliaceous vegetables traced the same trend as lettuce and chicory, with the harvest volume, cultivation area and yield all holding steady from 1992 to 2003, and the production volume increasing vigorously since 2004. This increase is due to an increase in the cultivation area.

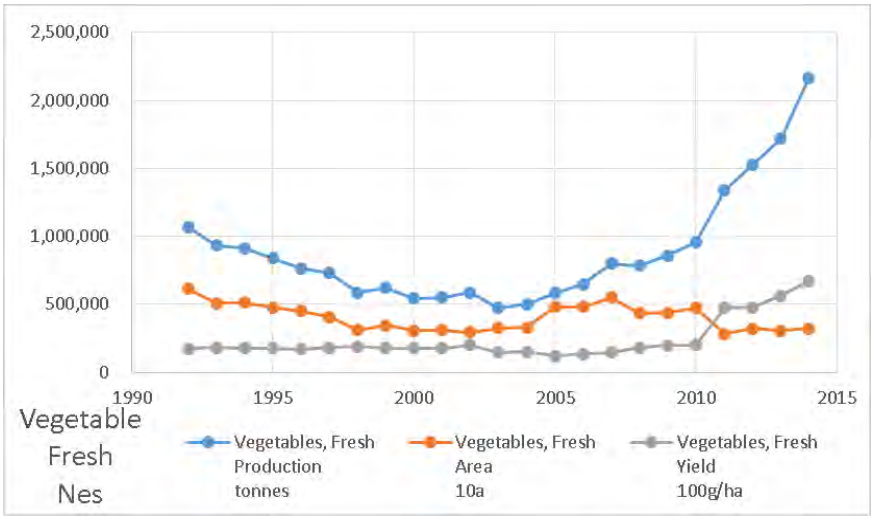


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-33: Changes in Leek and Other Alliaceous Vegetable Production Volume, Cultivation Area and Yield

(xi) Other Vegetables

Other vegetables include bamboo shoots, beets, celery, daikon radishes and watercress among others. Figure 3-34 shows how the harvest volume, cultivation area and yield for other vegetables have changed from 1992 to 2014. The production volume decreased from 1992 to 2003, but has increased rapidly since then. The reason for the increase in recent years is an increase in the yield.



Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-34: Changes in Other Vegetable Production Volume, Cultivation Area and Yield

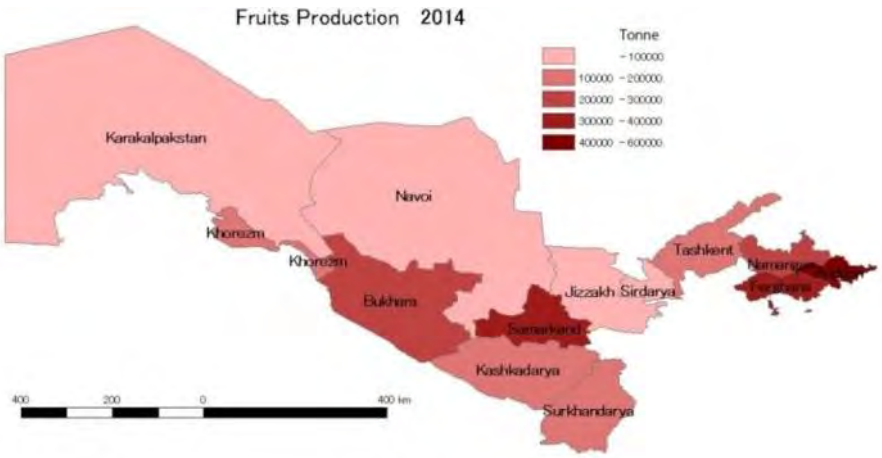
(d) Fruits

Grapes are a typical fruit, but in Uzbekistan, most of them are used to make raisins and wine; therefore, in the country's statistics, grapes occupy their own category, and are not counted as a fruit.

FAOSTAT data for fruits in Uzbekistan includes Apples, Apricots, Cherries, Peaches and Nectarines, Pears, Plums and Sloes, Quinces, Persimmons, Other Stone Fruits NES (Japanese Apricots, etc.), Other Pome Fruits NES (Marmelo, etc.), and Other Fresh Fruits NES (Loquats, Jujubes, Pomegranates).

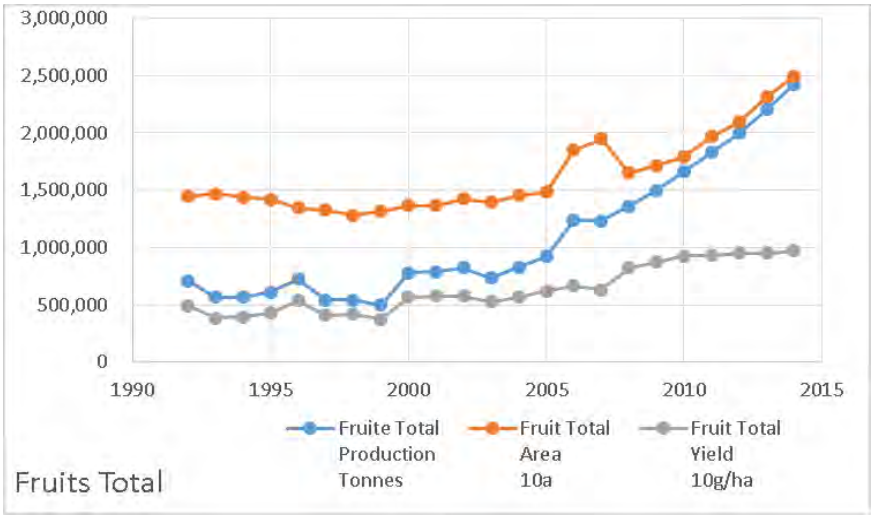
Figure 3-35 is a map of fruit production volumes for each region in Uzbekistan. Production volumes are high in the three Fergana Valley regions of Namangan, Fergana and Andijan, and in the Middle Western zone regions of Samarqand and Bukhara.

Figure 3-36 shows how the harvest volume, cultivation area and yield for fruits have changed from 1992 to 2014. The figure shows that production expanded rapidly starting in the early 2000s. In particular, the production increase since 2010 is due to the increase in the cultivation area.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-35: Fruit Production Volume by Region (2014)



Source: Prepared by the JICA Study Team based on FAOSTAT

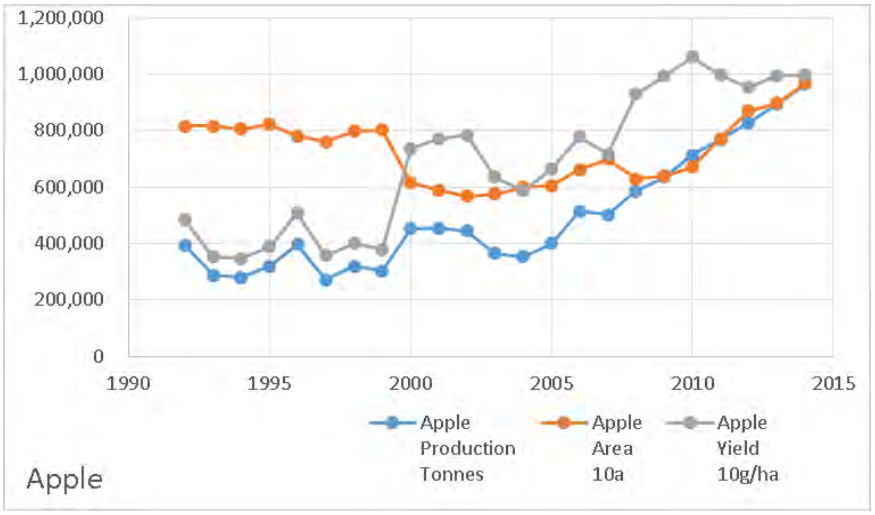
Figure 3-36: Changes in Fruit Production Volume, Cultivation Area and Yield

(i) Apples

Figure 3-37 shows how the harvest volume, cultivation area and yield for apples have changed from 1992 to 2014. Generally, the figures have increased vigorously since 2005. The increase in yield between 2005 and 2010 was a major factor in the increase in production volume, but when the yield hit its peak in 2010, the production volume continued to increase on the strength of cultivation area expansion. The production volume increased 150% from 400,000 tons in 2005 to 1 million tons in 2014. In 2014, the 1 million-ton production volume of apples accounted for 40% of the overall fruit production volume of 2.5 million tons.

Apple production has increased rapidly in recent years, but yield has stalled, and other technical problems persist. The Fukushima-Uzbekistan Cultural and Economic Exchange Association and Hirosaki University have introduced the Fuji variety and are providing technical

guidance for its cultivation, and this technology is being spread throughout the country via Tashkent State Agrarian University, the Samarkand State Institute of Agriculture, the Mirzaev Horticulture Research Institute and other institutions.

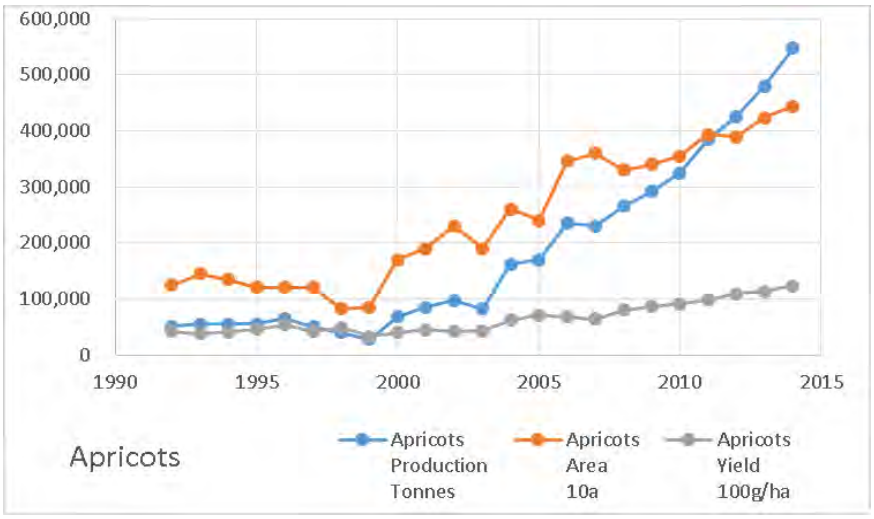


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-37: Changes in Apple Production Volume, Cultivation Area and Yield

(ii) Apricots

Figure 3-38 shows how the harvest volume, cultivation area and yield for apricots have changed from 1992 to 2014. The figures decreased somewhat between 1992 and 1999, but began to increase starting in 2000. The production volume has increased vigorously since then. Increases in both the yield and the cultivation area contributed to this increase in production volume.

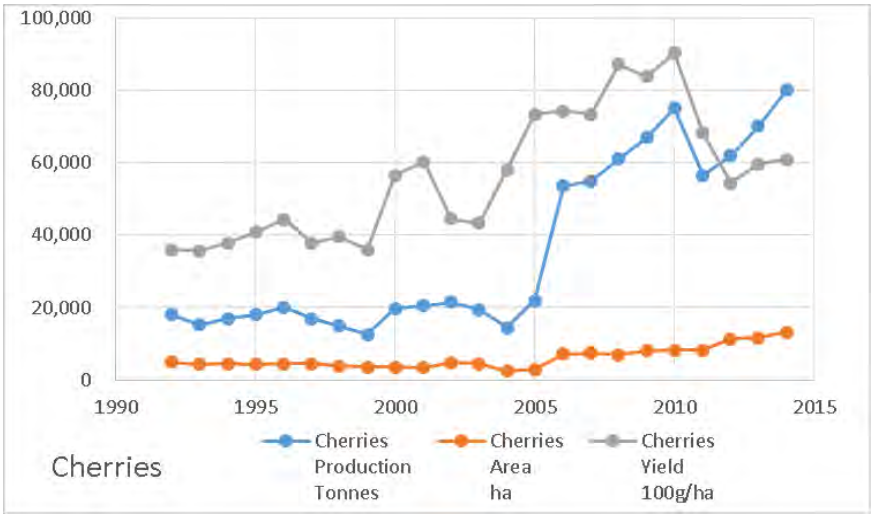


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-38: Changes in Apricot Production Volume, Cultivation Area and Yield

(iii) Cherries

Figure 3-39 shows how the harvest volume, cultivation area and yield for cherries have changed from 1992 to 2014. The production volume held steady from 1992 to 2004, but increased suddenly in 2005 and onward. The cultivation area has expanded vigorously, but the yield decreased from 2012 to 2013.

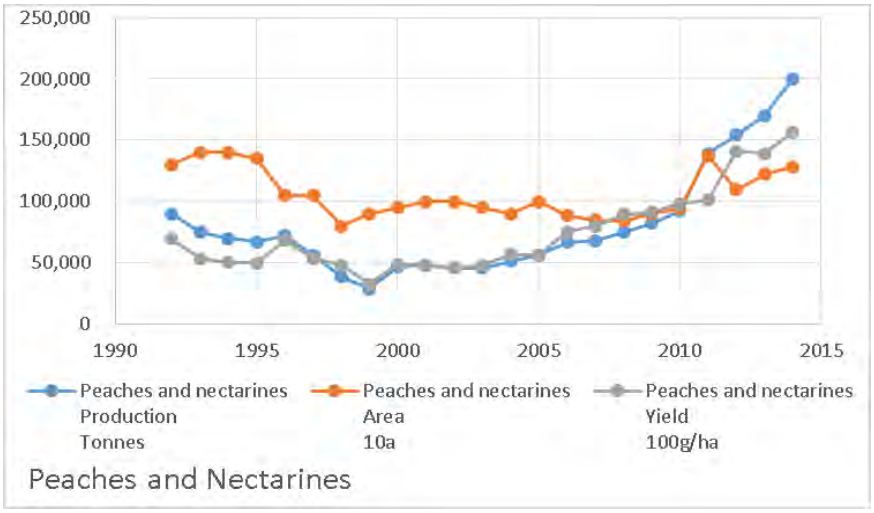


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-39: Changes in Cherry Production Volume, Cultivation Area and Yield

(iv) Peaches and Nectarines

Figure 3-40 shows how the harvest volume, cultivation area and yield for peaches and nectarines have changed from 1992 to 2014. The production volume decreased somewhat between 1992 and 1999, but began to increase rapidly starting in 2010. This increase is mainly due to an increase in the cultivation area.

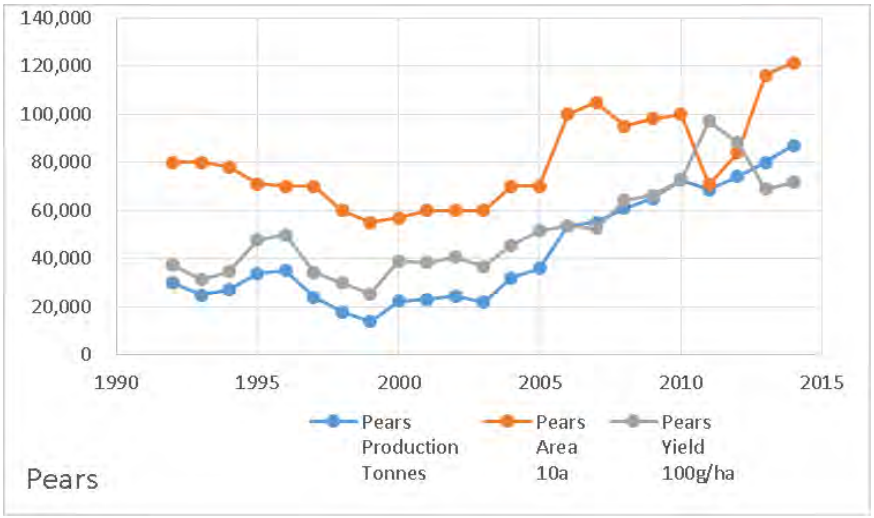


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-40: Changes in Peach and Nectarine Production Volume, Cultivation Area and Yield

(v) Pears

Figure 3-41 shows how the harvest volume, cultivation area and yield for pears have changed from 1992 to 2014. The production volume decreased or held steady between 1992 and 2004, but began to increase after then. The increase of both the cultivation area and yield contributed to the increase in the production volume, but the increase in the yield played a larger role.

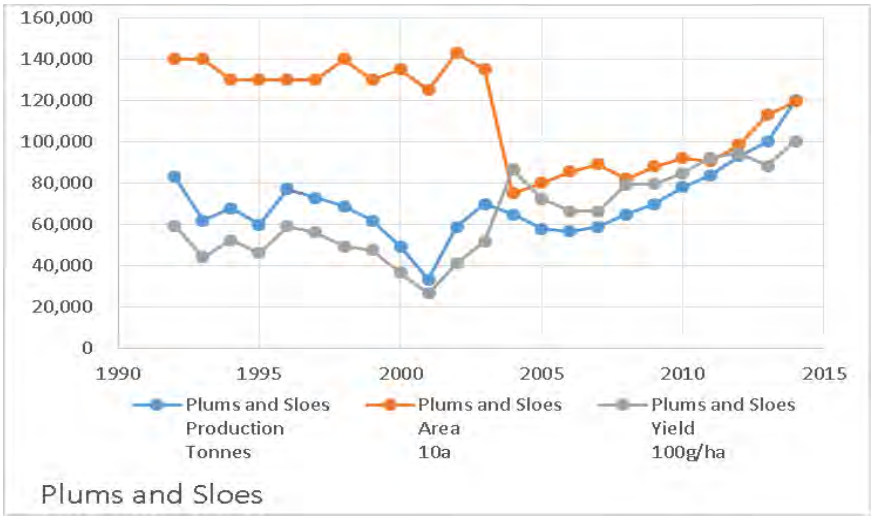


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-41: Changes in Pear Production Volume, Cultivation Area and Yield

(vi) Plums and Sloes

Figure 3-42 shows how the harvest volume, cultivation area and yield for plums and sloes have changed from 1992 to 2014. The production volume decreased slightly until 2000, and then the cultivation area decreased substantially in 2004. However, the increased production since then is due to increases in both the cultivation area and yield.

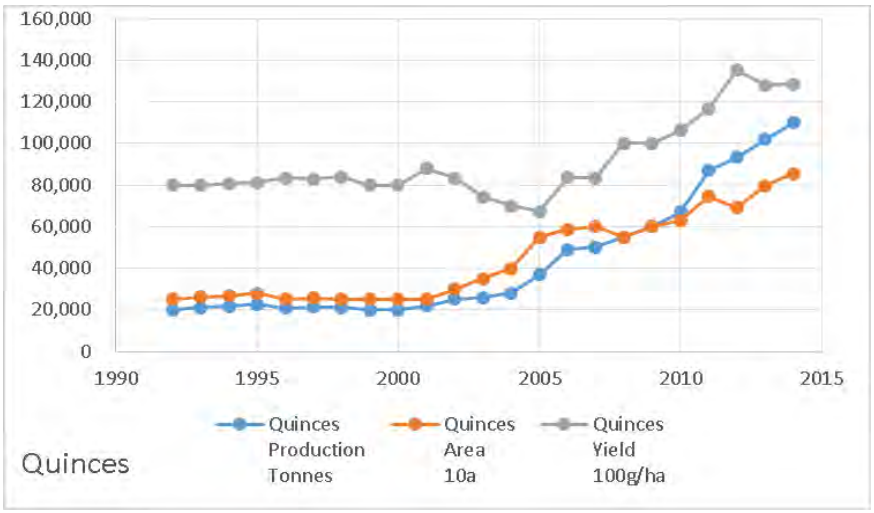


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-42: Changes in Plum and Sloe Production Volume, Cultivation Area and Yield

(vii) Quinces

Figure 3-43 shows how the harvest volume, cultivation area and yield for quinces have changed from 1992 to 2014. The production volume essentially held steady from 1992 to 2001. Production increased in 2001, and has continued to increase since then. This increased production is due to increases in both the cultivation area and yield.

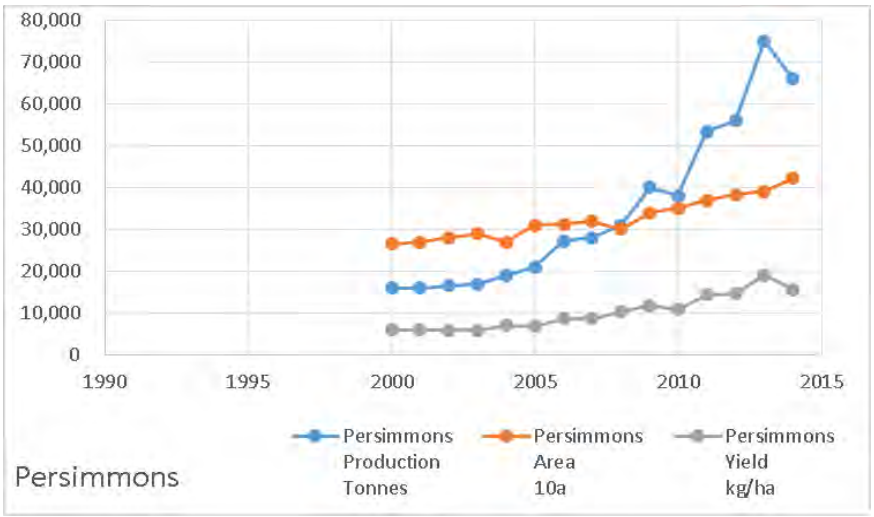


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-43: Changes in Quince Production Volume, Cultivation Area and Yield

(viii) Persimmons

Figure 3-44 shows how the harvest volume, cultivation area and yield for persimmons have changed from 2000 to 2014. The production volume has generally continued to increase since 2000 (no data is available before 2000). This increased production is due to increases in both the cultivation area and yield. The production volume fell from 2013 to 2014 due to a decrease in the yield.

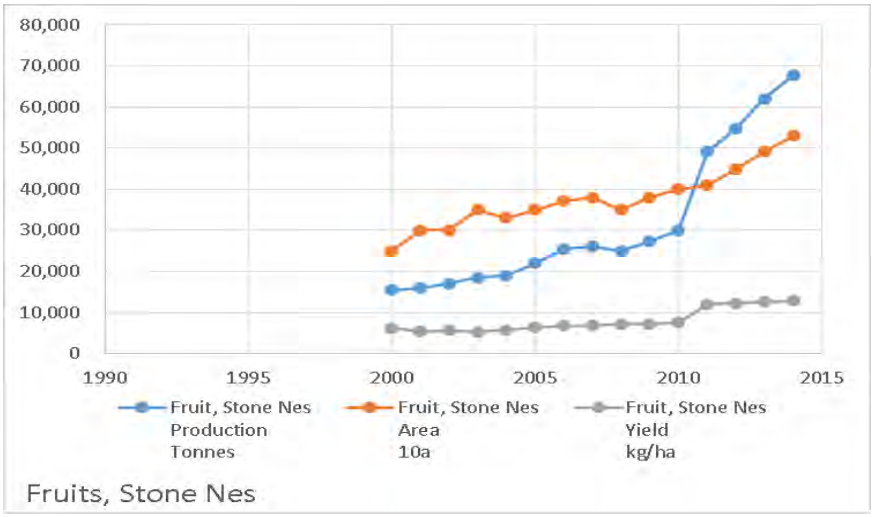


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-44: Changes in Persimmon Production Volume, Cultivation Area and Yield

(ix) Other Stone Fruits NES (Japanese Apricots, etc.)

Figure 3-45 shows how the harvest volume, cultivation area and yield for other stone fruits (Japanese apricots, etc.) have changed from 2000 to 2014. Although data is only available from 2000 onward, the production volume has continued to increase. This increased production is due to increases in both the cultivation area and yield.

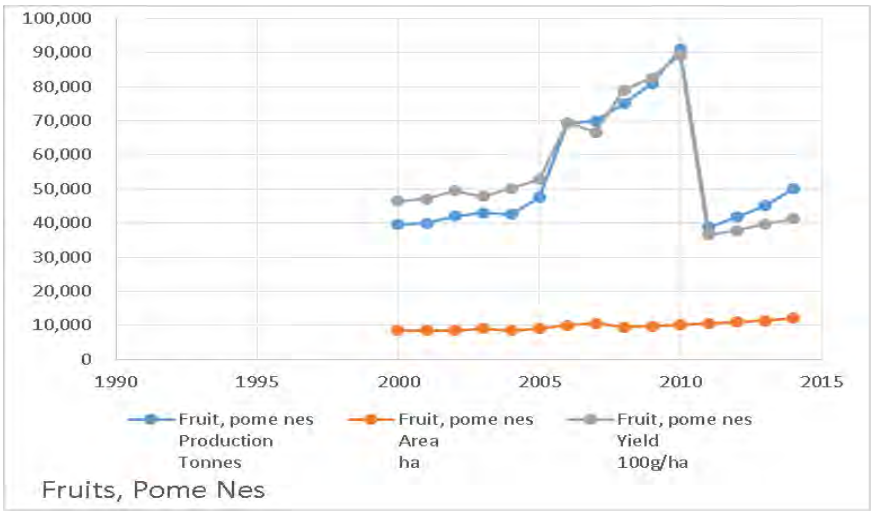


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-45: Changes in Other Stone Fruit NES (Japanese Apricot, etc.) Production Volume, Cultivation Area and Yield

(x) Other Pome Fruits NES (Marmelos, etc.)

Figure 3-46 shows how the harvest volume, cultivation area and yield for other pome fruits (marmelos, etc.) have changed from 2000 to 2014. The production volume continued to increase through 2010, but the yield decreased substantially in 2011, which in turn caused the harvest volume to decrease. However, since then each have begun to increase again.

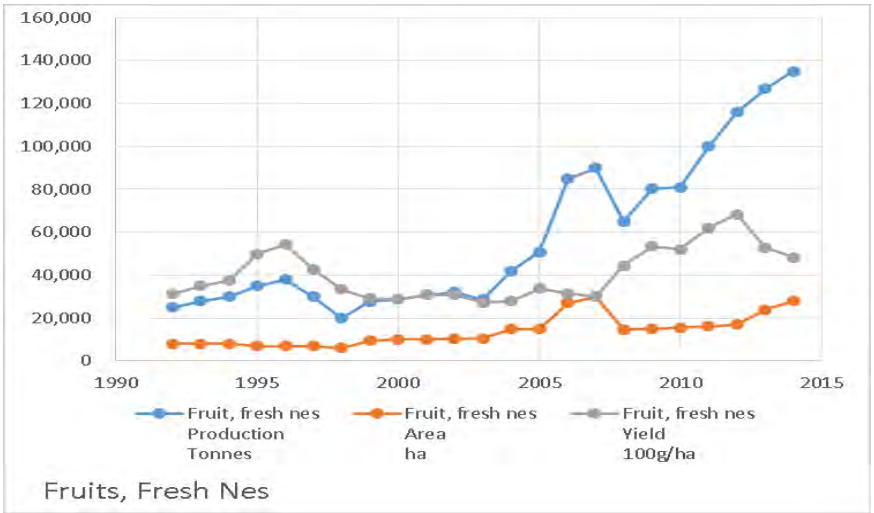


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-46: Changes in Other Pome Fruit NES (Marmelo, etc.) Production Volume, Cultivation Area and Yield

(xi) Other Fresh Fruits NES (Loquats, Jujubes, Pomegranates)

Figure 3-47 shows how the harvest volume, cultivation area and yield for other fresh fruits (loquats, jujubes, and pomegranates) have changed from 1992 to 2014. The production volume held steady through 2003, but has trended toward increasing since then. This increased production is due to increases in both the cultivation area and yield.



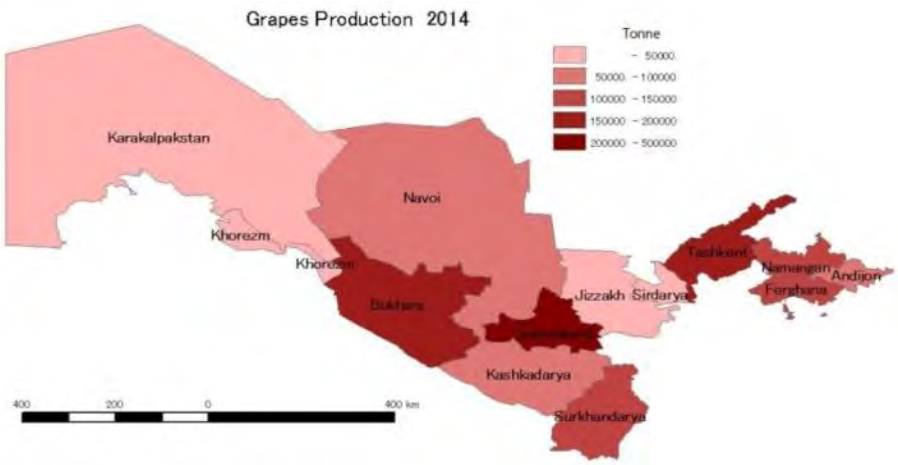
Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-47: Changes in Other Fresh Fruit NES (Loquat, Jujube, Pomegranate) Production Volume, Cultivation Area and Yield

(e) Grapes

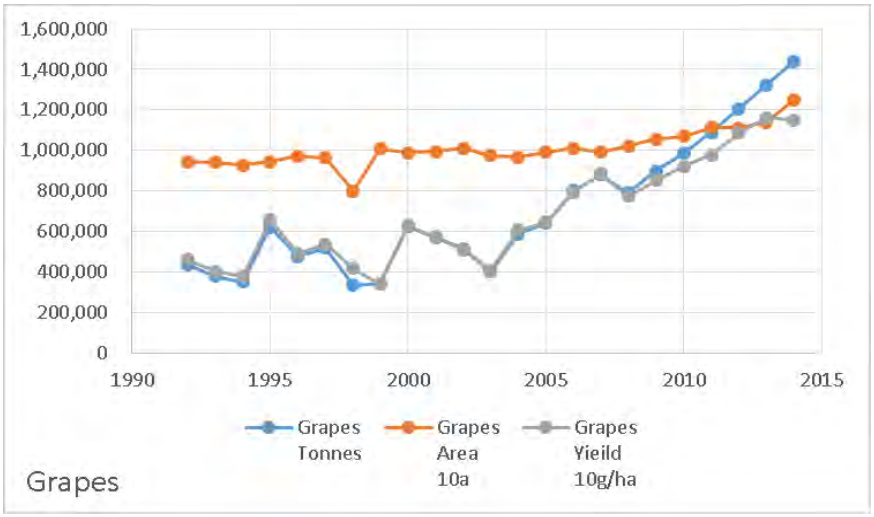
Figure 3-48 is a map of grape production volumes for each region in Uzbekistan. Production volumes are highest in the Central zone region of Tashkent and the Middle Western zone regions of Samarqand and Bukhara, followed by the Fergana Valley regions of Namangan and Fergana and the Southern zone region of Surxondaryo.

Figure 3-49 shows how the harvest volume, cultivation area and yield for grapes have changed from 1992 to 2014. The production volume was sluggish through 2003, but has trended toward increasing since then. This increased production is due to increases in both the cultivation area and yield.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-48: Grape Production Volume by Region (2014)



Source: Prepared by the JICA Study Team based on FAOSTAT

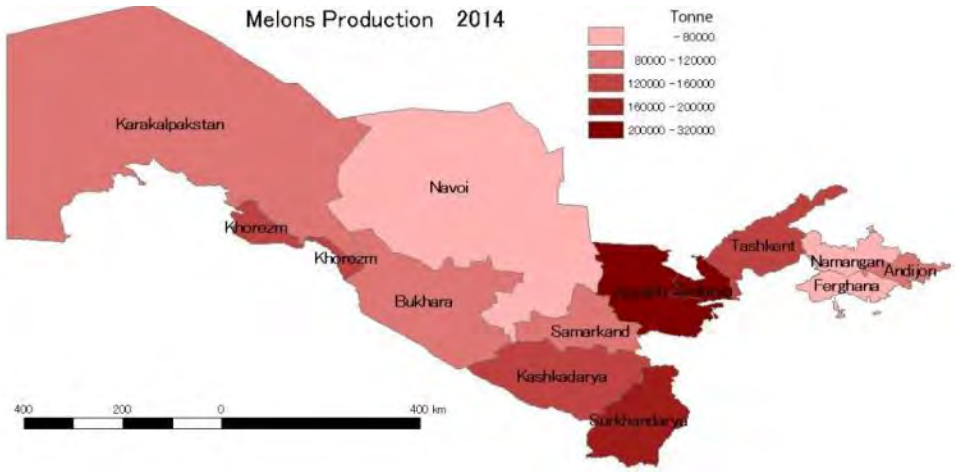
Figure 3-49: Changes in Grape Production Volume, Cultivation Area and Yield

(f) Melons

Figure 3-50 is a map of melon (honeydew melon, watermelon, pumpkin) production volumes for each region in Uzbekistan. Production is highest in the Central zone region of Jizzakh, followed by the Southern zone region of Surxondaryo, and further by the Central zone region of Tashkent, the Southern zone region of Qashqadaryo and the Northern zone region of Khorezm.

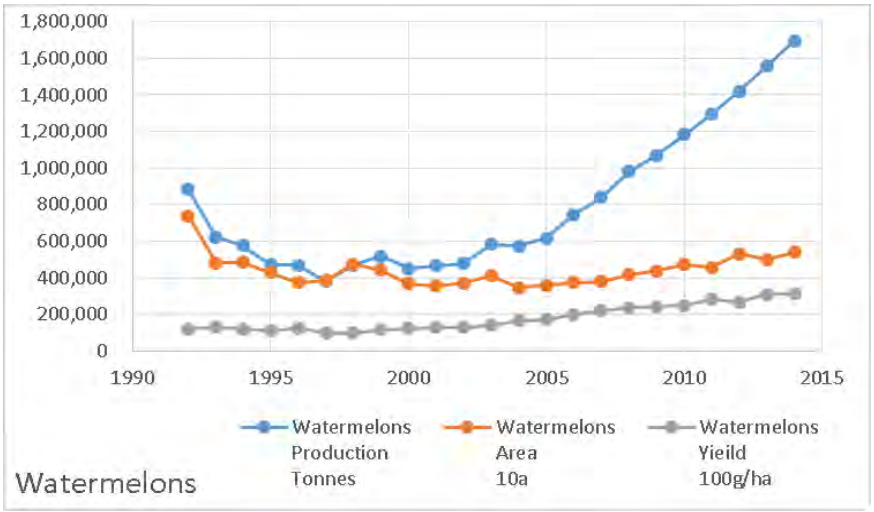
In the search for the FAOSTAT category that corresponds to the “Melons (Honeydew Melons, Watermelons, and Pumpkins)” category from Uzbekistan Agricultural Statistical Data 2016, the Study Team discovered that the production volume of FAOSTAT’s “Watermelons” category matched the Uzbekistan category for melons. Thus, the figures from the FAOSTAT category for watermelons were used. It is worth noting that FAOSTAT does not have figures for melons or pumpkins for Uzbekistan.

Figure 3-51 shows how the harvest volume, cultivation area and yield for melons (the FAOSTAT "Watermelons" category) have changed from 1992 to 2014. The production volume decreased or held steady from 1992 to 2003, but has continued to increase since 2003. This increased production is due to increases in both the cultivation area and yield.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-50: Melon Production Volume by Region (2014)



Source: Prepared by the JICA Study Team based on FAOSTAT

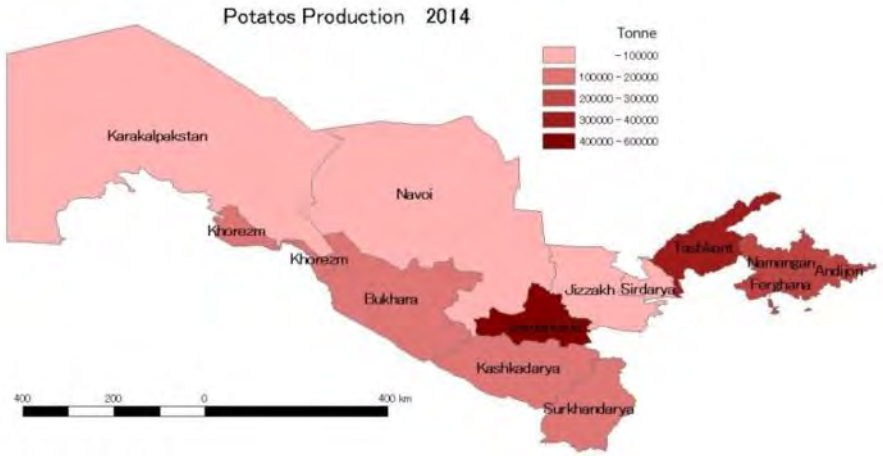
Figure 3-51: Changes in Melon Production Volume, Cultivation Area and Yield

(g) Potatoes

Figure 3-52 is a map of potato production volumes for each region in Uzbekistan. Production volumes are high in the Central zone region of Tashkent and the Middle Western zone region of Samarqand, followed by the Fergana Valley regions of Andijan, Fergana and Namangan.

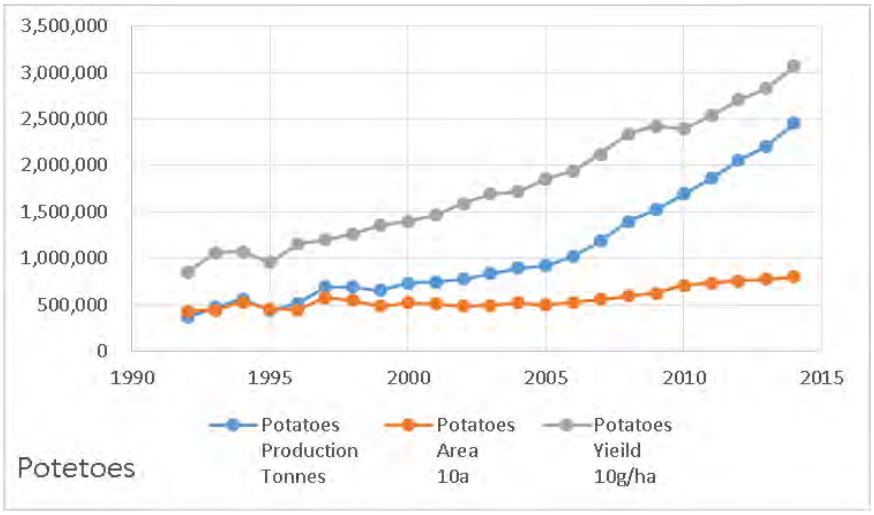
Figure 3-53 shows how the harvest volume, cultivation area and yield for potatoes have

changed from 1992 to 2014. The production volume has increased since 1992. This increase is mainly due to an increase in the yield.



Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-52: Potato Production Volume by Region (2014)



Source: Prepared by the JICA Study Team based on FAOSTAT

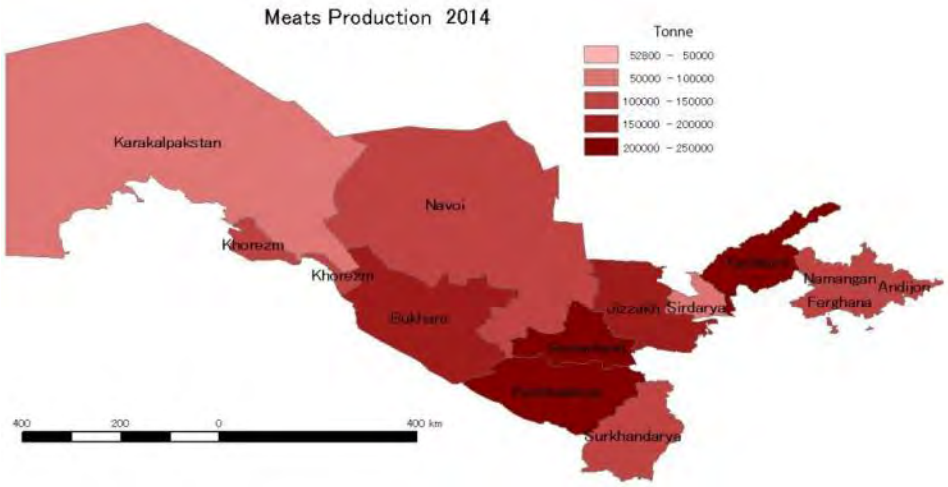
Figure 3-53: Changes in Potato Production Volume, Cultivation Area and Yield

(h) Meat

Meat production volumes in Uzbekistan Agricultural Statistical Data 2016 are calculated according to the live weights of the animals. In contrast, FAOSTAT meat production volumes are based on dressed carcass weight, and vary significantly from Uzbekistan's statistical data. Therefore, Uzbekistan Agricultural Statistical Data 2016 was used for production volumes for each region, and FAOSTAT data was used for changes in the production volume.

Figure 3-54 is a map of meat production volumes for each region in Uzbekistan. Production is highest in the Central zone region of Tashkent, the Middle Western zone region of Samarqand and

the Southern zone region of Qashqadaryo, followed by the Central zone region of Jizzakh and the Middle Western zone region of Bukhara.

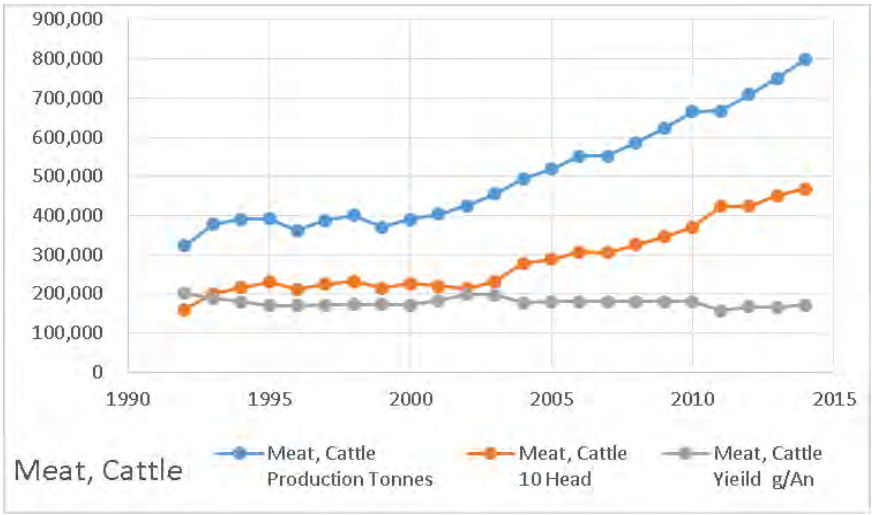


Source: Prepared by the JICA Study Team based on Agricultural Statistical Data 2016 (The State Committee of the Republic of Uzbekistan on Statistics)

Figure 3-54: Meat Production Volume by Region (2014)

(i) Beef

Figure 3-55 shows how the production volume, head count, and production volume per head for beef in Uzbekistan have changed from 1992 to 2014. The production volume held steady through 2000, but has continued to increase since then.

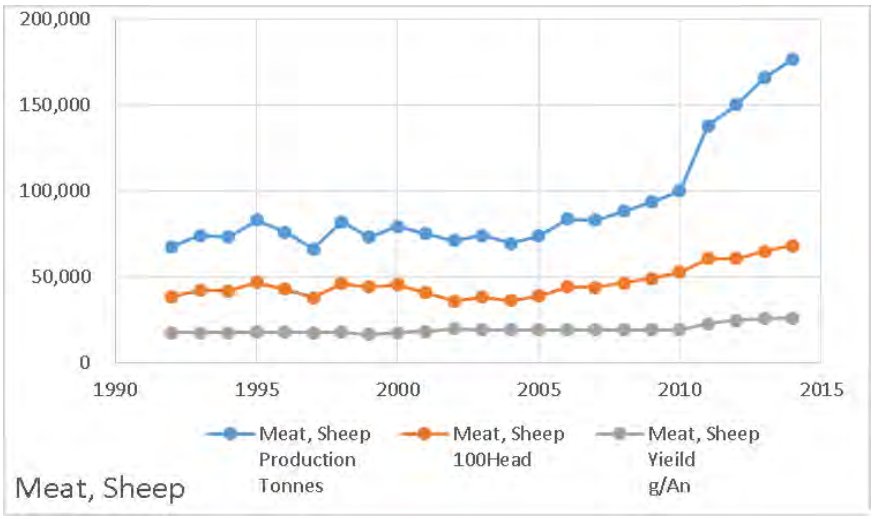


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-55: Annual Variation in Beef Production Volume, Head Count and Production Volume Per Head

(ii) Mutton

Figure 3-56 shows how the production volume, head count, and production volume per head for mutton in Uzbekistan have changed from 1992 to 2014. The production volume held steady through 2005, but began to increase after then. The pace of the increase has accelerated since 2010.

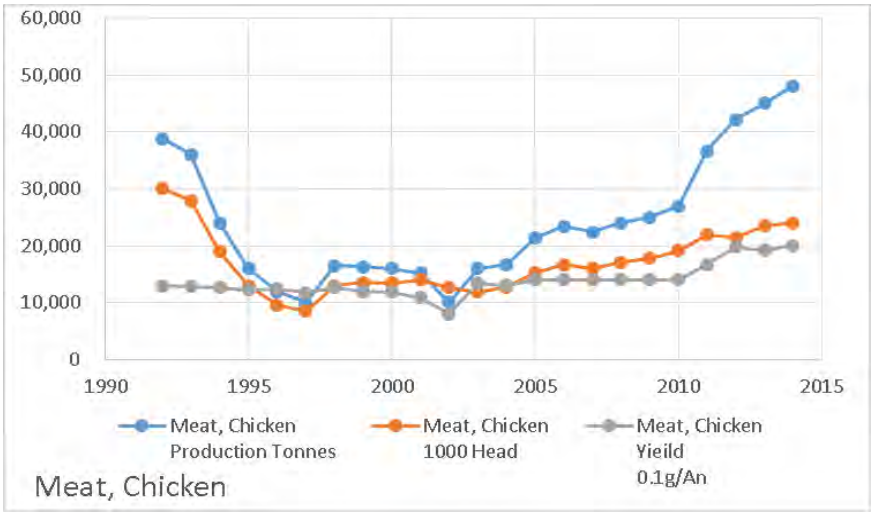


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-56: Annual Variation in Mutton Production Volume, Head Count and Production Volume Per Head

(iii) Chicken

Figure 3-57 shows how the production volume, head count, and production volume per head for chicken in Uzbekistan have changed from 1992 to 2014. The production volume continued to decrease through 1997, but held steady through 2002 and has continued to increase since then. The increase in the production volume since 2010 is particularly noticeable.

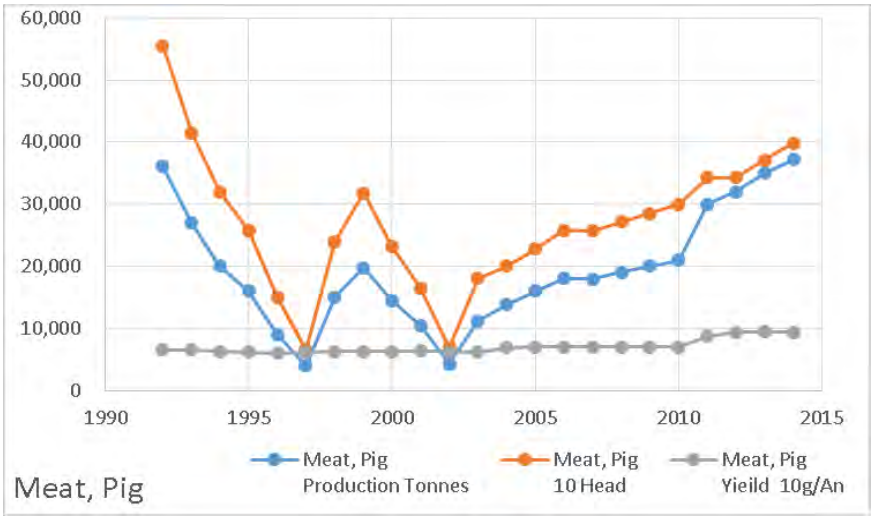


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-57: Annual Variation in Chicken Production Volume, Head Count and Production Volume Per Head

(iv) Pork

Figure 3-58 shows how the production volume, head count, and production volume per head for pork have changed from 1992 to 2014. The production volume decreased rapidly between 1992 and 1997, recovered for two years, but then decreased quickly over the next three years. However, production has recovered well since 2002.

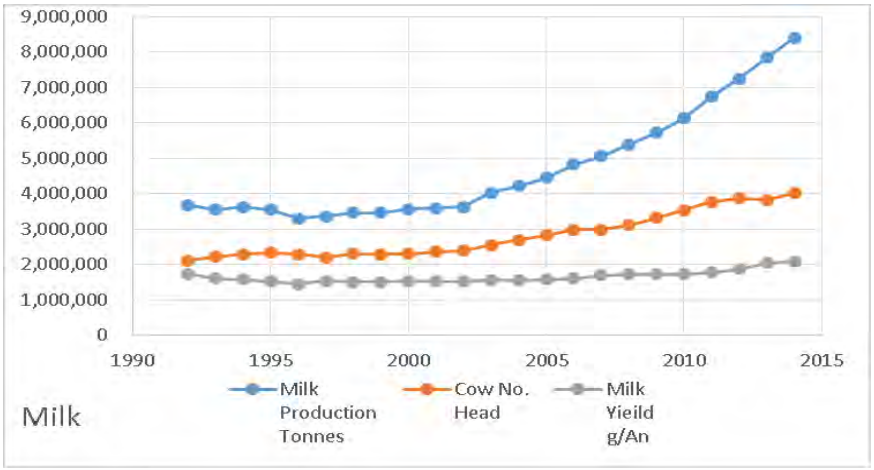


Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-58: Annual Variation in Pork Production Volume, Head Count and Production Volume Per Head

(i) Milk

Figure 3-59 shows how the production volume, dairy cow head count, and production volume per head for milk in Uzbekistan have changed from 1992 to 2014. The production volume held steady through 2002, but has increased vigorously since then. Reasons for this increase include an increased head count and increased milk production per head, but the increase in head count played a larger role.



