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IDA/R2017-0222/1

June 12, 2017

Closing Date: Thursday, June 29, 2017 at 6 p.m.

FROM: Vice President and Corporate Secretary

Uzbekistan – Ferghana Valley Water Resources Management Project – Phase II

Project Appraisal Document

Attached is the Project Appraisal Document regarding a proposed credit to Uzbekistan for a Ferghana Valley Water Resources Management Project – Phase II (IDA/R2017-0222), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

Document of
The World Bank

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Report No: PAD1054

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF US$ 144.90 MILLION EQUIVALENT

TO THE

REPUBLIC OF UZBEKISTAN

FOR

A FERGHANA VALLEY WATER RESOURCES MANAGEMENT PROJECT – PHASE II

June 8, 2017

Water Global Practice
EUROPE AND CENTRAL ASIA

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 30, 2017)

Currency Unit	=	Uzbekistan Soum (UZS)
UZS3,704.94	=	US$1
US$ 0.27	=	UZS 1,000

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AF	Additional Financing
AIS	Administration of Irrigation Systems
BAIS	Basin Administration of Irrigation Systems
BCM	Billion Cubic Meters
BVO	Basin Water Organization
CPS	Country Partnership Strategy
CSO	Civil Society Organization
C/FL	Child and/or Forced labor
DA	Designated Account
DIWIP	Drainage, Irrigation and Wetland Improvement Project
DL	Disbursement Letter
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ENPV	Economic Net Present Value
EPP	Emergency Preparedness Plan
ERR	Economic Rate of Return
EAMP	Environmental Assessment and Management Plan
FA	Financing Agreement
FAO	Food and Agricultural Organization of The United Nations
FBM	Feedback Mechanism
FFS	Farmer Field School
FM	Financial Management
FMR	Financial Management Report
FNPV	Financial Net Present Value
FV	Ferghana Valley
FVWRMP	Ferghana Valley Water Resources Management Project
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim Financial Reports
MASSCOTE	Mapping System and Services for Canal Operation Techniques
ILO	International Labor Organization
IPF	Investment Project Financing
ISF	Irrigation Service Fee
MDTF	Multi-Donor Trust Fund
MAWR	Ministry of Agriculture and Water Resources
MFERIT	Ministry of Foreign Economic Relations and International Trade
Mirob	A WCA staff in charge of canal water distribution
MIS	Management Information System
MOU	Memorandum of Understanding
NCB	National Competitive Bidding
O&M	Operation and Maintenance
OCC	Oblast Coordination Committee
OP	Operational Policy
PAP	Project Affected People
PDO	Project Development Objective
PFI	Participating Financial Institution
PIU	Project Implementation Unit
PMP	Pest Management Plan
POF	Probability of Failure
POM	Project Operational Manual
PPP	Public Private Partnerships
QCBS	Quality and Cost Based Selection
RAP	Resettlement Action Plan
RBC	Right Bank Canal
RESP-II	Second Rural Enterprise Support Project
RPF	Resettlement Policy Framework
SCADA	Supervisory Control And Data Acquisition
SDC	Swiss Agency for Development and

IFAS	International Fund for Saving the Aral Sea		Cooperation
FY	Fiscal Year	SKWRMIP	South Karakalpakstan Water Resources Management Improvement Project
GDP	Gross Domestic Product	SOE	Statement of Expenditures
GOU	Government of Uzbekistan	SSESI	Supplemental Social and Environmental Safeguard Instrument
HA	Hectare(s)	TA	Technical Assistance
HDP	Horticultural Development Project	TOR	Terms Of Reference
I&D	Irrigation and Drainage	TPM	Third Party Monitoring
IDA	International Development Association	UNDP	United Nations Development Program
ICB	International Competitive Bidding	UNICEF	United Nations Children's Fund
ICR	Implementation Completion Report	UZS	Uzbekistan Soum
ICCPR	International Covenant on Civil and Political Rights (ICCPR)	VAT	Value-Added Tax
		WCA	Water Consumer Association
ICWC	Interstate Commission for Water Coordination	WHO	World Health Organization
		WRM	Water Resources Management