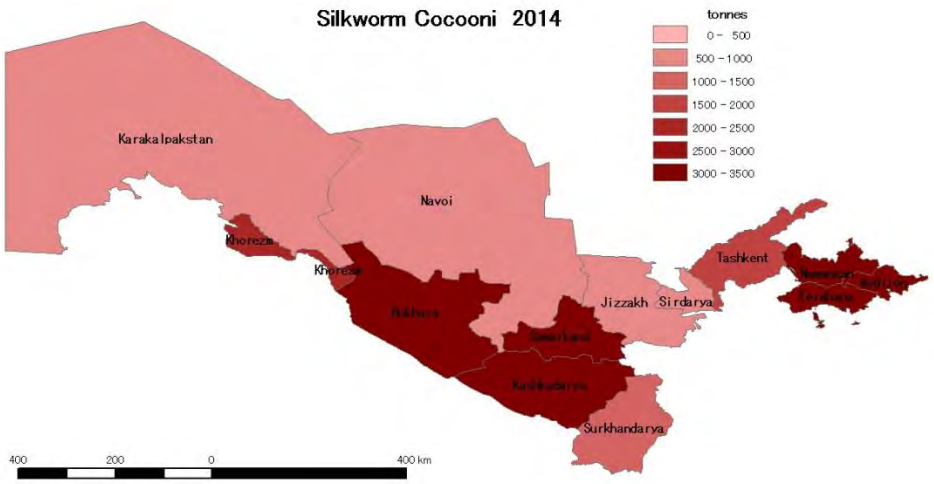
Source: Prepared by the JICA Study Team based on FAOSTAT

Figure 3-59: Annual Variation in Milk Production Volume, Dairy Cow Head Count and Production Volume Per Head

(j) Sericulture

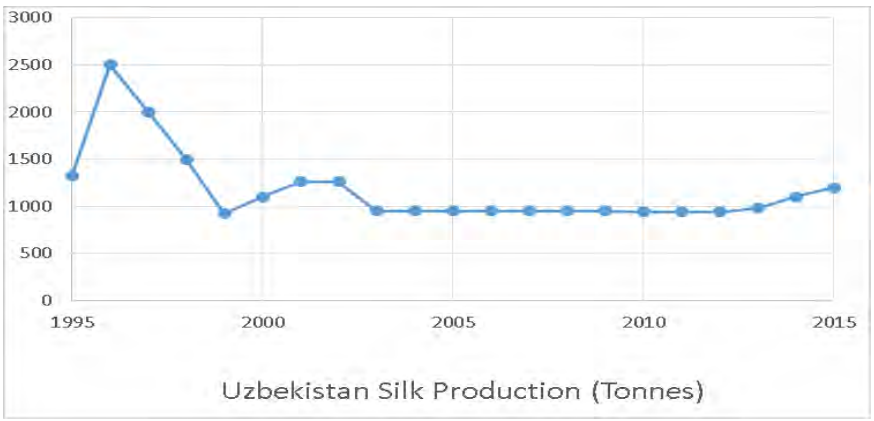
Figure 3-60 is a map of cocoon production volumes for each region in Uzbekistan. Cocoons are produced throughout the country. The central sericulture areas are the Fergana Valley regions of Namangan, Andijan and Fergana, and many cocoons are produced in the Middle Western regions of Bukhara, Qashqadaryo and Samarqand. Figure 3-61 shows how the silk production volume has changed between 1995 and 2015. The production volume continued to decrease from 1996 to 1999, but held steady after then before increasing slightly starting in 2013.

Figure 3-62 is a pie chart that shows silk production volumes by country. Uzbekistan's silk production volume is the world's third highest behind China and India. However, China produces 84% of the world's silk, and India produces 14%; Uzbekistan's share is just 0.6%. Mulberry trees are planted on both sides of many roads and irrigation channels in rural villages in Uzbekistan, and silkworm cocoon production is connected to farmers' incomes.



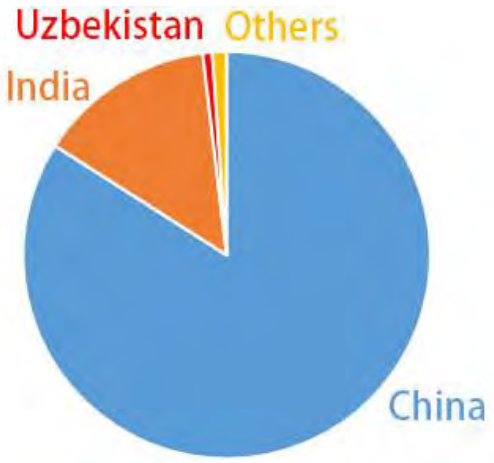
Source: Studies on the Effects of Revitalizing Rural Area and Independence of Women through Modernized Sericulture in Republic of Uzbekistan (Makoto Iikubo, 2016)

Figure 3-60: Cocoon Production Volume by Region (2014)



Source: International Sericultural Commission website, etc.

Figure 3-61: Silk Production Volume



	Production Tonnes
China	170,000
India	28,523
Uzbekistan	1,200
Thailand	698
Brazil	600
Vietnam	450
North Korea	350
Others	251
Total	202,072

Source: Prepared by the JICA Study Team based on data from the International Sericultural Commission website

Figure 3-62: Silk Production Volume by Country

2. Production Inputs (Agricultural Machinery, Seeds/Agrichemicals/Fertilizers)

Agriculture in Uzbekistan is shifting from cotton and wheat, which are suited for large-scale operations and large machinery, to vegetables and fruits, which involve many different varieties and require precision control and management. There has been an increase in the number of intensive gardens, in which dwarf fruit trees are planted so that there is room for more trees, and in which drip irrigation of water containing fertilizers is used to produce high-quality fruit. Trees are planted more densely in intensive gardens than in conventional fruit orchards; thus, there is not as much space between trees. Demand has increased for small rototillers that can till and weed narrow spaces, and for small chemical sprayers that enable farmers to eliminate pests while monitoring the condition of crops and fruits as they grow.

Broadly speaking, there are two types of agricultural operations in Uzbekistan in recent years: “farmer” farms, at which cotton and wheat are grown, and dehkan farms and a few advanced “farmer” farms, at which vegetables and fruit are grown. Part of the reason for this division is that returns from the traditional crops of cotton and wheat are limited by what the state will buy (state orders), while farmers who grow vegetables and fruits can expect greater returns when income from exports is included. The government prioritizes the supply of fertilizers and agrichemicals to cotton and wheat farmers in the areas where the fertilizers and agrichemicals are produced; vegetable and fruit producers have greater difficulty procuring fertilizers and agrichemicals. As a result, some of the more advanced vegetable and fruit producers who seek high yields and quality have turned to imported fertilizers and agrichemicals.

In addition, farmers considering exporting the crops they grow outside or in greenhouses purchase imported seeds to improve yields and quality. The increase in imported seeds is being

driven by successful farmers with the leeway to test seeds for new crops to meet demand for imported crops.Seeds have accounted for 15% of yield costs in recent years, while agrichemicals and fertilizers have accounted for 20%. Prominent participants in the market (importers) estimate the annual imported value of seeds to be 30 million USD.

Interestingly, importers also import materials for greenhouses and saplings for intensive gardens.

Table 3-13 shows the production cost per hectare of cotton, while Table 3-14 shows the same for wheat, and Table 3-15 for vegetables. The breakdown of costs for cotton is 3%-6% for seeds, 11%-32% for fertilizers, 4%-8% for agrichemicals, 7%-9% for irrigation, 14%-23% for machinery, 11%-20% for fuel and 16%-33% for labor; from highest to lowest cost, the order is fertilizers, labor, machinery, fuel, irrigation, agrichemicals, and seeds. The breakdown of costs for wheat is 11%-23% for seeds, 20%-45% for fertilizers, 3%-5% for agrichemicals, 0%-18% for irrigation, 11%-26% for machinery, 13%-20% for fuel and 4%-13% for labor; from highest to lowest cost, the order is fertilizers, machinery, seeds, fuel, labor, irrigation and agrichemicals. In contrast, the breakdown of costs for vegetables is 3%-15% for seeds, 8%-17% for fertilizers, 0%-5% for agrichemicals, 0%-4% for irrigation, 2%-4% for machinery, 4%-7% for fuel and 41%-63% for labor; the cost of labor is far and away the highest, followed by fertilizers, fuel, machinery, agrichemicals and irrigation. In any case, the highest cost outside of labor is fertilizers, followed by machinery. Seeds were third-highest, or lowest. Two major issues are lowering the prices of fertilizers, and applying fertilizer correctly by controlling against excess application.

However, as for the performance of cucumber varieties grown in Southern Kazakhstan (Table 3-16), in terms of seed price alone, the non-native varieties range from 192 USD to 1,470 USD per hectare. Interestingly, the native variety costs only 30 USD per hectare, but results in massive deficits due to its low yield. In vegetable cultivation, varieties that are resistant to disease must be used, and strong demand for quality seeds is expected. This should present an opportunity for technical cooperation from seed breeders.

Table 3-13: Cotton Production Cost per Hectare

	Cotton A		Cotton B		Cotton C		Cotton D	
	USD	%	USD	%	USD	%	1,000 UZS	%
Seeds	13	5.9	13	3.3	24	5.5	116	4.8
Fertilizers	52	23.6	125	31.6	125	28.8	264	11.0
Agrichemicals	10	4.5	15	3.8	25	5.8	200	8.3
Irrigation	15	6.8	35	8.9	35	8.1	200	8.3
Machinery	51	23.2	60	15.2	60	13.8	350	14.6
Fuel	43	19.5	75	19.0	75	17.3	267	11.1
Labor	36	16.4	72	18.2	90	20.7	800	33.4
Other	0	0.0	0	0.0	0	0.0	200	8.3
Total Cost	**220**	**100.0**	**395**	**100.0**	**434**	**100.0**	**2,397**	**100.0**
Survey Year	2003		2004		2005		2010	
Survey Area	Andijan Region		Andijan Region		Andijan Region		Fergana Region	
Target	"Farmer"		"Farmer"		"Farmer"		"Farmer"	

Source: Prepared by the JICA Study Team based on data from Ian Houseman Demonstration and Advisory Services Activities for Cotton Growing: A Case Study in Ak Altin, Uzbekistan, 2005, The World Bank, Uzbekistan Strengthening the Horticulture Value Chain, 2012

Table 3-14: Wheat Production Cost per Hectare

	Wheat A		Wheat B		Wheat C		Wheat D		Wheat E		Wheat F		Wheat G	
	USD	%	USD	%	USD	%	1,000 UZS	%	1,000 UZS	%	1,000 UZS	%	1,000 UZS	%
Seeds	51	22.0	55	17.1	59	19.1	190	14.7	210	22.7	150	11.3	210	19.2
Fertilizers	72	31.0	145	45.0	104	33.7	254	19.6	277	29.9	389	29.2	439	40.1
Agrichemicals	8	3.4	16	5.0	12	3.9	36	2.8	37	4.0	43	3.2	43	3.9
Irrigation	15	6.5	20	6.2	20	6.5	234	18.1	13	1.4	16	1.2	13	1.2
Machinery	71	30.6	71	22.0	90	29.1	333	25.8	125	13.5	315	23.6	125	11.4
Fuel							191	14.8	144	15.6	260	19.5	144	13.2
Labor	15	6.5	15	4.7	24	7.8	55	4.3	120	13.0	160	12.0	120	11.0
Total Cost	**232**	**100.0**	**322**	**100.0**	**309**	**100.0**	**1,293**	**100.0**	**926**	**100.0**	**1,333**	**100.0**	**1,094**	**100.0**
Survey Year	2003		2004		2005		2010		2010		2010		2010	
Survey Area	Andijan Region		Andijan Region		Andijan Region		Samarqand Region		Samarqand Region		Tashkent Region		Tashkent Region	
Target	"Farmer"		"Farmer"		"Farmer"		"Farmer"		Dehkan		"Farmer"		Dehkan	

Source: Prepared by the JICA Study Team based on data from Ian Houseman Demonstration and Advisory Services Activities for Cotton Growing: A Case Study in Ak Altin, Uzbekistan, 2005, The World Bank, Uzbekistan Strengthening the Horticulture Value Chain, 2012

Table 3-15: Vegetable Production Cost per Hectare

	Cabbages		Tomatoes		Onions		Melons A		Melons B	
	1,000 UZS	%	1,000 UZS	%	1,000 UZS	%	1,000 UZS	%	1,000 UZS	%
Seeds	120	2.8	250	5.5	720	15.4	360	8.3	300	12.6
Fertilizers	384	9.0	352	7.8	384	17.2	492	11.4	292	12.2
Agrichemicals	200	4.7	200	4.4	500	10.7	0	0.0	0	0.0
Irrigation	15	0.4	200	4.4	15	0.3	32	0.7	32	1.3
Machinery	150	3.5	170	3.8	150	3.2	100	2.3	100	4.2
Fuel	248	5.8	198	4.4	165	3.5	165	3.8	165	6.9
Labor	2,400	56.4	2,400	53.0	1,920	41.2	2,400	55.6	1,500	62.8
Other	735	17.3	755	16.7	810	17.4	765	17.7	0	0.0
Total Cost	**4,252**	**100.0**	**4,525**	**100.0**	**4,664**	**100.0**	**4,314**	**100.0**	**2,389**	**100.0**
Survey Year	2010		2010		2010		2010		2010	
Survey Area	Fergana Region		Fergana Region		Fergana Region		Fergana Region		Fergana Region	
Target	"Farmer"		"Farmer"		"Farmer"		"Farmer"		Dehkan	

Source: Prepared by the JICA Study Team based on data from The World Bank, Uzbekistan Strengthening the Horticulture Value Chain, 2012

Table 3-16: Performance of Cucumber Varieties in Southern Kazakhstan

Variety	Source[1]	Seed expenses (US$)	Total yield (t/ha)	Fruit rejection (%)	Sales (US$)	Profit (US$)	Profit/seed expense (US$)
Opera F_1	RZ	192	45.2	23.7	5186.2	3322.6	17.3
Sonata F_1	RZ	354	29.7	15.9	3758.0	1894.4	5.3
Muzika F_1	RZ	210	63.0	56.7	4103.9	2240.3	10.6
Harmony F_1	RZ	1134	52.3	27.2	5727.4	3863.8	3.4
Etyud F_1	RZ	1134	38.1	12.6	5005.9	3142.3	2.7
Ajax F_1	NZ	600	41.6	11.3	5547.0	3683.4	6.1
Hektor F_1	NZ	444	33.3	35.7	3217.0	1353.4	3.0
Delpina F_1	NZ	1470	44.6	19.9	5366.6	3503.0	2.4
Parker F_1	NZ	552	53.6	11.2	7155.5	5291.9	9.6
Crispina F_1	NZ	1362	50.0	9.6	6794.8	4931.2	3.6
Atlantics F_1	BZ	240	42.8	19.4	5186.3	3322.7	13.8
Asterics F_1	BZ	240	55.9	12.8	7335.9	5472.3	22.8
Medeu (check)	KZ	30	10.6	16.1	1337.9	−525.7	−17.5

[1] NZ – Nunhems Zaden; RZ – Rijk Zwaan; BZ – Bejo Zaden; KZ – Kazakhstan

Source: G. L. Ligay etc. Yield and Economic Performance of Cucumber Varieties Grown in Southern Kazakhstan, 2003

3. Production Issues

Issues involving production have already been described in the previous section (Agricultural Production Infrastructure) and in this section (State of Agricultural Production). This subsection will reexamine these previously mentioned issues as a sort of summary, and describe all issues regarding human development and other factors not yet mentioned.

(a) Irrigation Water Volume and Channels

As demonstrated in Figure 3-4, annual rainfall in nearly all of Uzbekistan (except the high mountain regions) is 300 mm or less, and most agricultural production is done on land served by irrigation channels. The channels were built during the Soviet era. Since Uzbekistan gained independence, the channels have been maintained by HGME under BISM control as well as WCA. However, these agencies have not been able to keep up with repairs due to the vast length of the system, and channels have fallen into noticeable disrepair, and irrigation leakage rates are high.

In addition, many pumps have been in service since the Soviet era, and observations revealed that propeller pumps are used as lift pumps. The water they pump is quite hard; thus, the propellers are replaced after several years of service. The existing pumps are quite durable, but it is likely that they consume a lot of power; thus, in terms of the cost, they must be replaced with high-efficiency pumps.

(b) Water Conservation Problems

Eighty percent of Uzbekistan's water comes from Kyrgyzstan and other countries, and the fact that Uzbekistan's rivers flow into Kazakhstan creates an international river management problem. Much of Uzbekistan's land is not arable due to the lack of water, but the amount of arable land can be expanded through water conservation. Therefore, it is important to save and also to discharge to downstream countries as much high-quality water as possible.

As explained previously, it is important to reduce the volume of irrigation water per unit of cultivation area in an effort to prevent leakage from irrigation channels. Presently, the irrigation method used by farmers is furrow irrigation, in which water is allowed to flow between furrows. This method tends to result in over-irrigation because there are inevitably places where it is difficult for the water to reach, as well as places where the water stagnates. In addition, over-irrigation causes water to seep more deeply into the earth, and when the soil dries out during periods when it is not being irrigated, both water and salts rise to the top layer, which causes salt damage. The first step toward conserving water while still using the furrow irrigation method is to make fields as level as possible. The use of laser-equipped instrumentation results in more precise leveling, to within a few centimeters.

Drip irrigation is an even more advanced water conservation technology. Under this method, tubes are used to deliver drops of water close to the roots of the crops without inundating them, thereby providing crops with only the water they need, and reducing the amount of water used to less than one-third the amount of conventional irrigation. If done properly, drip irrigation is also effective against salt damage because the water does not reach lower levels of soil, which prevents salts from rising to the surface and causing salt damage.

Water conservation is not making progress in Uzbekistan due to a lack of incentive for farmers and agricultural production organizations. There are few advantages to conserving water; the price of the water itself is free, and the cost for WCA is calculated according to surface area. Thus, the introduction of drip irrigation must reduce costs for WCA, and bonuses and other systems must be set up to reward farmers and others who adopt the technology.

(c) Drainage Channels and Salt Damage

In Uzbekistan, leaching, in which water is used to rinse away salts that have collected in soil layers, is used to combat salt damage. Leaching is done starting in November, after the harvest of summer crops. Fields are tilled and leveled, soil is piled into ridges on the perimeters of fields, and the fields are inundated with water. For leaching to be done effectively, it is important to properly drain water that has passed through highly saline soil layers and become highly saline

itself. In places where salt accumulation is a problem, open drainage ditches cross through every 50-250 ha of farmland, and underdrains several hundred meters long are installed 3 to 4 m underground at 200- to 350-meter intervals. The water that contains salts from the leaching passes through the underdrains, and is then discharged into the open ditches. If the underdrains are functioning properly, the surface water disappears within one week of inundation, but if the underdrains are clogged, the water table rises above the level of the underdrains, and the excess water must be pumped out over several days. In some cases, farmers do not wait for the water to seep into the lower levels of soil, and simply drain the surface water.

In addition, with a distance of at least 200 m between underdrains, the ability of leaching to remove salts weakens as the distance from the underdrains grows, although leaching is effective in areas near the underdrains. JIRCAS uses the "cutting drain method," which was developed in Japan, as a measure to improve leaching efficiency. Under this method, shallow underdrains are placed at right angles to existing underdrains at depths of 50-70 cm and intervals of 10 m. JIRCAS has discovered that the cutting drain method can remove salts from entire areas of farmland more or less evenly. Under the cutting drain method, underdrain boring machines known as "cut drains" are pulled behind tractors or bulldozers, and create underdrain cavities 50-70 cm deep below farmland. Excess irrigation water drains out through these shallow underdrains at 50-70 cm deep, and never reaches soil deeper than that; leaching may no longer be required because salts from soil layers beneath the shallow underdrains do not move to the surface.

Furthermore, vertical drainage is done in Uzbekistan to prevent accumulation of salts. Electric pumps are used to pump groundwater from several dozen meters underground, which lowers the water table. The reason for lowering the water table is to prevent water from rising from the ground and causing salts to accumulate. However, there are doubts as to the effectiveness of vertical drainage because one pump is needed for every 100-150 ha, and the amount of time they can operate is limited. JIRCAS is making efforts to address this issue as well, but further study is required to draw conclusions.

(d) Agricultural Machinery

Agriculture in Uzbekistan is shifting from cotton, wheat and other crops grown on large-scale farms and managed with large-scale machinery, to vegetables, fruits and other crops that requiremore labor force and capital per unit area. Thus, demand for Japanese agricultural machinery is increasing. One example of such machinery is small chemical sprayers that enable farmers to eliminate pests while monitoring the condition of crops and fruit as they grow. Another example is small rototillers to work in between fruit trees and densely planted orchards and

intensive gardens, or vegetable gardens that produce small quantities of many varieties.

In addition, demand is expected to grow for agricultural machinery such as cut drains and “cut soilers,” which insert harvest residue into shallow underdrain cavities, as ways to prevent salts from accumulating in farmland.

(e) Production Materials

It has been reported that farmers who grow cotton and wheat can easily access chemical fertilizers and agrichemicals due to the involvement of government-owned companies, but that farmers who grow other crops do not have such easy access. These materials are vital toward crop production, and this situation must be remedied as soon as possible.

(f) Vegetable/Fruit Seeds and Saplings

Many vegetable and fruits seeds and saplings are imported from overseas; Uzbekistan is not in a position to produce or supply quality seeds or saplings. Seeds for quality vegetable varieties are expensive, and the cultivation of vegetable and fruit varieties within the borders of Uzbekistan is a pressing issue.

(g) Cultivation Technology and Technical Guidance

Both production volumes and productivity of vegetables and fruits are largely on the rise, but there are many opportunities for technical cooperation in individual vegetable and fruit cultivation because Japanese agricultural technology is advanced in those areas. Japanese scallions, daikon radishes, Japanese yams and other vegetables, and apples, persimmons, chestnuts, peaches and other fruits come to mind.

The Fukushima-Uzbekistan Cultural and Economic Exchange Association and Hirosaki University are providing technical guidance for apple cultivation. This technical guidance is behind the present boom in intensive gardens in Uzbekistan, and is making major contributions to agriculture in the country by promoting a transition from extensive management of agricultural products to precision management performed appropriately and at the right times.

Universities and research institutions tasked with technical guidance are producing results, but there is no system for Japanese agricultural extension workers, nor are there organizations such as agricultural cooperatives for establishing rapport with and offering guidance to farmers. There is a noticeable need to establishinstitutions which would take leadership of farmers. .

(h) Sericulture

Sericulture is done throughout Uzbekistan, but the heart of the industry is in Fergana Valley. Silk is purchased through state orders, but state orders also come with obligations. Thus, farmers in areas where returns are generated through vegetables and fruits produce silk as a matter of duty, but farmers in areas where cotton and wheat are the main crops feel that silk production has a high value as an alternative income source.

Uzbekistan's silk production volume is the world's third highest behind China and India, but it accounts for only 0.6% of global production. Many mulberry trees are planted on both sides of roads and irrigation channels in rural villages, and the mulberry leaves are used for sericulture. There is high demand for silk thread in Uzbekistan, and increased production is required, but difficult to achieve for several reasons. Silkworm species breeding, reeling and other new needs are not being met due to the insufficient cultivation of silkworm's species since Uzbekistan gained independence. More mulberry leaves are required to increase the production of cocoons. In addition, sericulture technology is not progressing because conventional methods are followed. Tokyo University of Agriculture is currently involved in the promotion of sericulture in Uzbekistan, and is producing results through its efforts to introduce Japanese species to the country's cocoon varieties, and to offer technical guidance for silkworm farming.

Presently, silkworms are only bred in spring, and cocoons are produced once per year. This is because farmers breed silkworms as a side business while they grow cottons as a main business.They are afraid of the bad effect of withering agents used for harvesting cotton, and mulberry leaves are in short supply. . Tokyo University of Agriculture and Technology has produced cocoons twice per year as a trial, but has not been successful due to the pest damage of mulberry leaves in the summer, and the death of silkworms due to eating mulberry leaves tainted with withering agents sprayed on cotton farmland to streamline the cotton harvest. In order to breed silkworms twice a year, it is necessary to prevent harming silkworms by aiming an environment-maintaining type agriculture in the whole area, and to introduce excellent varieties of marberry trees, with guidance for their cultivation and pruning technique.

C. Processing of Agricultural and Animal Products

1. Processing Production Volume

The ratio of fresh products to processed products sold differs for each agricultural product produced. A relatively high percentage of cherries, grapes and tomatoes are processed, while particularly high percentages of pomegranates, plums and the like are sold fresh.

Table 3-17: Percentages of Fresh and Processed Products

	Quantity (t/year)			Percentage		
	Fresh	Processed	**Total**	Fresh	Processed	**Total**
Cherries	24,800	55,200	**80,000**	31%	69%	**100%**
Apples	686,000	294,000	**980,000**	70%	30%	**100%**
Apricots	382,900	164,100	**547,000**	70%	30%	**100%**
Peaches	148,000	52,000	**200,000**	74%	26%	**100%**
Grapes	849,432	591,768	**1,441,200**	59%	41%	**100%**
Pomegranates	57,200	7,800	**65,000**	88%	12%	**100%**
Plums	90,000	30,000	**120,000**	75%	25%	**100%**
Tomatoes	1,408,200	938,800	**2,347,000**	60%	40%	**100%**
Peppers	126	74	**200**	63%	37%	**100%**

Source: Prepared by the JICA Study Team based on the results of local interviews.

Processed products can be further broken down into categories, such as juices (apples and grapes), dried/frozen foods (grapes), jams (apples), pastes and canned foods (tomatoes).

Table 3-18: Breakdown of Processed Product Categories (Unit: t/year)

	Juices	Dried Foods	Jams	Pastes	Canned Foods	Frozen Foods	**Total**
Cherries	36,000	1,600	8,800	-	4,000	4,800	**55,200**
Apples	196,000	29,400	49,000	-	-	19,600	**294,000**
Apricots	82,050	54,700	-	-	27,350	-	**164,100**
Peaches	24,000	-	28,000	-	-	-	**52,000**
Grapes	115,296	390,000	-	-	-	86,472	**591,768**
Pomegranates	7,800	-	-	-	-	-	**7,800**
Plums	8,400	21,600	-	-	-	-	**30,000**
Tomatoes	140,820	23,470	-	586,750	187,760	-	**938,800**
Peppers	-	50	-	-	4	20	**74**

Source: Prepared by the JICA Study Team based on the results of local interviews.

2. Issues Regarding Agricultural and Animal Product Processing

Each stage of processing is important, from the planning and design of processing plants to the installation and configuring of machines, to operation and maintenance. However, during the field study, the Study Team noticed issues in the planning and design stages in particular.

For example, some food product processing companies have introduced user-friendly, low-cost Turkish machinery and equipment, but major companies use a mixture of equipment (German blast chillers, German calibrators, Italian packaging machines), and select and introduce equipment and machinery in line with their applications. One of those companies even purchased low-cost bottling sterilization machinery from China to decrease the initial cost.

However, they installed the machinery right next to a toilet, and ways to enter the plant from the toilet without passing through the sterilization space were observed; thus, the initial plant design stage must be revised to incorporate sanitation concerns. In contrast, one meat processing plant (where higher quality and sanitation is required) established a workflow that accounts for sanitation by introducing an advanced system equipped with a sensor that verifies that both hands and feet are sterilized, and lifts a gate to allow entry into the plant.

Picture 3-1: Toilet Near Sterilization Space (Food Processing Plant)

Picture 3-2: Step-In Automatic Sterilizer (Meat Processing Plant)

(2) National Strategies in the Agricultural Sector

A. Position of the Agricultural Sector in State Planning (Including Ukase of the President)

In 2017, the new president of Uzbekistan unveiled a national strategy, announcing "Uzbekistan's Development Strategy (2017-2021)" as an Ukase of the President. The five priority areas on the table below comprise the primary policy of the strategy. Democratization and modernization are the keystones of the policy, and the agricultural sector is a key industry for the third priority area, which is economic development and liberalization, and calls for the diversification and structural reform of agriculture.

Table 3-19: Summary of Uzbekistan's Development Strategy (2017-2021)

Priority Area	Description
1. Establishing new national and social systems	・Strengthening the role of the Supreme Assembly in democratic reform and modernization of Uzbekistan ・Developing a legal framework for government services, deregulation, policy to transition to a single-window system for government services ・Promoting mechanisms to strengthen civil society and the role of the media
2. Enhancing the rule of law and rebuilding the judicial system	・Enhancing assurance of the independence of the judiciary, and of civil rights and freedoms ・Improving the convenience of the judicial system, and anti-crime measures and crime prevention ・Establishing a court system that hears the claims of both defendants and plaintiffs ・Improving the systems of legal aid and legal service
3. Economic development and liberalization	・Improving competitiveness and openness ・Ensuring freedom of economic activity ・Strengthening macroeconomic stability and economic growth ・Modernizing and diversifying agriculture and other key industries ・Protecting private property and entrepreneurship ・Rebuilding the financial and banking sectors ・Assimilating into international economic activities ・Attracting investment from overseas ・Developing a tourism industry ・Implementing structural reform in the agricultural sector
4. Development of the social sphere	・Progressively increasing wages, pensions and other benefits ・Promoting employment ・Providing affordable housing ・Modernizing social infrastructure and public utilities ・Improving social welfare and medical care systems ・Improving education, science and state youth policy
5. Security, inter-ethnic harmony and religious tolerance, and the implementation of a balanced, mutually beneficial and constructive foreign policy	・Strengthening national independence and sovereignty ・Creating a belt of safety and security around Uzbekistan, and establishing consistent, positive, good relations with neighboring countries ・Enhancing a positive image of Uzbekistan throughout the world

Source: Uzbekistan Ministry of Justice Website (http://www.lex.uz; April 21, 2017)

In “economic development and liberalization” from Table 3-19, there are four objectives for the agricultural sector: promoting the reform and dynamic development of the production structure, ensuring food security, creating a safe, secure production environment, and improving export potential. Specifically, the following projects are underway.

- Optimizing crop acreage by reducing the amount of land dedicated to cotton and cereals, and planting potatoes, vegetables, forage crops, oil crops, new intensive gardens and grape vineyards instead of cotton and cereals
- Creating and promoting favorable conditions for developing a multifaceted industry for agricultural management, and in particular the production and processing of agricultural products, production of partially finished products, preservation, sales, construction work, services and more
- Implementing an investment project to encourage improvements, modernization, and the establishment of processing businesses that have the most technically advanced facilities and process high-quality agricultural products, produce partially finished and finished food products, and produce goods for packaging
- Encouraging infrastructure development for providing storage, transportation, and sale of agricultural products, agricultural chemistry, financial affairs, and other up-to-date market services
- Further improving hydrogeological melioration in lands that can be irrigated
- Hydrogeological melioration and developing irrigation facility networks
- Widespread introduction of intensive farming (particularly cutting-edge agricultural technology that conserves water and resources)
- Introducing highly productive agricultural machinery
- Improving varieties of agricultural products that are resistant to pests and diseases, and adapt to soil, climate and environmental conditions in the local area

B. Structure of Government-Related Organizations

In April 2016, government-related organizations involved in agriculture were reorganized, and a new structure was created. Among the new organizations are Uzagroexport, an export trading company that exports fruits, and Uzbekozikovkatzahira, a consortium that procures and stores fruits. Both companies play their respective roles under the control of the holding company O’zbek Oziqovqat Holding (UZ Food holding). Uzagroexport was just established in April 2016, but is already engaged in the development of institutional systems and infrastructure. The company primarily handles distribution and storage for promoting exporting, and does international

promotion and provides trading company services for export procedures at low commissions (0.4% to 0.8% depending on the transaction amount). In contrast, the consortium Uzbekozikovkatzahira broke away from the "Uzulgurjisavdoinvest" association, whose primary duties are to procure, store and domestically distribute wheat, cotton and other products purchased by the state. Presently, Uzbekozikovkatzahira is engaged in storing and distributing horticultural products, selecting products for export, and developing facilities for packaging in response to the government's export-oriented policy and policy to expand production of horticultural products.

Table 3-20: Summary of New Organizations

Organization Name and Summary	Ukase of the President
O'zbek Oziqovqat Holding (holding company) Established in 2016 in conjunction with the dissolution of the Food Processing Industry Association. The company does marketing; formulates development programs; modernizes production, processing, packaging and distribution; exports processed food products; and provides assistance for corporations regarding fruits and food products. The company primarily procures and supplies raw materials to prominent processors in Uzbekistan. Uzagroexport was placed under the control of a holding company in April 2016 under the national strategy.	2016.2.18 No. PP-2492
Uzagroexport (trading company) Established in 2016 as a trading company that specializes in the export of fresh and processed fruits. The company aims to expand varieties, quantities and destinations of fruits for export based on contracts with domestic farms and corporations and foreign partners. In addition, the company undertakes duties related to storage, refrigeration, packaging, quality control and standards required for expansion of exports. *See Table 3-21 for details.	2016.4.7 No. PP-2515
Uzbekozikovkatzahira (consortium) Established in 2016 by the reorganization of a former organization. The consortium builds and renovates refrigerated storehouses and the like for providing a consistent supply of fresh fruits to the domestic consumer market from winter to spring, and is reducing the loss of food products by modernizing distribution systems for storage and procurement. The consortium comprises 47 member companies that procure, store and supply fruits, potatoes, melons and grapes. *See Table 3-22 for details.	2016.4.8 No. PP-2517

Source: Various organization websites

Table 3-21: Republic of Uzbekistan Presidential Proclamation No. PP-2515 Dated April 7, 2016
Details from "On Establishment of the 'Uzagroexport' Fresh and Processed Fruit Product Export Trading Company"

Purpose	To promote the development of commercial/logistics infrastructure to expand varieties and increase quantities for export of fresh and processed fruits that are competitive in overseas markets based on complete marketing surveys of the international market, and further to respond to the demand for modernization of modes of transportation for merchandise destined for export, etc.
Position	The fresh and processed fruit product exporting trading company Uzagroexport was established as a joint-stock company and member of the holding company Uzbekoziqovqatxolding. The Ministry of Economy, the Ministry of Finance, and the Ministry of Foreign Affairs of the Republic of Uzbekistan, the State Committee for Privatization, Demonopolization and Development of Competition, the holding company Uzbekoziqovqatxolding, the Uzbekistan Farm Managers ("Farmers") Association and other Relevant organizations approved the proposal to establish Uzagroexport.
Roles	・Conducting complete marketing surveys of market conditions in worldwide and local fruit markets ・Ensuring transportation for domestically produced fresh and processed fruits destined for

	export, and finding and developing new markets for selling fruit ・Conducting surveys based on the balance of supply and demand in foreign markets for domestically produced, special-quality vegetables, fruits, grapes and melons ・Conducting research on seed allocation and the cultivation, supply and production of crops through farm management ("farmers") and subsistence farm management (dehkan), and conducting research on expanding the production of competitive finished products, etc. ・Concluding long- and short-term contracts to supply fresh and processed fruits to quality foreign buyers ・Hosting international fruit trade fairs, concluding export contracts, and executing contractual obligations ・Developing and strengthening physical and technical hubs that encourage participation by a wide array of foreign investors in companies that construct, renovate and modernize storage facilities and refrigerated facilities for vegetables for the export of fruits, organizations that produce modernized packaging materials using the latest foreign technology and designs, etc. ・Introducing modernized logistics systems for selecting fruits that satisfy international standards and regulations, classifying sizes, and preparing packaged products for export ・Cultivating managers and experts who specialize in research of fruit retail markets and demand

Source: Prepared by the JICA Study Team based on "On Establishment of the 'Uzagroexport' Fresh and Processed Fruit Product Export Trading Company" from the Republic of Uzbekistan Presidential Proclamation No. PP-2515 dated April 7, 2016

Table 3-22: Republic of Uzbekistan Presidential Proclamation No. PP-2517 Dated April 8, 2016 Details from "On the Establishment of the 'Uzbekozikovkatzahira' Consortium"

Purpose	To modernize procurement and storage systems for storing fresh fruits, potatoes, melons, grapes and other crops in order to provide a consistent supply of those crops to the domestic consumer market from winter to spring, to reduce after-harvest losses to international standard levels by introducing the latest storage technology, and strengthening and developing the storehouse industry and bases for providing physical and technical services for refrigerated storehouses
Position	The consortium is a group that comprises member companies. It should be noted that the "Uzulgurjisavdoinvest" Association, the Ministry of Economy, the Ministry of Finance, and the State Committee for Privatization, Demonopolization and Development of Competition also participate in the Consortium.
Roles	・Identifying basic issues with activities and developing policies ・Concluding procurement contracts for fresh fruits, potatoes, melons and grapes with farm managers ("farmers" and dehkan) and farming companies based on demand forecasts ・Introducing a modernized logistics system in an effort to maintain quality storage conditions and reduce losses of fresh fruits, potatoes, melons and grapes during the storage period from winter to spring ・Selling fresh fruits, potatoes, melons and grapes at specialized markets held on a regular basis in major cities in the republic ・Providing assistance for strengthening and developing physical and technical hubs for companies that belong to the consortium ・Building, renovating and modernizing dedicated storehouses and refrigerated storehouses ・Providing appropriate merchandise to remote and isolated locations ・Cultivating experts

Source: Prepared by the JICA Study Team based on "On the Establishment of the 'Uzbekozikovkatzahira' Consortium" from the Republic of Uzbekistan Presidential Proclamation No. PP-2517 dated April 8, 2016

C. National Policy and Development Plans for Agricultural Development

The following Ukase of the President and Presidential Proclamations were announced for the agricultural sector prior to Uzbekistan's Development Strategy (2017-2021).

Table 3-23: Recent Ukase of the President and Presidential Proclamations Regarding Agricultural Reform in Uzbekistan

Ukase of the President Title	Summary
Uzbekistan Ukase of the President No. 215 Dated July 14, 2012 "Agricultural Production Modernization, Technology, and Technology Reform Program (2012-2016)"	A program to conduct research and development on agricultural machinery modernization, introduction of new agricultural technology, establishment of agricultural machinery introduction systems, introduction of agricultural production technology training and other themes, and to promote the introduction of these themes in Uzbekistan.
Uzbekistan Ukase of the President No. UP-4707 Dated April 4, 2015 "On the Program for Measures Regarding the Structural Reform, Modernization and Diversification of Agricultural Production"	Focus areas are modernization of production, promotion of diversified transportation, introduction of energy efficient technology, etc.
Uzbekistan Presidential Proclamation No. PP-2460 Dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"	Reduction of cotton cultivation, expansion of vegetable, potato, melon, fruit, grape, etc. cultivation

The Uzbekistan Ukase of the President "Agricultural Production Modernization, Technology, and Technology Reform Program (2012-2016)" set up proposals regarding mechanization and the introduction of cutting-edge technology with the goal of modernizing agricultural production technology. In addition, the Uzbekistan Ukase of the President No. UP-4707 "On the Program for Measures Regarding the Structural Reform, Modernization and Diversification of Agricultural Production" set out basic policy for the focus areas of diversification of production in addition to modernization, promotion of transportation, and introduction of energy-efficient technology. The Uzbekistan Presidential Proclamation No. PP-2460 "Measures Regarding Agricultural Reform and Promotion (2016-2020)" set out details regarding the diversification of agricultural products among the goals in No. UP-4707.

The primary goals of Uzbekistan Presidential Proclamation No. PP-2460 "Measures Regarding Agricultural Reform and Promotion (2016-2020)" are further development of domestic agricultural product production, improvement of the economic effects of agriculture, financial stability for farmers, and strengthening of the ability to export agricultural products. The proclamation also identifies targets to achieve after the implementation of agricultural reform projects from 2016 to 2020 (with 2015 as the reference point), as well as specific project details for achieving those targets.

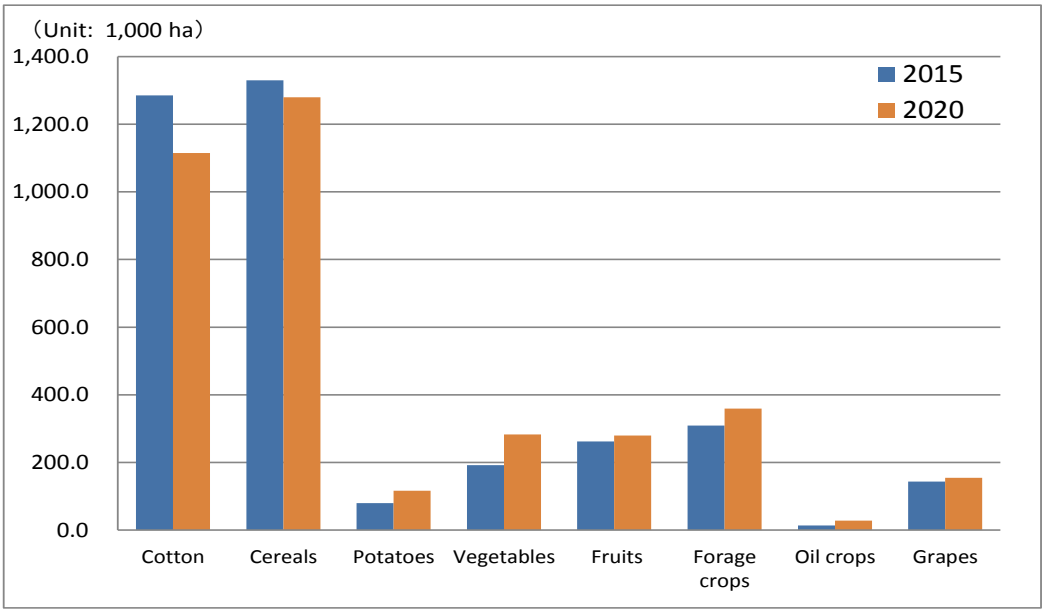
1. Targets Regarding Conversion of Crop Acreage

Uzbekistan's development plan for agriculture from 2016 to 2020 sets out a policy for converting 220,500 ha from land used for cotton and cereal cultivation into crop acreage for horticultural products over a five-year period. Particular varieties of horticultural products scheduled for increased crop acreage are vegetables (increase of 91,000 ha by the end of the plan) and forage crops (50,300 ha increase).

Table 3-24: Target Changes in Domestic Crop Acreage (Unit: 1,000 ha)

Variety	2015	2020	Change from 2015	Percentage Change from 2015
Cotton	1,285.5	1,115.0	-170.5	-13.3%
Cereals	1,329.5	1,279.5	-50.0	-3.8%
Cotton/Cereal Total	**2,615.0**	**2,394.5**	**-220.5**	**-8.4%**
Potatoes	80.3	116.3	36.0	44.8%
Vegetables	192.0	283.0	91.0	47.4%
Fruits	261.9	279.9	18.0	6.9%
Forage Crops	309.1	359.4	50.3	16.3%
Oil Crops	14.3	28.3	14.0	97.9%
Grapes	144.0	155.2	11.2	7.8%
Horticultural Product Total	**1,001.6**	**1,222.1**	**220.5**	**22.0%**

Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"



Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"

Figure 3-63: Target Changes in Crop Acreage (Unit: 1,000 ha)

2. Changes in Crop Acreage for Each Region/Zone

Area reduction targets in the cotton-cultivating regions of Sirdaryo, Jizzakh and Qashqadaryo are high, with respective areas of 22,700 ha, 22,500 ha and 18,400 ha scheduled to be converted to horticultural product production. In contrast, the reduction areas are small in Navoiy Region and the Republic of Karakalpakstan, with respective areas of 3,400 ha and 7,000 ha. As for wheat cultivation, all zones are scheduled for an equal reduction of 4,000 to 6,000 ha.

Table 3-25: 2020 Target Agricultural Product Allocation for Conversion from Cotton Cultivation by Region (Unit: 1,000 ha)

Region	Reduction Area	Allocation of Agricultural Products in Optimized Land					
		Potatoes	Vegetables	Intensive Gardens	Forage Crops	Oil Crops	Other Crops
Republic of Karakalpakstan	7.0	1.5	2.2	0.5	0.7	0.9	1.2
Andijan Region	11.2	2.8	4.7	1.2	1.2	0.8	0.5
Bukhara Region	10.0	2.4	5.1	0.6	0.7	0.8	0.4
Jizzakh Region	22.5	4.0	8.8	1.0	6.0	1.3	1.4
Qashqadaryo Region	18.4	2.3	8.2	1.5	3.3	1.6	1.5
Navoiy Region	3.4	0.5	1.4	-	1.0	0.5	-
Namangan Region	10.1	3.0	4.6	1.0	0.4	0.5	0.6
Samarqand Region	16.2	4.2	5.8	1.5	3.5	0.7	0.5
Surxondaryo Region	14.3	3.0	6.5	1.3	2.0	1.0	0.5
Sirdaryo Region	22.7	3.8	7.9	1.0	7.0	1.9	1.1
Tashkent Region	13.4	4.0	5.0	1.5	1.5	1.0	0.4
Fergana Region	12.5	4.1	5.0	1.1	1.5	0.3	0.5
Khorezm Region	8.8	0.4	4.8	0.3	1.5	0.9	0.9
Total	**170.5**	**36.0**	**70.0**	**12.5**	**30.3**	**12.2**	**9.5**

Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"

Table 3-26: 2020 Target Agricultural Product Allocation for Conversion from Wheat Cultivation by Region (Unit: 1,000 ha)

Region	Newly Available Crop Acreage	Allocation of Agricultural Products in Optimized Land				
		Vegetables	Intensive Gardens	Forage Crops	Oil Crops	Other Crops
Andijan Region	4.0	1.7	0.4	1.4	0.3	0.2
Bukhara Region	5.0	2.0	0.6	2.4	-	-
Jizzakh Region	5.0	2.2	0.5	1.8	0.3	0.2
Qashqadaryo Region	4.0	1.5	0.3	1.8	0.2	0.2
Namangan Region	5.0	2.2	0.6	1.7	0.3	0.2
Samarqand Region	6.0	2.5	0.5	2.8	-	0.2
Surxondaryo Region	5.0	2.2	0.5	2.0	0.2	0.1
Sirdaryo Region	5.0	2.2	0.6	1.8	0.2	0.2
Tashkent Region	6.0	2.5	0.8	2.5	-	0.2
Fergana Region	5.0	2.0	0.7	1.8	0.3	0.2
Total	**50.0**	**21.0**	**5.5**	**20.0**	**1.8**	**1.7**

Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"

3. Productivity Improvement Targets

Plans call for the improvement of yields for all varieties in 2020 in comparison to the figures for 2015. Particular targets include productivity increases of 29.4% for oil crops, 20.9% for cereals, and 13.3% for fruits.

Table 3-27: Target Yields by Variety (Unit: centner[5]/ha)

	2015	2020	Change from 2015	Percentage Change from 2015
Cotton	26.1	26.9	0.8	3.1%
Cereals	54.9	66.4	11.5	20.9%
Potatoes	218.9	230.5	11.6	5.3%
Vegetables	277.1	294.0	16.9	6.1%
Fruits	123.9	140.4	16.5	13.3%
Forage Crops	225.0	240.0	15.0	6.7%
Oil Crops	17.0	22.0	5.0	29.4%
Grapes	126.7	137.1	10.4	8.2%

Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"

4. Gross Harvest Volume Expansion Targets

Plans call for the expansion of gross harvest volumes for all varieties other than cotton in 2020 in comparison to the figures for 2015. The crop acreage for cereal crops will be reduced 3.8% over the five-year period from 2016 to 2020, but the productivity per unit of area will improve 20.9%; thus, the gross production volume is expected to increase 16.4%.

Table 3-28: Target Improvement of Gross Harvest Volume by Variety (Unit: 1,000 ha)

	2015	2020	Change from 2015	Percentage Change from 2015
Cotton	3,350.0	3,000.0	-350.0	-10.4%
Cereals	7,305.0	8,500.0	1,195.0	16.4%
Potatoes	2,670.0	3,601.0	931.0	34.9%
Vegetables	9,923.0	12,925.0	3,002.2	30.3%
Fruits	2,731.0	3,380.0	648.6	23.8%
Forage Crops	18,725.0	20,396.0	1,670.6	8.9%
Oil Crops	98.0	160.0	62.0	63.3%
Grapes	1,556.0	1,830.0	273.9	17.6%

Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"

[5] 1 centner = 100 kg

5. Specific Program Details

The introduction of tools and technologies is planned to improve productivity per unit of area (Table 3-29). In addition, plans call for the construction of distribution centers and storehouses in anticipation of increased production of vegetables and fruits.

Table 3-29 Agricultural Reform Projects and Target Values

Agricultural Reform Project	Unit	2016 Forecast	2020 Forecast	Change
Introduction of total tilling technology that reaches a depth of 30-45 cm with a two-level plow in domestic cotton-cultivating/cereal crop-producing regions with overgrowth of annual and perennial weeds	1,000 ha	520	901	381
Introduction of resource conservation technology via V-shaped cotton seed spreader	1,000 ha	214	456	242
Introduction of double-row cotton planting on land with limited agricultural capacity due to insufficient irrigation	1,000 ha	209	385	176
Introduction of land improvement using laser leveling on irrigated domestic farmland	1,000 ha	26	239	213
Planting and phased cultivation of dwarf and semidwarf fruit tree saplings	1,000 trees	5,500	12,500	7,000
Construction of distribution centers to handle processing, storage and transportation of fruit and vegetable products	Centers	3	17	14
Increase capacity by building new, modernized refrigerated storehouses for fruit and vegetable products	1,000 t	62	325	263

Source: Prepared by the JICA Study Team based on Uzbekistan Presidential Proclamation No. PP-2460 dated December 29, 2015 (Measures Regarding Agricultural Reform and Promotion (2016-2020)"

6. Government Decisions Regarding State Orders

Additionally, the government has purchased cotton and wheat from "farmers," and sets out the volumes, cash amounts, and payment terms for those purchases. For example, the terms for purchases in the 2016 fiscal year were set out in Republic of Uzbekistan Cabinet of Ministers Resolution No. 293 in an effort to further solidify the financial situations of cotton farmers. The table below contains details from the resolution.

Table 3-30: Payment Terms for Raw Cotton Harvested in 2016 in Republic of Uzbekistan Cabinet of Ministers Resolution No. 293 (September 2016)

1. The Republic of Uzbekistan Ministry of Finance, Ministry of Agriculture and Water Resources (MAWR), and Ministry of Economy, the holding company Uzpakhtasanoateksport, and the Uzbekistan Farmers Committee approved proposals regarding the following:

・Establishment of purchase prices for raw cotton harvested in 2016 according to the addendum

・A 9.6% increase in the standard wage per unit of raw cotton harvest work for the 2016 harvest compared to 2015, and the price of 285 UZS per kilogram for the hand-harvesting of medium-staple raw cotton

Together with the holding company Uzpakhtasanoateksport, the Republic of Karakalpakstan Cabinet of Ministers, and the governments of each region and area, the Republic of Uzbekistan Ministry of Finance and MAWR will collectively make an announcement to cotton farmers within one week regarding new fee

schedules for the purchase prices of raw cotton harvested in 2016.

2. Together with the holding company Uzpakhtasanoateksport, the publicly held commercial bank Agrobank and other commercial banks, the Republic of Karakalpakstan Cabinet of Ministers, and the governments of each region, the Republic of Uzbekistan Ministry of Finance and the Central Bank of the Republic of Uzbekistan guarantee the timely payment of wages to workers involved in the harvest, transportation and procurement of raw cotton.

Cotton farmers are recommended to pay wages to workers every five days (or every day, when necessary) for the actual delivery volume of raw cotton as set out in this decision.

3. Together with the Agricultural Product Purchase Settlement Fund for National Demand affiliated with the Republic of Uzbekistan Ministry of Finance, the holding company Uzpakhtasanoateksport will settle balances due to cotton farmers for raw cotton based on the prices on price lists in a timely fashion; 90% within the current year, and 10% by April 1, 2017.

Together with the joint-stock company Uzpakhtasanoat, the holding company Uzpakhtasanoateksport will submit general information on the equivalent of 10% of the final settlement price of raw cotton harvested in 2016 to the Republic of Uzbekistan Ministry of Finance by January 10, 2017.

4. The holding company Uzpakhtasanoateksport hold the heads of the joint-stock company Uzpakhtasanoat and the publicly held commercial bank Agrobank responsible for the timely settlement of balances with cotton farmers and the faithful and timely use of funds for the purposes of the funds.

C. Development of Legal System Regarding Agriculture

The Law on Agriculture in Uzbekistan was drafted while referring to the laws of the former Soviet Union, went into effect in October 1998, and set out the following items. However, the decision was made to nullify this law in Republic of Uzbekistan Cabinet of Ministers Resolution No. 323 dated December 7, 2013. Later, revisions, changes, new provisions and the like regarding the respective items were established in the form of Ukase of the President, Presidential Proclamations and the like.

Table 3-31: Provisions in the Uzbekistan Law on Agriculture (1998)

160.000.000 Law on Agriculture
160.010.000 General Issues in Agricultural Development
160.020.000 Social Development of Rural Villages
160.030.000 Agricultural Management
160.040.000 State-Run Agricultural Corporations
160.050.000 Collective Farms
160.060.000 Individually-Run Farms (Dehkan) and “Farmer” Farms
160.070.000 Agricultural Cooperatives (Shirkat)
160.080.000 Individually-Run Farms (Dehkan) and “Farmer” Farm Associations
160.090.000 Agricultural Complexes. Combination
160.100.000 Rural Citizen Migration
160.110.000 Lending in Agriculture
160.120.000 Cotton Cultivation
160.130.000 Agricultural Plant Cultivation
160.130 010 Cereal Cultivation
160.130.020 Fruit Cultivation
160.130.030 Grape Cultivation
160.130.040 Vegetable Cultivation

160.130.050 Industrial Raw Material Crops and Forage Crops
160.140.000 Agricultural Policy. Chemicalization. Extermination of Insect and Animal Pests, Agricultural Plant Diseases. Plant Quarantine.
160.150.000 Livestock and Fur Animal Breeding. Breeding Operations. (Rabbit Breeding, Karakul Sheep Breeding, Horse Breeding)
160.160.000 Poultry Farming. Artificial Incubation/Poultry Stations. Poultry Farms
160.170.000 Beekeeping
160.180.000 Sericulture
160.190.000 Policy for Veterinary Science and Livestock Science. Animal Quarantine
160.200.000 Agricultural Product Procurement
160.200.010 General Issues in Agricultural Product Procurement Contract System
160.200.020 Seeding, Harvesting and Other Agricultural Work
160.200.030 Consumer Cooperative Procurement Duties
160.200.040 Agricultural Products. Purchase and Delivery of Agricultural Products
160.200.050 Agricultural Product Purchase Prices and Contract Prices
160.200.060 Procurement of Raw Materials for Pharmaceuticals
160.210.000 Receiving Inspections, Storage, Processing, Exchanging and Selling Procured Products
160.220.000 Variety Improvement. Breeding. Experimental Farms

D. Main Tax Systems for the Agricultural Sector

1. Taxation of Agricultural Corporations

(a) Agricultural Producers Subject to Taxation

Corporations that satisfy the following requirements:

(i) Corporations whose main activity is to use land to produce agricultural products, and either process those agricultural products on their own, or only use the land to produce agricultural products.

(ii) Corporations that hold land zoned for agriculture, and were granted that land by regional authorities for the purposes ordered.

(iii) Corporations for whom at least 50% of gross volume is production/processing of agricultural products. Agricultural products purchased for sale or processing are included in this total, and are reflected in production/processing percentages of agricultural products.

(iv) Individuals Exempt from Single Land Taxes

- People involved in forestry/hunting
- Dehkan farms (people who received education and establish the farms, excluding corporations)

(b) Individuals Subject to Pay Uniform Land Tax

Producers of agricultural products who produce them for commercial use (Farmers) pay the uniform land tax. However, producers eligible to pay simplified taxes are obligated to pay withholding taxes, and to make payments required for paying the taxes below, and other budget

and government trust funds.

- Income taxes
- Value added taxes for employees (nonresidents of Uzbekistan)
- Value-added taxes for facilities and buildings, which include instruments executed for competitive bidding, and funds raised for government budgets or investment programs approved by the government
- Consumption taxes for product production (excluding entities that pay unified tax).
- Taxes and special charges for subsoil users. (excluding entities that pay unified tax)
- Taxes for water and resource use for producers of a set range of products set out in laws.
- Payment of customs duties
- A 15% tax is levied on wages of corporate employees as a uniform social tax. For example, a corporation that pays 100,000 UZS to an employee pays a tax of 15,000 UZS.
- Government obligations
- Taxes for rights related to the retail sale and provision of services for a set range of products
- Compulsory delivery for government trust funds (excluding entities that pay single taxes or single land taxes)
- Taxes on purchases (or) temporary vehicle imports to fund the republic's roads

(c) Tax Base

The tax base is the standard value of the land price subject to taxation, and is determined by law.

The standard value of agricultural land held by agricultural corporations is set out by the Uzbekistan government committee of Uzdaverlyloiha. This organization appraises the 13,732 ha of land zoned for harvesting held by the 105,210 agricultural producers throughout the Republic of Uzbekistan, and determines standard values. The mean of the standard value is 2,720,000 UZS/hectare.

Each year, the Supreme Assembly determines rates regarding taxes and payment obligations. These determinations include coefficients applied to standard values of land subject to taxation. The coefficient for 2017 is 0.95. Assuming a standard value per hectare of 2,720,000, the mean payment amount per hectare for the uniform land tax is 2,584,000 UZS.

(d) Tax Exemption Policy

Corporations that have introduced drip irrigation systems on a portion of their land are exempt from paying the uniform land tax for five years from the month they first introduced the systems.

Table 3-32: Government Budget Receipts (Unit: %)

Index	2011	2012	2013	2014	2015	2016
1. Direct taxes	26.4	25.4	24.2	23.4	24.1	24.0
Corporate income taxes	5.1	4.7	4.0	3.5	3.2	3.0
Personal income taxes	11.2	10.8	10.4	10.3	10.4	10.1
2. Indirect taxes	48.2	49.0	51.1	53.1	52.6	51.5
Value added taxes	27.9	28.0	28.8	29.9	29.7	29.0
Excise taxes	14.9	14.9	15.9	15.6	15.4	15.3
3. Resource taxes/fixed asset taxes	15.4	15.6	14.8	13.6	13.2	12.9
4. Other income	10.0	10.0	9.9	9.9	10.1	11.6

Source: Center for Economic Research and State Statistics Committee

Table 3-33: Government Budget Expenditures (Unit: %)

Index	2011	2012	2013	2014	2015	2016
1. Expenditures for social realm/assistance of the population	58.0	58.9	58.7	58.8	58.8	58.9
2. Economic expenditures	11.5	11.1	10.6	10.7	10.5	10.6
3. Expenditures for centralized investment	6.6	5.4	5.6	5.1	5.1	5.2
4. Maintenance of national governance, management, courts and civil self-administration organizations	3.8	4.1	4.5	4.5	4.4	4.4
5. Other expenditures	20.1	20.5	20.6	20.9	21.2	20.9

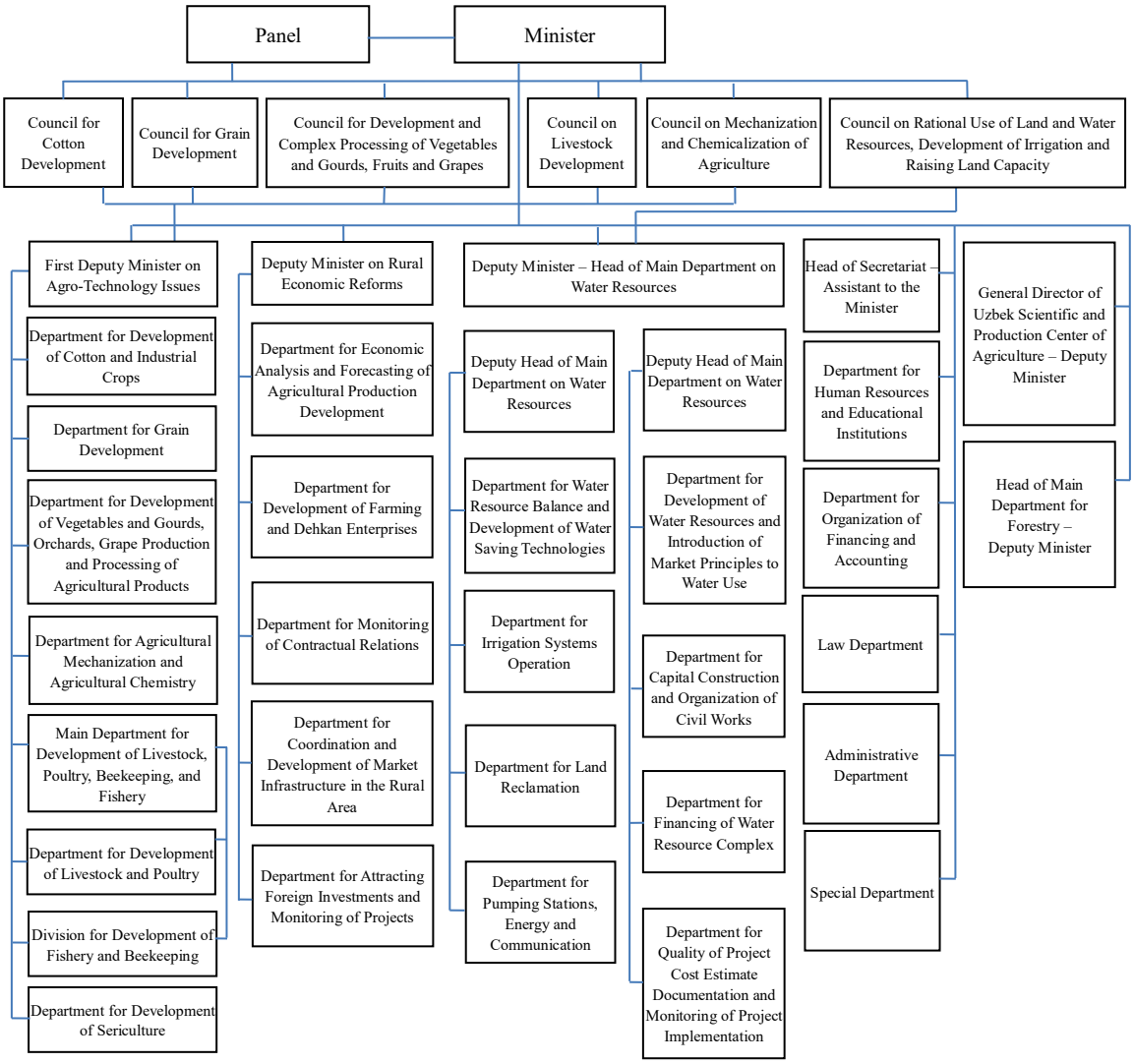
Source: Center for Economic Research and State Statistics Committee

E. Administration system and policy of MAWR, RRA and Irrigation fund

1. Personnel, organization system and scope of work

Organization chart of MAWR is shown below. Majour department in MAWR are agricultural production and livestock sector including fisheries and sericulture, Rural Economic Reforms sector, irrigation and water resource sector and forestory sector.

Structure of the Central Office
of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan

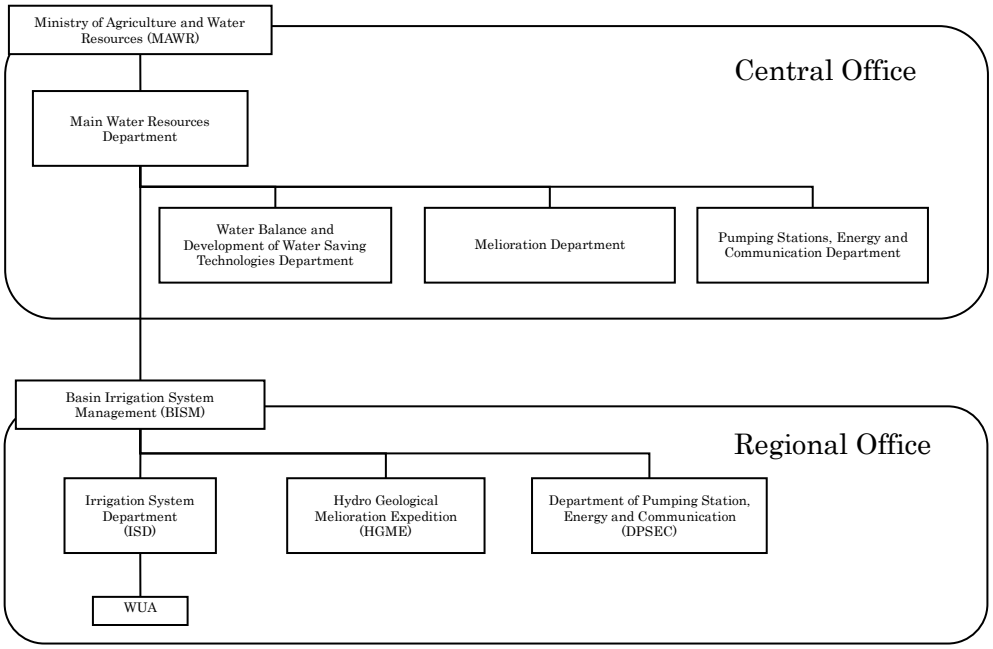


Source: Website or MAWR <http://agro.uz>（Accessed on 21st April 2017）

Figure 3-64: Structure of the Central Office
of the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan

Integrated water management is main irrigation policy of MAWR and that policy is forcusing on effective water use in existing irrigation scheme, implementation of water saving irrigation and development of new varaiety with low water consumption. In order to make effective use of water

resources, MAWR also carried out activities such as implementation of main canal lining and arranges low-interest loans for equipment like drip irrigation using irrigation funds to promote water-saving irrigation. As a branc office of MAWR in the field of agronomy sector, office within the provincial government is in charge of the agency. In the field of water resources, BISM is representating MAWR to managing irrigation fields. There is BISM in the water resources field divide the country into 10 basin areas and manage irrigation fields. HGME is under its umbrella, and this institution is set up in each province and is responsible for the land improvement field.



Source: Prepared by the JICA Study Team

Figure 3-65: Relationship between MAWR and their branc

MAWR is responsible for implementing a unified agricultural policy aiming for modernization and sustainable agriculture, and is responsible for Uzbekistan's agriculture, forestry and fisheries policy and water resource management. BISM, which is the underlying organization of MAWR, is responsible for estimation the amount of water demand in basin units, applying for amount of water intake, called “Limit”, to the MAWR based on the estiimation, allocating and supervising irrigation water based on the Limit. Besides, the role of BISM is maintenance and management of main canals and management of reservoirs. Under the umbrella of BISM, there is a pump department and each district office of BISM which is responsible for allocating water to each WCA. HGME, which is also under BISM, has offices in each province. Their duty is dredging drainage for countering salinization, water level observation of observation wells, and measurement of salt concentration of agricultural land. Regarding the budget of HGME, it is allocated from the Irrigation Fund to be described later to HGME in each province via BISM and used for the activity expenses of land

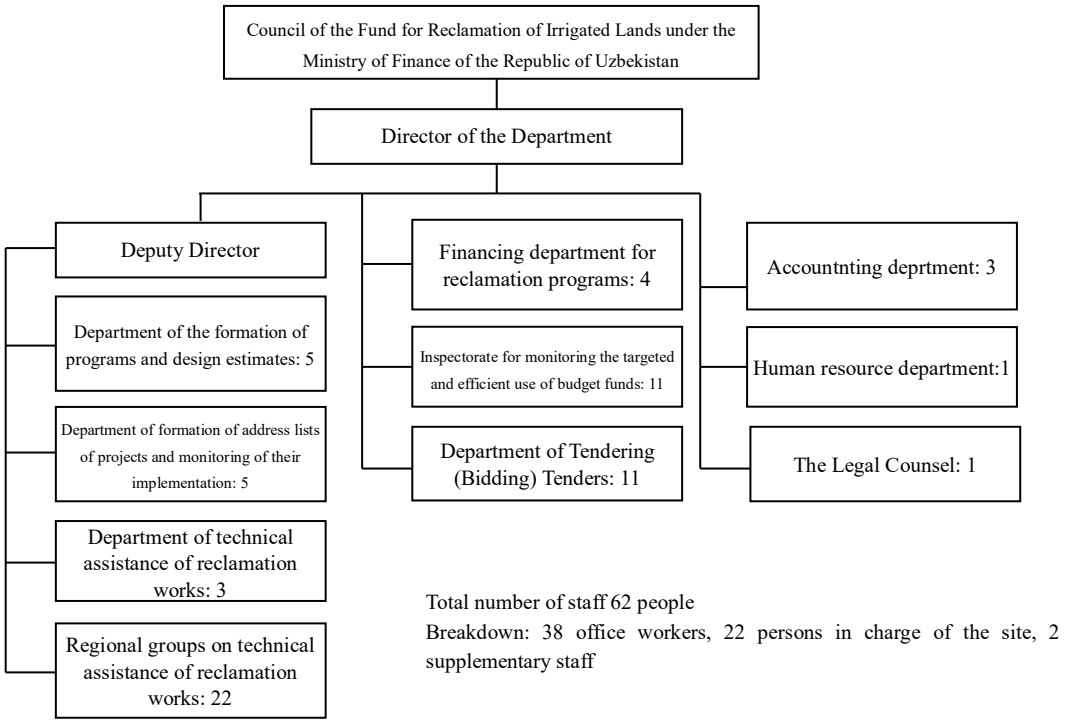
improvement related project.

The irrigated land improvement fund (Melioration Fund) was started by the Presidential Decree of 2007 and there is a department to manage this fund within the Ministry of Finance. This fund is a government agency that accumulates funds, improves the condition of irrigated land and acquires equipment for that purpose.

The first phase of this irrigation fund was conducted from 2008 to 2012 and the second phase from 2013 to 2017 is currently underway. The third phase from 2018 to 2022 is also planned. From the second phase, not only land improvement but also promotion of water saving irrigation is included as their activities.

The activities of the irrigation fund are aimed at the accumulation of funds and the utilization of effective funds for land improvement projects of irrigated land. The funds are funded by land tax and tax allocated to agricultural producers, budget allocation, etc. The main activities of the Fund are construction of, reconstruction, repair, and dredging of drainage canals, vertical drainage wells, pump station for drainage and underdrains.

The organization chart of the irrigation fund is shown below. There are 67 members below the director in total and 25 staff members for technical assistance within that.



Source: Web site of Ministry of Finance of the Republic of Uzbekistan <https://www.mf.uz/en/>（Accessed on 21st April 2017）

Figure 3-66: Organization chart of Council of the Fund for Reclamation of Irrigated Lands under the Ministry of Finance of the Republic of Uzbekistan

The Agricultural Reconstruction Agency (RRA) is an organization under MAWR and is responsible for the implementation of the project, in particular the disbursement of fund. The staff of the local branch of the RRA is located within the provincial government, has the seat of the provincial government, and it is obliged to put the report into the headquarter daily. RRA is responsible for their personnel expenses, and cost for activities, etc.

2. Budget allocation

The budget allocation and results of the irrigation fund in 2013 are shown in the table below. The total annual budget is 227,500,000,000 UZS, which is allocated approximately the same amount of 221, 117,800,000 UZS. Many of these revenues are accounted for by income from land tax (64%) and allocation of subsidies (31%). Regarding expenditure, almost the same as expenses for new construction and renovation are devoted to repair and other activities.

Table 3-34: Balance of plan and actural performance of Irrgation fund in 2013 (Unit: million UZS)

No.	Item	Plan	Actual performance
	Income	**227,500.0**	**221,117.8**
I	**Receipt of budgetary funds**	**216,500.0**	**209,174.3**
1	Unified land tax	141,700.0	141,700.0
1	Subsidy	74,800.0	67,474.3
II	**Repayment of borrowed funds,**	**11,000.0**	**11,077.7**
III	**other income**	**—**	**865.8**
	expenditure	**227,500.0**	**221,117.8**
I	**Construction and rehabilitation of land improvement system**	**225,500.0**	**219,253.6**
1	Construction and reconstruction	106,022.0	101,740.3
	Breakdown : Preparation of desoghn study report	5,500.0	4,137.3
2	reparement and rehabilitation	95,000.0	93,202.0
	Breakdown : Preparation of desoghn study report	4,300.0	4,473.0
3	Update equipment for land improvement	24,478.0	24,311.3
II	**personel expence of irrigation fund**	**2,000.0**	**1,864.2**

Source: Web site of Ministry of Finance of the Republic of Uzbekistan <https://www.mf.uz/en/>（Accessed on 21st April 2017）

3. Formulation of plan, implementation and evaluation process

The planning, implementation and evaluation process of MAWR is described in the Ministerial Conference Decision No. 395 dated September 12, 2003, the content of which is shown in the table below.

Table 3-35: The process of planning in Uzbekistan

Period	Content	responsible
April	The Ministry of Economy annually delivers to the ministries, the Council of Ministers of the Republic of Karakalpakstan, the regional khokimiyats and the city of Tashkent (hereinafter referred to as the "customers") guidelines for the preparation of proposals for inclusion in the Investment Program of the Republic of Uzbekistan for a three-year period	Ministry of Economy
May to June	Customers prepare initial information on projects, conduct their selection for a three-year implementation period and submit proposals to the Ministry of Economy	Customers
June to July	The Ministry of Economy considers proposals and carries out the ranking of projects in accordance with the development priorities of a particular industry for the medium-term period	Branch departments of the Ministry of Economy
August to Spetember	The Ministry of Economy together with the Ministry of Finance, the Agency for External Economic Relations, Gosarkhitektstroy and authorized banks conducts the final selection of projects included in the Investment Program	Ministry of Economy, Ministry of Finance, AVES, Gosarkhitektstroy, authorized banks
September	The draft of the Investment Program is considered by the Joint Board under the Ministry of Economy and, by its decision, is entered into the Department of Foreign Economic Relations and Foreign Investments for study and coordination with the Cabinet of Ministers	Joint Board under the Ministry of Economy, complexes of the Cabinet of Ministers
September to October	The project of the Investment program is adjusted taking into account the proposals of the complexes of the Cabinet of Ministers	Ministry of Economy
October	The draft Investment Program is submitted for approval by the Cabinet of Ministers	Department of WEC IA of the Cabinet of Ministers
October to November	Competitive tenders are held for newly launched facilities, included in the first year of the Investment Program	Gosarkhitektstroy, Customers
December	In accordance with the approved investment program and competitive bidding conducted in accordance with the established procedure, contracts are concluded, and address lists of design work for future years are approved.	Customers, contractors

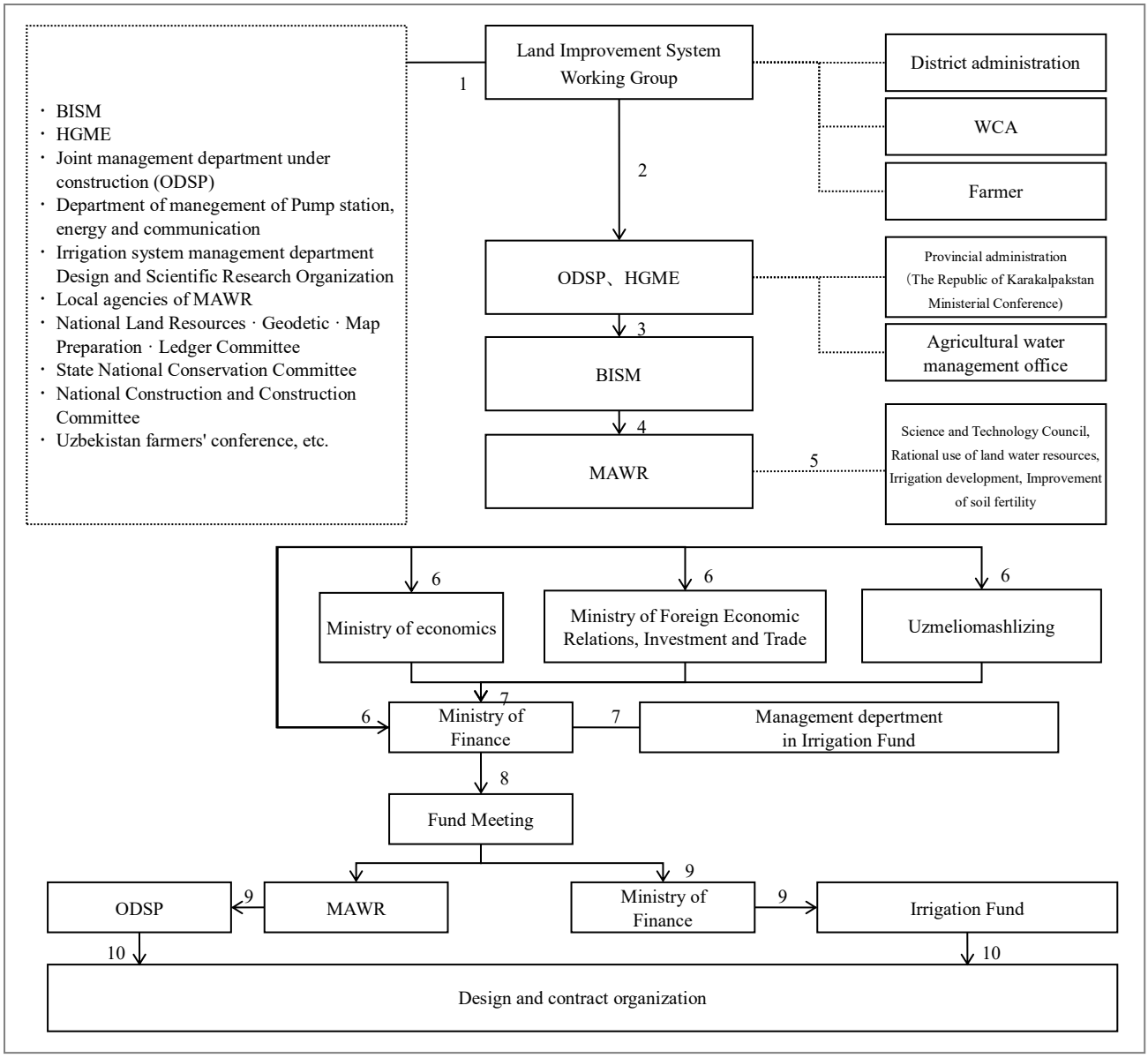
Source: Ministerial Conference Decision No. 395 dated September 12, 2003

Ministerial Conference Decision No. 261 (dated November 28, 2008) describes planning and implementation method of land improvement project. According to interviews, the state level plan organized a working group composed of BISM, HGME, pump department officials, etc. in each district, investigated land improvement facilities with WCA leaders and farmers, and as a result of salt damage monitoring Create a business plan based on. The result is compiled by the HGME at the state level and submitted to the Ministry of Agriculture and Water Resources after the approval of

the state governor. After that, adjustments will be made according to the presentation results by the representatives of HGME in each state, adjusted according to the overall budget and priority, and submitted to the Ministry of Finance. Final review will be conducted within the Treasury's irrigated land improvement fund board and the budget will be approved.

The flow of the figure below is outlined in the Ministerial Conference Decision No. 261 dated November 28, 2008, and the explanation of each stage is as follows.

1. By 1st May, investigate, analyze and summarize the technical condition of the land improvement facility and land improvement situation of the irrigated land, prepare and deliberate the land improvement proposal, and coordinate with the district chief.
2. Summarize the irrigated land improvement proposal, submit it to the joint management department of the company under construction and the land improvement survey team by May 15.
3. Analysis and summary of proposals of working group. Form the regional goal program for the next fiscal year and make a presentation to the district director (the governor of the provincial governor, representative of the Minister of the Republic of Kalakalpakstan) with the participation of the members of the irrigation meeting, BISM, and other related organizations.
4. By May 25, submit the regional target program to the MAWR for consideration.
5. Analysis, review and summarize the regional target program by June 1, discussion with the Science and Technology Council, the rational use of land water resources of the MAWR, the development of irrigation and the soil fertility improvement meeting.
6. By June 5, review the land improvement proposal for the next fiscal year on the irrigated land.
7. Review and draw conclusions by June 15.
8. Submit analysis of proposal and conclusion of irrigated land improvement to the Fund meeting by June 1.
9. Discuss and approve the target program of the next fiscal year and realize it.
10. Project realization.



Source: Ministerial Conference Decision No. 261 dated 28 November 2008

Figure 3-67: Schematic diagram of preparation, adjustment and approval of annual target program of irrigated land improvement

(3) Distribution of Agricultural and Animal Products: Present State Issues

A. Present State of Domestic Consumption/Distribution

The ratio of the distribution of market-ready fruits and vegetables (agricultural and animal products other than animal products (dairy products, meat) destined for domestic consumption) throughout Uzbekistan (domestic consumption) or outside the country (export) varies widely depending on the type of product. The tables below show distributions of value chain volume for typical products.

Nearly the entire portion of products that are processed is destined for domestic consumption. In addition, losses (defective goods) are generated in other distribution processes (transportation, loading, unloading, temperature changes, etc.) at harvest time.

Table 3-36: Changes in Harvest Volume (Cherries)

	Harvest Volume	Losses (at Harvest)	Processing	Losses (during Distribution)	Domestic Consumption	Export
Amount Used	—	7	58	3	24	8
Balance	100	93	35	32	8	0

*Quantity at harvest = 100
Source: Prepared by the JICA Study Team based on local interviews

Table 3-37: Changes in Harvest Volume (Grapes)

	Harvest Volume	Losses (at Harvest)	Processing	Losses (during Distribution)	Domestic Consumption	Export
Amount Used	—	9	35	5	35	16
Balance	100	91	56	51	16	0

*Quantity at harvest = 100
Source: Prepared by the JICA Study Team based on local interviews

Table 3-38: Changes in Harvest Volume (Tomatoes)

	Harvest Volume	Losses (at Harvest)	Processing	Losses (during Distribution)	Domestic Consumption	Export
Amount Used	—	12	32	4	33	19
Balance	100	88	56	52	19	0

*Quantity at harvest = 100
Source: Prepared by the JICA Study Team based on local interviews

Table 3-39: Changes in Harvest Volume (Cucumbers)

	Harvest Volume	Losses (at Harvest)	Processing	Losses (during Distribution)	Domestic Consumption	Export
Amount Used	—	4	5	2	79	10
Balance	100	96	91	89	10	0

*Quantity at harvest = 100
Source: Prepared by the JICA Study Team based on local interviews

These tables show that the ratio of domestic consumption is relatively low for cherries, but that cucumbers are mainly destined for the domestic market. In addition, many tomatoes are supplied to the market for export as fresh products.

B. Agricultural and Animal Product Domestic and Foreign Prices, Consumption and Market Trends

When the prices of the main agricultural and animal products bound for Uzbekistan (Tashkent) and the principal export market of Russia (Moscow, Ekaterinburg) are compared, the prices in Tashkent are highest, followed by Ekaterinburg and Moscow. As for breakdown of varieties, the price of tomatoes in particular differs widely between those urban areas. This is likely due to the fact that most tomatoes are cultivated in greenhouses, and could also be a reflection of the strength of demand.

However, even prices for the same product vary depending on the variety, production area, harvest year, and timing of sales. It is also important to remember that actual prices may be more reasonable in Uzbekistan (Tashkent) because two different exchange rates for the local currency UZS and USD exist.

Table 3-40: Domestic and Foreign Prices of Agricultural and Animal Products (Unit: USD)

Product	Unit	Tashkent	Moscow	Ekaterinburg
Apples	1 kg	1.10	1.62	1.57
Tomatoes	1 kg	0.93	3.04	2.01
Potatoes	1 kg	0.48	0.59	0.43
Chicken	500 g	2.81	2.88	2.26
Eggs	Dozen	1.73	1.76	1.28
Milk	1 liter	1.27	1.23	0.87
Cheese	500 g	5.45	6.42	4.55

*Exchange rate: 1 USD = 3678.89 UZS; 1 USD = 56.2030 RUB (Bloomberg, April 20, 2017)
Source: Prepared by the JICA Study Team based on data from Expatistan (expatistan.com, April 20, 2017)

The main products destined for domestic consumption are meat and dairy products, and cabbage, carrots and other fruits and vegetables other than cherries, grapes, apricots, melons, tomatoes and beans, which are relatively competitive outside Uzbekistan. In addition, most products of intensive gardens and greenhouses and other large-scale, advanced-technology production schemes are for export (particularly to Russia and Kazakhstan), despite the additional option to sell domestically. As of January 2017, the list of export partners for fruits has increased to 43 countries under Uzagroexport and other government initiatives to promote exports, and the establishment of commercial centers in major cities of export partner countries is progressing. In 2016, five commercial centers were established in Russia, and two were established in Kazakhstan. Plans call for the establishment of commercial centers in Novosibirsk, India, Germany, Poland, Latvia, the United Arab Emirates, Belarus and elsewhere in 2017.

C. Trends in Agricultural and Animal Product Import and Export

The Uzbekistan international trade structure accounts for 30% to 40% of that of CIS nations. Imports and exports for food products are largely on the rise, and exports have topped imports since 2013.

Table 3-41: International Trade Structure, 2016 (Unit: %)

Item	CIS Countries	Other Countries
Foreign Trade	35.5	64.5
Exports	37.5	62.5
Imports	33.5	66.5

Source: Center for Economic Research and State Statistics Committee

Table 3-42: Food Product Export and Import Values (Unit: 1 million USD)

Variety	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Exports	206	505	761	512	712	1,261	1,990	878	1,480	1,676
Imports	287	369	483	806	851	963	1,301	1,394	1,336	1,510
Net Exports	-81	136	278	-294	-139	297	690	-516	144	166

Source: 2015 Uzbekistan Statistical Yearbook (The State Committee of the Republic of Uzbekistan on Statistics)

Furthermore, in terms of quantity, exports of fresh vegetables and fresh fruits have increased vigorously since the worldwide financial crisis in 2008, and dried fruit exports have bounced back tremendously from their low in 2009. As for individual products, grape exports have trended upward since 2008, but apple exports vary widely from year to year, and have not demonstrated a consistent trend. Similarly, exports of juices, which are processed goods, are generally on the rise, but vary from year to year. These circumstances seem to demonstrate that export performance is affected not only by changes in crop yields, but also by insufficient competitiveness and fierce competition in the market.

Table 3-43: Trends in Import/Export Volumes of Fresh Fruit (Unit: ton)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export Volume	21,245	13,100	12,700	10,792	38,612	47,841	80,677	85,000	48,472	50,351	61,311	66,763	66,800	66,800
Import Volume	31	30	10	99	10	2	0	0	0	0	0	0	0	0
Net Exports	21,214	13,070	12,690	10,693	38,602	47,839	80,677	85,000	48,472	50,351	61,311	66,763	66,800	66,800

Source: Prepared by the JICA Study Team based on FAOSTAT

Table 3-44: Trends in Import/Export Volumes of Dried Fruit (Unit: ton)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export Volume	10,577	6,900	5,753	7,296	10,772	11,185	12,584	13,117	8,667	5,894	6,834	29,597	30,965	40,494
Import Volume	6	1	0	0	0	0	19	49	50	50	6	6	13	13
Net Exports	10,571	6,899	5,753	7,296	10,772	11,185	12,565	13,068	8,617	5,844	6,828	29,591	30,952	40,481

Source: Prepared by the JICA Study Team based on FAOSTAT

Table 3-45: Trends in Import/Export Volumes of Grapes (Unit: ton)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export Volume	91,485	30,900	20,620	31,294	90,055	108,991	142,719	110,871	58,146	72,616	54,022	112,027	118,804	120,000
Import Volume	318	2	0	3	1	0	0	0	0	0	0	0	0	0
Net Exports	91,167	30,898	20,620	31,291	90,054	108,991	142,719	110,871	58,146	72,616	54,022	112,027	118,804	120,000

Source: Prepared by the JICA Study Team based on FAOSTAT

Table 3-46: Trends in Import/Export Volumes of Apples (Unit: ton)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export Volume	17,633	7,200	1,500	4,019	4,116	4,566	10,599	4,403	2,199	1,764	2,003	3,305	3,179	1,653
Import Volume	6,781	700	1,500	550	540	31	30	30	9	39	120	143	62	145
Net Exports	10,852	6,500	0	3,469	3,576	4,535	10,569	4,373	2,190	1,725	1,883	3,162	3,117	1,508

Source: Prepared by the JICA Study Team based on FAOSTAT

Table 3-47: Trends in Import/Export Volumes of Juice (Unit: ton)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export Volume	433	1,500	1,512	841	178	392	798	1,560	1,048	1,000	572	696	972	634
Import Volume	58	200	178	137	123	110	49	71	63	60	50	23	108	42
Net Exports	375	1,300	1,334	704	55	282	749	1,489	985	940	522	673	864	592

Source: Prepared by the JICA Study Team based on FAOSTAT

Table 3-48: Trends in Import/Export Volumes of Fresh Vegetables (Unit: ton)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Export Volume	3,617	8,900	9,787	17,478	20,152	27,019	31,477	28,971	17,896	29,297	35,250	59,076	39,823	83,933
Import Volume	1	20	2	2	2	19	6	0	0	0	0	0	0	0
Net Exports	3,616	8,880	9,785	17,476	20,150	27,000	31,471	28,971	17,896	29,297	35,250	59,076	39,823	83,933

Source: Prepared by the JICA Study Team based on FAOSTAT

1. Export Destinations (Countries and Cities) for Primary Agricultural and Animal Products (including processed agricultural goods, here and hereafter)

Fresh fruits and vegetables are the primary agricultural products exported from Uzbekistan. According to information obtained from Uzagroexport, a public export company established in April 2016, export volumes were high for grapes, apricots and cherries, and prominent export destinations were Kazakhstan and Russia.

In addition, although volumes are limited, cherries have often been shipped to South Korea, and melons to Latvia, which suggests considerable demand and competitiveness for those products in those locations.

Note that processed goods (particularly processed animal products) are mainly destined for the domestic market.

Table 3-49: Export Volumes for Principal Agricultural Products by Country, 2016 (Unit: ton)

	Kazakhstan	Russia	Kyrgyzstan	Latvia	South Korea	**Total**
Grapes	70,241	24,569	1,492	-	-	**96,301**
Apricots	32,181	16,740	505	-	-	**49,426**
Cherries	23,244	5,486	-	-	151	**28,881**
Melons	2,086	1,952	-	824	-	**4,862**
Apples	3,071	1,009	328	-	-	**4,408**

Source: Prepared by the JICA Study Team based on Uzagroexport data

2. Verification of Domestic Price (and Quality) Differences in Primary Agricultural Animal Products

The prices of primary agricultural and animal products distributed throughout Uzbekistan are up to 20% to 30% cheaper in the countryside (Samarkand) than in the capital city (Tashkent). In particular, the prices of tomatoes and cheese in the countryside are less than 70% than those of the capital city. This difference can be explained by higher costs due to the cost of transporting agricultural products made in the countryside to Tashkent, and labor and other costs for producing these products in suburban areas.

In contrast, there is hardly any difference between the countryside and capital city prices of apples and eggs. Many different factors could explain this phenomenon, but at the very least it suggests that it costs the same to produce and sell these products in the same areas in which they will be consumed, rather than transporting identical goods to various places. For eggs in particular, when breakage and quality deterioration due to transportation are taken into account, it makes sense for egg farmers to produce eggs near the areas in which they will be consumed.

Table 3-50: Domestic Price Differences Between Capital City and Countryside

Product	Unit	Tashkent (Capital City)	Samarkand (Countryside)	Price Difference (Countryside - Capital City)	Percentage (Countryside / Capital City)
Apples	1 kg	1.17	1.17	0.00	1.00
Tomatoes	1 kg	0.83	0.56	-0.27	0.67
Beef	1 kg	7.14	6.00	-1.14	0.84
Chicken	1 kg	4.33	3.28	-1.05	0.76
Eggs	Dozen	1.13	1.09	-0.04	0.96
Milk	1 liter	1.03	0.90	-0.13	0.87
Cheese	1 kg	5.43	3.68	-1.75	0.68

Source: Prepared by the JICA Study Team based on data from Numbeo (numbeo.com, March 2017, mean prices in USD)

During summers in Uzbekistan, the temperature rises to around 40°C; thus, the quality of meat and dairy products in particular depends on transportation times and the quality of the cold chain that comprises refrigerators and refrigerated trucks. The network of expressways in Uzbekistan is not fully established; thus, to provide agricultural and animal products of consistent quality, it is best to produce and sell them in each region, including the countryside. In addition, one proposal for reducing loss and extending the shelf life of easily damaged agricultural products is to dry them, can them, make jams and pastes, and otherwise process them.

3. Evaluations of Primary Agricultural and Animal Products in Primary Export Markets

In Moscow and other major markets in CIS nations, there is a certain level of regard for fruits and vegetables imported from Uzbekistan and Middle Eastern countries. Both fresh and dried Uzbek fruits are distinct from others in terms of price, quality and taste, and consumers are aware that Uzbek products are supplied earlier in the springtime than those from other regions. However, highly regarded Uzbek products in those markets are limited to high-priced products such as cherries, apricots and grapes (which are harvested in August, before Serbian grapes are harvested). In addition, the need for fresh fruits and vegetables is particularly high in the Siberian market (Novosibirsk, Ekaterinburg). In contrast, dried vegetables are mainly sold to corporations and the military; they are not sold at retail supermarkets.

Meats are mainly destined for domestic markets, and only a limited amount is exported.

Table 3-51: Reputation/Presence of Uzbek Agricultural Products in CIS Markets

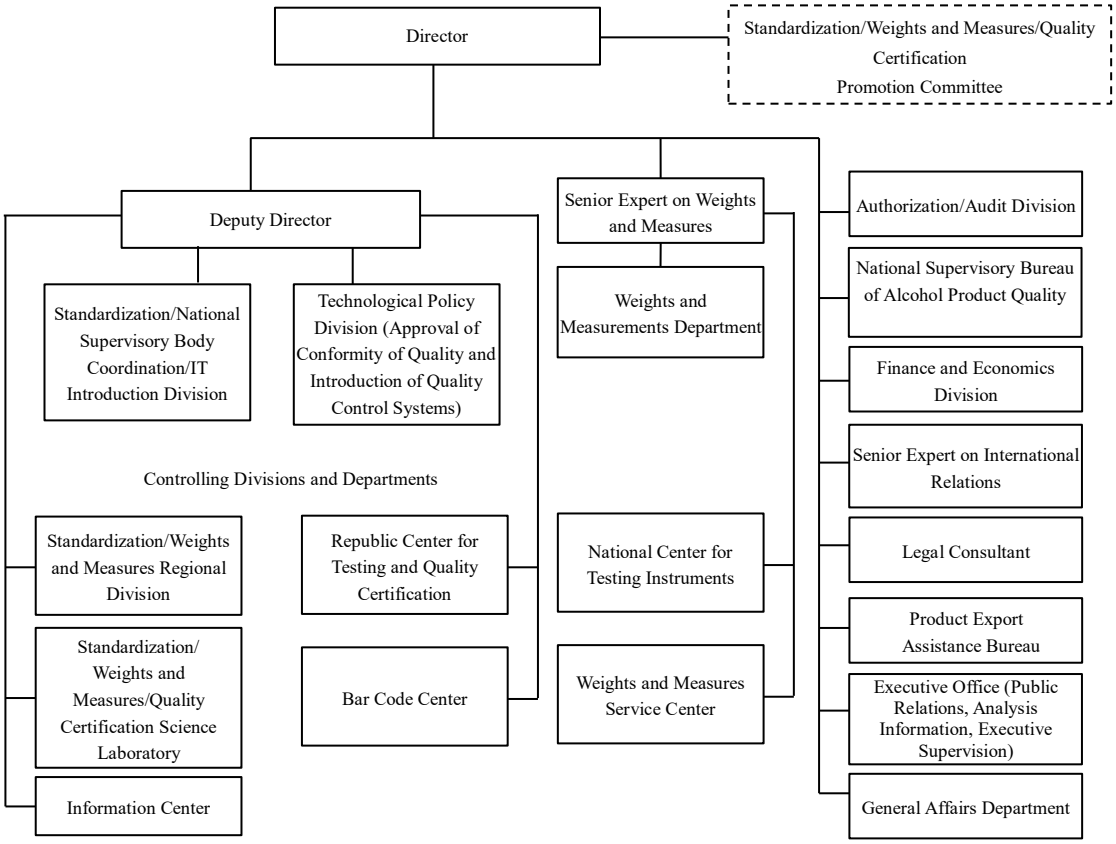
Main Markets	Fresh		Dried Foods	
	Fruits	Vegetables	Fruits	Vegetables
Moscow	Low	Low	Mid	Low
St. Petersburg	Mid	Low	Low	Mid
Novosibirsk	High	Mid	Mid	Mid
Ekaterinburg	High	Low	Mid	Low
Almaty	Mid	Low	Low	Low
Astana	Mid	Low	Low	Low

Source: Prepared by the JICA Study Team based on the results of field surveys

D. Quarantine/Inspection System for Import/Export

1. Overview of UZSTANDARD

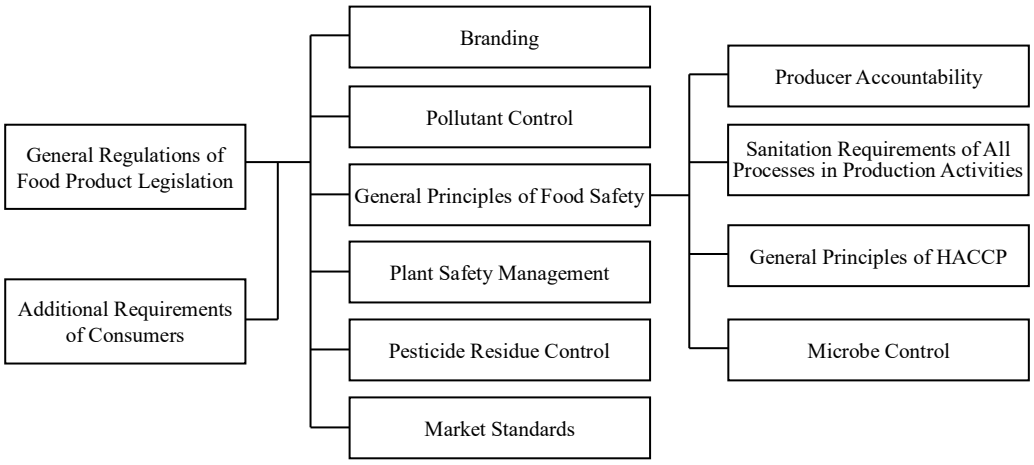
UZSTANDARD (Agency for Standardization, Metrology and Certification of Uzbekistan) is responsible for quality certification and other certification services, and Uzbekistan Cabinet of Ministers Resolution No. 373, which was approved in August 2004, sets out provisions regarding the agency's activities, which are regulated by provisions for service certification, measurement, technical regulations and compliance. The figure below shows the organization of UZSTANDARD.



Source: UZSTANDARD website (http://www.standart.uz/; April 21, 2017)

Figure 3-68: UZSTANDARD Organizational Chart

The targets (products, services) of UZSTANDARD are certified with 1)Uz State Standards or 2)GOST, which was used in the Soviet era. The target on the "List of Systems" set out by the government will be certified with regulation 1). For example, Uz State Standards are applied to processed products, while GOST is used for fresh products. The actual certification work is implemented by a total of 14 testing facilities (one in Tashkent and 13 in other cities) under the control of UZSTANDARD.



Source: UZSTANDARD pamphlet

Figure 3-69: UZSTANDARD Certification Duties in the Food Product Sector

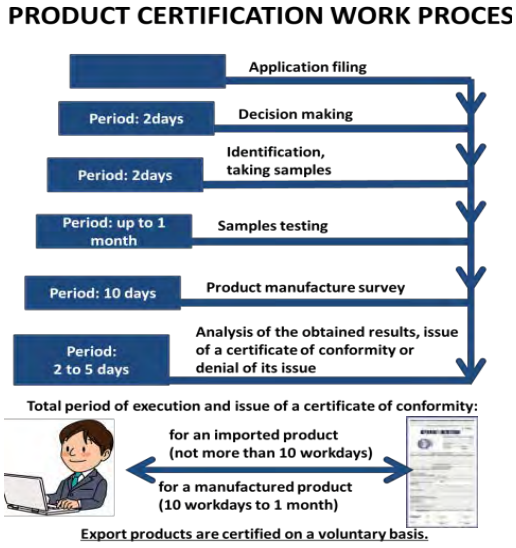
Note that it is possible for UZSTANDARD to respond to the standards and consumer needs in Figure 3-69.

2. Food Product Certification Process

Figure 3-70 shows the process for inspections and certification in Uzbekistan.

For general products, the process requires 10 business days to one month, but for imported products, the process is complete within 10 business days. In addition, food products can go through the inspection and certification process within 10 business days. It is possible to obtain certification on the third day from the application date for fresh products that are easily damaged, but have been certified in the past. Certification for production facilities and the like that is valid for three years can be issued in one month, but standards for water supply, wastewater and sanitation are under the jurisdiction of the Ministry of Health, which sometimes takes considerable time to do their work.

Products that have been certified according to UZ State Standards must bear the logo in the figure to the right.



Source: UZSTANDARD pamphlet

Figure 3-70: Implementation Process of Product Compliance Certification Work

Source: UZSTANDARD pamphlet

Figure 3-71: Uz State Standard Label

3. Quality Control Improvement Efforts to Promote Exports

Uzbekistan must improve its quality control inspection systems to expand exports of agricultural and food products. Toward that end, companies aiming to export are producing their products in line with international quality control standards such as ISO 20000, FSSC 22000 and HACCP. Twenty-eight organizations in Uzbekistan offer certification according to these international standards. At the present stage, satisfying these international standards means there should be no problems satisfying the technical requirements of Russia, Kazakhstan and other members of the Eurasian Economic Union (EEU). However, the EEU is in the process of developing various technical regulations and procedures; therefore, future developments must be confirmed.

In light of the situation, progress is being made on ensuring the safety of Uzbek products, improving quality, strengthening international competitiveness and introducing modernized management systems under the Republic of Uzbekistan Cabinet of Ministers Resolution "National Quality Infrastructure Development Program through 2020," which was approved on October 24, 2015. Specific program details are as follows.

- Modernization of testing and measurement laboratories, technology re-equipment projects, and the introduction of quality inspection equipment in the product production process
- Accreditation of testing laboratories at UZSTANDARD (Agency for Standardization, Metrology and Certification of Uzbekistan) regional centers for testing and compliance certification to ensure satisfaction of international standards
- Introduction of international standards
- Introduction of international management systems
- Development and introduction of information communication technology and software products within UZSTANDARD systems

UZSTANDARD implements an inspection system to international standards on a budget of 51,000 USD to operate a testing laboratory for food products and agricultural products in the special city of Tashkent, and is in the process of introducing standards that correspond to international standards for product groups in line with the customs tax code. In addition, a target has been set for 348 corporations (in all industries) in Uzbekistan to introduce ISO 9001: Quality Management System, ISO 14001: Environmental Management System, and ISO 22000: Food Safety Management System in the five-year period from 2015 to 2019.

Additionally, Uzagroexport plans to independently establish a quality inspection laboratory and certification institution that specializes in exports, and is considering cooperation systems and project overviews for realization of this project with South Korean government organizations and companies.

E. Agricultural and Animal Product Distribution Issues

Agricultural products face issues at each step in the food value chain (FVC): production, processing, preservation, transportation and sale. Of particular importance in distribution after production is improving physical infrastructure such as refrigerated trucks, refrigerators and other preservation facilities (large-scale and, in some regions, small-scale), as well as organizational infrastructure such as pre-cooling and sanitation and hygiene measures.

Ultimately, all actions must be taken into consideration of sales trends in final markets (the end of the value chain), and export strategies must align with quantities, quality, timing, configurations and other conditions set out by wholesalers, retailers and others on the market side. Accordingly, effective marketing strategies include shifting shipment times earlier or later and otherwise strategically choosing the timing of sales, supplying fresh produce to the Siberian region in winter, and supplying products with good name value and widely recognized branding. In addition, foreign currency deregulation for import and export transactions is a topical issue for importers who have difficulty changing UZS to USD (manufacturers who purchase food processing machinery, etc.).

It is worth noting that animal products are primarily destined to satisfy domestic demand.

(4) Current situation of producers support system

A. Extention service for agricultural technics

In Uzbekistan, there is no agricultural extension worker system implimented by the MAWR. Training of the purpose of extention technology for farmers is mainly provided by the agronomist in the agricultural sector of each provincial government and the Fermel Council.In addition, research institutes and universities independently conduct training to return research outcomes to farmers nationwide several times a year. At this time, local vocational high school is used as a venue to hold lecture. there is no expenses spent by farmers participating.

Training for WCA is conducted mainly by BISM and HGME during the agricultural off-season. The content of training is an appropriate irrigation method and introduction of water-saving irrigation to prevent salinization and training of desalination method in salt-affected farmland. BISM also provides information on the management of WCA and the content of related law reforms.

In recent years, agricultural extension center has been established in Tashkent State Agrarian University to centraliz of information service for farmers are being promoted.

At the private level, there are private enterprises such as farming consultants who sell fruit tree seedlings and provide technical information such as methods of fertilizer application and pest control according to the growth stage in a fee. Those private sectors play an important roll in Uzbekistan to provide technical assistance to farmers. In addition, among some advanced farmers, information sharing about cultivation know-how, how to apply fertilizer and pest control is being carried out utilizing SNS and message application by smartphone.

B. Reseach and development

The Mirzaev Horticulture Research Institute has its headquarters in Tashkent, branches in each province except Sirdaliya. Samarkand province and Sulhandarya province have two branch offices in each province. In the branch, specialized research is conducted on specific products in each province, and the amount of irrigation water and how to cultivate for each type of soil are studied. On the other hand, there is a department for research on the preservation and processing of harvested products but that department is not active.

In addition, there is a training field called a garden school on the premises of each laboratory. The Mirzaev Horticulture Research Institute provides classroom and practical training about cultivation for farmers. The branch in Samarkand province has received technical asistance by Hirosaki University for cultivating and pruning apples. The result of Japan's technical cooperation was

reflected to the contents of the training for farmer conducted by the branch and as a result the result spread to farmer level.

At the Research Institute of Irrigation and Water Problem (RIIWP), research and development on salinization control technology and on-site investgation are conducted. Research and technical development aimed at solving problems on the ground rather than basic research is being conducted. Training on the ground is also conducted by RIIWP to convey part of research results to farmers. RIIWP also colaborate with the study on the countermeasures against salinization by groundwater control implemented by JIRCAS conducted in the Sildariya province.

The World Vegetable Center under CGIAR conducts research activities based on the four themes such as germplasm, breeding, production and consumption related to horticultural crops and they introduces activities such as spreading of quality seeds and introducing new vegetable cooking methods.

C. Subsidy system for agricultural sector

The government subsidy system for agricultural equipment and materials etc. has not been confirmed. But there is a subsidy system for land improvement of irrigated farmland and agricultural machinerysucha as for fertilizer, fuel, production of products related to state order, Motor Tractor Parks service, and compensation for low interest rates for commercial banks. In addition, some funds such as Fund for settlements for agricultural products purchased for state needs and State incentive fund for equipping the agricultural enterprises with agricultural machinery are under umbrella of Ministry of Finance and low interest rate loans to the above items via related organizations are lent out to farmers.

In the government's budget plan, agricultural subsidies means funds provided to corporations and individuals and it is to be utilized for product production, labor, service provision, expenditure. In addition, subsidies to agricultural producers are provided through the specially established government funds listed below. Those government funds have been integrated into the following two funds since March 18, 2017.

- Fund for settlements for agricultural products purchased for state needs
- Fund for Improvement of Irrigated Farmland under Ministry of Finance in Uzbekistan

Furthermore, there are the following agencies under these funds.

Table 3-52: Agencies for governmental fund

No	Agency	Outline
1	Agrobank	Make loans from the fund
2	Uzagrosugurta	Insurance company
3	Uzagrokimyohimoya	Supply fertilizer and pesticide
4	Uzselhozmashleasing	Procurement and supply of leased agricultural machinery
5	JSC Uzpahtasanoat	Surrogate purchase of cotton from farmers
6	AK Uzdonmahsulot	Procurement agent for wheat and rice
7	HC Uzbekozikavkatholding, HC Uzvinprom-holding	Industrial processing related
8	Association Uzbekozikovaktzahira	Storage from winter to spring period
9	SVTK of JSC Uzagroexport	Delivery for export

Source: Uzbekistan Ministry of Justice Website <http://www.lex.uz> (Accessed on 21st April 2017)

From the summer in 2016, regulations also apply to state orders for fruits and vegetables. According to this regulation, at least 40% of contractual value is guaranteed for government procurement.

D. Financing Mechanisms

As for other financing mechanisms, banks in the city offer soft loans for small-scale farming, as well as loans for agricultural machinery that cover coolers, refrigerated vehicles, sorters, juicers, food preparation machinery, packaging machinery, dehumidifiers, and new models of machinery for updating machinery and facilities for intensive farming. The grace periods and repayment periods for these loans are somewhat relaxed. Hamkor Bank, Qishloq Qurilish Bank, Aloqabank and other commercial banks sat in on the Study Team's discussion with the Central Bank in March 2017, and it appears that those commercial banks are providing these types of financing products. In general, applicants for financing must be corporations, and corporations registered in Uzbekistan are eligible for financing in foreign currency as well. That is, even in the case of Dekhkans, corporate registration is necessary for bank loans. As for security, fruit trees, machinery, vehicles and the like are eligible for assessment, regardless of manufacturer. If the screening process goes smoothly, it can be completed in around one month, at which time the loan is executed. Recently, a guarantee scheme of up to 100,000 USD per loan by public guarantee institutions is under consideration. Specific amounts and other figures for individual banks are unclear, but according to information from the banks, loans are provided to roughly 50% to 60% of people who visit banks for consultations, and nonperforming loans occur in roughly 2% to 3% of cases.

Applicants are required to accurately fill out and submit documents for screening, but there is some difficulty to the procedure; the applications of farmers in particular are often not filled in correctly or fully.

Table 3-53: Model Case of Financing/Repayment (for Farmers)

Item	Description
Loan amount (financing amount)	7,710,000 UZS
Loan term (repayment deadline)	24 months
Grace period	6 months
Interest rate	9%

Source: Prepared by the JICA Study Team based on Agrobank information

Banks frequently monitor loans during the loan terms. Specifically, employees are sent out into the field to gain a fuller understanding of farmers' actual circumstances such as acreage, the performance of crops in each quarter, planned harvest periods and volumes, sizes of storehouses and class of customers. It is relatively common for farmers to fall behind on their payments due to natural disasters and the like, and depending on the circumstances, banks restructure or defer entire loan amounts.

Banks have customer service departments to provide various free guidance services to farmers and others, provide consulting and introduce experts to customers who ask, and offer fee discounts and increase the credit lines of paying customers.

The Central Bank recognizes the following three benefits of soft loans provided by international agencies:

- People can obtain financing in foreign currency, and repay in UZS
- Average interest rates are 4% to 5%, which is lower than market interest rates (depending on the bank or the case, the benchmark rate is around 9%)
- Three-year loans come with a six-month grace period, and five-year loans, which are popular with farmers, come with a one-year grace period

E. Human resource development in agricultural sector

In Uzbekistan, there are two types of high schools. One is General Education High School which is aiming to go on to university and the other is Vocational High School . In the Vocational high school, there are schools majoring in agriculture in general and majoring in agricultural engineering. Many of the students who graduated from Those schools work as farmers or work for farmers' support organizations such as employees of BISM, HGME and WCA. Some students in vocational high school also go on to agricultural universities.

During field survey period, JICA study team visited the Tashkent Institute of Irrigation and Melioration (TIIM), and the Tashkent State Agrarian University (TSAU), a major agricultural university in Uzbekistan.

The faculties established in each university are listed in the table below. Tashkent State Agricultural University is an agricultural university composed of seven faculties and graduate schools. Tashkent Irrigation Land Improvement University is an agricultural engineering university consisting of five departments and graduate schools. Among these university students, scholarship recipients from the government are required to work at government organization for several years after graduation. Graduates from these universities engage in agriculture in Uzbekistan, such as farming and entering the MAWR. The curriculum of these universities is a practical lesson content that will become a work-ready graduate as a farmer after graduation.

Currently, Hirosaki University implement farmer's livelihood improvement project by modernization of apple cultivation technology in Uzbekistan in the framework of technical cooperation at the grass-roots level. Tashkent State Agrarian University, along with Samarkand State Agricultural University and The Mirzaev Horticulture Research Institute are C/Ps on the Uzbekistan side of this project and those staff members received technical guidance of cultivation and participate in training in Japan. They highly appreciate current cooperation and hope to expand further cooperation relations.

Table 3-54: Facaluty name of major agricultural university

University	Name of Facalty
Tashkent State Agrarian University	Agronomy
	Selection, seed breeding and plant protection
	Animal husbandry
	Mechanization of agriculture
	Forestry and Environment
	Agriculture management
	Horticulture and viticulture
Tashkent Institute of Irrigation and Melioration	Water resources management
	Hydromelioration
	Automatization and mechanization in water resources
	Construction and Operation of Hydrotechnical structures
	Land using and land cadastre

Source: Prepared by JICA Study Team based on the collected document

The activity of these universities and research institutes and the contents of support that can be cooperated by the Japanese side are shown in the table below.

Table 3-55: Activity of each universities and research institutes in Uzbekistan and contents of possible cooperative at the Japanese side

University and Research institute	support themes	Knowledge and Contents	Expected support organization
The Mirzaev Horticulture Research Institute	Cultivation technics for apple and peach	Achivement of technical cooperation at the grass-roots level by Hirosaki University	Hirosaki University
	Preservation and processing technology of fruites	Long-term storage technology of fruit trees	National Agriculture and Food Research Organization (NARO) Institute of Fruit Tree Science
RIIWP	Countermeasure technology for salinaization	Countermeasure for salinaization developed by JIRCAS	JIRCAS Tottori University
Tashkent State Agrarian University	Assistance to the agricultural extension center	Development of training materials Know-how on extension system Training of trainers	
	Introduction test of Japanese vegetables	Introduction of vegetables in areas with similar to Uzbekistan environments	NARO Institute of Vegetable and Tea Science
Tashkent Institute of Irrigation and Melioration	Water resource and salinization investigation by using GIS and Remote Sensing		Institute for Rural Engineering, NARO
Sericulture Research Institute	Increase in production by the double cropping of cocoon (proper management of cotton defoliant)	Achivement of technical cooperation at the grass-roots level by Tokyo University of Agriculture and Technorogy	Tokyo University of Agriculture and Technorogy

F. Challenge on Support system in Agricultural sector

- Because the government-led technology extension system has not been established yet, there is no systematic extension system, and each organization is doing it independently. It is necessary to organize the training programs of each institution as a curriculum in the Agriculture extention Center which is now being developed in Tashkent State Agrarian University.
- Although the technologies are moderninzing under the private sector initiative, farmers with no financial capability have difficulty accessing such information.
- Technical information provided through training needs to be selected based on the needs of the farmers and it is necessary to organize the contents of these services by bottom-up approach rather than top-down approach.
- In the current system there is no incentive for water saving at the farmers and it is necessary to give the merit of introducing water-saving irrigation to promote it. Therefore, there is room for considering support measures for farmers, such as introducing incentives corresponding to the area and subsidies (cost burden) on drip irrigation system.

(5) Major donors

Donor agencies that have bases in Uzbekistan and are active in the agricultural sector · State of activity of the country · (Basic policy and contents of the plan underway and future planning projects, content, target priority areas, budget size and so forth), assumed targeted aid organizations · country etc. Are as follows.

A. Overview

The survey team contacted various donor agencies in Uzbekistan who 1. mostly host technical cooperation services, 2. combine financial loans and technical cooperation, and 3. offer loans without technical cooperation. They all had characteristic portfolio of cooperation to 1. focus on selected theme such as horticultural development or irrigation, 2. widely cover agriculture related themes including livestock production, irrigation and seedling, and to 3. prioritize down-stream services of agricultural production, including storage, shipment and transportation.

B. Geographical segregation

The typical case was IFAD who focused on the region of Surkhandarya to have offered a loan package to support small scale farmers with priority. They offer loans through commercial banks. The loan program has been implemented only in the region with total budget of US$31.7 million. The purpose of the project was to mitigate poverty. Due to the size of the budget, the fund negotiated with Uzbek government and finally it was agreed to select the region because of horticulture's high productivity. IFAD has her own terms and conditions on loan programme as a common guideline for both horticulture and livestock breeding. They apply different conditions that 1. Maximum loan amount for defcans is US$ 20,000 whose flexible use has been granted, 2. Fermers' loan amount is up to US$ 100,000 but can only be used for intensive gardening, and 3. Agro firms can use the loans for cold storage and relevant equipment up to US$ 600,000. The counterpart agencies of Uzbek government are RRA, ministry of finance and the central bank of Uzbekistan while 10 commercial banks undertake the loan operation.

The immediate loan conditions to Uzbek government are as follows;

- Pledged in 2012: Pay-back period 40 years, grace period 10 years, interest rate 0.75%
- Pledged in 2015 Pay-back period 20 years, grace period 5 years, net interest rate 1.25% with handling fee 0.75% consists 2% per annum of gross interest rate

Interest rate of the loans by the commercial banks to end-users is 9% in UZS and 3.5-4% in USD denomination. While either currency can be used, demand of USD is yet higher particularly to purchase agricultural machineries. IFAD's loans are used for pre-cooling system and for harvest storages. While the World Bank works in 8 selected regions which excludes Surkhandarya and this

is a case to have avoided duplication of support. The ongoing “Horticulture Development Project” has an organic collaboration with EU’s technical assistance project and together with the World Bank’s budget of US$ 150 million, the total amount of TSL/TA project comes to be US$174 million. Although the project administration was unified, hardware investment is borne by the World Bank’s budget while technical cooperation is financed by the EU fund. The loan fund flows through commercial banks to the private sector recipients, while the EU budget reaches Uzbek recipients through the World Bank’s trust-fund account where they keep the EU fund.

From the credit line, funds flow to the Private sector via commercial banks. Also, euro-denominated funds from the EU will be supplied to the Uzbekistan side via WB's trust account.

In addition, the banks attended at the time of the exchange of opinions with the central bank · RRA during the first field survey by the study team are as follows.

Table 3-56: Bank list

No	Bank	No	Bank
1	Central bank of the Republic of Uzbekistan	7	Khamkor Bank
2	Xalq Bank	8	Miliy Bank (NBU)
3	Turon Bank	9	Asaka Bank
4	Kishlok Kurilish bank	10	Aloka Bank
5	Ipoteka Bank	11	Mikrokreditbank
6	Ipak Yuli Bank	12	PSB (Prom Story Bank)

The loan fund is consisted with 80% in US dollar with the balance of 20% in UZS denomination. Approximately 70-80% of the disbursed loan reached the farmers who are expected to start paying back after 2 years of grace period.

Desert area was excluded from the target area due to requirement of the project to promote horticulture.

While on the other hands Asian Development Bank (ADB) covers the whole country and it may sounds redundant, but the banks who serve for the farmers have been in critical demand of cash to maintain credit lines active, and they seemed to have welcomed more than 2 financial institutions stay operational simultaneously.

The title of ADB’s active loan package for agriculture is “Horticultural value chain project”. It was contracted in 2016 but is on the way to be endorsed by the attorney general’s office and is expected to be commenced within 2017.

The total amount of the loan will be US$ 154 million. The project covers whole country and is to indirectly furnish cold storage facilities and relevant equipment to farmers and producers, via

exclusive loan through commercial banks. Concerning the cold storage, ADB loan mainly handles smaller units because the project aims to support mainly farmers therefore it does not compete with larger size of storage facilities including the logistics centers.

The interest rate of the loan will be between 4% and 9%. Grace period will be incorporated for 6 months on 3 years loan and 1 year on 5 years loan.

C. Wider coverage

It was found that EU and member countries including Germany, France, Italy and other EU countries have formulated an alliance under EU initiative which closely cooperates with the World Bank, in order to supplement technical cooperation (EU) and loan (WB) to seek for a synergy. They cover wide area of horticulture, livestock, irrigation and other derivatives of agriculture. While each project stays rather independent partly because of different Uzbek counterpart, in particular EU and the World Bank were committed to emphasize use of donors' coordination so that their assistance in wider range of challenges can be covered holistically. Yet they still had certain divergence in between EU and the World Bank while the World Bank prefers assistance toward those in sheer needs such as rural area development and poverty alleviation, the government has preferred construction of hardware while EU prefers to streamline agricultural production to marketing. What's been compromised amongst the players including EU and the World Bank was to acknowledge the differences and keep on constructively discussing what can be done under the circumstance.

D. Focused services

Both of KOICA and Switzerland's SDC have rendered a focused technical cooperation on irrigation. Since the linkage between irrigation and agriculture is so close, particularly SDC has been active to lead the donors' coordination in Uzbekistan, while on the other hand according to a staff-member of another donor agency, SDC's long lead time has been criticized, if not became physical obstacle, that it takes too long to further activate donors' coordination. In particular while EU's approach has been quite agile it should be synchronized by (for example) sharing a common calendar of coordination. Both of irrigation as well as agriculture have attracted attention of international community in connection with the global warming and measures to mitigate land degradation through improvement of farming soil, at this moment neither KOICA nor SDC implements irrigation project directly connected to agriculture production. Islamic Development Bank (IDB) implements loan projects but only for irrigation restoration and development in Khorezm (US$ 70 million) and Surkhandarya (US$ 87 million), where they deploy natural gravitation method to turn off the power of pumps. IDB once proposed another irrigation project

around Aral Sea area (Karakalpakstan, Navoi, Buhara and Khorezm) but it was not endorsed by the Uzbek government, assumably because of high interest rate. IDB also plans to launch a new project for 2017-2020 which covers agriculture, energy, transport and irrigation.

In accordance with IDB's country classification, Uzbekistan is categorized as a middle income country, whose eligibility will be limited to maximum 15 years loan with grace period of 7 years. So called "soft-loans for developing countries" is not offered to Uzbekistan and the applicable interest rate of the loan will be 3.0 to 3.5 % per annum. Since IDB has no technical cooperation schemes and they simply offer loan without much implications with other donors, they were not much concerned on the issue of donors' coordination.

E. Downstreamers

Both of USAID through technical cooperation, and ADB through loan scheme were found to have focused on harvesting, storage, processing and marketing agricultural products. In particular with regard to the loan programme, according to a staff of a commercial bank, it has been clarified that the project targets to value-adding investment which are mainly positioned in down-stream of horticultural industries such as chiller truck, cold storage, separator, squeezer, cooking machines, wrapping machines, food dryers, drying chamber, and replacement of existing equipment. Based on the policy to increase added value of agro products in order to increase farmers' income.

F. National coverage with wider variations

Geographically ADB (loan) and UNDP (technical cooperation) covers whole country. Concerning horticulture, there are advanced area where they have longer history of horticulture production and developing area with lesser accumulation of know-how and experiences. This situation reinforces an opinion to differentiate resource distribution to prioritize those who are ready to accelerate horticultural production with advanced assistance, another opinion to widely cover the country in order to prioritize self-sustainability of farmers and improve rural area's living standard. In either case donor agencies have been engaged with close dialogue with Uzbekistan government to reflect the reason why the assistance has to be effected, and even in cases of geographical collision (e.g. IFAD and ADB in Surkandarya), local coordination between the agencies sufficiently worked and viable co-habitation has been maintained through the effort.

Table 3-57: List of projects in Uzbekistan by international donor agencies (in order of fund size)

No.	Project name	Amount (US$ mil)	Grant/Credit	Donor(s)	Gvt authority	Implementing agency	Start(-end)	Duration	Geographic coverage	Main thematic areas
1	South Karakalpakstan water resource management improvement project	337.0	Credit	World bank	MAWR	PIU			South Karakalpakstan	Irrigation and water management
2	Fergana valley water resource management project 2	280.0	Credit	World bank	MAWR	PIU	2016	Pipeline 6 years	Fergana, Namangan, Andijan	Irrigation and water management
3	Amu Bukhara Irrigation System Rehabilitation	215.0	Credit	ADB/JICA	MAWR	Project management office	2014	7 years	Bukhara and Navoi	Irrigation, drainage and food production
4	Agriculture modernization and competitiveness project	200.0	Credit	World bank	MAWR	RRA	2018	Pipeline 4 years	TBD	Cotton sector modernization
5	Horticultural development project	150.0	Credit	World bank	MAWR	RRA	2015	6 years		Horticulture (TSL)
6	Livestock sector development project	150.0	Credit	World bank	MAWR	RRA	2017	Pipeline 4 years	TBD	Livestock
7	Horticultural development project 2	150.0	Credit	World bank	MAWR	RRA	2018	Pipeline 4 years	TBD	Value chain including cold storage (TSL)
8	Rural enterprise support project (Phase II + AF + GEF)	120.0	Credit	World bank, SDC	MAWR	RRA	2009	6 years	Bukhara, Kashkadarya, Samarkand, Tashkent, Syrdaria, Andijan	Agribusiness and value chains including cold storage(TSL), farmers training, irrigation, WUAs
9	Amu-Bukhara Irrigation System Rehabilitation Project	105.1	Credit	JICA	MAWR	PMU, MAWR	2015	5 years	Bukhara, Navoi	Modernization of existing pump station
10	Water Resource Management Sector Project	100.0	Credit/Grant	ADB/SDC	MAWR	Project management office	2009	6 years	Samarkand, Fergana, Namangan	Irrigation, drainage and food production

No.	Project name	Amount (US$ mil)	Grant/Credit	Donor(s)	Gvt authority	Implementing agency	Start(-end)	Duration	Geographic coverage	Main thematic areas
11	Reconstruction of main irrigation canals of Tashsaka Irrigation System in Khorezm region	90.4	Credit	IDB	MAWR	MAWR	2013	5 years	Khorezm	Rehabilitation and recover of main irrigation channels
12	Improvement of water resources management in Surkhandarya region (rehabilitation of Akkapchigay canals system)	89.6	Credit	IDB	MAWR	MAWR	2015	5 years	Surkhandarya	Water management
13	Fergana valley water resource management project	82.0	Credit	World bank	MAWR	PIU		6 years	Fergana, Namangan, Andijan	Irrigation and water management
14	Horticultural development in Aral sea region	78.8	Credit	IDB	MAWR	RRA	2016	Pipeline	Karakalpakstan, Khorezm, Bukhara and Navoi	Value chain including cold storage (TSL)
15	Rehabilitation of 29 pumping stations in Kashkadarya and Surkhandarya regions	76.7	Credit	IDB	MAWR	MAWR	2016	Pipeline	Kashkadarya and Surkhandarya	Irrigation
16	Rehabilitation of irrigation network and drainage system in Jizzak and Syrdaria	52.6	Credit	IDB	MAWR	MAWR	2009	5 years	Jizzak and Syrdaria	Rehabilitation of irrigation and drainage networks
17	Transboundary water management in Central Asia (part of the "Berlin process")	25.1	Grant	German Federal Foreign Office	MFA, MAWR	GIZ in cooperation with UNECE & CAREC	2009-2017	9 years	5 CA countries	Transboundary water management, water governance, IWRM, river basin planning, water saving technologies in agriculture.
18	Integrated natural resources management in drought-prone and salt-affected agricultural	11.0	Grant	FAO/GEF	MAWR/Uzhydromet	MAWR/Uzhydromet	2016-2021	4 years	5 CA countries + Turkey	Drought and salinity management, economies of land degradation, climate smart agriculture

No.	Project name	Amount (US$ mil)	Grant/Credit	Donor(s)	Gvt authority	Implementing agency	Start(-end)	Duration	Geographic coverage	Main thematic areas
	production systems in Central Asia and Turkey ('CALCIRM2')									
19	Sustainable Development in Rural Areas of Uzbekistan	10.1	Grant	European Union	MoE	GIZ led EUMS consortium	2015	3 years	Fergana, Andijan, Namagan, Jizzak, Syrdaria and Kashkadarya	Horticultural and livestock value chain
20	Sustainable economic development in selected regions of Uzbekistan	5.5	Grant	GIZ	MAWR, MoE, MERIT	Local institutes	2014	3 years	Andijan, Surkhandarya, Karakalpakstan, Khorezm	Horticulture, Fishery, Dairy, Agribusiness and Green Economy
21	Sustainable forest management in Mountain and valley areas in Uzbekistan	3.6	Grant	FAO/GEF	MAWR	MAWR	2016-2021	5 years	Uzbekistan	Sustainable forest management focusing for pistachio plantation and protective forest in the agricultural land (shelterbelts)
22	Central Asian Desert Initiative	3.6	Grant	FAO/ICI	MAWR	MAWR	2016-2019	3 years	Kazakhstan, Turkmenistan and Uzbekistan	Integrated land, forest and protected area management, desert ecosystem conservation and restoration (ICI: International Climate Initiative of German government)
23	National water resources management project	2.7	Grant	SDC	MAWR	IFAS's GEF agency	2015	3 years	Nationwide	Water management, water information systems, DRR
24	Innovation for Agriculture Modernization	1.0	TA grant	ADB	MAWR	ADB team and consulting	2014	3 years	Bukhara and Tashkent	Agricultural production and market

No.	Project name	Amount (US$ mil)	Grant/Credit	Donor(s)	Gvt authority	Implementing agency	Start(-end)	Duration	Geographic coverage	Main thematic areas
						firm				
25	Towards better national and regional locust management in Caucasus and Central Asia	0.6	Grant	FAO/Turkish gvt	MAWR	MAWR	2012	5 years	Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan	Locust management
26	Strengthening adaptation of Aquaculture and Culture-based Fisheries to Climate Change	0.4	Grant	FAO	MAWR	MAWR	2015	2 years	Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan	Reduce the vulnerabilities of the aquaculture
27	Strengthening capacities of the national phytosanitary control service in Central Asia	0.4	Grant	FAO	MAWR	MAWR	2014	2 years	Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan	Sustainable intensification of crop production, enable more inclusive and efficient food and agricultural systems at local, national and international levels
28	Institutional capacity building to develop organic agriculture and to promote Good Agriculture Practices	0.4	Grant	FAO	MAWR	MAWR	2015-2017	2 years	Uzbekistan	Organic agriculture, good agriculture practices (GAP)
29	Integrated Forest Land and Tree Resources Assessment in Uzbekistan	0.4	Grant	FAO	MAWR	MAWR	2016-2018	2 years	Uzbekistan	Sustainable forest management
30	Demonstration of diversification and sustainable crop production intensification in Uzbekistan	0.4	Grant	FAO	MAWR	MAWR	2016-2018	2 years	Uzbekistan	Potential sustainable crop management practices and diversified cropping systems tested and demonstrated for further promotion in farming systems and communities

No.	Project name	Amount (US$ mil)	Grant/Credit	Donor(s)	Gvt authority	Implementing agency	Start(-end)	Duration	Geographic coverage	Main thematic areas
31	Seed sector development in countries of the Economic Cooperation Organization (ECO)	0.4	Grant	FAO/Turkish gvt	MAWR	MAWR	2011-2016	5 years	Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, Turkey and Uzbekistan	Appropriate national seed policy, promotion/development of private seed sector, improvement and harmonization of legislations with the international rules, etc.
32	Enhancement of national capacity to develop strategy for mobilization of foreign investment in the agricultural sector of Uzbekistan	0.4	Grant	FAO/Turkish gvt	MAWR	MAWR	2016-2018	2 years	Uzbekistan	Donor coordination in the agriculture sector, strengthening efficiency of technical assistance and investment in the agricultural sector
33	Decision support for mainstreaming and scaling up of sustainable land management	0.2	Grant	FAO/GEF	MAWR	MAWR	2015-2018	3 years	Global + Uzbekistan	Sustainable land management
34	Promotion of water saving technologies in the Uzbek water scarce area of the transboundary Podshaota river	0.2	Grant	FAO/Turkish gvt	MAWR	MAWR	2014-2015	2 years	Namangan province	Sustainable agriculture production, water saving technologies

Source: Created by JICA Study Team based on FAO materials

(6) Private Investment in the Agricultural Sector

1. Present State of Activity and Investment by Domestic and Foreign Private Companies

In Uzbekistan, 22.3% of private capital is invested in the housing industry, followed by 17.6% in mining, 14.0% in processing, and 10.5% in shipping and storage. In sectors related to agriculture, the figures are 3.1% for agriculture, forestry and fisheries, and 1.2% for water supply, sewage and wastewater.

In contrast to investment figures in these technical fields, investment in non-technical fields is rather weak: 2.4% in education, 2.3% in telecommunications, and 0.9% in professional sciences and technology.

Table 3-58: Fixed Asset Investment through Economic Activity by Sector, 2016

Economic Activity Sector	Amount (1 billion UZS)	Percentage (%)
Agriculture, forestry and fisheries	1,548.3	3.1
Mining	8,704.7	17.6
Processing	6,932.2	14.0
Electricity supply, gas supply, steam and air conditioning	2,545.4	5.1
Water supply, sewage and wastewater	589.6	1.2
Construction	2,203.9	4.5
Wholesale, retail and automotive repairs	2,858.2	5.8
Shipping and storage	5,199.3	10.5
Hotels and food and beverage	496.6	1.0
Telecommunications	1,150.4	2.3
Financing and insurance	426.3	0.9
Professional sciences and technology	446.4	0.9
Education	1,181.4	2.4
Health and social services	924.0	1.9
Arts, entertainment and leisure	381.4	0.8
Other activities	2,875.5	5.7
Housing	11,013.2	22.3
Total	**49,476.8**	**100.0**

Source: Center for Economic Research and State Statistics Committee

Investment amounts have trended upward for the three years leading to 2016 across Uzbekistan, but the investment ratio is highest in the special city of Tashkent in each year. Other regions that stand out are Qashqadaryo, the Republic of Karakalpakstan, Bukhara and Tashkent. Also, it is worth noting that the regions of Tashkent, Jizzakh and Navoiy have special economic zones, but the investment ratios are not particularly high in Jizzakh and Navoiy compared to other regions.

Table 3-59: Fixed Asset Investment by Region

Region	2014		2015		2016	
	Amount 1 billion UZS	Percentage	Amount 1 billion UZS	Percentage	Amount 1 billion UZS	Percentage
Entire Republic of Uzbekistan	**33,715.3**	**100.0%**	**40,737.3**	**100.0%**	**49,476.8**	**100.0%**
Republic of Karakalpakstan	3,840.3	11.4%	5,757.0	14.1%	3,730.2	7.5%
Andijan Region	1,407.5	4.2%	1,637.8	4.0%	1,882.2	3.8%
Bukhara Region	3,308.3	9.8%	3,878.4	9.5%	5,822.7	11.8%
Jizzakh Region	1,026.7	3.0%	1,027.9	2.5%	1,252.7	2.5%
Qashqadaryo Region	3,944.4	11.7%	5,224.3	12.8%	6,334.0	12.8%
Navoiy Region	1,544.4	4.6%	1,690.7	4.2%	2,839.1	5.7%
Namangan Region	1,620.0	4.8%	1,926.6	4.7%	2,362.6	4.8%
Samarqand Region	2,185.7	6.5%	2,767.1	6.8%	3,362.2	6.8%
Surxondaryo Region	1,377.4	4.1%	1,552.4	3.8%	1,891.8	3.8%
Sirdaryo Region	920.4	2.7%	1,001.8	2.5%	1,091.2	2.2%
Tashkent Region	3,633.9	10.8%	3,929.2	9.6%	3,808.4	7.7%
Fergana Region	1,963.0	5.8%	2,072.7	5.1%	2,346.8	4.7%
Khorezm Region	1,220.6	3.6%	1,397.8	3.4%	1,451.4	2.9%
Special City of Tashkent	5,642.8	16.7%	6,747.3	16.6%	10,738.7	21.7%

Source: Center for Economic Research and State Statistics Committee

Investment growth rates were highest in the special city of Tashkent and the regions of Navoiy, Andijan and Namangan in the three years leading to 2016, but if the range is extended to the five years leading to 2016, the rates were highest in the Republic of Karakalpakstan and the regions of Namangan and Surxondaryo.

Table 3-60: Investment Growth Rates by Region

Region	2012	2013	2014	2015	2016	3-Year Mean	5-Year Mean
Republic of Karakalpakstan	120.4	179.6	143.4	109.6	57.8	103.6	122.2
Andijan Region	128.6	96.7	105.2	132.8	102.9	113.6	113.2
Bukhara Region	107.5	100.4	101.8	104.3	123.9	110.0	107.6
Jizzakh Region	117.3	129.4	97.1	102.1	110.2	103.1	111.2
Qashqadaryo Region	126.6	102.5	105.6	90.8	105.7	100.7	106.2
Navoiy Region	110.4	96.9	87.2	121.0	146.7	118.3	112.4
Namangan Region	114.7	121.7	140.2	96.8	102.5	113.2	115.2
Samarqand Region	110.9	120.0	103.4	105.9	110.6	106.6	110.2
Surxondaryo Region	112.9	123.0	106.3	116.7	111.2	111.4	114.0
Sirdaryo Region	100.2	108.1	105.1	103.1	95.1	101.1	102.3
Tashkent Region	77.0	143.4	116.8	98.4	86.8	100.7	104.5
Fergana Region	108.4	112.2	96.3	102.1	103.2	100.5	104.4
Khorezm Region	106.3	136.0	97.9	95.8	98.5	97.4	106.9
Special City of Tashkent	129.8	80.9	108.0	107.1	141.8	119.0	113.5
Entire Republic of Uzbekistan	**111.6**	**109.8**	**109.6**	**109.6**	**109.6**	**109.6**	**110.0**

Source: Center for Economic Research and State Statistics Committee

Foreign investment into Uzbekistan traces an upward trend in the 10 years leading to 2014, with the exception of 2011. Investment from Russia and South Korea stands apart from the other countries. Investment from South Korea has increased each year except for 2009, when it decreased after the country's participation in the air cargo terminal project in Navoiy Region in 2008.

Table 3-61: Foreign Investment in Non-Financial Assets by Country (Unit: 1 million UZS)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Foreign Investment/Credit	510,317	782,701	1,483,035	2,916,666	4,127,738	4,381,707	3,893,098	4,722,704	5,587,534	7,009,633
Australia	268	1,225	3,418	56	2,655	471	669	1,188	2,063	5,326
Belgium	4	1	53	122	-	-	-	-	90	-
Bulgaria	-	5	-	-	116	476	1,410	11,698	672	1,568
UK	-	29,879	25,120	140,813	97,026	131,988		160,829	121,412	127,987
Germany	70,157	22,888	88,914	63,208	18,711	54,152	28,460	19,201	19,350	12,087
Israel	1,389	210	29	561	273	501	490	176	9	-
India	-	5,450	4,661	4,587	2,002	1,776	4,685	447	330	1,094
Indonesia	16	-	162	-	58	178	-	339	638	-
Italy	23	1,447	112	694	808	9	210	-	840	465
Canada	-	595	635	1,139	1,069	585	956	679	-	-
South Korea	489	9,253	22,293	106,328	40,211	73,671	215,229	288,023	650,592	1,696,755
Lithuania	-	-	197	201	463	506	296	-	-	-
Malaysia	-	272	467	280	273	175	702	92,118	1,614	13,382
United Arab Emirates	-	16,443	2,944	12,637	5,680	9,362	15,560	4,661	18,456	5,109
Russia	48,625	117,474	722,852	863,731	512,387	1,070,937	1,309,916	1,037,858	1,571,475	1,962,683
Singapore	-	179	191	5,444	2,673	18,041	60,434	22,378	119,391	167,964
USA	19,342	30,334	13,656	11,565	99,831	44,306	35,563	60,338	38,252	3,817
Turkey	22,061	52,985	49,612	66,551	48,704	54,372	53,603	30,108	23,838	30,624
Ukraine	180	118	654	450	73	180	348	3	78	174
France	13,995	45	25,321	876	682	475	72,863	49,294	43,412	1,364
Switzerland	39,039	150,208	282,692	720,185	639,788	87,667	29,058	36,776	24,660	269,696
Czech Republic	-	132	454	317	894	648	226	2,675	32	216
Japan	38,707	31,115	310	15,837	3,916	1,646	50,519	15,427	7,362	465

Source: 2015 Uzbekistan Statistical Yearbook (The State Committee of the Republic of Uzbekistan on Statistics)

1. Government Investment Promotion Policy for Domestic and Foreign Private Companies

As policy to promote investment from foreign countries, the Uzbekistan government has enacted tax reduction and exemption measures for taxes on business profits (corporate taxes), value-added taxes, customs duties and other taxes. In addition, the government offers preferential treatment in special economic zones (FEZ) in Navoiy, Jizzakh and other regions. However, while these measures and this treatment encourage businesses in the manufacturing industry to build plants in Uzbekistan and export their products as in the Navoiy Special Economic Zone, it bears mentioning that foreign companies that venture into Uzbekistan for the sole purpose of selling to the Uzbekistan market are subject to foreign currency restrictions (USD cannot be carried outside the country, and must be exchanged for UZS).

Table 3-62: Various Preferential Treatments

1. Preferential Treatment for Taxes on Business Profits (Corporate Taxes)
The basic tax rate for taxes on business profits (corporate taxes) is 7.5%. For companies that export, when the ratio of exported products (including services) converted into foreign currency is: ・ 15% to 30% of the total production value, the basic tax rate for taxes on business profits (corporate taxes) is reduced 30% ・ More than 30% of the total production value, the basic tax rate is reduced 50% ・ A company in the service sector, the basic tax rate is reduced 5% on transactions settled by credit card
2. Preferential Treatment for Value-Added Taxes
・ Goods imported by corporations using funds from loans provided by international financial institutions or foreign government financial institutions under international agreements concluded with Uzbekistan, and goods imported as grants ・ Technical equipment, assembly parts and spare parts on an approved list under laws and regulations, and imported into Uzbekistan. However, this applies only to where the delivery of these goods is regulated by technical equipment delivery contract terms. If the imported equipment is sold as an export or delivered free of charge for export within three years of its import into Uzbekistan, this preferential treatment becomes null and void, and the operator is obligated to pay value-added taxes ・ Property carried into the country to fulfill an obligation to invest under contracts concluded between investors and national asset management organizations ・ The standard tax rate for the value-added tax is 20% (Presidential Proclamation PP-2455 dated December 22, 2015) *Source: JETRO Sensor, July 2016 edition
3. Preferential Treatment for Customs Duties
Companies are exempt from paying customs duties in the following cases: ・ Imported goods originally produced in partner countries that have formulated free trade systems ・ Goods carried into Uzbekistan by foreign corporations that have directly invested at least 50 million USD in Uzbekistan. However, these goods must be products manufactured by the company that carries them into Uzbekistan. ・ Property imported by foreign investors or companies whose founding capital comprises at least 33% foreign investment, for the purpose of the companies' own manufacturing, with the proviso that two years have passed since those companies registered in Uzbekistan. ・ Property brought into Uzbekistan for individual use by foreign investors, and stateless people and foreigners who are permanent residents of a country other than Uzbekistan and are residing in Uzbekistan under labor contracts concluded with foreign investors ・ Merchandise, labor, services carried into Uzbekistan by foreign investors based on written proposals in order to execute duties under production sharing agreements (PSA), or by other people participating in the execution of duties under those PSA, and merchandise carried out of another country by investors as their own property under PSA

- Merchandise delivered under loan agreements or financing agreements concluded with government guarantees
- Raw materials, materials and assembly parts to be used in the production of products for export, and provided by the buyer of those products
- Technical equipment, assembly parts and spare parts on an approved list under laws and regulations, and imported into Uzbekistan. However, this applies only to where the delivery of these goods is regulated by technical equipment delivery contract terms. If the imported equipment is sold as an export or delivered free of charge for export within three years of its import into Uzbekistan, this preferential treatment becomes null and void, and the operator is obligated to pay retroactive customs duties.
- Customs duties and value-added taxes are exempted for manufacturing equipment approved under the joint decision "On the Approval of Manufacturing Equipment Included on the List of Items Exempt from Payment of Import Duties and Value-Added Taxes When Imported into the Territory of the Republic of Uzbekistan" dated February 15, 2013.
- Since January 1, 2013, newly established foreign companies are exempt from import duties on property imported for the purpose of the companies' own manufacturing for two years following their registration in Uzbekistan.
- In order to verify the values of imported goods to which customs duties exemption will be applied, importers will submit to the state customs committee (1) export cargo customs declarations forms or other alternative when the clearance procedure is implemented under the "Free Distribution Release" system; and (2) other documents that prove expenses (prices and payments) paid before the goods reached the customs territory of the Republic of Uzbekistan.

When the prices of imported goods have been proven, exemption from customs duties will be granted; when the prices have not been proven, customs duties must be paid.

4. Benefits in the Countryside

Economic sector companies enumerated in the addendum to Ukase of the President UP-3594 "On Additional Measures to Promote the Attraction of Direct Investment from Foreign Private Sectors" dated April 11, 2005, and in "Provisions Regarding Guidelines for Applying Tax Incentives for Companies Attracting Direct Foreign Investment" Addendum No. 1 (addenda to Ministry of Finance No. 80 dated December 12, 2011, State Taxation Committee No. 2011-34 and Ministry of Economy No. 14 Joint Decision) are prime candidates for attracting direct investment from the private sector, and, as of June 1, 2005, if located in rural areas or in Uzbek cities other than the special city of Tashkent or Tashkent Region, such companies are exempt from paying taxes on business profits (corporate taxes, property taxes, social infrastructure and zone development taxes, environment taxes, and uniform payment taxes as well as uniform payment taxes for micro, small and medium-sized enterprises and payments into the national road fund.

These tax incentives are applied as follows in response to the amount of direct investment from the private sector:

- Three years, when the amount is at least 300,000 USD, but no more than 3 million USD
- Five years, when the amount is at least 3 million USD, but no more than 10 million USD

- Seven years, when the amount is at least 10 million USD

These tax incentives are applied under the following conditions:

- The investors are foreign capitalists with no Uzbekistan government guarantees, who are making private, direct foreign investments, and whose capital according to corporate bylaws comprises at least 33% foreign capital
- Foreign investments made in hard currencies or informs using the most advanced technological facilities
- The investors intend to reinvest at least 50% of income earned as a result of the tax incentives during their application period toward future development of their companies

5. Benefits in the Navoiy Free Industrial Economic Zone

The Navoiy Free Industrial Economic Zone was established in 2008 in the international airport area of the city of Navoiy.

Companies operating in the Navoiy Free Industrial Economic Zone are required to introduce the latest and most productive equipment, technologies, production lines, modules and innovations from abroad, thereby producing high-tech products that are competitive across a wide range in the global market.

The activity period for the Navoiy Free Industrial Economic Zone is 30 years, and in the future it will be possible to extend the period. During the activity period in the zone, special systems will be applied to customs duties that target the zone, foreign currency and tax systems, streamlining of the entry and departure processes and the visa process, permits to employ citizens of Uzbekistan as well as nonresidents, and more.

Companies registered in the zone are exempt from paying land taxes, property taxes, profit taxes, environmental and social infrastructure development, uniform taxes (to which small companies are subject), reserves for road funds and primary school education funds, and more.

- Seven years, when the amount is at least 3 million EUR but no more than 10 million EUR
- 10 years, when the amount is at least 10 million EUR, but no more than 30 million EUR. Additionally, for a five-year period, the tax rate for profit taxes and uniform taxes is 50% of the current tax rate
- 15 years, when the amount is at least 30 million EUR. Additionally, for a 10-year period, the tax rate for profit taxes and uniform taxes is 50% of the current tax rate

Under provisions set forth, companies registered in the zone are exempt from paying customs duties (excluding customs processing fees) throughout their period of activity in the zone for equipment, raw materials, materials and assembly parts imported for the purpose of manufacturing profits for export.

Unless the law sets out more advantageous benefits, customs duties (excluding customs processing fees) on raw materials, materials and assembly parts imported for the purpose of manufacturing products for sale within the Uzbekistan market are reduced 50% from the prescribed rates, and a 180-day grace period is applied.

Management entities registered in the zone are allowed the following:

- To make settlements and payments in foreign currency within the territory of the zone under arrangements and contracts concluded between management entities
- To make payments in foreign currency for merchandise, labor and services provided by other management entities and residents of Uzbekistan
- To use conditions, payment and settlement methods advantageous to the company for payments for imported and exported merchandise

*Source: Ukase of the President UP-4059 "On the Creation of a Free Industrial Economic Zone in Navoiy Region" dated December 2, 2008

6. Benefits in the Jizzakh Free Industrial Economic Zone

Residents of the free industrial economic zone "Jizzakh" are exempt from making the following payments:

- Profit taxes, corporate asset taxes, social infrastructure development taxes, uniform taxes for small enterprises, and payments into the national road fund
- Payment of customs duties (excluding customs processing fees) for equipment, assembly parts and materials (according to the list approved by the Cabinet of Ministers) not manufactured within Uzbekistan that the residents carry into the special free industrial economic zone "Jizzakh" within the framework of project implementation

These incentives are applied to the following investment amounts for terms of three to seven years.

- A term of three years for an amount equivalent to at least 300,000 USD, but no more than 3 million USD
- A term of five years for an amount equivalent to at least 3 million USD, but no more than 10 million USD
- A term of seven years for an amount of at least 10 million USD

*Source: Ukase of the President UP-4516 "On the Creation of a Special Industrial Zone 'Jizzakh'" dated March 18, 2013

Source: JETRO website, "Uzbekistan 'Various Preferential Treatment to Encourage Foreign Investment'"

2. Status, Examples and Economic Impact of Investment by Private Companies

Private companies invest in the agricultural sector in the areas of production, processing, storage, transportation, or a combination of these.

Table 3-63: Status and Examples of Investment by Private Companies

・GDF

Item	Details
Area	Special City of Tashkent (headquarters, plant), Tashkent Region (Yangiyul area), Namangan Region, Surxondaryo Region
Description	・Cultivation of crops that suit local characteristics in the northern, eastern and southern areas of the country. ・Cultivation of saplings bound for the EU, China and Russia in a 3-ha greenhouse in the northern area (Yangiyul). Production of cabbage, iceberg lettuce and other crops on 440 ha of farmland. Cultivation of intensive gardens (cherries, Turkish design) in the eastern area (Namangan Region) and greenhouses (tomatoes, South Korean technology) in the southern area (Surxondaryo Region). Has adopted drip irrigation (manufactured in Israel) ・Agricultural machinery: Introduced a blast chiller manufactured in Sweden, a calibrator manufactured in Germany, a cutting machine manufactured in Belgium, sorting/packaging machinery manufactured in Italy and other cutting-edge machinery and equipment for processing a variety of fruits and vegetables. ・Refrigerators (22 units with temperature control functions), pre-cooling storerooms (seven units manufactured in the Netherlands) ・The company has established its own distribution system on the strength of refrigerated trucks that it owns
Economic impact	The company plans to expand on the 2,250 ha of farmland it already owns, and produce pomegranates at the behest of the government on 5,000 ha of land, chiefly in Surxondaryo. In addition, the company plans to export 15,000 tons of fresh products, 1,100 tons of dried products, and 3,000 tons of frozen products in 2016, and is expected to enhance its production and processing in addition to storage and transportation areas. Therefore, the company is expected to increase employment at its three locations within Uzbekistan.

・Agrofresh

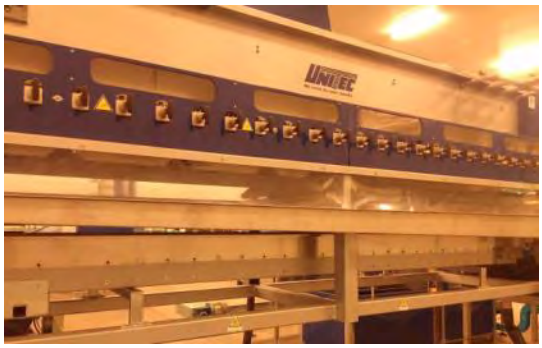
Item	Details
Area	Navoiy Region (inside the Special Economic Zone)
Description	A joint venture with the UAE. The company gathers vegetables and fruits produced domestically (apples, cherries, etc.) in refrigerated storerooms (manufactured in Italy) in the special economic zone, and exports them via air freight. The strength of the Agrofresh brand and the UAE market are appealing to the Uzbekistan side
Economic impact	The company functions as a distribution route that brings together farmers in Navoiy Region with its cutting-edge machinery and brand strength. Thus, farmers can expect the company to contribute to the expansion of sales.

・Chimyon Baraka Savdo Servis

Item	Details
Area	City of Fergana
Description	A corporate member of Zahira. Longtime local operators have improved their storage facilities by installing refrigerated storage units under the guidance of Zahira. The main work is distribution of wheat and cotton oil under instruction from the government, but the company also independently engages in the business of holding farmers' agricultural products for a fee.
Economic impact	This is an example of a small-scale local private company receiving assistance from government-related organizations and expanding its scale. Enhancing the storage capacity of its storehouses allows the company to reduce losses and sell products at higher prices by strategically shifting supply times; the company can be expected to increase returns, particularly in rural areas.

Picture 3-3: Intensive Garden
(Namangan Region)

Picture 3-4: Drip Irrigation
(Cherry Farm in Namangan Region)



Picture 3-5: Cherry Sorting Machine
(Fruit Processing Plant)

Picture 3-6: Small-Scale Refrigeration Facility
(Parkent District of Tashkent Region)

Reference: Investment Simulation

The following are typical investment examples. They are simulations of returns compared to input expenses for the model cases of a fruit orchard and a greenhouse. As these are typical examples, calculations must be made for actual situations in light of individual investment environments and land conditions with respect to initial costs, running costs and investment recovery periods.

Table 3-64: Fruit Orchard (Cherries)

Expenses	Expense per Unit	Total Expense
Cost of establishing orchard	35,000 USD/ha	1,000,000 USD (28.57 ha)
Labor	60 USD/person/day	20,570 USD
Seasonal workers for harvest	50 USD/person/day	1,429 USD
Plant quarantine/fertilizers	1,100 USD	188,562 USD
Returns	**Return per Unit**	**Total Return**
Yield	10,000 USD/kg	1,142,800 USD

*Cherry harvests start in the fourth year after the saplings are planted, and reach commercial yields in the sixth year.
Source: Prepared by the JICA Study Team based on interviews with local agricultural companies

Table 3-65: Greenhouse (Tomatoes, Cucumbers)

Expenses	Expense per Unit	Total Expense
Cost of establishing greenhouse	350,000 USD/ha	1,000,000 USD (2.86 ha)
Labor	1,200 USD/person/day	20,592 USD
Heating	200 USD/month	3,432 USD
Electric power	50 USD	858 USD
Seeds	2,000 USD	11,440 USD
Fertilizers, agrichemicals and other inputs	3,000 USD	17,160 USD
Returns	**Return per Unit**	**Total Return**
Yield	100,000 USD/kg	915,200 USD

*Greenhouse depreciation must be considered separately. Both tomatoes and cucumbers can be harvested in a single greenhouse. The sale price for the initial harvest is 2 USD, and the sale price for the second harvest is 1.2 USD. In addition, expenses fluctuate for packaging, sorting and other operations.
Source: Prepared by the JICA Study Team based on interviews with local agricultural companies

B. Promising Agricultural and Animal Products and Business Sectors, Target Regions, Development Scales, Risks and Rewards, and Restrictions and Resolutions Private Companies Encounter in the Course of Investment

Several cases of private company investment have been confirmed in the region, particularly related to fruits and vegetables, and it seems that the investors regard agriculture as a promising sector for export expansion. Presently, investment in the production, storage and transportation of mainly fresh fruits and vegetables stands out, but there is a need for more investment in processing as a single area. This could be due to the government promoting the export of fruits and vegetables, and the expansion of financing by private banks using capital supplied by the World Bank, ADB and other international agencies. Investors are attracted by investment opportunities that provide potential for growth, but are also concerned with the risk of suffering losses due to widespread pest damage in monocrop cultivation, insufficient operation and management technology in processing plants and storehouses that are inefficient due to poor planning and design, and the like. These risks can be mitigated through efforts such as diversifying crops, planning both physical and organizational aspects in advance, providing guidance through training, and creating manuals.

Note that, even when single companies invest on their own, there are cases where those investments reflect the actual requests of the government; thus, it is best for corporate investment activities to be implemented in tandem with government assistance.

Table 3-66: Opportunities for Investment by Private Companies

Item	Description
Agricultural products	・Fresh products: Fruits (cherries, grapes, pomegranates), vegetables (tomatoes) ・Processed products: Juices, dried products, jams, pastes, canned foods, frozen foods
Activity areas	・Intensive gardens (intensive fruit orchards, drip irrigation use) ・Greenhouses ・Storehouses (refrigerated storehouses, pre-cooling facilities) ・Processing facilities
Target areas	・Large-scale crop cultivation suited to the climate characteristics of each area ・There are special economic zones in Navoiy Region, Jizzakh Region and the city of Angren (Tashkent Region) ・In some areas, there is consideration of attracting processing facilities
Scale	・There are some examples of production scales in the hundreds to thousands of hectares ・There are also needs for small and medium-sized storehouses for handling collection for distribution
Risks and rewards	・Mass production of crops suited to climates is efficient and scales well. In addition, products can be sold at higher prices if they are harvested earlier than competitors ・Large-scale, concentrated cultivation of identical varieties in a single area increases the risk of widespread pest damage
Restrictions and resolutions	・Organizational improvements do not automatically come along with increased improvement of physical infrastructure (plant sanitation management, safety control in storehouses, etc.) ・Technical assistance (TA), training, and sufficient instruction based on manuals are required

IV. Summary of Issues in the Food Value Chain

(1) Summary of Issues in Food Value as a Whole and the Review Process

Uzbekistan faces a number of issues in agriculture which include (1) a high dependence on cotton and wheat and a market excessively influenced by their growers and related companies, (2) slow systemization of production and distribution systems that are extremely outdated as they were planned and established during the former Soviet era and have remained unchanged for over 20 years, and (3) the division of responsibilities for all the former Soviet Union, including Uzbekistan, was designed centrally in Moscow, but after becoming independent, the value chain has unfortunately been developed independently in individual countries in isolation from each other and the distribution system is now undergoing restructuring to build a value chain structure suited for international trade.

Shown below is a summary of issues in the agricultural sector. There are issues at each stage of production, manufacturing/processing, logistics, and sales. At the same time, there are deficiencies in funding at all stages, clear understanding of consumer needs, logistics, and access to the market. In particular, the latest price information in the selling market is not being adequately shared with stakeholders at the earlier stages of growing, manufacturing, processing, and distribution, and there is a shortage of human resources with specialized knowledge and experience in each field.

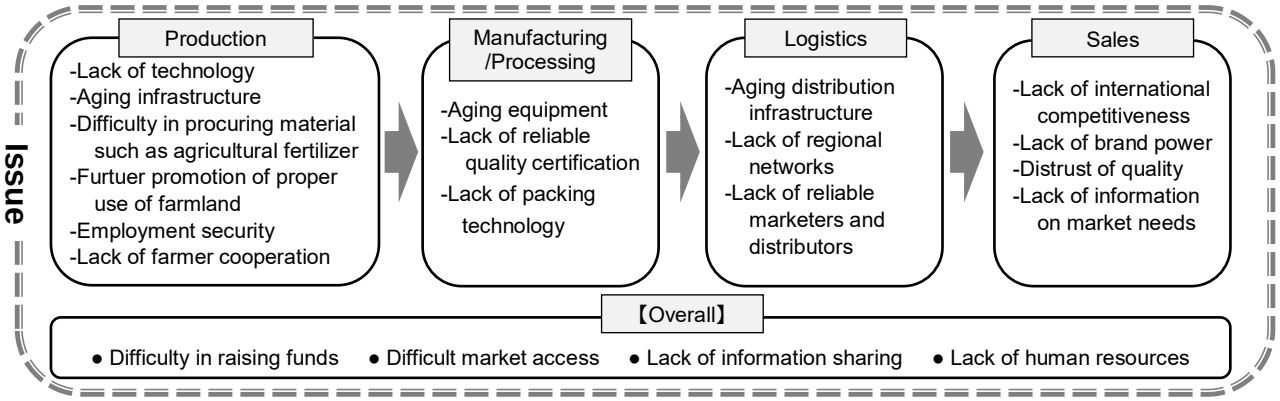


Figure 4-1: Common Issues in Building an FVC in the Agriculture Sector

Given this background, the Uzbekistan government listed "equipment for agriculture and land improvement, transport methods, and projects for new production systems in production/processing facilities" in the № 215 Presidential Decree of the Republic of Uzbekistan (July 14, 2012), titled the "Agricultural Production Modernization and Skills/Technology Reform Program for 2012–2016." In addition to relevant ministries and agencies providing support for various projects, the government is also pursuing the agricultural subsidy programs discussed in Section III, (4) C of this report (p.90) and promoting producer capital investment from the lending programs discussed in the same section (p.91). Because of the large impact of weather and international market conditions on Uzbekistan's agricultural format, which is highly reliant on cotton and wheat, the government of Uzbekistan is aiming to diversify agriculture in a manner that is suitable for the regional climate, (such as with fruit trees, garden crops, etc.) and increases amounts of highly cashable crops. Numerical targets for crop

diversification have been set in the Resolution of the President of the Republic of Uzbekistan № PP-2460 "On measures for further reforming and development of agriculture for the period of 2016-2020," dated December 29, 2015. Along with expanding production of crops such as fruits and vegetables in the coming years, it is also necessary to develop a processing and distribution system appropriate to harvest volume. After receiving these decree orders, the Uzbekistan government began setting up farmland that will serve as a model for intensive gardens and is promoting production technology in a bid to solve issues at the production stage. At the distribution stage, the government has taken the initiative of setting up organizations such as Uzbekistan Produce Holdings and Uzbekistan Agro Export to address nationwide processing and distribution, and is working towards solving issues.

(2) Food Value Chain in Horticulture

One of the problems in the food value chain is an unstable water supply as more than 80% of the water sources flow from neighboring countries. Open productivity improvement can be expected by using water resources as efficiently as possible, but there is little motivation for farmers to do so since water fees (partner fees) are calculated by land area. This is delaying the widespread adoption of water saving techniques (installing water-saving irrigation is expected to save on labor, improve the quality of crops, etc.). Except for some parts of Samarkand, WCA activities are stagnating. The fact that fee collection and field canal repair are not being fully carried out is considered reasons that water resources are unable to be utilized effectively. Further, since support for WCA from MAWR and BISM is limited, the problem remains unresolved. The promotion of horticultural crops is also being hindered by the prevalent salt-damaged farmland scattered around with Pakistan, where it is difficult to grow vegetables and fruit trees.

Issues in production lie in the increased risk when pest damage occurs on an intensive garden, which are being promoted nationwide; lack of considering cultivation methods that prevent damage to harvested produce (avoidance of devaluing produce); lack of staggering harvest times to avoid price collapse; and lack of post-harvest management such as pre-cooling. In fruit growing at the general farm level, there are also issues with a lack of skilled pruning and fruit thinning.

Issues in production and processing lie in design and layout of plants in terms of hygiene (disinfection facilities, lavatory location, etc.), and in management/operation of the factories themselves (preventing collapsing loads, etc.). There have been some advancements at processing facilities with the installation of Turkish machinery and equipment, and plants seem to be on the verge of installing dry and shock freezing equipment as well as jelly making technology. However, it is not only production efficiency, but also the consideration of hygiene and safety in design and operation that will lead to an increased product value.

Issues in distribution lie in preserving product freshness by pre-cooling fresh perishables, and establishing warehouses with sizes commensurate with the demand size of the target area. MMWR

and RRA on the Uzbekistan side have requested that Japan enhance the refrigerating facilities of the project concept proposal. At the kickoff meeting, held on March 7, 2017 in Tashkent, RRA explained that refrigeration technology is one of the project's objectives. Improvement of refrigerated warehouses has been progressing to address future increases in the production volume of horticultural crops. However, facilities to pre-cool fresh produce immediate after harvesting are not sufficiently established and there is room for improvement in the quality of fresh products. Small-scale refrigerators may suffice depending on the area, thus the scale of the refrigeration needs to be considered based on demand in its respective area. Otherwise, running costs such as electricity utility expenses may be squandered. It is worth noting that in USAID's "USAID's Agricultural Value Chain (AVC)" project material (dated September 27, 2016); it states the importance of pre-cooling in maintaining aroma, taste and quality, as well as its ability to extend the shelf life of perishables.

In distribution there are transport issues that lie not only in increasing refrigerated trucks, which are the primary means of transport, but also in the government forcing use of rail for domestic transport, and in air transport, the fact that there is no profit margin unless large lots can be gathered. As far as refrigerated trucks, there have been some examples where major local food processors have deployed refrigerated trucks themselves to build transport systems. Especially for fresh produce, truck transport seems to be prevalent due to the convenience of door-to-door service. Nevertheless, dry vegetable/fruit products and cotton are also transported by rail. As for air cargo, a minimum of 50 tons is required to be considered profitable. In reality, products with high selling values, such as cherries, are the only product worthwhile for this mode of transport. The Uzbekistan government plans to establish 17 trade & logistics centers in the 5 years from 2016 to 2020. The centers will be prepared with integrated freezing/chilling facilities and rail/truck transport capabilities. According to interviews with local logistics operators, some facilities are apparently already in operation in Tashkent, etc.

Issues in sales lie in dealing with complex foreign-currency settlement with overseas buyers; boosting the brand power of Uzbekistan products; regularly acquiring the latest market price trends of the shipping destination; and satisfying various demands of the market and customers, such as with inventory management, shipping, packing (size, format, lot). Regarding settlement in particular, a facilitator must be used to receive export fees and handle procedures. When importing equipment, etc., and USD settlements/procedures must pass through a service provider, making the process complicated and costly.

In addition, as quality that meets the quarantine standards of each country goods are sold in must be met, is it necessary to not only acquire various certifications (i.e. fSSC22000, ISO22000, HACCP, etc.) but also maintain quality such that it meets the standards of each overseas customer through every stage of production, processing, storage, and transport.

From the viewpoint of sales strategy, it is considered effective to increase products that can be supplied to the market faster, such as grapes, and improve competitiveness in Siberian cities like Novosibirsk and Yekaterinburg where there is strong demand for fresh produce.

Table 4-1: Current Situation and Issues in the Food Value Chain of Horticultural Crops

Stage	Current situation	Issues
Production	・ Shifting from cotton and wheat to vegetables and fruit trees ・ Promotion of mass growing of fruit trees in intensive gardens	・ Progressive approaches, such as staggering harvest times, are needed ・ Cultivation methods that help prevent damage to harvested produce, disease and pest control are needed
Manufacturing/ Processing	・ Has completed significant installation of machinery and equipment from developed countries and Turkey ・ Seems to be on the verge of installing dry and shock freezing equipment, and jelly technology	・ Design and layout of plants in terms of hygiene (disinfection facilities, lavatory location, etc.) ・ Management and operation of the factories (preventing collapsing loads, etc.).
Distribution (Storage and transport)	・ MAWR, RRA has requested enhancement of refrigerating equipment. In particular, there is a need for enough storage space to cope with future horticultural crop increases ・ There is little sense of shortage as local companies have already installed refrigeration equipment ・ Perishable goods are transported to Russia mainly by refrigerated truck ・ Appeals are being made for processing facilities at the logistics terminal (in Tashkent suburbs) ・ Fertilizer and cotton is transported to South Asia via Bandarabas	・ Pre-cooling is needed to maintain the freshness of fresh produce (there are some examples of its introduction) ・ There seems to be a need for small-scale refrigerators for local wholesalers ・ Inefficient railway transport is being recommended by the government ・ Air cargo requires large lots ・ A response to China's aggressive discounts is needed
Sales	・ Exports are expanding to Russia, Europe, South Korea, Kazakhstan, etc. However, they are limited to high-cost items such as cherries, apricots, grapes (harvest is August, earlier than those grown in Serbia) ・ There is especially strong demand for fresh fruits and vegetables in Siberian cities (Novosibirsk, Yekaterinburg) ・ South Korea was importing cherries from Uzbekistan, but as of March 2017, shipments have been suspended due to insect contamination. Uzbekistan is currently enlisting the help of quarantine experts in an aim to restore shipments within 2017 ・ Fresh meats are heavily biased towards the domestic market	・ Foreign-currency settlement ・ Boosting brand power (there have been examples of attracting foreign companies from UAE to the Navoi FEZ) ・ Providing timely information on overseas market prices ・ There's a need for inventory management, shipping, packing (size, format, lot) that satisfies market and customer needs

Uzbekistan's government has identified the following issues in the project concept relating to further promotion of horticulture such as fruit trees and vegetables.

Table 4-2: Issues in the Project Concept Concerning Horticulture

A. Responding to food security and securing water resources	Diversity in agriculture is necessary. It should consist of not only cereals such as wheat, but also fruits and vegetables, and it a system to secure water resources is needed to achieve this goal.
B. Improving production technology	It is crucial to have production technologies capable of improving productivity and countering loss in transport. Due to the lack of distribution expertise, cooperation with the market is important to acquire the necessary knowledge.
C. Supply chain development	Although the supply chain is improving, there is a shortage of infrastructure and market information. There is also a need in the private sector to improve awareness of quality control and ensuring safety.
D. Other general issues	・ There are few expert producers growing vegetables and fruits ・ Lack of cooperation between agricultural producers and processors ・ Inadequate cultivar improvement to satisfy market needs ・ Large losses due to spoilage during transport ・ Lags behind in appreciating of the worth of high-quality products (demonstrated by inadequate storage and transport facilities) ・ Technology improvement for quality control and certification ・ Lack of awareness and compliance of international standards (safety management, quality) vegetable/fruit producers ・ Slow to modernize the agricultural distribution system ・ Supply system for high-quality seeds and cultivation equipment/materials is inadequate

Source: RRA "Project Concept" p. 31–32

(3) Challenge for development of better FVC in each region

A. Context of Samarkand province1. Current situation and challenge

The Zeravshan River, the main water source of agriculture in Samarkand province, flows from Tajikistan to Uzbekistan. Due to topographical constraints on Tajikistan side, most of the water resources flow into Uzbekistan. For this reason, it can be said that the water resources in Samarkand province are relatively abundant in Uzbekistan.

As shown in the table below, there is only about 2% of salinization in the irrigated farmland of Samarkand province. This is due to the fact that the groundwater level of agricultural land is difficult to rise because there is some elevation gap between river water level and ground water level in agricultural land. Due to the influence of waste-water from agricultural land being returned to the river through drainage, salt concentration of river water occurs at the downstream of the Zeravshan River. Eventually, Salinaization occurs also in some agricultural land near doqnstream. However, it is not obstructive to the promotion of horticultural crops.

Table 4-3: Area of salinaized irrgatited area in Samarkand province (2000-2011)

Region	Year	Irrigate	Non		Low		Middle		High	
		k ha	k ha	%	k ha	%	k ha	%	k ha	%
Samarkand	2000	373.0	359.6	96.4%	8.6	2.3%	4.0	1.1%	0.80	0.2%
	2004	376.6	368.4	97.8%	7.3	1.9%	0.8	0.2%	0.20	0.1%
	2005	376.4	367.9	97.7%	8.0	2.1%	0.4	0.1%	0.20	0.1%
	2006	376.8	366.7	97.3%	9.7	2.6%	0.4	0.1%	0.03	0.0%
	2007	378.1	368.2	97.4%	9.5	2.5%	0.4	0.1%	0.03	0.0%
	2011	379.2	373.4	98.5%	5.4	1.4%	0.4	0.1%	0.00	0.0%

Source：JIRCAS

Samarkand province has been known as the production area of vegetables and fruit trees for a long time, and horticultural crops have been promoted traditionaly. Now a days, fruit trees are planted at intervals of about 2 m × 4 m, called “intensive gardens”, and dwarf cultivation methods are performed in many orchards. There is the apple intensive garden of 500 ha scale in Samarkand province. Introduction of drip irrigation system realizes saving of water resources and reduction of labor power for irrigation work.

While intensive gardens are highly productive and labor-saving, the risk of spreading when pests occur is high since single varieties are cultivated in large areas in the high density.

Some of advanced enterprises in the province have a large-scale refrigeration storage and adopt a storage method that decompresses and encapsulates carbon dioxide (CA: Controlled Atmosphere, decrease oxygen concentration (reduce oxygen concentration, increase carbon dioxide concentration)). This is one of the advanced long-term storage technologies.

Considering the current situation of agricultural production, support for human resource development related to Integrated Pest Management (IPM), mainly targeting fruit tree cultivation in the intensive garden, is considered as a consideration measure. In Hirosaki University's project for

technical cooperation for apple cultivation to Samarkand State Agricultural University, Japanese-made pest control machines (agricultural machines for spraying agrochemical) were already introduced to model farms in campus.

Also, since Samarkand province is widely cultivating fruit and vegetables, it is currently enhancing of processing facilities and storage facilities. However, as production continues to increase due to expansion of intensive gardens in the future, there is a high possibility that further capacity expansion is required for further processing and storage facilities.

2. Target area of the survey and other donors' assistances

Total population is about 3.45 million with cultivated acreage is 1.2 million hectare, of which 1.3% has been salinated. Agriculture production reached 3.7 trillion UZS in 2013. Major products are cotton and wheat while 6.5% of farmland was dedicated for vegetable production, 7.3% for fruit trees and 10.4% for grape yard. Recorded productivity of vegetable was 36.4 tons and of melon was 25 tons per hectare[6].

In Samarkand there was a branch of fruit laboratory where USAID conducts apple fair as a promotional event of apple farmers' manual produced by USAID. Switzerland also implements human resource development programme in Samarkand, for which they run a facility called "Regional competence centre".

B. Context of Samarkand province

1. Current situation and challenge

The main water source for agriculture in Navoiy province is Zeravshan River, farmer in Navoiy province can use water resources that is remaind in Samarkand province where located upstream. Although MAWR and BISM manage amount of water intake in the country and for each watershed, water supply is unstable by year in Navoiy province located downstream. Because the supply of river water is unstable, many intensive gardens have plans to utilze groundwater for irrigation, and there is case of using tap wateras a source of irrigation in hydroponic cultivation of tomatoes in greenhouses.

Area of salinized farmland in Navoiy province is shown in the table below. Although the areas with high to middle salinization gradually decrease, about 87% of the irrigated farmland is still salinized in 2011. For this reason, it is a limiting factor to expand cultivation area for crops that are relatively low tolerance to salinization such as fruit trees and vegetables. As a cause of salinization in Navoiy province, it is mentioned that wastewater generated from agricultural field in Samarkand province flow into Zeravshan River.

[6] Source: RRA "Project Concept" p.21

Table 4-4: Area of salinaized irrgatited area in Navoiy province (2000-2011)

Region	Year	Irrigate	Non		Low		Middle		High	
		k ha	k ha	%	k ha	%	k ha	%	k ha	%
Navoiy	2000	124.7	14.1	11.3%	65.6	52.6%	37.2	29.8%	7.8	6.3%
	2004	131.8	16.8	12.7%	78.7	59.7%	26.9	20.4%	9.4	7.1%
	2005	131.8	16.8	12.7%	80.2	60.8%	25.8	19.6%	9.0	6.8%
	2006	131.8	16.8	12.7%	83.1	63.1%	23.2	17.6%	8.7	6.6%
	2007	131.8	16.8	12.7%	86.9	65.9%	20.8	15.8%	7.3	5.5%
	2011	131.8	16.8	12.7%	93.8	71.2%	18.4	14.0%	2.8	2.1%

Source：JIRCAS

On the farming side, efforts are being focused on promoting intensive gardens through the will of the government, and large scale cherry orchards are being set up to export product from the FEZ. Furrow irrigation was being used at the (plum, apple) intensive gardens visited by the study team. Although drip irrigation is the preferred method locally, it has not been realized due to access to financing becoming an issue.

As for vegetable cultivation, there was an example of a Korea-financed greenhouse which has been growing tomatoes with hydroponics since 2010. Such use of greenhouses is enabling year-round cultivation. Since perishables are not well-suited for long distance transport, it is desirable to cultivate them near the consuming area.

As with the case of Samarkand Region, human resource development in general pest-control technology with special focus on health control in intensive gardens will be considered as a control measure in Navoi Region as well. Considering the introduction of Japan's advanced hydroponics and greenhouse technology opens the possibility of extending the harvestable period of tomatoes past even current greenhouse methods, as well as timely deliveries that meet demand and price conditions.

The Navoi Region has vast land area, second only to the Autonomous Republic of Karakalpakstan. However, it has a limited amount of cultivable land due to its many desert areas.

One of the notable characteristics of Navoi Region is that Navoi city is located near both the Navoi FEZ and Navoi International Airport (air cargo terminal). Navoi FEZ has a great many industrial companies, such as those engaged in auto parts, but there are also examples of facilities involved in modern processing, refrigeration, fumigation. Agrofresh, a joint venture with UAE, serves as a notable example. There are 32 flights per week from Naboi International Airport, of which, 11 are Korean Airlines. Korean Air accounts for about 90% of the cargo handling volume with over 1,000 tons of agricultural products handled per week at peak times. Korean Air has experience exporting to Korea produce such as cherries, which are relatively expensive and have high market competitiveness. This is one of the products that have excellent future prospects as an export item from Naboi.

On the other hand, there are few local trucking operators in Naboi and transport companies from

Tashkent often run trucks to Naboi. If considering the enhancement of Navoi's transporting capabilities in the future, it would be necessary to improve the area's truck transport.

2.Target area of the survey and other donors' assistances

The survey team also covered farmland near Navoi city of which the coverage was about 2 thousand km^2. There have been 22 ADB sub-loan projects to finance agro production facilities such as fruit processing equipment, cold storage and greenhouse.

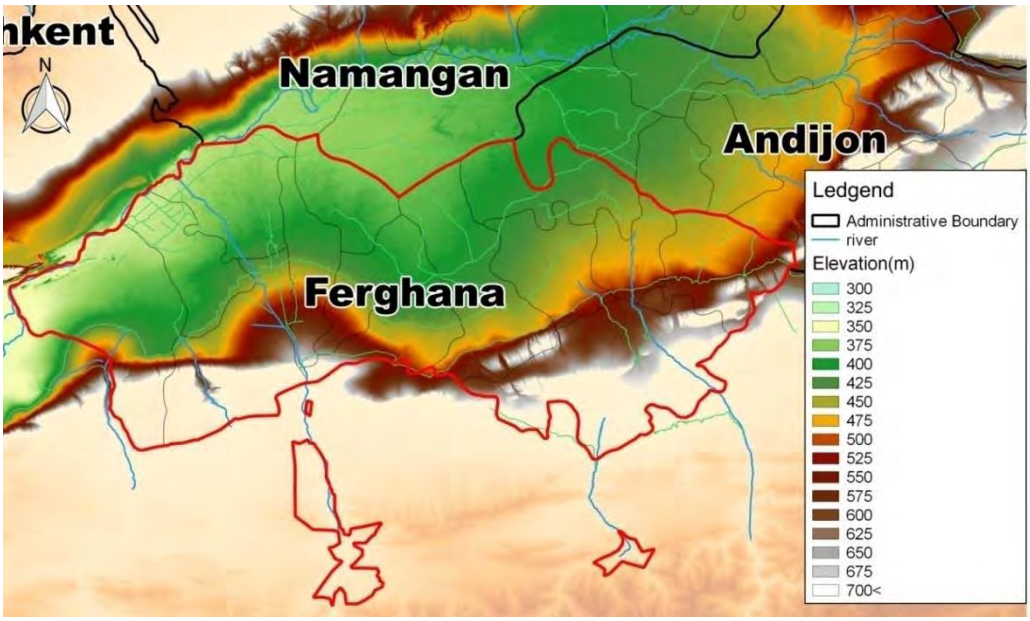
The team contacted a sub-loan project who was at the stage of feasibility study to apply for ADB credit-line through NBU. Total budget of the project was $6.5 million USD and the plan was to expand the intensive garden with 10 hectare as well as to purchase seedlings, fertilizer and to conduct staff training.

C. Context of Fergana province

1.Current situation and challenge

Water sources of Fergana province are the Sirdaliya River, the large Fergana canal (Katta Fergana canal) and the Great Andijan canal (Katta Andijan canal). In addition, there are some rivers flows from the mountains at the southern and southeast of Fergana province. Since Fergana province is located downstream in the Fergana Valley, river flow becomes unstable when water demand becomes high such as in summer season.

The terrain of Fergana province is as shown in the figure below and inclined from the mountain side on the south side to the north side. The large Fergana canal and the large Andijin canal flow in the hillside and the Syrdarya River flows in the lowland part. Therefore, pum stations are required to irrigate higher altitude areas than canal and rivers, and about 40% of the irrigation area is distributed irrgation water by the pum station. However, many pumps and related facility of these pump stations were built and installed in the former Soviet era and many of them are now degradated. Therefore maintenance and operation costs and electricity bills take up major portion of the limited budget of BISM.



Source: Prepared by the JICA Study Team based onSRTM

Figure 4-2: Altitude map of Fergana province

Approximately 48% of irrigated land in Fergana province is classified as salinization land. Many salt-affected farmlands are distributed in low-altitude areas along Syrdarya River. Cotton is grown in those areas because it is difficult to cultivate fruits and vegetables in those salinized farmlands.

Table 4-5: Area of salinaized irrgatited area in Fergana province (2000-2011)

Region	Year	Irrigate	Non		Low		Middle		High	
		k ha	k ha	%	k ha	%	k ha	%	k ha	%
Fergana	2000	356.9	153.1	42.9%	119.8	33.6%	72.7	20.4%	11.3	3.2%
	2004	357.4	181.8	50.9%	109.7	30.7%	55.2	15.4%	10.7	3.0%
	2005	358.8	183.1	51.0%	109.9	30.6%	56.5	15.7%	9.3	2.6%
	2006	358.8	184.5	51.4%	126.2	35.2%	40.2	11.2%	7.8	2.2%
	2007	359.7	187.4	52.1%	124.5	34.6%	40.1	11.1%	7.6	2.1%
	2011	366.1	191.1	52.2%	131.7	36.0%	39.1	10.7%	4.2	1.1%

Source: JIRCAS

While Fergana province has high fruit tree production in the country and it seems that there is no big issue in the field of agrocomy, the area of agricultural land per farmer is the smallest among the 13 reagions of Uzbekistan, so it can be said that production efficiency is lower than other province.

As an anticipated countermeasure, it is considered to renew facilities at degradated pump station and also consider installation of pipeline to distribute irrigation water to each field as a model project for modernizing on-farm irrigation facilities. At the same time, it is considered to introduce water-saving irrigation facility such as drip irrigation system.

In addition, it is considered possibility of modeling to increase income for small-scale farmers through strengthening WCA for operation and maintenance of related on-farm facilities, the traial of producer union and activity such as joint purchase of agricultural input materials and joint shipment of harvested materials.

As a countermeasure against salinization on farmland, it is considered to utilize salt-damage countermeasure technology that has been developed by JIRCAS in the state of Syrdarya. Since there are some geographical conditions in common with the Japanese production environment that the area of the cultivated area is relatively small and there are many slopes, it is also consider the possibility of introducing Japanese small agricultural machinery.

There are 100 processing, storage and transport related projects planned in Ferghana Region and it is expected USD$50 million will be financed by ADB. In terms of processing, currently about 30% of agricultural products are processed into dry products. Refrigerator capacity is also expected to be expanded to 120,000 tons in 2017. In the future, the expansion of processing and storage facilities will become increasingly more difficult as production scale expands.

There is a 400 ha FEZ located in Kokand city where companies from Italy and other European countries have introduced Turkish grown saplings to grow lemons. After being harvested, lemons are immediately pre-cooled, stored, sorted, packed, and then exported. Overseas competitiveness in countries like Russia is apparently quite high since the harvesting period differs from the traditional Uzbekistan lemon cultivar. This is attracting attention as one of the future product strategies in the Fergana Region.

2. Target area of the survey and other donors' assistances

Total area of the region is approx. 6.76 km^2 and population is about 3.4 million, out of which 1.9 million are urban inhabitants. Cultivated acreage is more than 310 thousand hectare, of which 44% have been with damage of salination. Agriculture production is about 2.6 trillion UZS whose main products are wheat and cotton. Vegetable production takes 5.5% of farmland, while fruit tree takes 13.85%. Productivity of vegetable was 28 tons and of melon was 18.8 tons per hectare.[7]

In Fergana region the World Bank refurbished irrigation channel and ADB assisted water saving irrigation.

D. Context of Namangan province

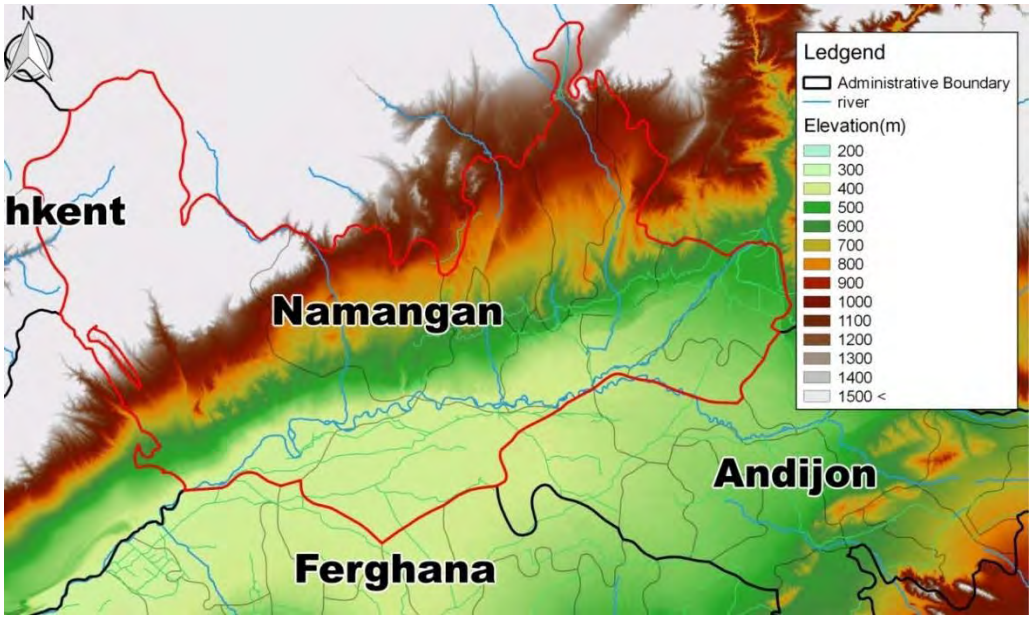
1. Current situation and challenge

Many of the agricultural water resources of Namangan province are supplied from Toktogul reservoirs located in Kyrgyzstan at upstream of the Syrdarya River. Since supply volumes fluctuate irrespective of the demand on the Uzbekistan side, shortage of resources occurs during the period of high demand during the summer season. Therefore, there are some cases where farmland which can not be irrgated is abandoned due to lack of irrgation water.

Since Namangan province is located in the Fergana Valley as well as Fergana province, the topography is inclined from the mountainous area in the north to the southern plain as shown in the

[7] Source: RRA "Project Concept" p.23

figure below. About 40% of the irrigated area is distributed water from the pump station because of the lowland part of the Syrdarya River, but the pumps and related facilities of these pump stations were constructed and installed in the former Soviet era, Many of them are degradated, maintenance and operation costs and electricity bills take up major portion of the limited budget of BISM.



Source: Prepared by JICA Study Team by using SRTM

Figure 4-3: Altitude map of Namangan province

There is no salinization in about 90% of the irrigated farmland in Namangan province, and most agricultural lands where salinized occurs are classified as low salinization. Therefore, salinization on irrigated farmland is not considered an important issue in Namangan province.

Table 4-6: Area of salinaized irrgatited area in Namangan province (2000-2011)

Region	Year	Irrigate	Non		Low		Middle		High	
		k ha	k ha	%	k ha	%	k ha	%	k ha	%
Namangan	2000	277.8	235.4	84.7%	27.5	9.9%	13.0	4.7%	1.9	0.7%
	2004	279.4	248.8	89.0%	18.7	6.7%	9.8	3.5%	2.2	0.8%
	2005	278.9	251.7	90.2%	17.1	6.1%	8.9	3.2%	1.2	0.4%
	2006	281.6	254.9	90.5%	17.4	6.2%	8.1	2.9%	1.0	0.4%
	2007	282.6	256.6	90.8%	17.3	6.1%	7.8	2.8%	0.9	0.3%
	2011	282.5	256.9	90.9%	17.6	6.2%	7.1	2.5%	0.9	0.3%

Source: JIRCAS

On the farming side, the State Order is exempted in the six district[8] of Namangan province, and the conversion to farmland where cotton and wheat have been cultivated is being converting to the intensive garden. Farmers are focusing on the production of apples and cherries in the intensive garden, and some private enterprises already have hundreds ha of intensive gardens. Like Samarkand province, single varieties are cultivated in large areas, so the risk of spreading when pests occur is high. Therefore, it is considered to develop human resource for Integrated Pest

[8] 66 districts nationwide are designated, and the state order of cotton and wheat is exempted

Management with pest control measures in the intensive garden.

Same as Ferghana province, As an anticipated countermeasure, it is considered to renew facilities at degradated pump station and also consider installation of pipeline to distribute irrigation water to each field as a model project for modernizing on-farm irrigation facilities. At the same time, it is considered to introduce water-saving irrigation facility such as drip irrigation system.

In addition, it is considered possibility of modeling to increase income for small-scale farmers through strengthening WCA for operation and maintenance of related on-farm facilities, the traial of producer union and activity such as joint purchase of agricultural input materials and joint shipment of harvested materials.

There are currently 198,000 intensive gardens in Namangan Region, 4,300 ha of which are apple or cherry orchards. There are plans to increase intensive gardens by 2,000 ha in the future, and the region intends to boost production with a focus on its highly-competitive cherry crop. As for notable processing developments, Agromir Chust, which sells the 'Bliss' brand, has plans to establish a new factory. There been another 27 projects launched based on plans to expand refrigeration and transport. Warehouse storage capacity is scheduled to be increased from 6-15%. Products are exported directly from Namangan Region to CIS countries such as Russia, Kazakhstan, Belarus, Ukraine, etc. The target value of the export plan is an expansion from USD$96 million in 2016 to USD$200 million 2017.

Mountainous region lies between Namangan and Tashkent regions and road traffic also crosses mountain passes. Access is far from favorable, especially in winter. Exports directly from Namangan Region to overseas are expected to expand, due in part to such road conditions.

2. Target area of the survey and other donors' assistances

Total area of the region is approx. 7.44 km^2 with population of 2.5 million, of which 1.6 are living in urbanized area. Cultivated land is about 287 thousand hectare, where 9% have been damaged by salination. Agriculture production is about 2.4 trillion UZS with annual growth rate of approx. 8% in 2013. Their main products are wheat and cotton while fruits production has increased to take 10% of cultivated area, together with grapeyard which takes another 4% plus. They grow vegetables and melon as well, and the productivity of vegetable was 27 tons while of melon was 25 tons per hectare[9]. In Namangan province, two cases of introducing a medium-scale refrigerator by ADB loan can be confirmed.

[9] Source: RRA "Project Concept" p.20

V. Selected the Development Issues in Agriculture and Japan's Proposal for Support

Japan's future support for Uzbekistan will be considered based on the contents of Chapters I to IV in this report. In doing so, we will propose cooperation projects that consider the existence of superior options from Japan, the existence of agencies, organizations, and human resources capable of providing support and which can, as much as possible, be facilitated with these resources. An evaluation of project concept feasibility has been implemented by Uzbekistan's government prior to consideration being given.

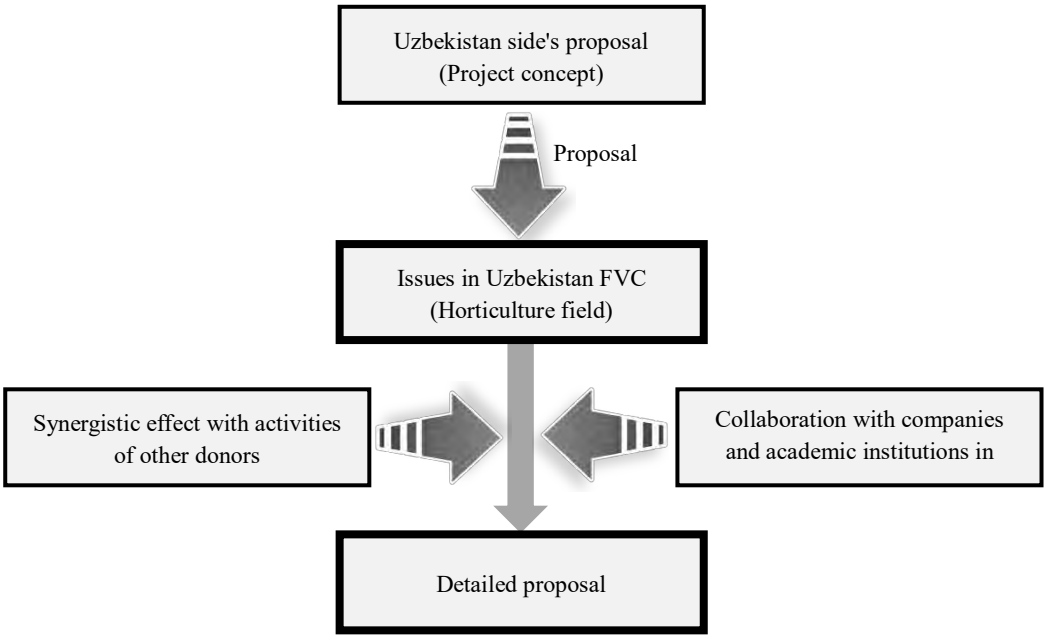


Figure 5-1: Process for Consideration of Support Project

(1) Evaluation of "project concept"

As the concept of "Production, trade and logistics center" (hereinafter "logistics center") has indication of capital expenditure with certain breakdown, there was no forecast of business profitability and social added-value analysis. Further, the concept did not pay much attention on mid-term risks of business environment transformation. Therefore the survey team will conduct 1. Financial appraisal of the indicated investment project, 2. Economic appraisal focusing on added value and 3. Analysis on measures to cope with the change of the business environment, based on scenario-planning methodology. The reason to deploy the scenario-planning methodology was to be prepared for future volatility of business circumstances which stems from 1) horticulture in Uzbekistan has not yet secured larger export market, 2) export market has been with tough competition, and 3) external conditions such as global warming may critically affect.

A. Outlook of the "logistic center"

The project concept indicated outline of the investment project as follows;

Table 5-1: Indicated investment of the logistics center on the "Project Concept"

Equipment	Power	Amount, mln USD
Cold storage with CA	5,000t	2.5
Drying products line	-	0.6
Workshop calibration-packaging	-	0.4
Juice and jam production line	1,000t per year	0.5
Intensive garden	100ha	3.0
Greenhouse	5ha	0.8
Spec Agricultural equipment, auto refrigerators, equipment (trucks, scales, packaging)	-	0.5
Creation of infrastructure (access roads, parking, electricity, gas, showroom, office etc.)	-	1.7
Total	-	**10.0**[10]

Source: RRA "Project Concept" p.35

In accordance with the project concept (p4), it was proposed to construct 10 logistics centers to cover 10 regions indicated on the concept. The project concept it was shown on a table that the project will compliment with other donor agencies including the World Bank, Asian Development Bank and Islamic Development Bank.

B. Financial appraisal of the logistics center

1. Commercial profitability

As per the Table 5-2 attached financial appraisal, the IRR of the investment shows rather high to exceed 30%. However, the analysis has not taken into account of typical risks of agriculture investment to face against 1. Cultivation risks including unusual climate and/or disease and pest, 2. Market risks including wholesale market corruption by excessive harvest, and 3. Quality risks caused by long term storage, therefore the indicated IRG136R is not subject of "assured return", unlike investment of manufacturing industries[11].

[10] Baseline scenario of financial appraisal deployed $10.5 million based on findings in the field.

[11] Technically forecasting trouble occurrence is not impossible but due to lack of credible data, the practiced appraisal did not reflect the trouble occurrence rate.

Table 5-2: Return on investment of LC

US dollar	Construction 1	Production 2	Production 3	Production 4	Production 5	Production 6
TOTAL CASH INFLOW	0	2,170,400.00	4,340,800.00	5,960,326.00	6,195,988.00	6,462,292.00
Inflow operation	0	2,170,400.00	4,340,800.00	5,960,326.00	6,195,988.00	6,462,292.00
Other income	0	0	0	0	0	0
TOTAL CASH OUTFLOW	10,050,000.00	759,841.43	1,096,676.74	1,300,081.28	1,298,519.52	1,318,623.20
Increase in fixed assets	10,050,000.00	0	0	0	0	0
Increase in net working capital	0	88,499.20	41,792.29	19,105.50	−130.902618	−0.022315
Operating costs	0	619,411.87	858,073.73	971,183.87	971,183.87	971,183.87
Marketing costs	0	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
Income (corporate) tax	0	39,930.36	184,810.72	297,791.91	315,466.56	335,439.36
NET CASH FLOW	−10,050,000.00	1,410,558.57	3,244,123.26	4,660,244.72	4,897,468.48	5,143,668.80
CUMULATIVE NET CASH FLOW	−10,050,000.00	−8,639,441.43	−5,395,318.17	−735,073.45	4,162,395.03	9,306,063.82
Net present value	−10,050,000.00	1,410,558.57	3,244,123.26	4,660,244.72	4,897,468.48	5,143,668.80
Cumulative net present value	−10,050,000.00	−8,639,441.43	−5,395,318.17	−735,073.45	4,162,395.03	9,306,063.82
US dollar	Production 7	Production 8	Production 9	Production 10	Production 11	Scrap
TOTAL CASH INFLOW	6,544,980.00	6,544,980.00	6,544,980.00	6,544,980.00	6,544,980.00	149,178.11
Inflow operation	6,544,980.00	6,544,980.00	6,544,980.00	6,544,980.00	6,544,980.00	0
Other income	0	0	0	0	0	149,178.11
TOTAL CASH OUTFLOW	1,322,361.86	1,322,449.83	1,322,449.83	1,322,449.83	1,322,449.83	0
Increase in fixed assets	0	0	0	0	0	0
Increase in net working capital	−87.962963	0	0	0	0	0
Operating costs	971,183.87	971,183.87	971,183.87	971,183.87	971,183.87	0
Marketing costs	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00	0
Income (corporate) tax	339,265.96	339,265.96	339,265.96	339,265.96	339,265.96	0
NET CASH FLOW	5,222,618.14	5,222,530.17	5,222,530.17	5,222,530.17	5,222,530.17	149,178.11
CUMULATIVE NET CASH FLOW	14,528,681.96	19,751,212.13	24,973,742.30	30,196,272.48	35,418,802.65	35,567,980.76
Net present value	5,222,618.14	5,222,530.17	5,222,530.17	5,222,530.17	5,222,530.17	149,178.11
Cumulative net present value	14,528,681.96	19,751,212.13	24,973,742.30	30,196,272.48	35,418,802.65	35,567,980.76
NET PRESENT VALUE	at 0.00%	35,567,980.76				
INTERNAL RATE OF RETURN	34.62%					
MODIFIED INTERNAL RATE OF RETURN	34.62%					
NORMAL PAYBACK	at 0.00%	4.15 years	5			
DYNAMIC PAYBACK	at 0.00%	4.15 years	5			
NPV RATIO	3.487338					

Source: Prepared by the JICA Study Team

Box 5-1: Baseline of financial analysis on the model project proposed by Uzbekistan's project concept

1 Planning horizon

1.1 Construction period 1 year (year 1) + Production period 10 years (year 2 to 11)

2 Fixed investment cost

2.1 Indicated cost of investment (p.35 of the project concept) was respected with a few corrections.

2.1.1 Cold storage with $1.5 million (2.5 if generator is required).

2.1.2 Drying product line $0.6million.

2.1.3 Measurement package line $0.4million

2.1.4 Juice and jam production line $0.6million.

2.1.5 100ha Intensive orchards, $3.0million, whose 80% expenditures can locally be procured with 20% import.

2.1.6 5ha Greenhouse, $1.75million, whose 80% expenditures can locally be procured with 20% import.

2.1.7 Special equipment, $0.5million.

2.1.8 Infrastructure, $1.7million.

3 Products and services

3.1 Indicative line-up of intensive orchard products are as follows;

3.1.1 Fresh apple (intensive orchard)

3.1.2 Fresh table grape (ditto)

3.1.3 Fresh peach (ditto)

3.1.4 Fresh pear (ditto)

3.1.5 Fresh sweet cherry (ditto)

3.1.5.1 The above selection was just an example without market-based justification and the picked-up products were those with sufficient statistics data. Pomegranate was a promising candidate but dropped due to lack of sufficient statistics data.

3.2 Indicative line-up of juice and jam

3.2.1 Apple juice, 400ton in year 2, 800ton in year 3 and 900ton in year 4 to 11. Wholesale price $700/ton, raw material cost $400/ton (to be procured from neighboring orchards).

3.2.2 Apricot jam, 100ton in year 2, 200ton in year 3 and 300ton in year 4 to 11. Wholesale price $1,000/ton, raw material cost $400/ton (to be procured from neighboring orchards). Same volume of sugar has to be added with cost of $600/ton. Pectin is expensive but the consumption volume is quite small (55/1,000 apple) therefore cost ignored together with citric acid.

3.3 Storage service

3.3.1 Cost storage facility has a capacity of 5,000ton and storage charge can be estimated as UZS 500,000/ton/month. Average volume of acceptance was estimated to be 900ton in year 2, 1,800ton in year3 and 2,400ton in year 4 to 11. Only this component has local sales income in Uzbekistan currency.

3.4 Greenhouse production

3.4.1 Tomato with yield rate of 100ton per hectare. 2 hectare will be dedicated and export price $200,000 per hectare / maximum sales $400,000.

3.4.2 Cucumber with yield rate of 50ton per hectare. 1 hectare will be dedicated and export price $100,000 per hectare / maximum sales $100,000.

3.4.3 Sweet pepper with yield rate of 40ton per hectare. 2 hectare will be dedicated and export price $160,000 per hectare / maximum sales $320,000.

4 Production cost

4.1 Agricultural input was estimated to cover staff salary, heating cost, electricity cost, seedling cost and fertilizer, whose variable cost to cover both of intensive orchard (100ha) and greenhouse (5ha) was estimated to be variable cost of $189,375 and fixed cost of $39,375 (total $228,750).

4.2 Overhead of labor cost ($12,000/year) and marketing overhead ($12,000/year) added on to cover manning cost at the concessionee's office.

4.3 No specific cost allocation on each product/service except $100,000/year (50% variable cost) for apple juice including decorated bags, and $40,000/year for apricot jam (100% fixed cost).

4.4 Cost of cold storage operation. Variable cost of UZS 1,446/ton/year to cover electricity consumption. Labor cost $1,000 per month.

5 Production and sales

5.1 Fresh fruits: unit prices were in reference to the website of Uzagroexport.

5.1.1 Apple 20ha x $3,180. Harvesting starts in year 4 and full production from year 6 and onward.

5.1.2 Grape 20ha x $8,172. Harvesting from year 5 and full production from year 6 and onward.

5.1.3 Peach 20ha x $7,997. Harvesting from year 4 and full production from year 6 and onward.

5.1.4 Pear 20ha x $4,144. Harvesting from year 4 and full production from year 6 and onward.

5.1.5 Cherry 20ha x $10,336. Harvesting from year 5 and full production from year 7 and onward.

5.1.5.1 Note: Preparation for next generation. Usually apple tree has sufficient yield of production until year 25 while tree growth takes time therefore orchards have to start planting seedless of next generation as early as year 16, in order to maintain constant output. Although the financial appraisal did not cover the replacement cycle and cost incurred, due to recognition that the "logistics center" will after all be a storage and transportation facility while the intensive orchards / greenhouses are supposed to be supplemental appurtenances to the center, and the logistics center's business assumption was to meet with market demand for next 10 years.

5.2 Juice and jam

Materials and consumables will fully be procured from neighboring orchards and shops.

5.2.1 Apple juice production starts year 2 with volume of 400ton, year 3 with 800 ton and full capacity of 900 ton production for year 4 and onward.

5.2.2 Apricot jam production starts year 2 with volume of 100 ton, year 3 with 200 ton and full capacity of 300 ton production for year 4 and onward.

5.3 Cold storage service

5.3.1 Unit price will be UZS 500,000 per ton per month. It was said to be soon 800,000, instead.

5.3.2 900ton for 12months in year 2.

5.3.3 1,800ton for 12 months in year 3.

5.3.4 2,400ton for 12 months in year 4 and onward.

5.3.5 Balance of the capacity will be dedicated to store products of orchards / greenhouses.

5.4 Greenhouse

5.4.1 Tomato starts from 0.6ha in year 2, 1.2ha in year 3 and 2ha in year 4 and onward.

5.4.2 Cucumber starts from 0.3ha in year 2, 0.6ha in year 3 and 1 ha in year 4 and onward.

5.4.3 Sweet pepper starts from 0.6ha in year 2, 1.2ha in year 3 and 2ha in year 4 and onward.

6 Working capitals

6.1 Payables and receivables: 30 days coverage and settlements will be made at the end of each calendar month.

6.2 Harvesting: 360 days coverage to have one year production cycle.

7 Source of finance

7.1 To be separately discussed but loan coverage will be 100%.

8 Tax

8.1 Corporate tax of 7.5% per annum.

8.2 Agriculture tax on intensive orchard with fixed amount of UZS2.85 million to be paid from year 7.

8.3 Need to clarify a statement on the project concept (p.12) to be exempted from taxation.

On the Box 5-2, the survey team conducted appraisal of variations based on price fluctuations of optimistic scenario and pessimistic scenario.

Box 5-2: Variations of the baseline scenario (Optimistic and pessimistic scenarios)

1 Consideration of export price fluctuation

The survey targeted horticultural products, whose export market price has wider fluctuation than for example industrial products, and storage service whose main customers are horticultural farmers as the source of revenue, additional appraisal was conducted to verify in consideration of price fluctuation (optimistic and pessimistic scenarios).

On the other hand, tendency of price fluctuation by seasonal reason may similar elsewhere in the world, e.g. soaring up before harvesting due to shortage of supply and suddenly falls down by harvesting, and bounces back after the harvesting period and remain stable by constant supply via cold chain. Therefore in this process the price fluctuation data of Japanese market was deployed as a practice, in order to refer to a standard deviation by which theoretical variations of lowest price (pessimistic scenario) and highest price (optimistic scenario) were assumed for the appraisal.

1.1 Seasonal fluctuation

The data of 5 years monthly prices of Orin apple at the Ota market of Tokyo was used. The average price was yen 308 per kg and the standard deviation was figured out as yen 79. If the range of variation can be covered by 2σ, bottom price is supposed to be yen 150 or price ratio against the average price is 49% and top price yen 466 and 151%.

1.2 Quality fluctuation

There was an accessible data of Okinawa fruits market to deal 'Sun-fuji' made in Aomori and assumable reason to have price difference is quality of the product. The data indicates standard deviation to be yen 73 in case of average price of yen 253, and if the range of variation can be assumed as 2σ, it is calculated that the bottom price will be yen 107 with price ratio against the average to be 42% and the top price yen 399 with 158%.

1.3 Applicable deviation range

Based on the practice, it was found that baseline analysis which stays as a proxy of neutral scenario can offer variations of optimistic scenario to increase sales prices with 50% higher than the original prices, and pessimistic scenario with 50% lower prices. The above referred practice may theoretically justify the deployed multiplier to be acceptable.

1.4 Result of analysis

Summary of the result is as shown on the Table 5-3.

Table 5-3: Typical financial indicators

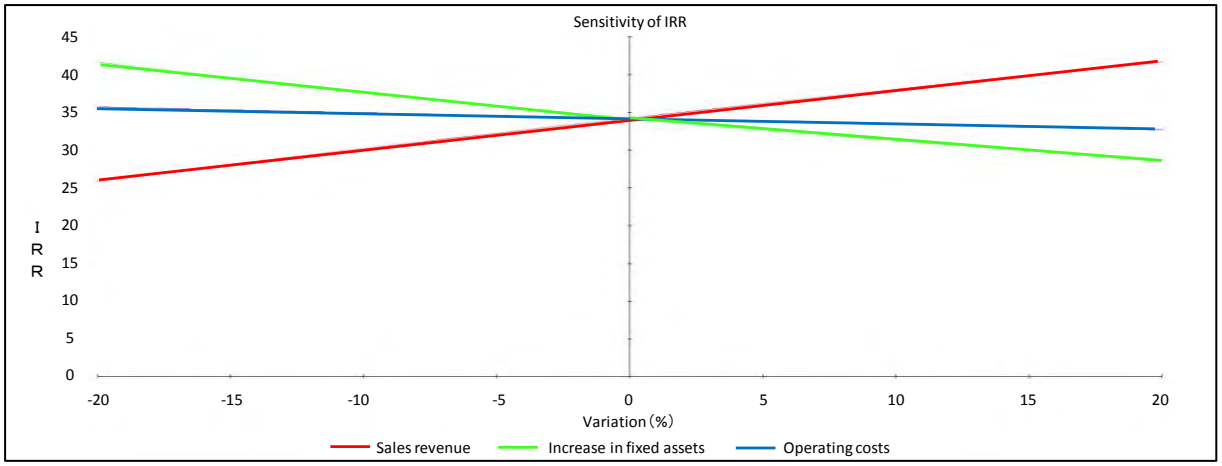
	Optimistic	Neutral	Pessimistic
IRR	51.96%	34.62%	10.67%
Static pay-back	3.34 years	4.15 years	7.24 years

Source: Prepared by the JICA Study Team

Though the assumption to deploy fixed ranges with wider deviation may be criticized to be rather extreme that the volatile parameters came to be fixed by unknown factors or possible improvement of quality was neglected, yet the pessimistic scenario shows the internal rate of return to be more than 10% and the optimistic scenario exceeds 50%. It can be interpreted that the pessimistic scenario may presents a simulation to cope with agricultural risks (cultivation risk, market risk and quality risk) which was referred to on V-(1)-B "Financial appraisal of the logistics center" (p.129).

As indicated on the sensitivity analysis (Figure 5-2), if the sales decreases 20%, the IRR comes down to the level of 25% and price fluctuation of 20% is not quite unusual, the use of soft loan to

hedge the subsumed risks may secure certain reasonability.



Source: Prepared by the JICA Study Team

Figure 5-2: Sensitivity analysis

C. Scenario planning and perspective on future of the "Logistics center"

1. Based on PEST analysis to adjust possible change of business circumstances

The risks that can occur in the future necessary to consider the long-term development of LC are organized as follows.

Table 5-4: Based on PEST analysis to adjust possible change of business circumstances

Politics	(i) Truce of Ukraine conflict and resumption of fruits export from Europe to Russia. This scenario will have a big impact but may not happen easily due to current situation. (ii) Rapid enhancement of protectionism and export regulation. While the protectionism may become stronger, it will not immediately stop ongoing free-trade negotiations therefore will have lesser impact on the logistics center project. (iii) Risks of cross-border terrorism. Uzbekistan may be targeted by terrorist and once it happens a serious implication may take place but possibility may not be high to damage reginal trade with broad and persistent blockage of horticultural export because of the terrorism.
Economics	(i) Liberalization of forex. While there always an enduring rumor that the forex is soon liberalized, due to sizable resistance by those who have benefitted, the forex control may not be ceased soon and it seems to be continued for the time being. (ii) Collapsing oil market and another economic crisis in Russia. If there is a new crisis arises on Russian economy the effect on the project may be serious but international economy to date as well as recent oil market do not have any such indication of rapid fall of Russian economy. (iii) Market saturation by rapid increase of fruits supply. Horticulture has been promoted in neighboring countries where production of fruits will certainly be increased by the promotion. In the meantime market population can enjoy marginal population growth (Russia decreases), price competition by market saturation will have to be concerned.
Society	(i) Stagnant growth of population and economy. The growth of population came to be slower in not just Uzbekistan but Kazakhstan as well (Russia decreases) and the continued economic growth of 8% per annum for last several years may have uncertain perspective for future. However IMF forecast[12] stays as high as 6% per annum for net several years therefore the impact of the scenario may not necessarily be very big. (ii) Popularization of higher education. Due to ongoing economic growth and decrease of youth population, the popularization of higher education will take place inevitably (evident on

[12] "Uzbekistan NOW" (No.38:Sep2015-Oct2015) <http://www.jp-ca.org/data/uzbeknow/uzbeknow38.pdf>

	grapevine), but it may not affect on volume consumption of fruits, impact on horticultural production will be rather limited. (iii) Formulation of new wealthy class. Due to economic growth there should be new entrepreneurs who may form a cluster of wealthy class to demand high-end consumer market which may limitedly affect on the horticultural production.
Technology	(i) Improvement of seedlings and fruit quality. As it was clarified by the survey, in many different aspects technical cooperation have been advanced, by which quality of horticultural products will be improved to address high-end market demand. Yet assurance of the market expansion to demand more supply was not necessarily verified. (ii) Increase of production by improved cultural system. Similar to the above, production volume of horticultural products will certainly be increased. As a result, the market competition will be heated up due to increase of supply and demand to cultivate new market will accordingly be raised. (iii) Higher yield due to communization of cold-chain. Currently there is a high demand of cold-chain development and the improvement of commercial supply flow will further be continued, which affects on yield ratio of fruit by reduction of rotten waste. Accordingly the competition comes to be tighter and demand of new market cultivation will be arise. (iv) Delay of adaptation measures to climate change. While it has been tangible that global warming affected the environment, in the Central Asian region a negative effect on irrigation sector has been a concern. While on the other hand the warming may increase yield of certain agriculture product and due to variety of effect the impact of climate change is not easy to assess. In this analysis the scenario is to get delayed to take measures on adaptation and looks at how the logistic center will be affected.

2. PEST analysis

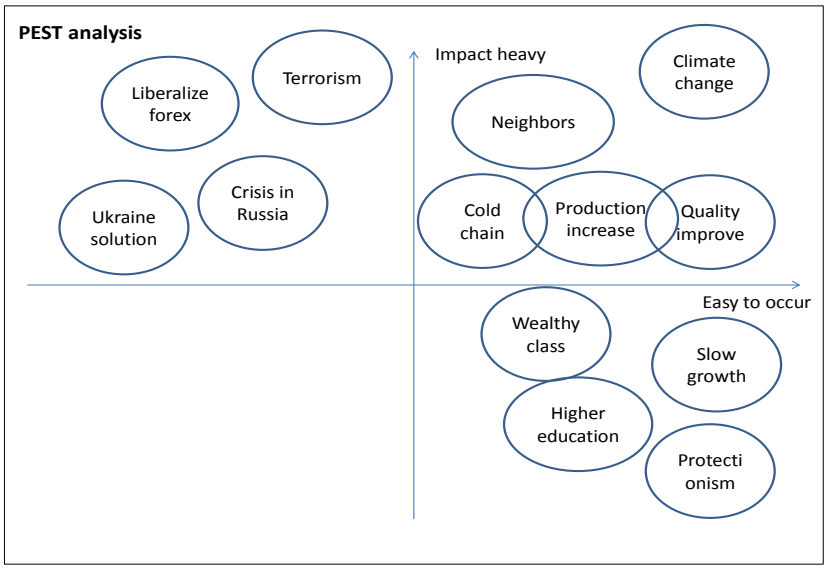
The above listed assumptions are dispersed on the Figure 5-3, it is conceivable that there are 3 phenomenons which are comparatively prone to take place and cause bigger impact.

(i) Delay of adaptation measures to climate change

(ii) Increase of production by neighboring countries

(iii) Introduction of new technologies to improve quality and quantity of supply

Within the above phenomenon, (iii) is a hybrid of improved culture system and introduction of cold chain.



Source: Prepared by the JICA Study Team

Figure 5-3: PEST analysis

3. Scenario development

The 3 selected phenomenons will be sorted in order of bigger impact and based on the scenario adequate measures have to be considered for the logistics center.

(i) Delay of adaptation measures to climate change

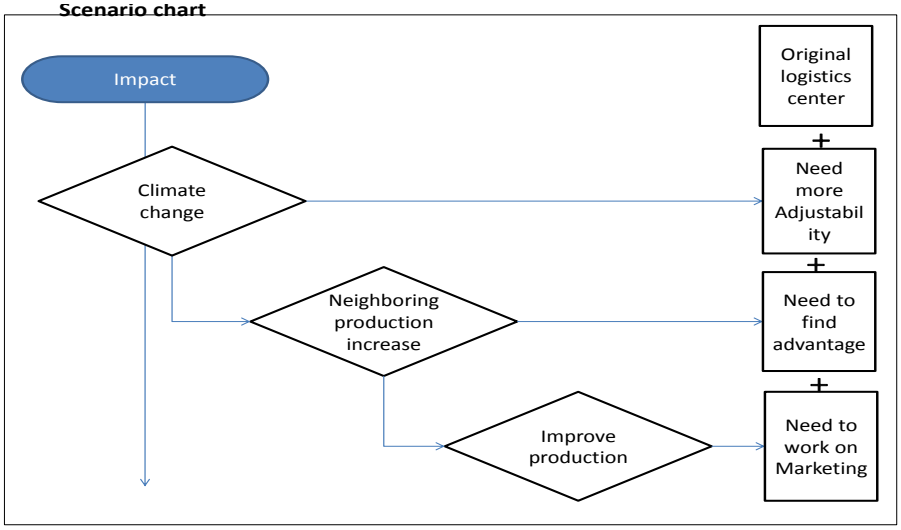
The plausible measures will be; A. change of growth season, B. change of fruits to introduce tropical species and C. improvement of seedlings to be heat-resistant. Since the project has a big cold storage capacity, the measure a can easily be considered, while the attached intensive orchard of 100ha have to consider either B or C which comes to be a burden of the project. In this perspective the project should be prepared to take an alternative concept to prioritize cold chain and focus on commercial storage and distribution in terms of resource allocation.

(ii) Increase of production by neighboring countries

The plausible change is to have more export of horticultural products from Kazakhstan as well as from Russian Federation and competition comes to be fiercer. GDF Company, an agro firm of Uzbekistan already took into account of the change and is shifting production to stop growing apples due to inferior quality and increase grape and stone fruit production. In this perspective the scenario suggests the project to be prepared to improve quality of the products, differentiation to select species and making use of the center as an information hub on preferable species and accessible market.

(iii) Introduction of new technologies to improve quality and quantity of supply

Through the survey it has been recognized that in Uzbekistan interest in new technology is rather high amongst different stakeholders. Partly due to progress of various international cooperation programmes, both of product quality and supply volume will further be improved for certain. Accordingly the LC will have to be equipped with capacities of quality assurance and marketing so that the supply chain can smoothly be managed.



Source: Prepared by the JICA Study Team

Figure 5-4: Scenario chart

4. Conclusion

As stated above, the analysis of the scenario planning indicates that the project should focus on downstream, rather than enhancement of intensive orchard / greenhouse. Although the analysis did not touch upon geographic conditions, it is obvious to pay attention on the commercial flow of product shipment when the location of the center is decided.

(2) Perspective on immediate actions

A. Coordination with other donors and related challenges

As stated on III-(5), there already are plural cases of donors coordination amongst different players including EU and the World Bank as well as SDC of Switzerland, which covers horticulture, irrigation and other relevant themes. While on the other hand it has been pointed out that Uzbek government runs short of sufficient capacity to coordinate with plural donors simultaneously and neither one of the donors is not equipped with sufficient resources to pull-up the capacity of Uzbek government on the particular task of coordination amongst multiple donors, the coordination effort may not have sufficiently fruited despite of continuous effort.

However, horticultural development is gifted with A. Species of products with potential market value, B. Good climate condition in Uzbekistan and C. Diligent and talented workforce, which make the effort quite promising therefore donors coordination has a convincing justification to avoid redundant duplication of the services and to focus on each donor's comparative advantages.

It has also been observed that European donors such as EU and SDC has very strong commitment on their own policy of cooperation and the donors coordination is one of different tools for them to make their own programme to be successful. Therefore coordination with Japan is not to seek for a good balance of 50:50 co-habitations, or to seek for a granted win-win game, but to negotiate and secure their own field of interest. Under the recognition Japan should make it clear and definite the purpose of coordination rather than formulation of co-habitants' peaceful alliance.

B. Credit scheme for effective implementation of the project and challenges

1. Concession agreement between government ownership and private sector operator

According to Mr. Nadimov of RRA, he denies ownership and operation of the centers to be in hands of the government and he insisted on a direction to introduce private sector companies as operators of the center in order to seek for efficient operation as well as to meet with the demand of export market.

While on the other hand a critical condition of the LC construction is to secure stable power supply in order to smoothly run the cold storage. If the project is planned solely by private sector companies they may have to have their own power generators in order to cope with frequent black-outs particularly in rural area. This comes to be a financial handicap to plan the project.

Under the circumstances, a possible solution is to implement the project through concessional agreement to firstly furnish the facility to Uzbek government who should be obliged to secure constant power supply, and thereafter delegate the operation to selected vendors who should seek for higher efficiency. For more details please refer to "Financial appraisal to separate ownership/operation by concessional agreement" of the Box 5-3. In this case, possession of the LC assumes the government or a related organization.

Box 5-3: Financial appraisal to separate ownership/operation by concessional agreement

(a) Construction of "logistics center" by the government of Uzbekistan and possible application of Japan's "Sector-loan" program

As stated on page (leaf) 35 of RRA's Project Concept it has been proposed to build and operate the centers in 10 selected regions in order to promote export of horticultural products and it looks to fit policy of Japan's loan program to benefit a specific industrial sector of the country.

However, as stated on the report (IV-(2), p.116), the government of Uzbekistan has indicated her preference to avoid ownership and operation to be delegated to the government in terms of operational efficiency. Therefore if it has to be considered to respect the Concept to build and operate the logistics center, a plausible solution is to separate the ownership and operation by introducing concessional agreement between the government and operators.

A minimum rent of US$ 1.2 million per annum will suffice to cover assumed interest of around 3% per annum (assumed IRR will be 3.12%). However, the indicated simulation does not include 1. Cost of capital including handling fee of the central bank, 2. Legal cost to deploy the concessional agreement, and 3. Cost of staff in case of assigning secretariat to the project. This is attributable to uncertainty to bear the cost solely by the project but particularly 2. Legal cost would incur due to the nature of the project. It should therefore be recognized that on implementation phase these points should exhaustively be clarified including responsibility of cost coverage.

(b) Operation of the Center by private sector companies (Baseline scenario)

A business forecast of operation assuming the idea of concessional agreement indicates a constant growth of profit with assumption to avoid various risks of agriculture business, since the sales forecast and operation cost shall remain unchanged from the baseline scenario.[13].

However, the operator is supposed to join the project as a tenant of the center and it is not expected to bear substantive investment including construction of fixed-assets, technically it is not suitable to seek for "return on investment". In other words the operator would solely be responsible for the operational cost and recovery, and the appraisal shows that annual balance shall remain profitable as from the very first year of operation. If the business is well maintained, estimated internal reserve may exceed US$ 32 million after 10 years.

2. Challenges

In this system, it can be cited as an issue how to implement business selection and contract process on concession contracts in addition to general loan agreement.

On the other hand, if this system can be implemented, it would be high possibility for ODA loan providers to other countries with the objective of industrial promotion.

C. Synergistic effects with Other JICA Projects and Potential for collaboration with Japanese Private Sector

In considering promotion of the agricultural sector in Uzbekistan, especially in the horticulture field, multiplier effect with other Japanese projects in Uzbekistan and ensuring collaboration with Japan's private sector, educational institutions, etc., allow the project to be effective and clearly demonstrate Japan's presence in Uzbekistan's economic development.

[13] V-(1)-B "Financial appraisal of the logistics center" (p.128) cultivation risks, market risks and quality risks

1. Status of Other JICA Projects

Shown below are projects undertaken in the agricultural sector JICA. In addition to preparing the recent development plan focused on the agricultural sector in Study on Regional Development in Karakalpakstan Regional Development (2008), JICA has also implemented technical cooperation and loan assistance for irrigation and water management related projects.

Meanwhile, in Grassroots Cooperation projects which focus mainly on domestic localities and science/research institutes, JICA has promoted technologies that suit the needs of localities in the areas of fruit trees, sericulture, etc. Human resource development that is practical and directly relevant to business is also being carried out at the Japan Center, which operates in cooperation between Japan and Uzbekistan.

Table 5-5: Agricultural Sector Projects in Recent Years Implemented through JICA Support

Scheme	Project name	Period	Target Area
Development study	Study on Regional Development in Karakalpakstan Regional Development	2008/03–2010/12	11 counties in northern area of the Autonomous Republic of Karakalpakstan
Technical Cooperation Project	Water Management Improvement Project	2009/11–2013/12	Culdaliya Region, Tashkent Region, Jizzakh region
Loan Assistance	Amu-Bukhara Irrigation System Rehabilitation Project	2015/01–2019/12	Bukhara, Navoi regions
Grassroots Technical Cooperation (Partnership)	Revitalization of the Silk Road Silk Industry in Uzbekistan	2009/09–2012/08	Ferghana special municipality, Ferghana Region; Margilan city
	Technical Cooperation Project for Promotion of the Silk-Road Industry in Uzbekistan-Developing a Technical Transfer Model to Increase Sideline Income of Remote Villages	2013/03–2015/09	Ferghana Region, Khorezm Region
Grassroots Technical Cooperation (Regional proposal)	Grass-roots Technical Cooperation for Improvement of Fruit Growing Technology in Ferghana Region	2007/04–2008/03	Ferghana Region
	Enhancement of Uzbekistan Farmers' Income through Applying Modern Apple Growing Technology	2015/03–2017/03	Tashkent Region, Samarkand Region, Ferghana Region
	Technology Improvement of Fruit Growing Project in Tashkent State and Samarkand State of Uzbekistan	2011/05–2014/03	Tashkent Region, Samarkand Region,
	Grass-roots Technical Cooperation for Improvement of Fruit Growing Technology in Ferghana Region	2008/04–2011/03	Ferghana Region

2. Activities of Japan's Private Sector

Uzbekistan's population, at roughly 30 million people, is the largest in Central Asia, and since agriculture is the principal industry, farm machinery, logistics/warehousing, and trading companies have made local visits and exhibited in trade fairs to look into the possibility of conducting business. However, there have been few specific examples of progress due to issues with foreign currency management, logistics routing, maintenance system development, etc. Under such circumstances, the companies and organizations listed below are looking into business expansion into Uzbekistan in consideration of the support schemes of JICA and JETRO.

Table 5-6: Activities and Issues of Japanese Companies Interested in Uzbekistan's Agriculture Sector

Organization name (active field)	Activity status
Torishima Pump Mfg. Co., Ltd. (irrigation and hydroelectric power pumps)	Currently supporting Uzbekistan's agriculture sector with pumps (through a JICA private sector collaboration project). Demonstrations are scheduled to be carried out in Chirchik in 2017. Issues: Inefficiencies of the aging irrigation system, installed 40 years ago. Upgrading pumps to boost efficiency and save energy, as well as establishing guidelines, are desirable improvements.
Yamabiko Corporation (agricultural machinery)	Yamabiko has delivered one SS ('Speed Sprayer', pest control equipment) to agriculture universities in each Samarkand and Tashkent in connection with an apple cultivation technical guidance project at Hirosaki University. In 2016, the company also lent its cooperation by offering inspection tours of its Morioka factory to visitors from Uzbekistan.
Textile trading companies (multiple)	Information is being gathered on infrastructure as well as the possibility of creating natural materials such as silk thread, etc. Interviews are also being held with sericulture farm households and fiber industry participants in Ferghana and Jizzakh regions.

In the field of academic research, the companies listed below have engaged in collaborative research using the experience and technology of Japan, and taken part in technical cooperation efforts. Aside from such activities, in recent years these companies have shown a trend of long-term human interaction including actively accepting international students from Uzbekistan and concluding academic exchange agreements between universities and faculties.

Table 5-7: Activities of Academic Research Institutes in Collaborating with the Uzbekistan Agricultural Sector

Organization name (active field)	Activity status
Hirosaki University	The university has supported improvement of apple cultivation techniques in Samarkand through Grassroots Technical Cooperation (regional economy activated special frame). Hirosaki University also entered into an inter-university exchange agreement with Tashkent State Agrarian University in 2016.
Tokyo University of Agriculture and Technology	The university has been supporting the improvement of technology and revenues for households engaged in sericulture in Ferghana. It has carried out demonstration tests to that apply to remote farming villages in Khorezm Region a model intended to increase Ferghana farm sideline income by improving sericulture and related industries. Through this they aim to improve the livelihood of residents by establishing a self-sufficient production system for high-quality silkworm cocoons.
Japan International Research Center for Agricultural Sciences (JIRCAS)	JIRCAS has nine years of cooperation experience in Uzbekistan. In recent years, the Center has conducted salt damage countermeasure tests and drainage tests as the Chief Advisor for surveys on salt damage countermeasures. JIRCAS has provided cooperation in Uzbekistan's agricultural sector, with particular focus on the field of irrigation water resources.

(3) The envisioned project

Taking as a starting point the issues in the local area discussed up to this point in the chapter, the proposal (project concept) provided by Uzbekistan and the state of activities being carried out by other donors and by enterprises and organizations in Japan, the following projects, designated A through F, are proposed. The various projects are categorized based on the issue addressed by that project, as shown below (see Table 5-8 and Figure 5-5). Details are discussed starting from page 144, but beyond providing aid in various aspects such as production, distribution and processing, the projects are also aimed at improving the overall food (including sericulture) value chain, and will not only encompass facilities improvement and the grant aid necessary to that end, but will also implement human resource development and technology transfer as a package, with the aim of carrying out the aid project more effectively and on an ongoing basis.

A. Raising the level of production, processing and distribution in order to promote the horticulture sector (Yen Loan, Two-Step-Loan)

When considering the feasibility of the project concept created by the Government of Uzbekistan, access to credit was identified as a bottleneck to implementation. This proposal is aimed at resolving that issue by improving access to credit. The target project will not only establish LCs that will integrate production, processing and distribution in a single facility, as illustrated by the project concept, but will also enable incremental improvement of each separate component, meaning, production, processing, distribution and others. The project will make credit available for projects tailored to regional characteristics and needs, and will strive to achieve improvement in the horticulture sector from the bottom up, raising the level overall. The project will not only address the availability of credit, however; it will also be crucial to cultivate human resources capable of designing and managing both the incremental and the overall implementation of each unit, meaning, production, processing and distribution. For this purpose, 1) support for dispatching experts from Japan, 2) training in Japan for local instructors ,would be effective as technical assistance. Moreover, there is strong interest in the local area in the introduction of state-of-the-art technology used in Japanese methods of cultivation (greenhouses and seedling rearing), distribution (sorting and temperature control) and processing (achieving high quality levels and differentiation), and the project will take into consideration linkages with Japanese companies that are interested in the agricultural sector in Uzbekistan.

B. Plan for improving storage and post-harvesting handling of products by farmers to maintain their freshness (Yen Loan, Two-Step-Loan + Technical Cooperation Projects)

This project focuses on how produce is handled immediately after being harvested, which is the most crucial aspect of quality control of horticulture crops. It provides aid for making credit available and for technology transfer in a package format, in order to refurbish facilities for pre-cooling and for storage at the site. By linking it to project A above, the quality of agricultural produce can be improved and competitiveness can be effectively assured.

C. Improved production and refurbishment of small-scale horticultural food processing facilities by bringing producers together (Yen Loan, Two-Step-Loan + Technical Cooperation Projects)

In the processing field in Uzbekistan, major processors that have received funding and technology from overseas play an active role, but there are not enough processing facilities to ensure employment in the region and to develop specialty products indigenous to the area. Because it is difficult to maintain and operate processing facilities in units of individual producers in rural areas, a structure is needed by which producers can be organized. Uzbekistan, however, does not have a culture of organizational activities such as the agricultural cooperatives and producers' associations found in Japan, so models for organization must be formed as the refurbishment of technologies and facilities proceeds.

D. Project to refurbish production environment with reference to Japan, to increase production of vegetables and fruits (Yen Loan, Project finance + Technical Cooperation Projects)

Because Uzbekistan's agriculture centers primarily around raw cotton and wheat, the country is currently in the midst of a transition to diversified agriculture, including vegetables and fruits that could possibly be exported. Raw cotton and wheat can be stored for long periods of time, and there have been no problems with storing and selling these products even when large volumes are harvested at one time. Vegetables and fruits, however, cannot be easily stored, so they need to be harvested over as long a time period as possible. To achieve this, rather than irrigating large-scale fields of raw cotton and wheat at one time, irrigation facilities need to be capable of separately irrigating each type of item being grown, at each growing stage. Because of this, not only does the infrastructure for supplying water from the source to the field or orchard need to be improved, but improving systemization and organization are also needed. Furthermore, inappropriate irrigation has led to accumulation of various types of salt in the soil being cultivated, and finding ways to prevent damage from salts is an urgent issue. In Japan, shallow canal technology has been established as a means for preventing damage from humidity in the arable lands. When shallow canals are installed, irrigation water no longer reaches the soil beneath the canals, and salts no longer accumulate as far as the surface layer (see III-(1)-B-3.-(c), "Drainage canals and salt damage problem" on page 53). This project proposes refurbishing the production environment in order to increase production of vegetables and fruits using Japanese technology.

E. Introduction of new species of horticulture crops and new cultivation technologies using Japanese technologies and species (Technical Cooperation Projects)

In the Soviet Union era, Uzbekistan was responsible for cultivating raw cotton and wheat, and the country is accustomed to a large-scale, extensive approach to agricultural management. Currently, Uzbekistan is transitioning to precision control of diverse types of fruits and vegetables, and Japanese species and agricultural technologies can make a contribution to the further development

of horticulture in Uzbekistan. Uzbekistan has strong interest in Japanese production technology, and this proposal includes human resource cultivation and technology transfer grounded in verification testing at the site. Preferably, when implementing the project, a research institute would serve as a liaison that could carry out technology transfers across all of Uzbekistan.

F. Construction of a sericulture value chain (Technical Cooperation Projects)

There are a number of problems plaguing Uzbekistan's silkworm production, including the use of silkworm species with low productivity, low quality based on an emphasis on production volume, insufficient efforts in mulberry tree growing, and insufficient quantities of mulberry leaves. Tokyo University of Agriculture and Technology implemented two JICA grassroots technical cooperation projects, one called "Revitalization of the Silk Road Silk Industry in Uzbekistan - Developing a Rural Income Generation Model by the Improved Sericulture in Fergana Valley" (2009-2012) and the other called "Technical Cooperation Project for Promotion of the Silk-Road Industry in Uzbekistan - Developing a Technical Transfer Model to Increase Sideline Income of Remote Villages" (2013-2015). These projects were highly successful, leading to the use of hybrid silkworm species using Japanese species, increased volume of silkworms as a result of introducing silkworm breeding technology, and product development using traditional silk fabrics. However, there are issues that stand in the way of further increasing silk production and expanding the production of silk products, among them upgrading mulberry orchards, cultivating silkworms twice a year (spring and fall), and refurbishing organizations that can provide guidance in creating silk products. The proposed project will build synergy, introducing activities that create interaction between Uzbekistan and entities such as Tokyo University of Agriculture and Technology and Tomioka City in Gunma Prefecture.

Table 5-8: Proposed projects and issues involving FVC

Issues involving FVC (See Figure 5-5 below.)		Proposed project: A. Raising the level of production, processing and distribution in order to promote the horticulture sector B. Plan for improving storage and post-harvesting handling of produce by farmers to maintain freshness C. Improved production and refurbishment of small-scale horticultural food processing facilities by bringing producers together D. Project to refurbish production environment with reference to Japan, to increase production of vegetables and fruits E. Introduction of new species of horticulture crops and new cultivation technologies using Japanese technologies and species F. Construction of a sericulture value chain					
		A	B	C	D	E	F
Overall	Difficulty in raising funds	◎	◎	◎	○	○	○
	Difficult market access	○	◎				
	Lack of information sharing	○	○			○	
	Lack of human resources	○	○		○		
Production	Lack of technology	○	○	○	○		○
	Aging infrastructure			◎	◎	◎	○
	Difficulty in procuring material such as agricultural fertilizer				○		○
	Furtuer promotion of proper use of farmland	○			◎		○
	Employment security				○		◎
	Lack of farmer cooperation				○		○
Manufacturing / processing	Aging equipment	○	○	○			
	Lack of reliable quality certification	○				○	
	Lack of packing technology	○					
Distribution	Aging distribution infrastructure	○		○			
	Lack of regional networks	○		○			
	Lack of reliable marketers and distributors	○		○			
Marketing	Lack of international competitiveness	○	○	○		○	
	Lack of brand power		○	○		○	○
	Distrust of quality	○	○	○		○	○
	Lack of information on market needs					○	○

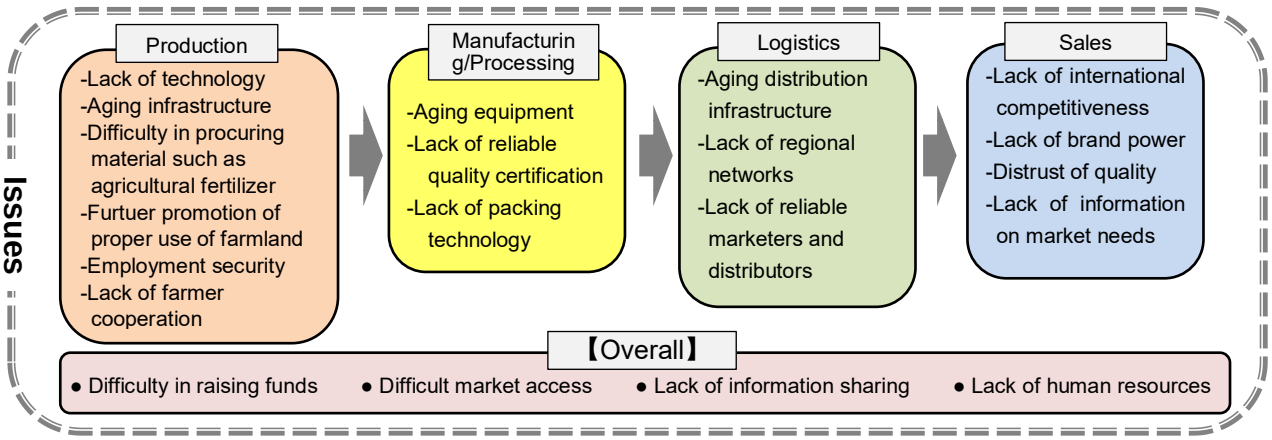


Figure 5-5: Organization of common FVC construction issues involving agricultural sector (reprinted)

Appendix

Appendix 1: Project concept

Appendix 2: Banks & Lease

Appendix 3: Summary of open seminar

Appendix 1: Project concept

Ministry of Agriculture and Water Resources

The Republic of Uzbekistan

Rural Restructuring Agency

Project Concept

"Horticulture Development Project in the Republic of Uzbekistan"

Activities for implementation of the "model" projects for the production, storage, processing and formation of an effective commercial and logistics infrastructure of horticulture export in Uzbekistan with financial assistance of "JICA"

Tashkent 2015

Content

1. The purpose of the project (description)

With limited land and water resources, intensification and diversification of agriculture, radical land improvement, the deepening of breeding, introduction of modern agricultural technologies and highly efficient water management are the priority directions of development of agriculture of the Republic of Uzbekistan.

As a result of a deliberate policy in the field of agricultural development recent years have seen production growth in exports of high-quality fruit and vegetable products and horticulture production compared to traditional crops such as wheat and cotton. In particular, the statistics show that by the end of 2014, total exports of fruits and vegetables increased more than threefold, from about 373 million US Dollars to 1.5 billion US Dollars. In terms of exports of apricots, plums, grapes, nuts, and cabbage and other fruits and vegetables Uzbekistan is surely among the world's top ten suppliers.

Uzbekistan has a good geographical location, taking into account the prospects of development of export performance in traditional and potential markets. However, it should be noted that the participants of the sector do not fully realize the existing potential of the country, including the issue of compliance with international requirements for quality and food safety in the external markets.

In order to ensure sustainable growth of horticulture sector a number of investment projects with foreign loans guaranteed by the Government of the Republic of Uzbekistan are currently being implemented.

On the basis of the authority and the positive experience of work and collaboration, the implementation of investment projects in the field of horticulture sector in the country with one of the most promising joint venture is with the Japan International Cooperation Agency (JICA), in particular the project "Horticulture sector development in the Republic of Uzbekistan".

The project "Horticulture sector development in the Republic of Uzbekistan" with the assistance of JICA is developed on the basis of:

1) Order of the President of the Republic of Uzbekistan dated 01.07.2014 "On measures to implement the practical outcomes of the International Conference "On the implementation of the most important reserves Food Program in Uzbekistan" № P-4308;

2) Joint Declaration of the 5th meeting of foreign ministers of Central Asian countries and Japan in the framework of cooperation "Central Asia plus Japan" (07.16.2014);

3) Resolution of the President of the Republic of Uzbekistan dated 02.02.2015 "On measures for the further expansion of trade-economic, investment, financial and technical cooperation between Uzbekistan and Japan" № PP-2292.

The project aims are to increase the productivity and profitability of horticulture sector, the modernization and organization of modern enterprises for the production of export-oriented high-quality horticulture products, meeting all international standards of quality and safety.

The project includes the provision of preferential credit lines to participating commercial banks through the allocation of foreign currency funds to refinance projects for the production, storage, processing and formation of an effective commercial and logistics infrastructure of exports of fruit and vegetables.

Assistance by JICA to the financing of this project will be:

- To stimulate the further development of the horticulture sector in the country;

- To carry out the implementation of the "Road map of cooperation with Japan in the field of agriculture" (adopted on 16 July 2014) in horticulture sector (attached);

- Creation of a logistics distribution center for the storage and processing of fruits and vegetables;

- The introduction of modern technologies of Japanese crop production, soil quality control and production, processing and storage of fruits and vegetables, agricultural pest.

The total cost of the project amounts to 148 428 000 US dollars (including capital investments 123.70 million US dollars), including:

• JICA loan is in the amount of 97.80 million US dollars (1.4% interest rate, maturity of 30 years, including a grace period of 10 years);

• JICA grant funds are in the amount of 2.20 million US dollars;

• The contribution of the Republic of Uzbekistan is in the form of tax incentives, single social payment, also cover of financial costs in the investment period – eq. 24.728 million US dollars;

• The contributionof the beneficiaries - eq. 23.7 million US dollars, is formed at the expense of own funds of the beneficiaries in the amount of 20% of the total cost of the sub-projects.

Loan of JICA will focus on the following objectives:

- Credit line to create a "model" projects - 94.8 million Dollars;

- Marketing research, monitoring and management of the project - 3,0 million USD (preliminary);

Grant of $ 2.20 million US dollars will be aimed at increasing knowledge of farmers and agricultural companies to implement GlobalGAP standards, modern technologies of cultivation, plant protection, the study of the soil, and so on

Project implementation period is from 2016 to 2022 (7 years).

The project will cover the territory of Andijan, Bukhara, Jizzakh, Kashkadarya, Navoi, Namangan, Samarkand, Syrdarya, Tashkent and Ferghana regions.

The main beneficiaries of the project are trade and logistics companies, diversified farms, agricultural firms, enterprises on processing agricultural production, employment and planning to do in the horticultural sub-sector of the country.

2. The Customer of the project

Executive body, responsible for timely implementation of the project, targeted and effective use of loan funds is the Ministry of agriculture and water resources of the Republic of Uzbekistan.

The functions of coordination, implementation and management of the project entrusted to the Rural Restructuring Agency under the Ministry of agriculture and water resources of the Republic of Uzbekistan.

It should be noted that RRA has extensive experience in large international projects in Uzbekistan. Currently, the Agency implemented a series of major projects, totaling more than 325 million USD, including:

- Project "Improving the melioration of lands in Bukhara, Navoi and Kashkadarya regions" with the Asian Development Bank and the global environment fund (GEF) - 166 400 000 US dollars;
- The project "Support to the development of infrastructure and restructured farms Akaltyn district of Syrdarya region" with the Asian Development Bank (ADB) - 72.0 mln. US dollars;
- The project "Rural enterprises Support project" with the IBRD - 43.5 million US dollars;
- The project "Improving the productivity of crops" with ADB - 40.0 mln. US dollars;
- The project "preventing and responding to the risk of an avian flu pandemic in the Republic of Uzbekistan" - 2.96 million Dollars.

In addition, current projects: "Rural enterprises Support project. Phase II"with the participation of the International development Association (IDA), GEF, the Swiss Agency for development and cooperation - 131.6 million Dollars, "Support the development of horticulture sector in the Republic of Uzbekistan"with the participation of the International Fund for agricultural development (IFAD) is 28.4 million Dollars.

3. THE COVERAGE OF THE MACROECONOMIC SITUATION

The economy of the Republic of Uzbekistan for years of independence is developing on basis of the national model taking into account the socio-economic potential of the country, the history of the Uzbek people, national values and global best practice.

As a result of the change the structure of the economy was radically altered, a reliable legal framework for its dynamic development and favorable investment climate were created.

This is evidenced by such macroeconomic indicators as the increase during the years of independence of the national economy in 5.5 times, GDP per capita in purchasing power parity is

4 times. The implementation of the State budget has been achieved with a surplus since 2005, thereby enhancing macroeconomic stability.

Agriculture is the largest sector of the Uzbek economy and plays an important role in ensuring economic and social stability of the country. The possibility of raising the people's welfare, economic stability and balance of the consumer market depend from its state.

The agrarian reform in Uzbekistan contributes to the development of agricultural infrastructure to provide agricultural producers a wide range of industrial, banking, consulting, trading, veterinary and other services. And efficiently to move product from field to final consumer, on the one hand, and on the other – effectively deliver market information from the consumer to the manufacturer.

The successful development of the agricultural sector of the Republic of Uzbekistan in many respects depends on the application of advanced equipment and technologies, introduction of innovations in agricultural production, effective management of agriculture under conditions of changing climate globally.

The agricultural sector provides about 18% of the gross domestic product (GDP), a large part of foreign exchange earnings of the country. It employs more than 40% of the working population. The agricultural sector not only supplies food to the population, but also is an important source of raw materials for other sectors of the economy.

Over the last ten years in the structure of GDP significant positive structural changes across sectors of the economy have undergone.

Structure of grossdomesticproductby industry sector(%)

	2005	2013	Changes (+/-)
Industry	21,1%	24,2%	3,1%
Agriculture	26,3%	17,6%	-8,7%
Transport and communication	10,6%	11,9%	1,3%
Construction	4,8%	6,0%	1,2%
Trade and catering	8,8%	8,5%	-0,3%
Other sectors, including services and taxes	28,4%	31,8%	3,4%

Source:StateCommitteeon Statistics of Uzbekistan

Data show that in recent years there was rapid growth in the industry. If in 2005 the share of industrial production in GDP stood at 21%, in 2013 it rose to 24%. During the same period, the share of agriculture fell from 26% to 17%. The decline in the share of agriculture means that production in these years decreased. It has developed rapidly, and on average over 2004-2013, the growth rate of gross output of agriculture amounted to 6.5%, including crop production - 6.7% and livestock production - by 6.4%. Diversification of economic sectors of the Republic, has allowed an increase in the share of industry in the GDP structure.

The volume of gross output of agriculture of the Republic in 2013 amounted to 31,0 trillionsums, including the amount of crop production to 18.5 trillionsum and livestock - 12.5 trillion sum.
The main means of production, and the "Golden Fund" of the Republic, are irrigated. Today the total area of irrigated lands in the Republic that are used by land users engaged in agricultural production amounted to 3.7 million hectares, or 24% of the total area of agricultural land.

In recent years, the Republic has taken targeted measures for the gradual optimization of the structure of sown areas in favor of food crops in dehkan and private farms.

The measures of optimization of structure of sown areas for the period 2008 - 2014 have provided a reduction in the acreage of cotton - 124,0 thousand hectares and the expansion of cultivation of crops grain cereals - by 74.6 thousand hectares, potatoes - by 20.4 thousand hectares, vegetables - by 29.1 thousand hectares, melons food - by 9.3 thousand hectares.

In 2014 the total area of agricultural crops in all categories of farms amounted to 3678,0 hectares. Of which, the area occupied by potatoes, amounted to 80,3 thousand hectares (+2.6 per cent by 2013), vegetables - 191,9 thousand hectares (+1.4 per cent), melons food - 51,5 thousand hectares (+1.8 per cent).

In addition, expanding of fruit and orchards, the total area in 2014 reached 262,5 thousand hectares, of which 47.6 thousand hectares or 22.2% more than in 2008, thus, pays special attention to the creation of new intensive orchards of dwarf and semi-dwarf fruit trees, fruit on the second or third year.

As a result, in 2014 in all categories of farms 8050,5 thousand tons of cereals (+3.1% 2013), 3400,2 thousand tons of raw cotton (+1,2 percent), 2452,4 thousand tons of potatoes (+9.0 per cent), 9286,7 tons of vegetables (+9.1%), the 1696,1 thousand tons of melons food (+8.9 percent), 2490,6 tons of fruits and berries (+10,2%), 1441,2 thousand tons of grapes (+9.0 per cent) produced.

In the process of reforming of agrarian relations,market mechanisms of economic management gradually improved, a legal agrarian framework was created and economic reforms were carried out. In agricultural production there are different forms of management, provided legal protection of private property. In the system of mixed economy of the agricultural sector the development of farms prioritizes. Farms are not only the source of the welfare of rural families, but also the lifestyle of a farmer.

The development of farms promotes competition in the market of agricultural products and is an integral part of a market economy. The Order of the President of the Republic of Uzbekistan from October 29, 2009 P-3287 "On measures to further optimize the size of land plots managed by farmers" was made in order to further improve the functioning of farms, by implementing additional measures to optimize the size of land plots under their care, providing on that basis an increase in yields and production volumes of agricultural products, as well as improving the financial situation of farms.
As a result of optimization of land plots number of farmers in the Republic in 2013 amounted 73588 and the average size of the land was 80.7 ha.

Along with farming, dehkan farms played a big role for the development of agriculture.

Unlike private farms, dehkan farms in its sole discretion, focusing on the market, place their own crops and produce the necessary agricultural products for own consumption and the implementation of its market value.

As of 2014, the number of dekhkan farms accounted for more than 4.7 million units, of which 33264 with the formation of a legal entity. For dehkan farms 726,3 thousand hectares of land was fixed, including 536,2 thousand hectares irrigated land.

Currently, the state pays great attention to the development of the horticultural sector of Uzbekistan. The resolution of the President № PP-255 dated 11 January 2006 "On organizational measures to reform horticulture and viticulture", and the Decree of the President № PP-1047 of 26 January 2009 "On additional measures on expanding production of foodstuffs and saturate domestic market" identify important measures for the further development of the horticultural sector. These measures are aimed at the development of market infrastructure in the field of agribusiness by creating a distribution, procurement and storing of enterprises, development of investment projects aimed at expanding exports, and introducing tax exemptions and reducing tax rates for companies operating in this field.

Investment in agriculture of Uzbekistan is the main condition for the modernization of the agricultural sector and becomes the most important factor of its further development. During the reporting period the total investment in the agricultural sector amounted to $ 636.6 million USD, which is 5 times higher than in 2005. The specific investments per 1 ha amounted to 174,0 US dollar.

According to MAWR today in the Republic there are 10 533 infrastructure, which is 9, 029times more than in 2005 Directly to horticulture sector the following objects provide services: agricultural firm, points billet of agricultural products, the items of information support and consulting services, the items of packaging and container harvesting and so on.

Dynamics ofthe creation ofinfrastructure in agriculturein Uzbekistan

№	Nameofinfrastructure	2005	2014	Changes (+,-)
1	Agrofirms	0	274	+274
2	Minibanks	178	1293	+1115
3	AlternativemachineTractorParks(MTP)	366	1543	+1177
4	Associationofwaterusers	253	1497	+1244
5	Points of saleof petroleum products	244	1359	+1115
6	Points of saleof fertilizers	218	884	+666
7	Points of harvestingagricultural products	99	582	+483
8	The pointsof information supportand consulting	61	328	+267

9	Pointsoftransportservices	0	105	+105
10	Points of packaging andcontainerharvesting	0	77	+77
11	Pointstoprovideveterinaryservicesandsaleof pedigree cattle	85	2591	+2506
	Total	**1504**	**10533**	**+9029**

Source: Ministryof Agriculture and WaterResources of Uzbekistan.

4. STATE SUPPORT

In Uzbekistan, over the years, strategy of development of agriculture consistently implemented aiming at ensuring food security of the country.

This approach to the production of fruit and vegetables as an important part of the whole system of livelihood, maintaining their health, as well as the creation of conditions of employment has become one of the main vectors of economic and social policy of the state.

So, one of the first measures to radically change the approach to achieve food independence in Uzbekistan, was an unprecedented decision, taken back in 1989on the allocation of more than 400 thousand hectares of irrigated land for garden plots.

Further steps in the implementation of market and institutional reforms in the agricultural sector included changes in the structure of sown areas, a reduction of almost 2 times in favor of cotton crops. As a result, Uzbekistan, which previously imported more than 80% of the demand for grain, gained grain independence. Annually, the country produces about 8 million tons of crops.

Other important directions of the state policy in the field of agriculture are:

- The elimination of the state and collective farms and the establishment of farms, providing productivity growth based on modern agricultural technologies;
- Diversification of the sectors of the agricultural sector, the development of potato farming, viticulture, apiculture, poultry and fish;
- Extension of the system of preferential crediting of agricultural production;
- Creation of an effective system of maintenance of farming enterprises, as well as provisionofnecessarymaterial and technical resources (fuel, chemical fertilizers, biological and chemical pesticides, seeds)for their needs;
-Formation of logistics system for storage and transportation of agricultural products, as well as its industrial processing.

Much attention is paid to the development of farming. It is creating and improving the legal framework. The Law "On the farm" and the provisions of Presidential Decree "On measures for further improvement of the organization and the development of farming in Uzbekistan" purposefully work to transform the farm as a major producer of agricultural products, a powerful social and political force capable take responsibility for the further development of the agricultural and other sectors, as well as to increase the level and quality of life.

For a short period in Uzbekistan drastic reforms were carried out, which allowed almost entirely to diversify agriculture and to provide the population with basic food crops, to establish large volumes of their exports.

Thanks to the measures taken by the system export potential of the industry is steadily increasing. In recent years, Uzbekistan has become a major exporter of high quality and competitive horticulture products. In order to ensure it throughout the year a lot of attention is paid to the processing and storage. Over the past 10 years, the volume of processing of vegetables and grapes increased by 3.5 times, including the volume of canned fruits and vegetables increased by 2.5 times, dried fruits - 4 times, natural juices - 7 times. The share of processing exceeds the total production of vegetables and grapes for more than 16%. Currently more than 180 species of fresh and processed fruit and vegetable products are exported. Inthestructureof exports, its share reaches 73%.

The geography of exports of horticulture and viticulture is expanding. Previously Republic traditionally supplied it mainly to Russia, Kazakhstan and other CIS countries, then today it is shipped from Uzbekistan to the markets of over 120 countries. In particular, the geography of deliveries has expanded by establishing exports to Indonesia, Norway, Mongolia, Saudi Arabia, Slovakia, the USA, Thailand and Japan.

There have been positive developments in the water sector.

The issues of improvement of ameliorative condition of irrigated lands, rational and careful use of scarce water resources, and an increase in soil fertility are one of the priorities in the policy of the further development of the country. Uzbekistan over the years has managed to not only maintain its irrigation potential and successfully to modernize and improve the irrigation system. The principles of integrated water resources management, advanced water-saving technologies, systems automated control and management of water distribution are widely introduced; measures to improve the technical conditions of water facilities of irrigated land, agricultural diversification are taken.

For effective management of water and water supply for water users and consumers 10 basin management of irrigation systems, 1502 water users' association, with about 70 thousand Members across the country have successfully operatedsince 2003.

Every year a renovation of more than 5.0 thousand km of canals is made by the state budget and by water users - more than 100,0 thousand km of irrigation network and chute, 10 thousand units of various hydraulic structures. In recent years, the republic built and reconstructed about 1.5 thousand km of canals, more than 400 large waterworks and 200 pumping stations.

In 2007 a specialized fund for land reclamation was created. At the expense of this structure State Program for Land Reclamation in 2008-2012 has been developed and implemented.

On the implementation of measures, including the construction, reconstruction and rehabilitation of drainage systems, it spent more than 500 million US dollars.
To implement the program, a special company "Uzmeliomashlizing", which in accordance with the Program of further modernization, technical and technological re-equipment of agricultural production in the years 2012-2016 on an annual basis provides enterprises involved in irrigation and reclamation activities on the basis of preferential lease more than 5,000 units of special

equipment. During the reporting period the company provided the participants more than 50.0 million units of modern agricultural and other machinery.

In order to further improve the reclamation and irrigation infrastructure the State Program on improvement of irrigated land and the rational use of water resources for the period 2013 - 2017 years has been approved. For its implementation more than 1.2 billion US dollars has been provided.

As part of the program in 2013-2014, 1771 km drainage network was built and reconstructed, repair work on the 24.7 thousandkm was carried out, and at a reduced lease 360 units of reclamation techniques were purchased. In addition, irrigated lands on the area of more than I million 700 thousand ha were improved.

Particular attention is paid to the development of water-saving irrigation technologies. So, in recent years it has been implemented drip irrigation over an area of 16.3 hectares with an annual increase of 5 hectares. Watering by means of flexible hoses and through the film is already applied on the area of 18.7 hectares, mainly in the cotton fields.

In the period from 2013 to 2017 at the expense of the state long-term loans to land users and farmers for the implementation of drip irrigation systems on an area of 25 hectares will be allocated on a preferential basis.Farmers who have implemented water-saving technologies in their activities, are exempt from payment of land and other types of taxes for 5 years.

Government pays great attention to the improvement of water infrastructure by attracting foreign investment. A major project with the participation of international financial institutions and partner countries is being carried out.

Such projects as "Drainage projects in Uzbekistan" worth 74.55 million US dollars with the World Bank, "Rehabilitation of the pumping stationKuyumazar"together with the Organization of Petroleum Exporting Countries (cost - 12 million US dollars), "Rehabilitation of Karakul pumping station" with the assistance of Chinese investors (14 millionUSDollars) have now been completed.

In the period 2009-2014, the first two phases of "German Water Initiative for Central Asia" have successfully been implemented, in particular the program "Trans boundary Water Management" (TBWM), under which the reconstruction of interdistrict channel "Bad Bad" (Samarkand region) rivers "Padshaata" (Namangan region) and its headwork. Also technical assistance was provided to the State Inspectorate for Control and Supervision of the technical condition and safety of the largest and most important water economy objects under the Cabinet of Ministers of the Republic of Uzbekistan (Gosvodkhoznadzor), SUE "BotiometrikMarkaz",Zarafshan basin management of irrigation systems, the Executive Committee of the International Fund for Saving the Aral Sea.

5. PROJECT STRATEGY

Agriculture plays a crucial role in ensuring economic and social stability during the reform. The possibility of improving the welfare of the people, economic growth and the balance of the

consumer market depend on its state. This industry is a priority for the entire field of tangible and intangible production.

The main objective of the project is to increase the efficiency and productivity of horticultural sector, and improving trade logistics infrastructure exports of fruits and vegetables.

In the public sector, the project will provide institutional support for the creation of CAs, quality and safety of fruits and vegetables.

The project envisages the use of Japanese management practices in agriculture (production, harvesting, processing, logistics and export), the creation of energy-saving greenhouses using the technology of "hydroponics", transfer of knowledge and experience of agricultural cooperatives. Tackling agricultural firms will be carried out on a competitive basis according to criteria such as the availability of infrastructure (train station and cars, electricity and gas maintenance), the current production of fruits and vegetables on an area of not less than 100 hectares, the potential for storage and processing of horticultural products, the availability of land plot for the construction trade and logistics centers, the possibility of collateral and repayment of the loan.

The project is expected to provide suchagricultural companies long-term soft loans, tax and customs privileges, exemption from the mandatory sale of foreign currency earnings from exports. It is expected that the selected agricultural firms will be able to obtain credit for the implementation of their business plans.

The project will implement the following components:

- Component 1: "The credit line to create a "model"projects";
- Component 2: "Improving knowledge of farms and agricultural enterprises";
- Component 3: "Market research, monitoring and management of the project".

Description of the components

Component 1: "The credit line is to create a "model"projects"

In this componentthe following activities will be carried out:

- Selection of participating commercial banks to refinance by JICAcredit;
- The signing of the tripartite agreements between the RRA, the Ministry of Finance and the participating commercial banks;
- Financing of subprojects.
- The selection of eligible firms, companies and agricultural companies to create model projects "turnkey" business and financing plans for production, storage, processing and the formation of regional trade and logistics center "from field to consumer";
- Together with the World Bank project "Development of the horticulture sector in the Republic of Uzbekistan" the implementation of standards for the production, preparation, certification and marketing of fresh and processed horticulture products, in accordance with the standards of GGAP, HACCP and others,internationally recognized standards for food safety.
- Establishment of certification, quality and safety of fruits and vegetables.

Types of credit

The credit line will provide the following types of loans.

- Investment loans to finance the development of trade and logistics centers, and other types of investments in the horticulture sector.
- Traditional working capital loans of up to 18 months.
- The financing of industrial relations and chains of value creation.

The main terms and conditions of credit:

(a) Participating financial organizations (PVO) in the credit line under the Lending Agreement make loansto eligible beneficiaries for the implementation of eligible sub-projects under the leadership of Credit and its banking requirements.

(b) PVO will receive funds of the credit line in hard currency for the period up to 15 years, including a 5-year grace period.

(c) Funds will be issued in Uzbek sums or US dollars, based on the needs of sub-borrowers.

(d) Interest rate of PVO is specified in the loan management.

(e) Repayment of loan principal and interest will be in hard currency.

(f) The maximum repayment term of sub-loans will not exceed 10 years or the period of depreciation of an asset, depending on which date comes first. Actual size and maturity of the loan/lease will depend on the type of funded investments, profitability of operations, generated cash flows, collateral, and other considerations.

(g) The maximum percentage of financing: The project will finance up to 100% of the sub-loans/leasing transactions in US dollars.

(h) PVO assess sub-loans/leasing and sub-borrowers on the basis of agreed criteria, and fully take over the risk of repayment of sub-loans.

Presence of regional branches and representative offices of PVO is presented in the following table.

Presence of regionalbranches and representative officesby regions

Regions	JSCB Agro-bank	JSCB «Microc redit-bank»	JSCBXa mkor-bank	JSCPr omstro ybank	JSCBQi shloqqur ilishbank	JSCT uron bank	JSIC Bipak Yo'li	JSICBIp oteka bank	GCX alq bank
Andijan	+	+	+	+	+		+	+	+
Bukhara	+	+	+	+	+	+	+	+	+
Jizzakh	+	+	+	+	+			+	+
Kashkadarya	+	+	+	+	+	+	+	+	+
Navoi	+	+	+	+	+	+	+	+	+
Namangan	+	+	+	+	+	+	+	+	+

Samarkand	+	+	+	+	+	+	+	+	+
Syrdarya	+	+	+	+	+	+	+	+	+
Tashkent	+	+	+	+	+	+	+	+	+
Fergana	+	+	+	+	+	+		+	+

High level of qualitative and quantitative losses in the collection, processing, transportation, storage and processing of fruits and vegetables, as well as the lack of modern specialized procurement, trade and logistics infrastructure (sorting, grading, packaging) has identified the need for the implementation of a single component designed to provide soft loans for the creation the establishment of model projects "turnkey" for the production, storage, processing and the formation of regional trade and logistics center "from field to consumer" on the basis of existing or established agricultural companies owning a cold storage capacity of at least5.0 thousand tons.

Model projects will be conducted in each project area, and they will be managed by research institutes, the project agronomists and international consultants.

It is proposed to use selection criteriain the selection of model projects, demonstration sites can be created based on the field of the farm and on the scientific and experimental base of the institutions involved.

The project will assist the producers of fruits and vegetables in the use of advanced methods of production and refining on the basis of internationally recognized food safety system. Based on international experience, the development and adaptation of a modern system of food safety in the horticultural sector will be assisted in.

Also the development of guidelines on the requirements to the quality and packaging of products used in the various countries of importing fruit and vegetables in Uzbekistan and the countries - potential importers will be provided.

The above activities will be carried out jointly with the World Bank project "Development of the horticulture sector in the Republic of Uzbekistan".

It is planned to create centers of certification, quality and safety of fruits and vegetables.

Component 2: "Improving knowledge of farms and agricultural enterprises"

This sub-component aims to improve the transfer of knowledge and best practices in the field of new production methods, storage, post-harvest handling and marketing and business management.

The subcomponent will support producers of fruit and vegetables in the use of advanced methods of production and refining on the basis of internationally recognized food safety system. Based on international experience, the development and adaptation of a modern system of food safety in the horticultural sectorwill be assisted in.

In addition, for the most important fruit and vegetable crops detailed manuals and video tutorials covering all aspects related to weeds, pests and diseaseswill be developed. This information will also be posted on the web portal, distributed through regional offices in electronic form and in the form of a manual in printed form at the field days, training sessions and other activities as a handout.

In particular, it will assess the requirements for the food safety of the supply chain, both nationally and internationally, in order to identify shortcomings, which will develop appropriate standards and procedures for use at all stages of the value chain.

Also the development of guidelines on the requirements to the quality and packaging of products used in different countries, the importer of fruits and vegetables in Uzbekistan and the countries - potential importerswill be provided.

In the project overseas study tours for officials and techniciansswill also be held, in order to familiarize with the legal bases and ways/methods of assessment, management and communication of information on risks to food safety.

Measures to improve knowledge and skills of producers and processors will be implemented through:

-Conducting demonstrations and training for beneficiaries including modern technologies of production, post-harvest handling, storage, cultivation in greenhouses, etc.

- Representatives of trade and processors will inform of the preferred varieties, and demonstrate how they should be packaged, categorized, sorted, etc.

As part of the component:

• Co-financing of the project "Development of the horticulture sector in the Republic of Uzbekistan" with the participation of IBRD in the sub-component - capacity building of manufacturers in the field of international quality standard Global GAP.

• Increased knowledge and skills of producers associated with growing, harvesting, processing, storage, transportation, marketing and export of fruit and vegetables.

This component aims to build the capacity of producers of fruits and vegetables, as well as to improve the knowledge and skills associated with growing, harvesting, processing, storage, transportation, marketing and export of fruit and vegetables.

Component 3: "Market research, monitoring and management of the project"

The component aims to:

- conducting market research in the sector of horticulture;
- monitoring of the project;
- support the activities of RRA and financing of the general management of the project.

In order to determine the current position and orientation of the efforts of the beneficiaries in the long term, this component will begin its activities with the marketing research. The experience of existing projects shows that market research should be carried out in the early stages of the project and updated in three or four years, to take into account the new market realities.

The component will focus on strengthening the capacity of the Executive Agency in the field of project management, monitoring and evaluation through the provision of goods, consulting services, training and financing of operating expenses.
This component:

- supports the activities of the Executive Agency, and finances overall project management and contract administration, procurement and financial management;
- creates a reliable management information system, organizes data collection and reporting on key performance indicators of results and impact of the project by comparing the raw data, joint evaluations, mid-term review and final evaluation.
- Executive Agency will have overall responsibility for the financial management of the project, including the management of the flow of funds, budgeting, accounting, reporting and auditing.

Geographyoftheproject

The project will be carried out on the territory of Andijan, Bukhara, Jizzakh, Kashkadarya, Navoi, Namangan, Samarkand, Syrdarya, Tashkent and Ferghana regions.

All of the selected areas for the project are the most productive regions in respect of fruit and vegetables with the largest area of land dedicated to horticulture. In these areas, there are favorable climatic conditions for the cultivation of fruits and vegetables.

Projectarea

Andijan region is the easternmost region of Uzbekistan, which occupies the eastern part of the Fergana Valley. It shares borders with the Republic of Kyrgyzstan, Ferghana and Namangan regions. The regional center - the city of Andijan.The area of the region - 4.30 thousand sq. Km.
Andijan region - the smallest in size, but the most densely populated in Uzbekistan, nearly 10% of the population all over Uzbekistan. The total population of the region at the end of 2013 was 2805.5 thousand People, including the city 1476.3 thousand People (52.6% of the total) and 1,329,200 agriculture (47.4%).
According to the State land fundCommittee "Zemgeodezkadastr" area of the region is 374 thousandHa, including 255 ha of agricultural land or 68%.

According to the Research Institute for Soil Science and Agricultural Chemistry, in 2002 the average score of irrigated agricultural land in the province was 57.

Irrigated land areas are in a good state of reclamation. Only 3.0% of the land affected by salinity, and the rest 97.0% - non-saline. According to the degree of salinity, the share of slightly saline - 1.3% of the land, middle saline - 1.7%, and strongly saline lands there.
Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 3056.1 billion sums, including crop production and livestock 2203.8 billion sums 852.3 billion sums. The growth rate of agricultural production to the previous year was 107.5%, including crop production - 107.3%, animal products - 108.2%.

In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 229.9 thousand Ha. The main areas were occupied by grain crops, which account for 36.3%, cotton35.7%, potatoes 2.4%, vegetables 6.9%, melons 0.7%, forage crops5.4%, orchards 11.1% and vineyards1.5%.

Most of the crop is placed in farms, which account for - 85% of the total arable land in the farmer households - 12.4% and agricultural enterprises - 2.2%.

Vegetables are placed on the area of 18.1 thousand hectares. Melons - by 1.7 thousand ha. The average yield is 30 tones/ha and 24 tones/ha respectively. 65% of the area for vegetables and 45% for melons are at the disposal of dekhkan farms.

From perennial plants in the area there are 29.2 thousand Hectares of gardens and 4.0 thousand Hectares of vineyards, of which the gardens at fertile age make up 89%, and vineyards - 90%. The average yield of the gardens is 185 quintal/ha. Vineyards - 158.0 quintal/ha. At the disposal of farms there are 48% of gardens and 70%vineyards, and the rest in farmer households.

The main producers of agricultural products in the region are farmers. According MAWR, the number of farms in the region as of 01/12/2014, amounts to 6590 units. On average, one farm accounts for 37.3 hectares agricultural crops, orchards and vineyards.

According MAWR number of dehkan farms as of June 2014 amounted to 481,972 units. At one private farm it accounts for 0.10 ha crops and perennial plantings. In general, private farms produce animal products, potatoes and fruit and vegetables.

According MAWR in 2014 greenhouse cultivation of vegetables was carried out in 4492 the greenhouse area, a total area of 411.8 hectares.

For the storage and freezing of fruits and vegetables in the region there are 260 cold stores with a storage capacity of 47 thousand tons.

Bukhara region - an area located in the southwestern part of Uzbekistan, most of its territory is occupied by the Kyzylkum desert. It shares borders with Turkmenistan, Navoi and Kashkadarya regions and the Autonomous Republic of Karakalpakstan. The territory - 39.4 thousand sq. km. The territory - the desert plain with some hills, more than 90% of the area occupied by the sands of KyzylKum, only in the south, in the lower reaches of the Zarafshanthere are are small, irrigated oasis - Gijduvan, Bukhara and Karakul. The climate is sharply continental. Winter is very cold, summers are hot and dry. Water resources are limited. The main rivers are Amudarya and Zaravshan. Amu, Amu-Karakul machine channels are held from the Amudarya to the irrigated oasis of Bukhara.

The total population of the region at the end of 2013 was 1707.6 thousand people, including urban population -546.4 thousand people (32% of the total) and 1161.2 thousand people –rural population (68% of the total).

In 2013, the total area of irrigated land in Bukhara region was 274.9 thousand ha. In this area irrigated horticultural crops amounted to 33,9 thousand ha., including fruit - 11.6 thousand ha., vineyards - 9.7 thousand ha., vegetables - 8.2 thousand ha. and potato - 4,4 thousand ha.

Horticulture is an important sector of economy of Bukhara region. Horticulture industry is one of the first in the country in terms of yield. In 2013, the average yield per 1 ha. was as following: fruit - 189 quintals, grapes - 160 quintals, vegetables - 257 quintals and potatoes - 245 quintals. However, the volume of production and the level of processing of fruits and vegetables produced in the Bukhara region remain high. At the disposal of farms there are 58.3% of orchards and 58.3% of vineyards and the rest at dehkan households' disposal.

Irrigated land areas are in a satisfactory state of reclamation. 89.5% of the land affected by salinity and 10.5% of the land is non-saline. According to the degree of salinity, the share of slightly saline land is 61.5% of the land, middle saline - 25.0% of the land, and 3.0% of the land is strongly saline.

Jizzakh region - the administrative region of the Republic of Uzbekistan.Jizzakh region located in the central part of Uzbekistan, between the rivers Syrdarya and Zarafshan. The regional center - the city of Jizzakh.The territory - 21.21 thousand sq. Km.

The total population of the region at the end of 2013 was 1226.8 thousand people, including urban - 581.4 thousand persons (47.4% of the total) and 645.4 thousand People - agriculture (52. 6%).

According to the State land fundCommittee "Zemgeodezkadastr"area of the region is 1447.4 thousand Ha, including agricultural lands 1182.4 ha or 81.7%.
According to the Research Institute for Soil Science and Agricultural Chemistry, in 2009 the average score of irrigated agricultural land in the province was 51.

Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 1.5288 trillion UZS, including crop production - 756.1 billion UZS and livestock - 772.7 billion UZS. The growth rate of agricultural production to the previous year was 106.2%, including crop production - 103.7%, animal products - 108.5%.

In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 394.4 thousand Ha. The main areas were occupied by grain crops, which account for 53.35%, cotton26.2%, potatoes 0.45%, vegetables 2.1%, melons 1.3%, forage crops12.2%, orchards 3.4% and vineyards1.0%.

Most of the crop is placed in farms, accounting for -91.6% of the total arable land in the farmer households -6.0% and agricultural enterprises - 2.4%.

Vegetables are placed on an area of 8.1 thousand Ha, Melons by 5,1 thousand Ha. The average yield of 20.3 tons/hectare and 17.5 tons/ha, respectively. At the disposal of dekhkan farms there are 58.0% of the area for vegetables and 56.9% for melons.

From perennial plants in the area there are 13.1 thousand Ha Gardens and 4.0 thousand havineyards, orchards are at fertile age - 77.9%, and vineyards - 92.5%. The average yield of gardens 71.2 quintal/ha and vineyards - 73.6 quintal/ha. At the disposal of farms there are 55.7% orchardsand 50.0% vineyards and the rest to farmer households.

Kashkadarya region - an administrative unit of territorial division of the Republic of Uzbekistan.Kashkadarya region is located in the southern part of Uzbekistan in KashkadaryaRiver Basin on the western slope of the Pamir-Altai mountains. The regional center - the city of Karshi.The territory - 28.57 thousand sq. Km.

The total population of the region at the end of 2013 was 2895.3 thousand People, including 1250.8 thousand urbanpersons (43.2% of the total) and 1644.5 rural(56.8%).

According to the State Land Fund Committee "Zemgeodezkadastras" of 01.01.2013 area of the region amounted to 2404.8 thousand Ha, including agricultural lands 2012.4 ha or 83.7%.

According to the Research Institute for Soil Science and Agricultural Chemistry, in 2012 the average score of irrigated agricultural land in the province is 52.3.

Irrigated land areas are in a satisfactory state of reclamation. 44.9% of the land affected by salinity and 55.1% non-saline. According to the degree of salinity, the share of slightly saline - 34.0% of the land, middle saline - 8.6%, and strongly - 2.3%.

Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 2618.4 billion sums, including crop production - 1382.1 billion sums and livestock - 1236.3 billion sums. The growth rate of agricultural production to the previous year was 106.8%, including crop production - 106.9%, animal products - 106.8%.

In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 494.3 thousand Ha. The main areas were occupied by grain crops, which account for 48.05%, cotton32.1%, potatoes 1.4%, vegetables 3.0%, melons 1.3%, forage crops8.8%,, orchards 3.2% and 2.15% of vineyards.

Most of the crop is placed in farms, accounting for -83.4% of the total arable land in the farmer households -13.7% and agricultural enterprises - 2.9%.

The main crops in the area are grain and cotton. These crops are placed on farms on 85.1% of the total arable land. As can be seen from the table below, in 2013 the sown area of cereals in the region amounted to 246.8 thousand hectares, and the average yield of 40.8 quintal/ha. The share of farms account for 84.2% of grain production and 99.3% of raw cotton.

Vegetables are placed on an area of 15.8 hectares, 6.5 hectares to melons The average yield of 25.3 tones/ha and 17.8 tones/ha, respectively. At the disposal of dekhkan farms there are 58.9% of the area for vegetables and for melons - 40.0%.

From perennial plants in the area there are 16.5 thousand Hectares of gardens, 11.0 thousand Hectares of vineyards, of which the gardens at fertile age 79.4%, and vineyards - 77.3%. The average yield of the gardens is 73.9 quintal/ha and 90.0 quintal/ha of vineyards. At the disposal of farms there are 9.1%orchards and 75.5% of vineyards and the rest to farmer households.

Navoi Region is located in the central part of Uzbekistan. The area of the region is 110.8 thousand sq. km, or 24.8% of the total area of the country.

The area is bordered on the north and east with the Republic of Kazakhstan and Jizzakh region, in the west - with the Republic of Karakalpakstan, in the south - Samarkand, Bukhara and Kashkadarya. North-western part of the area is occupied by the Kyzylkum plateau, to the east the region is stretched to Nuratau ridges and in the south the region borders with Zarafshan River. The climate is sharply continental and dry, summers are dry and hot, winters are relatively cold and snowless.

The total population of the region at the end of 2013 amounted to 886.5 thousand people, including urban population -428.1 thousand people (48% of the total population) and rural population - 458.4 thousand people (52% of the total population).

In 2013, the total area of irrigated land in Navoi region was 123.8 thousand ha. In this area irrigated horticultural crops amounted to 17.3 thousand ha, including fruit - 5.6 thousand ha., vineyards - 6.5 thousand ha., vegetables - 3.7 thousand ha., and potato - 1,5 thousand ha.
Horticulture is an important sector of the economy of the Navoi region. Horticulture industry is one of the leading in the country. In 2013, the average yield on 1 ha. was as following: fruit - 159 quintals, grapes -94 quintals, vegetables - 271 quintals and potatoes - 274 quintals. At the disposal of farmers there are57.2% of orchards and 66.9% of vineyards, the rest is at dehkan households' disposal.
Irrigated land areas are in a satisfactory state of reclamation. 83.2% of the land affected by salinity and 16.8% of the land is non-saline. According to the degree of salinity, the share of slightly saline land is 68.3% of the total land, middle saline - 13.8%, and strongly saline - 1.1%.

Namangan region - the administrative region of the Republic of Uzbekistan. In the west, the region borders the Tashkent region (connected Kamchik pass), in the south-west of Sogd region of Tajikistan, on the east by the Andijan region, in the south with the Ferghana region and in the north with the district Alabuka Jalalabad of the Kyrgyz Republic. Administrative center - the city of Namangan.The territory of the region - 7.44 thousand sq. Km.
The total population of the region at the end of 2013 was 2504.1 thousand persons, including 1593.2 thousand urbanpersons (63.6% of the total) and 910.9 thousandruralPeople (36.4%).
According to the State Land Fund Committee "Zemgeodezkadastr" as of 01.01.2013 are of the region was 504.6 thousand Ha, including 287.0 ha of agricultural land, or 56.9%.

According to the Research Institute for Soil Science and Agricultural Chemistry, in 2011 the average score of irrigated agricultural land in the province is 60.

Irrigated land areas are in a good state of reclamation. 8.9% of the land affected by salinity and 91.1% of non-saline. According to the degree of salinity, the share of slightly saline - 6.0% of the land, middle saline - 2.4%, and strongly - by 0.3%.

Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 2429.2 billion soums, including crop production - 1623.2 billion soumsand livestock - 806.0 billion soums. The growth rate of agricultural production to the previous year was 108.1%, including crop production - 108.2%, animal products - 107.8%.
In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 222.0 thousand Ha. The main areas were occupied by grain crops, which account for 36.6%,

cotton32.2%, potatoes 2.6%, vegetables 5.4%, melons 0.8%, forage crops7.6%, orchards 10.5% and vineyards4.3%.

Most of the crop is placed in farms, accounting for -85.7% of the total arable land in the farmer households -13.2% and agricultural enterprises - 1.1%.

The main crops in the area are grain and cotton. These crops are placed on farms on 77.5% of the total arable land. As can be seen from the table below, in 2013 the sown area of cereals in the region amounted to 94 400 ha, while the average yield of 50.5 quintal/ha. The share of farms account for 79.3% of grain production and 99.1% of raw cotton.

Vegetables are placed on the area of 14.0 thousand hectares. Melons by 2.0 thousand Ha. The average yield of 27.0 tones / ha and 25.2 tones / ha, respectively. At the disposal of dekhkan farms there are 68.6% of the area for vegetables and for melons - 65.0%.

From perennial plants in the area there are 27.0 thousand Hectares of gardens and 11.1 thousands Ha of vineyards, of which the gardens at fertile age -91.9%and vineyards -96.4%. The average yield of the gardens is 73.5 q/ha and 91.9 t/ha of vineyards. At the disposal of farms there are 55.9% orchardsand 61.3% vineyards and the rest to farmer households.

Samarkand region - a region in the central part of the Republic of Uzbekistan. Samarkand region is located in the center of Uzbekistan, in the Zarafshan River Basin. It bordered on the north-west of the Navoi region in the north-east - Jizzakh, in the south - Kashkadarya, in the east - with the Republic of Tajikistan. The regional center - the city of Samarkand.The territory - 16.77 thousand sq. Km.

The total population of the region at the end of 2013, amounted to 3445.6 thousand people, including 1324.8 thousandurbanPeople (38.4% of the total) and 2120.8 thousandrural People(61, 6%).

According to the State Land Fund Committee "Zemgeodezkadastr" as of 01.01.2013 area of the region amounted to 1509.1 thousand Ha, including agricultural lands 1221.1 ha or 80.9%.

According to the Research Institute for Soil Science and Agricultural Chemistry, in 2010 the average score of irrigated agricultural land in the province is 59.3.

Irrigated land areas are in a good state of reclamation. Only 1.3% of the land affected by salinity and the remaining 98.7% - non-saline.According to the degree of salinity, the share of slightly saline - 1.2% of the land, middle saline - 0.3%. There are not Strongly saline lands there.

Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 3732.3 billion soums, including 2216.0 billion soumscrop production and 1516.3 billion soumslivestock. The growth rate of agricultural production to the previous year was 106.5%, including crop production - 106.6%, animal products - 106.5%.
In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 360.2 thousand Ha. In 2013, the sown area of crops on irrigated land, in all categories of farms

amounted to 222.0 thousand Ha. The main areas were occupied by grain crops, which account for 45.4%, cotton23.0%, potatoes 2.8%, vegetables 6.5%, melons 0.5%, forage crops5.1%, orchards 7.3% and 10.4% of vineyards.

Most of the crop is placed in farms, accounting for -84.1% of the total arable land in the farmer households -15.1% and agricultural enterprises - 0.8%.

The main crops in the area are grain and cotton.These crops are placed on farms on 76.8% of the total arable land. As can be seen from the table below, in 2013 the sown area of cereals in the region amounted to 187.3 thousand Ha, while the average yield of 44.2 quintal/ha. The share of farms account for 80.0% of grain production and 99.8% of raw cotton.

Vegetables are placed on the area of 26.8 thousand hectares and Melons by 2.2 thousand Ha. The average yield of 36.4 tones / ha and 25.0 tones / ha, respectively. At the disposal of dekhkan farms there are 45.5% of the area for vegetables and for melons - 54.5%.

From perennial plants in the area there are 30.2 thousand Hectares of gardens and 38.7 thousand Hectares of vineyards, of which the gardens at fertile age, 85.4%, and vineyards - 92.8%. The average yield of the gardens of 116.6 kg / ha and 130.1 kg / ha of vineyards. At the disposal of farms there are 56.3% of orchardsand 76.7% of vineyards and the rest to farmer households.

Syrdarya regionis located in the center of Uzbekistan, on the left side there is one of the longest rivers in Central Asia - the Syrdarya, which is streched 94 km away along the region. The total area of the region is 4.3 thousand sq. km or 0.9% of the total territory of the republic. The relief of the region is characterized by lowland areas.

In the north, Syrdarya region is bordered with the Republic of Kazakhstan, in the east with Tashkent region, in thesouth-east with the Republic of Tajikistan, in the south-west withJizzakh region. The climate is continental, dry and partly sunny. The average annual temperature is 13-15 degrees Celsius, the maximum temperature reaches 45-47 degrees.

The total population of the region amounted to 727.2 thousand. people at the end of 2013, including urban population - 225.4 thousand people (31% of the total) and rural population 501.8 thousand. people - (69% of the total population).

In 2013, the total area of irrigated lands in the Syrdarya region amounted to 353 thousand ha. Irrigated horticultural crops amounted to 13.5 thousand ha, including fruit - 6.0 thousand ha., vineyards - 1.6 thousand ha.,, vegetables - 4.1 thousand ha., and potato - 1,8 thousand ha.

Horticulture is an important sector of the economy of Syrdarya region. In 2013, the average yield on 1 hectare was as following fruit - 55 quintals grapes - 70 quintals, vegetables - 266 quintals and potatoes - 139 quintals. At the disposal of farmers there are 64.5% of orchards and 44.6% of vineyards, and the rest is at dehkan households' disposal.

Tashkent region - an administrative unit within the Republic of Uzbekistan.Tashkent region located in the north-eastern part of Uzbekistan, between the western part of the Tien Shan Mountains and the River Syrdarya. The area is bordered on the north and north-west Kazakhstan, in the north-east of the border of the Kyrgyz Republic, to the east with Namangan region of

Uzbekistan, in the south - with the Republic of Tajikistan, on the south-west - the Syrdarya region. The regional center - the city of Tashkent.The territory - 15.25 thousand sq. Km.

The total population of the region at the end of 2013 was 2725.9 thousand People, including 1338.5 thousandurban People (49.1% of the total) and 1387.4 thousand rural People (50.9%).

According to the State Land Fund Committee "Zemgeodezkadastr" as of 01.01.2013 area of the region was 784.3 thousandHa, including 575.0 ha of agricultural land, or 73.3%.

According to the Research Institute for Soil Science and Agricultural Chemistry, in 2008 the average score of irrigated agricultural land in the province is 59.

Irrigated land areas are in a good state of reclamation. Only 2.8% of the land affected by salinity and the remaining 97.2% - non-saline.According to the degree of salinity, the share of slightly saline - 2.5% of the land, middle saline - 0.3%, and strongly - 0.0%.

Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 3.9534 trillion UZS, including 2407,4 billion UZS crop production and 1546.0 billion sums livestock. The growth rate of agricultural production to the previous year was 105.9%, including crop production - 106.4%, animal products - 105.3%.

In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 355.6 thousand Ha. The main areas were occupied by grain crops, which account for 39.8%, cotton24.6%, potatoes 2.15%, vegetables 8.6%, melons 1.05%, forage crops10.7%, orchards 8.6% and 4.5% for vineyards.

Most of the crop is placed in farms, which accounted for - 84.6% of the total arable land in the farmer households -11.4% and agricultural enterprises - 4.0%.

The main crops in the area are grain and cotton. These crops are placed on farms on 74.9% of the total arable land. As can be seen from the table below, in 2013 the sown area of cereals in the region amounted to 159.0 thousand hectares, and the average yield of 44.8 quintal / ha. The share of farms account for 91.4% of grain production and 99.4% of raw cotton.

Vegetables are placed on the area of 34.2 thousand hectares andMelonsby 4.2 thousand Ha. The average yield of 27.2 tones / ha and 21.4 tones / ha, respectively. At the disposal of dekhkan farms there are 56.7% of the area for vegetables and 28.6% for melons.

From perennial plants in the area there are 34.4 thousand Hectares of gardens 18.1 thousand Hectares of vineyards, of which the gardens at fertile age, 56.7%, and vineyards - 72.9%. The average yield of 89.0 quintal gardens / ha and 106.5 quintal / ha of vineyards. At the disposal of farms there are 66.0% of orchards and 64.1% of vineyards and the rest to farmer households.

Ferghana region - an administrative unit of the territorial division of the Republic of Uzbekistan.Located in the southern part of the FerghanaValley.The regional center - the city of Fergana.The territory of the region - 6.76 thousand sq. Km.

The total population of the region at the end of 2013 was 3386.5 thousand People, including 1937.0 thousand urban People (57.2% of the total) and 1449.5 thousandrural People (42.8%).

According to the State Land Fund Committee "Zemgeodezkadastr" as of 01.01.2013 area of the region was 566.8 thousandHa, including 312.7 ha of agricultural land, or 55.2%.

According to the Research Institute for Soil Science and Agricultural Chemistry, in 2011 the average score of irrigated agricultural land in the province is 56.

Irrigated land areas are in a satisfactory state of reclamation. 44.2% of the land affected by salinity and 55.8% non-saline. According to the degree of salinity, the share of slightly saline - 35.9% of the land, middle saline - 7.0%, and strongly - by 0.9%.

Agricultural output in farms of all categories at the end of 2013 (at current prices) amounted to 2.5733 trillion UZS, including 1641,2 billion UZS crop production and 932.1 billionUZS livestock. The growth rate of agricultural production to the previous year was 107.8%, including crop production - 107.7%, animal products - 108.0%.
In 2013, the sown area of crops on irrigated land, in all categories of farms amounted to 289.8 thousand Ha. The main areas were occupied by grain crops, which account for 37.6%,cotton 29.2%, potatoes 2.75%, vegetables 5.5%, melons 0.8%, forage crops8.7%, orchards 13.85% and 1.6% for vineyards.

Most of the crop is placed in farms, accounting for -84.2% of the total arable land in the farmer households and 14.1% of agricultural enterprises - 1.7%.

The main crops in the area are grain and cotton. These crops are placed on farms on 74.1% of the total arable land. As can be seen from the table below, in 2013 the sown area of cereals in the region amounted to 128.8 thousand Ha, while the average yield of 59.8 quintal / ha. The share of farms account for 82.4% of grain production and 99.8% of raw cotton.

Vegetables are placed on the area of 18.8 thousand hectares and Melons by 2.8 thousand Ha. The average yield of 28.2 tones / ha and 18.8 tones / ha, respectively. At the disposal of dekhkan farms there are 80.9% of the area for vegetables and melons for 42.9%.

From perennial plants in the area there are 47.4 thousand Hectares of gardens, 5,4 thousand Hectares of vineyards, of which the gardens at fertile age, 65.4%, and vineyards - 79.6%. The average yield of gardens - 112.2 quintal / ha and of vineyards - 216.0 quintal / ha. At the disposal of farms there are 80.8% of orchardsand 24.1%of vineyards and the rest to farmer households.

The marketing strategy of the project

The centuries-old culture of the traditional vegetable production, horticulture and viticulture in Uzbekistan was originally based on the principles of the biological agriculture with the use of organic fertilizers that allows growing organic vegetables and fruit with a unique flavor and nutritional qualities without GM technologies. fruits and vegetables that are grown in the conditions of the republic, are significantly higher than similar products from other regions on

the basic of consumer characteristics, the content of natural sugars, amino acids and organic acids, which are important for the health of trace elements and other biologically valuable substances, essential in the diet.

For example, the sugar content in Uzbek grape varieties from 20 to 35%, and solids content in tomatoes is higher than 5.5%, which is significantly higher and more attractive to buyers than at the European manufacturers of similar products. The chemical composition of peaches, apricots, plums, pears, cherries, figs, pomegranates, grapes and other fruits, as well as Uzbek melons withspecial taste and aroma, produced in the country, are superiorto similar varieties grown in other CIS countries.

As a result of targeted measures, annual increasein production of fruits and vegetables, potatoes, melons and grapes is manifested. The total amount of all types of farms in 2013 reached 15.9 million tons, compared to 2007 increased by 1.8 times. Production of vegetables in 2013 amounted to 8.5 milliontons; growth was achieved by increasing the cultivated area by 18%, increasing the yield by 19%. The main increase in output (3.3 million Tons) was due to the intensive use of irrigated lands, i.e., re-planting vegetables after harvesting of winter grains crops. The share of these products in the total harvest of vegetables has reached 39%, with 20% in 2007. Re-seeding is most successfully usedinAndijan, Bukhara, Surkhandarya and Syrdarya regions in which the production of vegetables was more than 55% of total production in the open field. Crops such as radishes and turnips are grown entirely on re-seeding, 56% of the total cabbage production is in the open field, respectively, carrots - 55% and other - 54%.

Uzbekistan produces all kinds of vegetables. The range of production of vegetable crops emerged from the traditional power of the population, industrial processing and eventual export of vegetables. From field vegetables the largest share falls for tomato production, which accounted for 27% of gross collection that not only provides fresh consumption, but also allows you to direct a significant amount for industrial processing. The share of carrots accounts for 20% of the gross harvest of vegetables, onions -13%, cabbage-11%, cucumbers -7%, garlic -2% and other vegetables -20%.

Production ofhorticulture,potatoes, melonsandgrapesin the Republicof Uzbekistan in2007-2013.(thousandtones).

Production	2007	2009	2011	2013	2015[1]	2013in % as compared to 2007
Potato	1189	1531	1863	2250	2606	189
Vegetable	4692	5710	6994	8518	9536	182
Melons	841	1071	1295	1558	1770	185
Fruit	1270	1545	1879	2261	2703	178

[1]Defined bythe Cabinet of Ministers as of04.12.2014, № 334"Onthe forecast parametersof production and useof fruit and vegetables, potatoes, melonsand grapes in2015."

Grapes	879	901	1090	1322	1526	150
Total	**8871**	**10758**	**13120**	**15910**	**18141**	**179**

Fruit and vegetable products are produced in all regions of the country, but the different soil and climatic conditions for allow growing the most profitable products. The largest producers of vegetables are Andijan, Samarkand, Surkhandarya and Tashkent regions, which account for almost 60% of the gross harvest of vegetables produced in the country in the open field. The most intensively used the production of greenhouse vegetables in the Bukhara and Tashkent region and the Fergana Valley, the share of these regions accounted for 89% of the total produced in the republic, and the per capita production was 7.4 kg.

In the whole country 24 rural districts, or 15% of the total, do not have a crop of cotton. They are specialized in the production of fruits, vegetables, legumes and other food crops.

Placing fruit and vegetable crops - potatoes, melons and grapes produced mainly near the regional centers. This significantly reduces transportation costs for the delivery of fresh produce. Thus, rural areas adjacent to the city of Tashkent, Zangiata, Kibray and Yangiyul areas where farms are specialized in the production of food crops, not of cotton. Similarly, in the city of Samarkand - Jambay and Samarkand regions are specialized in the production of food crops.

Production of, in monetary terms, vegetables, melons, potatoes, fruits and grapes amounted to 69% of the total gross value of crop production. The share of cotton, grain crops and lumpy accounts, only 31% of gross production.

In his speech, the President of Uzbekistan Islam Karimov (6 June 2014)at the international conference "On the implementation of the most important reserves Food Program in Uzbekistan" defines the main objectives and priorities for the sector of production of fruits and vegetables, potatoes, melons and grapes. The main priorities are as follows: primarilythe saturation of the domestic consumer market with this product, meet the needs of the processing of domestic enterprises, and expand export capacity. The main goal in 2020 is to reach in production of fruits and vegetables, melons and grapes an increase of not less than 2.3 timesas compared to 2014.

The demand for vegetables, melons and grapes fully satisfies the need of the population in these foods. Availability of fruits and berries in the general population of the republic, including the project area, annually increases, but remains lower than the standard. In vegetables, melons and grapes, there is a real opportunity to increase the volume of production for industrial processing and export. The project due to the establishment of new intensive orchards will significantly increase the production of fruits and ensure the population's demand and lower prices in the domestic market.

Demand is strongly influenced by the prices of fruits and vegetables, which are highly seasonal. The country clearly pronounced seasonal nature of fruit and vegetable products. The massive collection of fruits and vegetables produced in July, August and September. The prices for the products in these months are the lowest. Since October prices, monthly increases and reaches a

maximum value in winter. At this time, the price of fruit and vegetables is significantly higher than in the period of mass harvesting. Starting from May to June, the prices sharply lower down. The lowest price of melons in dekhkan markets develop in the period of mass ripening of melons and watermelons. Further, they increase in 3-4 times due to storage for 5 months. The average price of melons, compared with watermelons is 30-40% higher.

Lowest retail prices for the fruit of apples and pears are in August, September and October, during the harvest season. There are species of trees early, middle and late ripening. During the storage period the price increases on a monthly basis, about 2.5-3 times by the new harvest time. Unlike many pome fruit, stone fruit and berries in the country are not stored in warehouses until next year's harvest. These include apricots, peaches, cherries, cherry, plum. Since apricots ripen early in May, middle-grade in June, late varieties in July. Prices for early varieties are 2-3 times higher. Cherriesripen in June.

Prices of vegetables: onions, carrots, cabbage do not have significant seasonal fluctuations. In winter, prices are rising and half times compared to the summer period. However, the price for the vegetables produced in greenhouses (greenhouse), tomatoes and cucumbers in the winter and early spring period is 7-8 times higher than those produced in the summer in the open ground.

Farms and private farms sell all fruit and vegetables, potatoes, melons and grapes on their own, making contracts with harvesting and processing enterprises in the field. The main markets for these products are: the domestic consumer market and external. Domestic consumer market can be divided into the following segments:

• Dehkan retail markets, which are located in all settlements of the republic: in villages and district centers, cities of regional and national importance.

• Supermarkets, restaurants, catering companies.

• Medical institutions - hospitals and sanatoriums, as well as children's homes, kindergartens, boarding schools and special institutions.

• Large segment of the domestic market are companies that specialize in fruit and vegetable processingand companies that specialize in grape processing.

Companies specializing in the processing of fruits and vegetables mainly located in the regions of the republic, which comprise a large production of these products. So in the Samarkand region there are industrial enterprises, the annual capacity of which on processing of raw materials is 30% of the power enterprises. Accordingly, the Tashkent region -15%, Andijan -14%, Namangan -13%, Ferghana-10%.Every year, on the basis of the balance of production and use of horticultural products, forecast parameters of production, industrial processing and export of these products are approved by the provisions of the Cabinet of Ministers. To address issues of rational use of fruit and vegetables, potatoes, melons and grapes on the domestic market of the country, as well as the efficient organization of export supplies, a working group is entrusted with:

- monitor the implementation of the basic parameters of the forecast production and use of products;

- addressing a stable and smooth saturation of the domestic consumermarket of fruits and vegetables, potatoes, melons and grapes in the required quantity and range, as well as management of price monitoring for the specified products;

- prompt consideration of issues related to the organization of transport, timely release of cars and refrigerators for export with customs clearance of goods.

This decree defined the forecast parameters of production of fruits and vegetables, potatoes, melons and grapes, as well as the volume allocated for consumption by the population in fresh form, for industrial processing and export.

In the marketing of fresh products farming enterprises are provide assistance by agricultural firms. Agricultural firms are a commercial organization whose main activity is the processing and sale of vegetables and grapes, produced by farmers and the public. Relations between farmers and processors from other companies that are part of the agricultural firm, are based on signed contracts, which clearly regulate the rights and obligations of the parties, including the provision of not less than 30% advance payment of delivered products and its subsequent purchase guaranteed.

In addition, agricultural producers at their discretion sell products in the markets. In the organization of sales of agricultural products farming enterprises are provided services by enterprisesof market infrastructure, organized in each district. This is the point of sale of agricultural products; points to provide information and consulting services; points for the production of container products and packaging; points to provide transport services.

Dehkan farms are privately owned small-scale producers of crop production. The government does not restrict the activities of dehkan farms. They make their own decisions on the allocation of agricultural crops, production and sales. Most of the products manufactured by farmer households used for own consumption, excess production is sold in the local markets, as well as to processing plants. The average level of marketability (of goods manufactured) of dehkan farms in 2013 was as follows: 34% of wheat, vegetables -55%, potatoes -40%, melons -32%, fruit and grapes -25%.

Foreign-trade companies of the Ministry for Foreign Economic Relations, Investments and Trade (FTC MFERIT) are mainly engaged in the organization of export of fruits and vegetables, melons and grapes, as well as Association "Uzulgurjisavdoinvest", agricultural companies, farmers and others providing services to farmers for the sale of products. Farmers and private farms with a legal entity, can also realize the fruits and vegetables for export on their own. Export of fruits, vegetables, melons and grapes is carried on a contract basis for the free convertible currency.

Uzbekistan has significant agricultural export potential. More than 180 species of fresh and processed fruit and vegetable products are exported to 80 countries. The main importers are Russia and Kazakhstan. According to FAO, Uzbekistan holds 2nd place in the world in terms of exports of dried apricots, fresh apricots - 4th, plums - 7th, cabbage - 8th, raisins - 9th, peaches and grapes - 10th place. Relatively low production costs, high quality allowed in recent years increasing the export of fresh, dried and processed fruit and vegetable products. In 2010-2013, the volume of products exported was as followinginthousandtons:

	2010	2011	2012	2013
• Freshvegetables	292,4	315,7	200,4	337,3
• Melons	65,9	87,9	41,8	45,7
• Fruit	148,8	178,1	117,3	204,1
• Grapes	66,4	111,1	118,9	22,1
• Dried fruit	24,2	48,2	41,7	46,1
• Sultana grape	29,8	36,1	35,9	26,1

Source:State Customs Committee ofthe Republic of Uzbekistan

The cost oftheexportof fruits and vegetablesby regions Republic of Uzbekistan for2006-2013years(mln.USD)

Regions	2010	2013
RepublicofKarakalpakstan	1,9	0,4
Andijan	0,1	50,3
Bukhara	5,5	0,1
Jizzakh	8,9	65,0
Kashkadarya	4,0	2,3
Navoi	0,7	0,0
Namangan	0,1	4,4
Samarkand	200,9	54,0
Surkhandarya	19,2	95,9
Syrdarya	12,9	67,6
Tashkent	541,4	144,4
Fergana	18,1	40,8
Khorezm	8,1	1,5
Tashkent c.	331,3	810,6
Total	**1153,1**	**1337,3**

Source:State Customs Committee ofthe Republic of Uzbekistan

Analysis ofthemainexportsof fruit and vegetablesinthe project areafor2013			
Nameof products	Qty tons	Price ths. dollars. US	The priceof 1 ton US dollars
Tomatoes	5626	19427	3453
Onions, garlic	2878	3304	1148

Cabbage	19619	14421	735
Carrots, turnips, beets, radishes	23451	23447	1000
Cucumbersandgherkins	8665	9844	1136
Othervegetables	9946	18731	1883
Leguminousvegetables	13154	24893	1892
Grape	13539	42678	3152
Melon and Watermelon	3461	4736	1368
Apples, pears, quince	481	1569	3262
Apricots, cherries, cherry	38875	110215	2835
Otherfruit	10548	11204	1062
Driedfruits	8475	19050	2248
Peanut	5286	13550	2563
Total	173033	361613	

Source:State Customs Committee ofthe Republic of Uzbekistan

The cost of fruits and vegetables sold for export in 2013 amounted to 1.3373 billion US Dollars, 23% more than in 2010.

The main range of exports of fresh vegetables are: carrots and other root vegetables, which accounted for 32.7% of total exports of vegetables, cabbage -21.8%,cucumbers -18.4%, tomatoes -6.3%, onion -5.7%, and other vegetables 15.1%.

From the export of fresh fruit the share of seed species (apples, pears and quinces) accounted for 1.2% of total exports of fruits, from stone fruit species: apricot, plum, cherry, peach, cherry - 69.8% and other fruits -30%. Traditional export items from dried fruits: dried apples, prunes, dried apricots (the bulk of which is dried apricots).

In 2013 export of vegetables was 3.9%, melons -4.4%, fruit -8.2%, grape -6.9% of the gross volume of production. For conversion of dried fruit and grape production in the fresh production, export share of the gross production of the fruit was -20% and -18% of grapes. Uzbekistan has significant potential for export of early vegetables, melons, fruit and grapes, which ripen earlier than in the countries situated to the north of Uzbekistan. Ties are set with neighboring States Customs Union of Kazakhstan, Belarus and Russia to increase exports of fruits and vegetables.

Expert estimates suggest that in the long term, the production of food crops in the Republic of Uzbekistan may increase to 15.9 million Tons in 2013 to 29.7 million Tons in 2030, or 1.9 times, including vegetables -to 1.2 times, fruits –to 3.9 times, grapes –to 2.2 times, melons -to 1.4 times and potatoes –to 2.4 times. At the same time, the introduction of modern soil conservation technologies, as well as the use of innovative agricultural technologies in crop production would increase their yields by an average of 6-8% per year, which will provide up to 65% increase in gross production of fruits and vegetables to 2030. The expansion of primary and secondary crops through the effective placement of crops provides about 35% of the increase in gross fruit and

vegetables to 2030. Export potential of fresh and processed fruit and vegetable products will be 7.3 milliontons, compared with 2013 will increase by 10 times.

Every year the production of fruit and vegetables, melons and grapes increases, which allows for not only providing domestic consumption, but also significantly increasing the export potential.

The estimated volume of exports of fruit and vegetables, melons and grapes in the project area will reach 1.9 million tons in 2022, with export value of 3.9 billionUS dollars.

Uzbekistan is a supplier of fresh vegetables, fruits, grapes in the CIS, EU and Asian countries. In recent years, the geography of deliveries has expanded at the expense of exports to Thailand, Indonesia, Japan, Hong Kong, Mongolia, Saudi Arabia and the United States.

Considering the results of the study of the horticulture sector as well as arrangements in the course of the 5th meeting of foreign ministers of Central Asian countries and Japan within the framework of cooperation "Central Asia plus Japan" the following priority areas are selected out:
• creation of intensive orchards and vineyards with drip irrigation systems, energy-efficient greenhouses, cold storage system, controlled atmosphere, increasing the processing capacity of fruit and vegetables, purchase of special agricultural machinery and equipment (tractors, cultivators, seeders, etc.);
• introduction of modern agricultural technologies of Japanese cultivation, quality control, processing, storage, monitoring of soil, pest control, logistics, and sales with the latest Japanese technology and equipment.

6. MAIN ISSUES

The problems are related to food security, increasing water scarcity, which will be exacerbated by climate change according to prognosis, have stimulated changes in the structure of agriculture in the country: first, there was a shift to wheat for food security, and now - to the fruit and vegetable crops to take advantage of growing domestic and lucrative export markets.

However, the knowledge of farmers and entrepreneurs in the field of modern technologies and improved horticultural and agricultural practices is limited, which prevents an increase in productivity and reduce post-harvest losses, as there is a lack of knowledge about the mechanisms that could be more effective to link farmers to markets.

The supply chain of Horticulture sector is developing, but there are still a lot of weaknesses in the market, including a lack of adequate infrastructure and logistics (e.g., cold chain equipment, sorting and packaging), poor market information system as well as limited capacity of the private sector to ensure the quality and safety of food products in various markets.

Among the main problems in the production of fruit and vegetables followings should be noted:
• Low share of specialized farms in total production of fruits and vegetables (30% of farms, 70% of private farms / households);
• Poor co-operation between producers and processors;

• Lack of industrial production and breeding varieties of products intended for export (the same color, taste, quality and size);
• High level of qualitative and quantitative losses in the collection, processing, transportation, storage and processing of fruits and vegetables;
• The lack of modern specialized procurement, trade and logistics infrastructure (sorting, grading, packaging);
• Lack of modern technical equipment standardization and certification;
• Lack of knowledge and skills of producers of fruits and vegetables in the modern market requirements and standards of quality and safety;
• The low level of mechanization of agricultural operations;
• Lack of capacity to provide developed the capacity to provide producers of horticultural sector with modern high yielding seeds and planting materials.

7. Forward-looking economic analysis and technical and economic indicators of project

According to the basic technical and economic parameters of the project, the whole cost of the project is 148.428 million US Dollars, will be financed by JICA - amount of the loan will be 97.80 million US dollars, or 66.00% of the value of the project and grant of - 2.2 million US Dollars (1.00%), the contribution of the Republic of Uzbekistan - 24,728,000 US Dollars (17.00%) and the beneficiaries - 23.7 million US Dollars (16.00%).

Budget funds are made up of tax and customs benefits and payment of financial costs in the investment period.

Own funds of the beneficiaries will be in the amount of 20% of the loan.

The main technical and economic parameters of the project are given in the following table:

							Including by
#	Indicator name	Unit of measure	Total	Japan's loan	Grant Fund	Republic of Uzbekistan	Beneficiary contribution
1	Total cost of project	eq. to thousand US dollars	148,428.63	97,800.00	2,200.00	24,728.63	23,700.00
2	Amount of capital investment, total	eq. to thousand US dollars	123,700.00	97,800.00	2,200.00		23,700.00
	including						
2.1	Credit line to commercial bans	thousand US dollars	118,500.00	94,800.00			23,700.00
	in free currency	thousand US dollars	118,500.00	94,800.00			23,700.00
	in national currency	eq. to thousand US dollars					
2.2	Machinery and	thousand US					

	equipment	dollars					
	in free currency	thousand US dollars					
	in national currency	eq. to thousand US					
2.3	Building installation work	eq. to thousand US dollars					
	in free currency	thousand US dollars					
	in national currency	eq. to thousand US dollars					
2.4	other costs	eq. to thousand US dollars	5,200.00	3,000.00	2,200.00		
	in free currency	thousand US dollars	5,200.00	3,000.00	2,200.00		
	in national currency	eq. to thousand US dollars					
2.5	initial working capital	thousand US dollars					
	in free currency	thousand US dollars					
	in national currency	eq. to thousand US dollars					
3	Financial cost during investment period	eq. to thousand US dollars	4,728.63			4,728.63	
4	Contribution of Republic of Uzbekistan in the form of tax and customs privileges	eq. to thousand US dollars	20,000.00			20,000.00	

The financialandeconomicbenefits are calculated based on thegrowthincropyieldsafter the successfulimplementation of the project. The followingtable is the basis for thecalculation:

The volume of the gross yield and the cost in the Republic and in the project area

Nameofcultures	Gross yield in the project area		Average selling price, sum/kg[2]	Average selling price, dollar/kg	Cost price, sum/kg	Cost price, dollar/kg	Revenue in the project area, thousand dollar	Necessary revenue for the project, thousand dollar
	Total	Including farm enterprises						
Potato	1 489,60	438,10	1 372,00	0,65	760,00	0,36	127 049,00	25 409,80
Vegetable	5 225,60	2 104,90	646,50	0,31	276,00	0,13	378 882,00	75 776,40
Melons	777,00	429,50	530,00	0,25	407,00	0,19	25 770,00	5 154,00
Fruitsandberries	1 206,40	648,80	876,20	0,42	586,00	0,28	90 832,00	18 166,40

The average price for crop 2013, the average exchange rate adopted for 2013 was 2095.47 sum for US dollar

Grapes	908,40	516,60	1 443,20	0,69	799,00	0,38	160 146,00	32 029,20
Total	**9 607,00**	**4 137,90**					**782 679,00**	**156 535,80**

Nameofcultures	The expected gross yield after implementation of the project, thousand tons		Average selling price, dollar/kg	Cost price, dollar/kg	Revenue in the project area, thousand dollar	Profit from the project, dollar/kg
	Total	Including farm enterprises				
Potato	1 787,52	525,72	0,65	0,36	30 491,76	5 081,96
Vegetable	6 270,72	2 525,88	0,31	0,13	90 931,68	15 155,28
Melons	932,40	515,40	0,25	0,19	6 184,80	1 030,80
Fruitsandberries	1 447,68	778,56	0,42	0,28	21 799,68	3 633,28
Grapes	1 090,08	619,92	0,69	0,38	38 435,04	6 405,84
Total	**11 528,40**	**4 965,48**			**187 842,96**	**31 307,16**

Source: The State Statistics Committee, expert evaluation of the specialist of the project

In total, about148.428 million US Dollars is required for theimplementation of the project.Thetotalinvestmentcostof the projectbycomponentis given inthe table below.

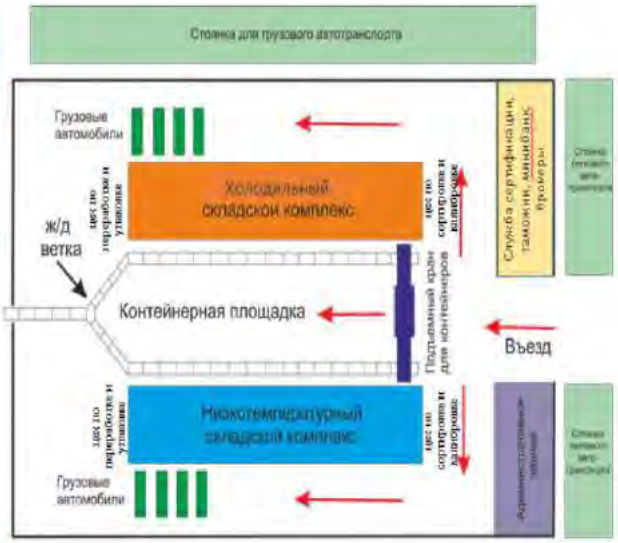
The totalinvestmentcostof the projectby component (mln. dollars. USA)

Component No.	Component name	Costofcomponent, mln. dollar in total	JICE Loan	JICE Grant	Contribution of government	Contribution of beneficiaries	Financial costs
Component 1	Credit line for creation of "model" projects	139,46	96,80		18,96	23,70	-
Component 2	Increase the knowledgeof farmers andagricultural companies	2,64		2,200	0,44		-
Component 3	Marketing research, monitoring and management of the project	1,60	1,00		0,60		
	Financial costs	4,73					4,73
	Total	**148,43**	**97,80**	**2,20**	**20,00**	**23,70**	**4,73**

Production trade and logistics center

- Creating a model of "turnkey" for the production, storage, processing and the formation of regional trade and logistics center "from field to consumer" on the basis of existing or established agricultural companies owning cold storage with a capacity of not less than 5.0 thousand tonnes.

Equipment	Power	Amount mln. USD
Cols storage with CSG	5000 t	2,5
Drying products lyne		0,6
Workshop calibration-packaging		0,4
Juice and jam production lyne	1000 t per year	0,5
Intensive garden	100 ra	3,0
Greenhouse	5 ra	0,8
Spec. agricultural equipment, auto refrigerators, equipment (trucks, scales, packaging)		0,5
Creation of infrastructure (access roads, parking, electricity, gas, showroom, office, etc.)		1,7
TOTAL		10,0



Scheme of production and trade and logistics center

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As indicated above, a source of external financing will be loan from JICA. JICA funds will be provided under the following conditions (according to data provided by JICA):
Loan term - 30 years;
Grace period - 10 years;
The interest rate on the loan 1.4%;
Commitment fee - one-time payment in the amount of 0.20% of the total loan amount will be covered by JICA and be capitalized for loan.

The executing agency will coordinate annual procurement plan, the forecasted amount of work and development funds from JICA by category and components.

The payback period is realized due to the fact that the project will improve the efficiency of project areas; increase the income of the rural population due to the increase of productivity of fruit and vegetables, better access to credit, as well as the creation of new jobs.

8. POTENTIAL RISKS OF THE PROJECT

The risks of the project are the following factors:
– Low initiative of agricultural companies involved in the horticulture sector.
–Financial institutions consider agriculture as a risky sector.
–The low potential of initiators of subprojectsadversely affects their ability to access the credit line.

– Increased costs and the return of loan funds and interest in foreign currency may reduce the desire of initiators to get credit.

There are risks inherent in all development projects, which lie in the fact that the planned investments may be untimely or investment will not lead to the expected results.

Nevertheless, the experience in implementing similar projects in Uzbekistan demonstrates the ability to successfully manage these risks.

9.EXPECTED RESULTSAND CONCLUSIONS

Thenameofindicators	Unitofmeasurement	Priortotheimplementation	In the framework of the project of World Bank	In the framework of the project of JICE	ExpectedResult
The increase inthe area underintensiveorchards	hectare	28 000	4 680	1 200	33 880
Creatingacoldrooms	ton	325 000	163 000	75 000	563 000
Creatingenergy-efficientgreenhouses	hectare	1 800	180	65	2 045
The increase inprocessingcapacity of fruit and vegetables	thous. tons	2 300	96	50	2 446
Equipment of farms of horticulture sector with agricultural machinery and equipment	pcs	786	1 240	700	2 726

• Increasing yields through the introduction of new varieties of seeds and seedlings, modern technology, water-saving technologies, development of methods of fighting against diseases and pests;
• Improving access to credit for the creation of infrastructure for the production and export;
• Reducing post-harvest losses by establishing a system of timely collection, storage, transportation and processing of fruits and vegetables by creating a trade and logistics center;
• Increased value-added finished products through the use of modern technologies for processing and packaging;
• Improving the quality and safety through the establishment related laboratories and accredited CAsby internationally recognized consulting companies;
• Increased competitiveness and increase in exports of fresh and processed fruit and vegetable products by improving sorting, grading and packing;
• Creation of additional jobs and increase rural incomes.

In the coming years significant investments of the World Bank, Asian Development Bank, Islamic Development Bank, International Fund for Agricultural Development and the Japan International Cooperation Agency, provide comprehensive modernization of horticulture, viticulture and vegetable growing, and will also allow an increase in capacity for the industrial processing of fruits and vegetables, construction of greenhouses, network storage and refrigerators. It is envisaged to implement a major modernization and development of research capabilities in the field of seed production, plant breeding and plant protection from pests and disease.

In connection with the growing annual export of fresh and processed fruits and vegetables,it is necessary to introduce new marketing technologies for access to world markets. This, of course, requires more coordination and cooperation, the scale of international cooperation, joint approaches and assessments in the future. Organization of conferences, exhibitions, specialized fairs in international venues, creation of trade houses in the importing country, systematic and continuous exchange of experiences and practices that builds up in different parts of the world as part of marketing research all have great importance.

The proposed project will improve the productivity, financial and environmental sustainability of agriculture and the profitability of farmers and agribusiness in the Project. It will create conditions for the creation of new varieties of seedlings, fruit and vegetable crops; establishment of demonstration plots with application of advanced technologies for growing; construction of greenhouses, storages, warehouses and shops for processing of fruits and vegetables, as well as the purchase of equipment; certification, standardization and sale of fruit and vegetables; training and advisory services to farmers.

To implement the project,in the country there is a unique experience of the implementation of the project "Rural enterprises Support Project" and "Rural enterprises Support Project. Phase-2"with the participation of the World Bank.

The project is cost effective. Its implementation will strengthen the region's economic potential, increase employment and living standards, improve the ecological environment.

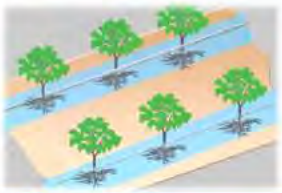
It is also believed appropriate the harmonization of the project concept and the final amount of funding from JICA to conduct the necessary studies and detailed pre-feasibility study of the project with the financial support of JICA.

APPENDIX 1.

Design Project - Intensive gardening (area of 1 hectare)

Fruits	The cost of seedlings (USD)	Qty (pcs./ha)	Total (USD) for 1 ha
• Apples	3,5	2 500	8 750
• Plum	6,0	650	3 900
• Cherry	7,0	500	3 500
• Cherry *(shpanka)*	6,5	1 250	8 125
• Apricots	6,0	350	2 100
• Pear	5,5	1 000	5 500
• Pomegranate	3,0	850	2 550
• persimmon	3,0	350	1 050
• Walnuts	10,0	350	3 500

Note. According to expert opinion



Estimated amount for 1 ha garden
- Soil preparation, planting of trees.– 2 000 USD.
- Fencing, trellises, mesh, etc. accessories– 14 000 USD.
- Install a drip irrigation system– 4 500 USD.
- **TOATL – 20 500 USD**

Equipment
Spraying equipment for weeding– **4000 USD.**

Growing *(annual operating costs)*
- Weeding, pruning and others
- Adding plant protection products and fertilizers
- Watering and care. **TOTAL – 5 000 USD**

TOTAL – 29 500 USD

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Design Project - Intensive gardening (area of 1 hectare)

Implementation

Average yield from 1 ha
- Apples – 30 t.
- Plum – 20 t.
- Cherry – 20 t.
- Cherries – 10 t.
- Apricot – 30 t.
- Pear – 40 t.
- Pomegranate – 20 t.
- Peaches – 40 t.
- Quince – 40 t.
- Persimmon – 30 t.
- Walnut – 8 t.

Implementation on the local market
- Firms and processors
- Dekhkan markets
- Supermarkets and hotels
- others

Export
- In the CIS countries, the Baltic States, Eastern Europe, Korea, Japan, United Arab Emirates

Creating of intensive garden (*by the example of cherries garden*)

Index	Unit	Qty
Garden size	**ha**	**10**
Number of seedlings (trees)	pcs	5000
Seedlings procurement	USD	35 000
Laying of the garden and primary work	USD	245 000
Annual operating costs (3 years)	USD	21 000
TOTAL COSTS	**USD**	**301 000**

Index	Unit	Qty
The first fruiting	year	2nd year
Yields per 1 ha (3 Year)	tons	20
The harvest (10 ha)	tons	200
The wholesale price in the domestic market	Thos soum/t	5 000
Export price	USD/t	2 500
Revenue per season (*current prices*)	**Thous.soum**	**1 000 000**
	Equivalent USD	*382 409*
Payback period	**year**	**4-5 year**

Creating of intensive garden
(on the example of plums)

Indicator	Unit of measurement	Quantity
Size of the garden	**ha.**	**10**
Number of seedlings (trees)	pcs.	6 500
Procurement of seedlings	USD	39 000
Planting trees in the garden and primary works	USD	250 000
Annual operating costs (5 years)	USD	35 000
TOTAL COST	**USD**	**324 000**

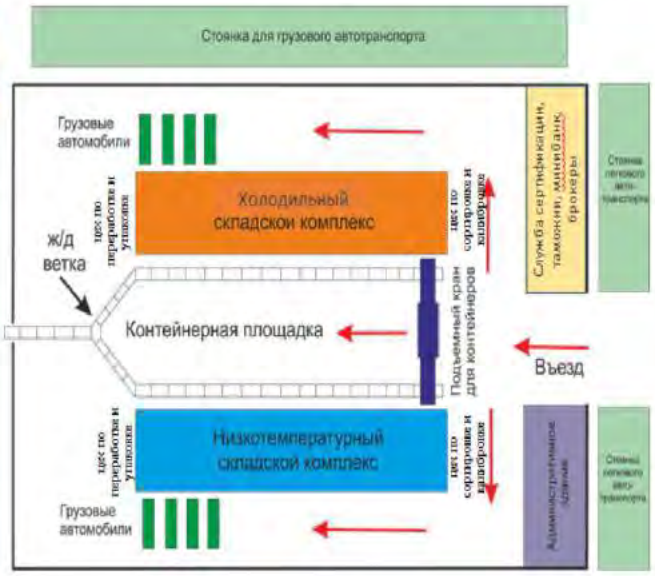
Indicator	Unit of measurement	Quantity
First fruiting	year	third year
Yields per 1 ha (5 years)	ton	20
Harvest volume (10 ha)	ton	200
The wholesale price in the domestic market	thousand sum/ton	2 700
export price	USD/ton	800
Revenue per season *(current prices)*	**thousand sum**	**540 000**
	In equivalent to USD	*206 028*
Project payback period	**years**	**5-6 years**

APPENDIX 2.

Production trade and logistics center

- Creating a model of "turnkey" for the production, storage, processing and the formation of regional trade and logistics center "from field to consumer" on the basis of existing or established agricultural companies owning cold storage with a capacity of not less than 5.0 thousand tonnes.

Equipment	Power	Amount mln. USD
Cols storage with CSG	5000 t	2,5
Drying products lyne		0,6
Workshop calibration-packaging		0,4
Juice and jam production lyne	1000 t per year	0,5
Intensive garden	100 ra	3,0
Greenhouse	5 ra	0,8
Spec. agricultural equipment, auto refrigerators, equipment (trucks, scales, packaging)		0,5
Creation of infrastructure (access roads, parking, electricity, gas, showroom, office, etc.)		1,7
TOTAL		10,0



Scheme of production and trade and logistics center

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APPENDIX 3.

The volume of agricultural production in specific areas on January1, 2015)

bln. sum

	Total	including:	
		cropproduction	livestock
TheRepublicOfUzbekistan	**36957,0**	**21810,4**	**15146,6**
TheRepublicOfKarakalpakstan	1097,3	533,2	564,1
regions:			
Andijan	3754,6	2733,0	1021,6
Bukhara	3297,4	1862,5	1434,9
Jizzakh	1857,4	889,0	968,4
Kashkadarya	3078,8	1566,7	1512,1
Navoi	1804,1	841,9	962,2
Namangan	2877,1	1917,5	959,6
Samarkand	4394,1	2638,1	1756,0
Surkhandarya	3323,5	1985,4	1338,1
Syrdarya	1464,7	930,1	534,6
Tashkent	4667,3	2817,5	1849,8
Fergana	3103,9	1960,8	1143,1
Khorezm	2236,8	1134,7	1102,1

The production of agricultural products (in current prices)
onJanuary 1, 2015)

	Totalproduced (billionsoum)	including		
		Farmers	Dehkan and private farms	Organizations carrying out agricultural activities
TheRepublicOfUzbekistan	**36957,0**	**12142,0**	**24067,3**	**747,7**
TheRepublicOfKarakalpakstan	1097,3	355,0	713,7	28,6
regions:				
Andijan	3754,6	1259,7	2466,0	28,9
Bukhara	3297,4	915,7	2348,8	32,9
Jizzakh	1857,4	642,5	1201,0	13,9
Kashkadarya	3078,8	1123,6	1919,0	36,2
Navoi	1804,1	419,6	1328,3	56,2
Namangan	2877,1	882,2	1966,8	28,1
Samarkand	4394,1	1615,5	2652,1	126,5
Surkhandarya	3323,5	961,6	2330,8	31,1
Syrdarya	1464,7	595,0	834,9	34,8
Tashkent	4667,3	1651,6	2765,0	250,7
Fergana	3103,9	1047,2	2004,0	52,7
Khorezm	2236,8	672,8	1536,9	27,1

Keyperformanceindicatorsoffarms

	2013	
	Numberoffarms	Totaldedicatedlandarea, ha
TheRepublicOfUzbekistan	**73831**	**5953344,0**
TheRepublicOfKarakalpakstan	3395	544413,0
regions:		
Andijan	6590	245897,0
Bukhara	4007	875269,0
Jizzakh	5846	484905,0
Kashkadarya	8100	776392,0
Navoi	1746	209823,0
Namangan	5355	271568,0
Samarkand	8388	524032,0
Surkhandarya	5155	731032,0
Syrdarya	5330	258542,0
Tashkent	6359	452687,0
Fergana	8695	336957,0
Khorezm	4865	241827,0

The total cultivated area in all categories of farms for 2014)

hectare

	Inallcategoriesoff arms	including		
		Farmers	Dehkan and private farms	Organizations carrying out agricultural activities
TheRepublicOfUzbekistan	**3677928**	**3114310**	**474344**	**89274**
TheRepublicOfKarakalpakstan	229761	191051	32086	6624
regions:				
Andijan	230079	196549	28453	5077
Bukhara	240569	199456	39205	1908
Jizzakh	396000	361095	24161	10744
Kashkadarya	500347	417459	68147	14741
Navoi	102911	79491	16889	6531
Namangan	223673	191736	29634	2303
Samarkand	364223	303392	56447	4384
Surkhandarya	283189	236003	43469	3717
Syrdarya	232850	211310	14794	6746
Tashkent	353157	297735	40759	14663
Fergana	289522	243102	41071	5349
Khorezm	231647	185931	39229	6487

Entire crop irrigated area

hectare

	2008	2009	2010	2011	2012	2013	2014
The Republic Of Uzbekistan	**3321282**	**3314608**	**3387862**	**3292774**	**3355885**	**3341497**	**3357361**
The Republic Of Karakalpakstan	227713	202462	265750	224388	254772	233410	229762
regions:							
Andijan	229665	230177	230129	230179	229583	229912	230079
Bukhara	242500	242910	242438	239733	240374	240283	240569
Jizzakh	261970	261673	265845	261960	267182	268644	268440
Kashkadarya	391949	402987	405948	396520	400681	406989	407685
Navoi	98206	97904	97118	95952	96685	98706	100116
Namangan	223953	223964	223971	221113	221143	221965	223673
Samarkand	309322	307421	300084	298599	296473	296416	298194
Surkhandarya	264927	265608	266618	265569	265976	265405	270116
Syrdarya	234107	234724	235586	222720	227026	229989	232850
Tashkent	330267	331991	335067	335334	340760	336948	334708
Fergana	290215	292171	290779	290331	290146	289783	289522
Khorezm	216488	220616	228529	210376	225084	223047	231647

Vegetables for 2014

	All categories of farms			including: Farms		
	The area ha	Yield, t/ha	Gross collect, tons.	The area ha	Yield, t/ha	Gross collect, tons.
The Republic Of Uzbekistan	**191937**	**281,4**	**9286685**	**65384**	**284,9**	**3254183**
The Republic Of Karakalpakstan	10543	183,4	227476	4146	180,2	85763
regions:						
Andijan	18627	301,0	1308928	6429	299,3	450609
Bukhara	8251	259,0	520023	2438	208,1	91400
Jizzakh	8075	208,4	341143	3036	209,2	148073
Kashkadarya	16074	267,7	467265	6501	226,7	158612
Navoi	3901	271,7	215208	887	262,0	49874
Namangan	14303	254,0	622547	4305	199,7	133874
Samarkand	26867	428,6	1457709	14531	442,5	828241
Surkhandarya	13263	212,6	807007	760	221,5	182300
Syrdarya	4291	270,6	263805	826	266,6	52784
Tashkent	33672	273,5	1841748	13043	268,2	772907
Fergana	19323	278,0	712072	3151	245,3	135459
Khorezm	14747	242,3	501754	5331	217,3	164287

Melons for 2014)

	All categories of farms			including:		
				Farms		
	Gross collect, tons.	The area ha	Gross collect, tons.	The area ha	Gross collect, tons.	The area ha
The Republic Of Uzbekistan	**51540**	**205,8**	**1696091**	**25546**	**197,5**	**841182**
The Republic Of Karakalpakstan	9172	111,4	105963	3874	125,9	52354
regions:						
Andijan	1896	262,0	92688	1019	320,0	55632
Bukhara	1859	241,2	113989	730	204,3	26450
Jizzakh	5370	175,9	236698	2297	144,3	135039
Kashkadarya	6680	187,3	130605	3896	175,6	69403
Navoi	1522	264,9	60922	519	283,5	20886
Namangan	2120	228,7	68138	803	184,1	19325
Samarkand	2213	284,0	97187	1057	251,5	46556
Surkhandarya	2967	320,8	169934	985	302,2	48044
Syrdarya	4059	335,8	285286	2090	321,1	154543
Tashkent	4285	214,7	144831	2855	216,5	105333
Fergana	2570	187,8	64230	1397	192,9	39427
Khorezm	6827	177,0	125620	4024	161,1	68190

Fruit and berry plantations - total for 2014)

	All categories of farms			including:		
				Farms		
	Gross collect, tons.	The area ha	Gross collect, tons.	The area ha	Урожайность, ц/га	Валовый сбор, тонн.
The Republic Of Uzbekistan	**262511**	**117,2**	**2490624**	**164499**	**91,2**	**1135963**
The Republic Of Karakalpakstan	5624	82,8	36811	2107	71,2	11370
regions:						
Andijan	29269	201,0	522891	14112	119,1	132543
Bukhara	11792	200,4	217150	6762	148,8	90277
Jizzakh	13764	75,2	82005	8060	65,0	38725
Kashkadarya	19667	82,5	110744	14680	67,6	64158
Navoi	5768	175,3	95719	3219	144,4	46473
Namangan	27225	82,2	203503	15410	58,5	76845
Samarkand	32318	108,8	341672	17236	96,0	165456
Surkhandarya	15578	85,3	124806	9031	65,1	53778
Syrdarya	6080	58,6	29497	3882	45,7	14658
Tashkent	34257	90,3	188537	22940	82,4	102257
Fergana	48134	113,8	375895	39068	97,0	249189
Khorezm	13035	137,1	161394	7992	125,4	90234

The vineyards - total for 2014)

	All categories of farms		including:			
			Farms			
	The area ha	Gross collect, tons.	The area ha	Gross collect, tons.	The area ha	Валовый сбор, тонн.
The Republic Of Uzbekistan	**128972**	**122**	**1441211**	**86270**	**98**	**766295**
The Republic Of Karakalpakstan	702	99,2	5286	112	69,5	508
regions:						
Andijan	4120	174,1	63430	2885	151,3	37589
Bukhara	9800	174,8	154581	5707	117,4	59469
Jizzakh	4536	77,2	28493	2355	82,9	15924
Kashkadarya	11402	106,5	88915	8622	87,7	51322
Navoi	6444	100,8	64890	4318	67,3	29024
Namangan	11243	102,7	114216	6908	71,5	48853
Samarkand	38968	129,6	497316	29746	112,5	326752
Surkhandarya	14171	81,6	115695	11332	60,8	68941
Syrdarya	1602	76,3	12097	715	72,5	5079
Tashkent	17361	107,6	155902	10960	107,1	93927
Fergana	5881	216,0	103573	1478	142,3	16903
Khorezm	2742	143,2	36817	1132	115,1	12004

Production of major products in 2014

(All categories of farms)

tons

	Potato	Vegetables	Melons	Fruits	Grapes
The Republic Of Uzbekistan	**2452449**	**9286685**	**1696091**	**2490624**	**1441211**
The Republic Of Karakalpakstan	44699	227476	105963	36811	5286
regions:					
Andijan	253782	1308928	92688	522891	63430
Bukhara	175270	520023	113989	217150	154581
Jizzakh	55893	341143	236698	82005	28493
Kashkadarya	150198	467265	130605	110744	88915
Navoi	62742	215208	60922	95719	64890
Namangan	226992	622547	68138	203503	114216
Samarkand	526779	1457709	97187	341672	497316
Surkhandarya	193997	807007	169934	124806	115695
Syrdarya	40253	263805	285286	29497	12097
Tashkent	361400	1841748	144831	188537	155902
Fergana	252056	712072	64230	375895	103573
Khorezm	108388	501754	125620	161394	36817

Average price in dehkan markets in the Republic of Uzbekistan for January - December

(kg in sum)

The name of the region	Potato				Cabbage				Onion			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
The Republic Of Uzbekistan	**746,13**	**1296,53**	**1346,70**	**1703,05**	**777,97**	**680,52**	**817,60**	**934,55**	**812,40**	**893,72**	**551,93**	**1159,57**
The Republic Of Karakalpakstan	831,91	1456,36	1488,58	1813,69	677,08	661,78	875,83	988,15	835,15	979,94	606,53	1134,11
regions:												
Andijan	719,32	1313,44	1451,53	1762,29	632,43	661,30	794,03	883,87	798,75	877,60	543,10	1222,91
Bukhara	773,14	1354,44	1351,82	1770,49	779,45	691,29	858,33	928,26	832,58	1012,05	595,75	1297,92
Jizzakh	659,12	1299,98	1363,20	1736,57	735,69	608,82	732,81	907,39	806,67	859,47	512,35	1085,84
Kashkadarya	802,47	1344,42	1385,55	1672,94	690,60	595,98	749,35	810,83	779,37	884,33	538,33	1225,10
Navoi	861,64	1321,72	1333,44	1714,31	857,35	708,46	801,49	912,43	888,35	924,03	599,32	1193,36
Namangan	657,26	1238,19	1293,82	1645,59	823,48	738,54	891,08	965,00	759,76	876,97	507,54	1125,93
Samarkand	679,74	1194,41	1159,65	1566,31	801,08	659,27	788,82	838,88	772,38	793,02	468,68	1045,93
Surkhandarya	779,69	1330,41	1365,29	1787,20	756,85	692,33	817,18	896,90	864,55	944,85	524,71	1200,60
Syrdarya	847,95	1289,53	1320,03	1600,62	984,93	698,71	976,83	960,76	871,15	871,27	566,39	1085,18
Tashkent	654,98	1168,57	1306,66	1564,45	643,38	698,77	718,78	886,39	714,84	863,70	500,08	1113,86
Fergana	644,51	1148,45	1299,83	1534,20	699,63	607,12	793,47	990,12	701,20	843,88	533,53	1135,33
Khorezm	713,28	1197,78	1270,64	1870,08	697,05	623,53	687,36	928,93	836,36	853,64	588,61	1223,19
Tashkent city	820,81	1493,65	1463,73	1804,02	1112,65	881,37	961,03	1185,81	912,45	927,32	642,15	1144,70

Average price in dehkan markets in the Republic of Uzbekistan for January - December

(kg in sum)

The name of the region	Carrot				Cucumber				Tomato			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
The Republic Of Uzbekistan	**744,61**	**728,46**	**706,60**	**1018,47**	**2126,60**	**2261,93**	**2930,06**	**3072,46**	**2033,48**	**2565,59**	**3298,04**	**3166,49**
The Republic Of Karakalpakstan	593,39	590,87	702,63	975,54	1969,86	2473,16	2945,67	2999,01	2296,77	2752,47	3251,81	3371,70
regions:												
Andijan	720,27	634,29	653,95	1017,31	2135,46	2126,91	2615,45	3066,23	1864,37	2403,13	3323,53	3362,76
Bukhara	743,00	815,90	785,05	1062,72	1878,94	2004,63	2691,55	3046,64	2130,90	2354,22	3335,65	3363,19
Jizzakh	793,23	709,60	716,54	1026,97	2333,76	2362,71	3126,88	3312,89	2142,91	2654,98	3220,77	3394,16
Kashkadarya	683,33	785,02	736,51	1018,21	2037,90	2146,43	2899,31	2791,96	1982,72	2597,92	3375,30	3078,27
Navoi	854,25	793,75	754,83	1054,17	1951,30	1843,33	2524,29	2787,56	2236,85	2296,39	3121,25	2807,55
Namangan	659,06	632,64	540,90	885,99	1979,86	2274,07	3178,95	3061,92	1914,87	2386,28	3436,23	3350,06
Samarkand	825,98	774,74	711,49	975,50	1899,01	1862,24	2438,96	2686,72	2002,22	2481,68	2984,86	3016,23
Surkhandarya	784,56	770,61	743,85	1104,47	1933,36	2347,02	3038,19	3137,33	1937,69	2533,72	3484,67	3189,63
Syrdarya	756,26	751,61	711,28	937,53	2495,67	2555,22	3376,26	3071,56	1778,69	2320,78	3145,24	2858,07
Tashkent	735,58	761,13	716,84	1046,73	2017,54	2227,96	2824,99	3104,05	1702,34	2315,57	3172,12	2914,35
Fergana	671,65	653,06	590,59	979,44	2149,41	2573,63	3199,19	3699,28	2093,49	2882,27	3560,49	3356,53
Khorezm	561,56	541,28	576,47	884,44	2073,97	2274,07	2610,99	2869,94	2186,19	2903,05	2992,64	2968,06
Tashkent city	1042,45	983,99	951,45	1289,52	2916,35	2595,58	3550,21	3379,42	2198,80	3035,86	3768,08	3300,25

Average price in dehkan markets in the Republic of Uzbekistan for January - December

(kg in sum)

The name of the region	Apple				Pear				Apricot			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
The Republic Of Uzbekistan	**2347,04**	**2087,07**	**2783,16**	**3031,43**	**3456,93**	**4032,82**	**4779,30**	**5436,12**	**1631,69**	**1639,22**	**2390,39**	**2656,55**
The Republic Of Karakalpakstan	2279,95	1911,42	2707,49	2753,06	3074,71	2641,07	4582,70	5693,35	1762,86	1156,46	1389,02	1558,04
regions:												
Andijan	2149,57	1986,63	2909,98	3243,06	3135,05	3404,86	4001,61	5110,72	1489,58	1701,39	2490,16	2794,20
Bukhara	2157,64	2070,14	2727,78	2929,28	4025,12	5148,10	5766,76	6689,85	1325,34	1430,01	2263,43	1997,68
Jizzakh	2628,25	2306,06	2761,36	3201,73	3630,48	4110,17	4999,63	5467,37	1999,10	1934,74	1823,86	3165,71
Kashkadarya	2438,79	2403,77	3005,06	2945,48	3609,92	4310,17	5144,55	6267,66	1485,52	968,10	2516,67	2525,12
Navoi	2480,12	2055,11	2551,59	2652,62	4131,01	4946,53	4999,81	5405,25	1064,78	1430,00	1782,72	1941,39
Namangan	2124,59	2030,09	2564,83	2701,36	2756,79	3125,00	3966,47	4624,26	1640,87	2204,17	2163,16	2346,55
Samarkand	2132,29	1522,83	2322,28	2674,00	3306,54	5312,85	5233,28	4397,83	1728,24	1629,04	2995,14	3221,89
Surkhandarya	2624,28	2277,86	2786,06	3161,21	4010,29	4648,21	5408,08	6166,79	1013,85	1356,95	2655,43	2295,03
Syrdarya	2269,55	1822,21	2610,68	3060,10	3689,75	4299,07	5684,72	5794,21	2012,59	1524,41	2145,37	2734,84
Tashkent	2212,34	2109,09	2798,42	3162,16	2969,24	3233,17	4459,44	4708,71	1823,05	1866,61	2327,89	3011,04
Fergana	2258,72	2340,85	3294,88	3404,09	2749,71	3671,85	4198,55	5631,51	1399,96	1683,23	3110,91	2877,38
Khorezm	2252,84	1948,47	2094,72	2527,47	3209,85	3561,03	3535,78	4310,08	1597,38	1785,93	2126,56	3468,89
Tashkent city	2849,62	2434,47	3829,16	4024,47	4098,61	4047,35	4928,83	5838,08	2500,51	2278,03	3675,17	3253,90

Average price in dehkan markets in the Republic of Uzbekistan for January - December

(kg in sum)

The name of the region	Grapes				Watermelon				Melon			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
The Republic Of Uzbekistan	**3431,79**	**3072,98**	**3176,07**	**4066,48**	**752,43**	**768,18**	**959,03**	**979,02**	**1082,71**	**1075,20**	**1444,92**	**1416,72**
The Republic Of Karakalpakstan	2521,28	3082,45	2496,59	3750,79	497,18	690,04	993,20	772,08	901,38	985,56	1434,88	1286,70
regions:												
Andijan	3352,02	3116,78	3038,92	3893,08	756,49	649,14	806,20	999,12	1018,90	938,98	1405,14	1441,95
Bukhara	2741,61	2519,15	3325,37	3551,95	583,23	649,01	776,13	864,30	1346,41	1347,27	1832,78	1626,01
Jizzakh	3460,84	3202,56	3384,39	4410,40	730,08	745,88	826,42	937,82	911,36	920,45	1239,51	1236,72
Kashkadarya	3902,77	3425,18	3718,29	3902,05	620,20	762,73	791,25	908,95	1030,13	1314,04	1160,69	1577,23
Navoi	3614,69	3549,92	3346,54	3433,94	879,51	740,00	880,44	842,71	1138,38	1236,48	1375,57	1349,16
Namangan	3327,90	2872,47	2862,47	3997,43	763,25	857,56	933,43	1216,00	1150,60	1049,77	1329,61	1800,09
Samarkand	3141,56	2475,10	2732,48	3461,80	712,11	605,31	827,07	894,42	1235,10	917,59	1389,66	1400,01
Surkhandarya	2939,42	3541,36	3172,88	3762,36	616,53	909,77	1108,18	1062,06	788,64	1062,32	1577,25	1302,99
Syrdarya	3759,79	3406,00	3538,51	4268,50	734,33	916,85	1055,98	900,48	790,17	970,40	1219,25	1005,78
Tashkent	3291,03	3268,89	3205,38	4358,74	741,81	707,28	949,90	1111,36	1135,03	1031,71	1302,57	1501,64
Fergana	2946,41	2641,50	2580,44	4955,39	660,86	715,59	842,66	879,44	907,46	1033,45	1568,33	1493,76
Khorezm	2642,56	2413,27	2706,24	3305,22	814,44	714,22	790,17	849,26	1075,04	911,12	1288,33	1018,12
Tashkent city	6403,18	3507,05	4356,50	5879,08	1423,97	1091,17	1845,41	1468,29	1729,27	1333,67	2105,27	1794,00

Appendix 2: Banks & Lease

(1) Banks

Table 1: List of Banks which has interest in Agriculture sector

Name	**JSC Asaka Bank** https://www.asakabank.uz/ en/ (Second commercial bank in Uzbekistan founded in 1995)
Main shareholder	MoF (54.14%) The fund of Reconstruction and development、Uzbekistan railway Other firms and organization in natural resources or energy sector
Main Activity	It grew up with loans for natural resource development and Energy sector. Now expanding to other business sector mainly manufacture sector.
Experience in Agriculture sector /Donor collaboration	Being experienced for project finance activity with other donors like WB, ADB in energy and mineral resource development/utilization sector. Working with JBIC in Export bank loan for Urea plant. While less experience in agriculture sector, financing to Agri firm for Poultry farming, dairy farming, greenhouse Their interest in JICA project is high
others	Management is stable with loans for large companies such as electricity, energy, railroads. Based on the government's policy, aiming to expand business in agriculture (horticulture) and logistics.
Name	**National Bank of Uzbekistan for Foreign economic activity (NBU)** http://www.nbu.com/en/
Main shareholder	MoF
Main Activity	· Support for promoting external economic activities of Uzbekistan companies. · Financial support for enterprises utilizing donor funds and government funds.
Experience in Agriculture sector /Donor collaboration	· Rich experience of various credits in collaboration with MoFERITm RRA · In the agricultural sector (FVV) dealing with credits such as WB and AADB · In the horticulture sector, having experience for warehouses, greenhouses and processing facilities throughout the country.
Others	· It has not financed for comprehensive logistics center experience including field, processing facility, logistics, etc., but it has experience with donor credit line (ADB, World Bank), of large warehouse such as major food processing enterprise (juice), credit for nursery. · Setting up small business export support association in bank, it is supporting companies to prepare of financing plan, introduce overseas investors, utilize donor funds etc.
Name	**JSCAloqa Bank** http://aloqabank.uz/en/ (Registered by Central bank in 19951)
Main shareholder	· "Uzbektelecom" JSC; · Fund for Development of information-communication technologies; · Center of Electromagnetic Compatibility; · Tashkent University of Information Technologies; · "Alskom" Insurance JSC · Ministry for Development of Information Technologies and Communications of the Republic of Uzbekistan
Main Activity	· Financing for private enterprises mainly in the field of IT communications. · Support for introducing the latest technology of companies · Diffusion of Internet banking or credit cards · Support diversification of companies
Experience in Agriculture sector /Donor collaboration	· Rich experience in cooperation in project finance in the field of communication with other donors. · In recent years, having financed the logistics, processing industry, greenhouse etc. based on the government policy. · Willing to begin handling donor credits in agriculture (horticulture) field from now on.
Others	·Its management is stable, as the main customers are large enterprises for communications such as cellular phones, IT companies. · Tring to support the agricultural sector of client. Aiming to expand financial support for greenhouses and plant factories, agricultural mechanization and so on.
Name	**JSC Microcreditbank** https:// ikrokreditbank.uz/en/ (Founded in 2006 by President degree)
Main shareholder	MoF, Central bank, NBU Asaka bank, Agrobank, Uzbek invest, SC «UZBEKTELEKOM»
Main Activity	· Private enterprise development · Financial support for small and medium enterprises, entrepreneur support fund · Micro credit provision for local enterprises
Experience in Agriculture sector /Donor collaboration	· IFC, IFAD etc. Microcredit utilizing funds is implemented. It is mainly credit for micro / small business for about 500 times the monthly minimum wage. · Main clients in agriculture sector are Dehkan and agricultural enterprise.
Others	· Lacking of human resources to conduct financial product development and credit screening, it expects to implement human resource development program. · It is supporting the preparation of credit application documents for Dehkan and small / medium-sized agricultural enterprises.

(2) Lease

Leasing is possible way for purchasing agricultural material and equipment as well as bank loans. In Uzbekistan about 50-80 leasing companies are founded because they don't need any license for establishment.

Table 2: Ranking of leasing companies (2016)

No	Company Name	New leasing amount (Bil UZS)
1	UzAgroLeasing（O'zagrolizing）	273.7
2	Uzavtosanoatlizing	80.1
3	Uzbek Leasing International A.O.	74.7
4	Taiba Leasing	24.9
5	Uzmeliomashlizing	20.5

Source: Brochure of Uzbek Leasing International AO

To collect information JICA study team visited 3 leasing companies who are different types. Among these companies UzagroLeasing runs agricultural leasing in particular.

Table 3: Features of Leasing companies

	UzAgroLeasing	UzbekLeasing International AO	InfinLeasing
Year of establishment	1999	1995	2008
Major stockholder	UzAgroTechSonoatHD UK Fund Uzagrosugurta Agrobank	NBU(Milly Bank) Maybank (Malaysia) UzOmanCapital	100% Private
Main lease asset	Traktor (13types, 90%: Made in Uzbekistan)	Medical equipment, Refrigerator, Agricultural machinery, Processing equipment, Poultry equipment, Greenhouse etc.	Gas trading (Agricultural leasing is suspended)
Clients	80% are cotton farmers	Medical, Real estate, Construction, Food manufacturing, Agriculture etc.	400 companies -Tashkent local companies -Foreign companies(Gas filling)
Lease condition	Lease term 10 years (for farmers) 7 years (for MTP: Motor Traktor Parks) *Long lease term: severe condition area for production *Lease term is depend on machine price	-Companies between green and brown field.(at least 2 years business experience) -Sufficient liquidity on B/S and less debt	- Down payment: at least 30% of total amount - Lease term: 1-5 years - Period for credit review: 1 week - Required P/L, B/S, - P/L、B/S、income certificate (no need business plan) - Pass rate: 90%
Feature	-Largest leasing company in Uzbekistan -Low income farmers can be their client as group.	-3rd ranks in Uzbekistan	-Subsidiary of Infin bank (Uzbekistan) -Business with China gas company

Source: Prepared by the JICA Study Team

Appendix 3: Summary of open seminar

(1) Summary of the Seminar

The JICA study team organized an Open Seminar to report the research result with Uzbekistan stakeholders.

Overview of the Open Seminar

Date	Fri. 26th May 2017, 14:00～17:00
Place	Seminar Hall of Uzbekistan – Japan Center
Participants	36 participants mainly from research institutions, international organizations, private companies, financial institutions
Agenda	- Greetings: General Director of Rural Restructuring Agency (RRA), Mr. Nasriddin NAJIMOV - Greetings: Senior Representative of JICA Uzbekistan Office, Mr. Eiji Asami - Report of the research result: Hokkaido Intellect Tank (HIT) Mr. Takumi Togashi (Leader of the JICA study team) - Q&A session

Greetings from RRA (Mr. Najimov)


Q&A session

(2) Summary of opinions from Uzbek side in Q&A session（Excerpt)

・As for the production stage of FVC, the priority should not only be on crops which are good for export, but on crops for local consumption. Farmers should select which crops to grow in line with local situation. Uzbekistan farmers are now growing hybrid species which were developed abroad, but they should conserve local species in Uzbekistan. There are problems about a lack of seeds, insufficient regulation of land allocation for crops species, needs for farmers' training, and needs for certification of species.

・Uzbekistan needs improvement not only in certification of organic products, but also in enhancing or capacity building of certification, since demand for organic products is increasing in developed

countries.

- Foreign companies, especially Japanese companies should work on food processing together with local companies in Uzbekistan, so that the credit of certification system might be improved. Besides, each region in Japan has its own method of sowing and raising seedlings. For example, in some regions, they supply necessary materials to farmers in a unique way. Also, in Uzbekistan, there is a lack of raw material for packaging and Japanese companies could provide those materials of good quality.
- Uzbekistan product doesn't have strength as a brand abroad. Participation of Japanese companies in processing of agriproducts could help Uzbekistan side to gain a brand power. For example, Isuzu Motors Ltd is a world brand which is working on Uzbekistan.