Regional Vice President:	Cyril Muller
Country Director:	Lilia Burunciuc
Senior Global Practice Director:	Guang Zhe Chen
Practice Manager:	Michael Haney
Task Team Leader:	IJsbrand H. de Jong

UZBEKISTAN
Ferghana Valley Water Resources Management Project - Phase II

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PAD DATA SHEET

Uzbekistan

Ferghana Valley Water Resources Management - Phase II (P149610)

PROJECT APPRAISAL DOCUMENT

EUROPE AND CENTRAL ASIA

0000009392

Report No.: PAD1054

Basic Information			
Project ID P149610	EA Category B - Partial Assessment		Team Leader(s) IJsbrand H. de Jong
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 29-June-2017	Project Implementation End Date 31-May-2024		
Expected Effectiveness Date 4-October-2017	Expected Closing Date 31-August-2024		
Joint IFC No			
Practice Manager Michael Haney	Senior Global Practice Director Guang Zhe Chen	Country Director Lilia Burunciuc	Regional Vice President Cyril E Muller

Borrower: Ministry of Finance			
Responsible Agency: Ministry of Agriculture and Water Resources			
Contact:	Mr. Sh. Hamraev	Title:	Deputy Minister, Ministry of Agriculture and Water Resources
Telephone No.:	+998-71241-0042	Email:	piu-diwip@buzton.com

Project Financing Data(in USD Million)					
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	225.0	Total Bank Financing:	144.90
Financing Gap:	16.40		

Financing Source	Amount
BORROWER/RECIPIENT	63.70
International Development Association (IDA)	144.90
European Union (proposed)	16.40
Total	225.00

Expected Disbursements (in USD Million)

Fiscal Year	2017	2018	2019	2020	2021	2022	2023	2024
Annual	0	8.15	11.15	28.91	41.66	40.42	9.61	5.00
Cumulative	0	8.15	19.30	48.21	89.87	130.29	139.90	144.9

Institutional Data

Practice Area (Lead)

Water

Contributing Practice Areas

Agriculture

Proposed Development Objective(s)

The project development objective is to improve the quality of irrigation and drainage service delivery to agricultural users within the project area.

Components

Component Name	Cost (USD Millions)
Component A: Irrigation Modernization	191.40
Component B: Support for Agricultural Modernization	21.50
Component C: Project Management	12.10

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Moderate
6. Fiduciary	High
7. Environment and Social	High
8. Stakeholders	Substantial
9. Other	
OVERALL	Substantial

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ] No [X]
Does the project require any waivers of Bank policies?	Yes [ ] No [X]
Have these been approved by Bank management?	Yes [ ] No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ] No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X] No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04		**X**
Forests OP/BP 4.36		**X**
Pest Management OP 4.09	**X**	
Physical Cultural Resources OP/BP 4.11		**X**
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37	**X**	
Projects on International Waterways OP/BP 7.50	**X**	
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
A.1. Section I, Schedule 2. Implementation arrangements	**X**		Yearly

Description of Covenant

The Ministry of Agriculture and Water Resources (MAWR) of the Recipient shall be responsible for overall Project supervision and policy guidance, and shall maintain, until the completion of the Project implementation, the Project Implementation Unit with regional offices in all Project Regions, with functions and responsibilities (including responsibility for Project management and fiduciary functions, and monitoring and evaluation), adequate funds, facilities, services and resources, and with competent staff, in adequate numbers, qualifications, and experience, all acceptable to the Association.

Name	**Recurrent**	**Due Date**	**Frequency**
A.2. Section I, Schedule 2. Establishing and maintaining OCC	**X**		Yearly

Description of Covenant

Not later than 30 days after the Effective Date, the Recipient shall establish and thereafter maintain until completion of the Project and the OCC in each of the Project Regions, all with functions, composition

and terms of reference set forth in the Project Operational Manual and satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
A.4. Section 1, Schedule 2. Works Verification Agent	X		Yearly

Description of Covenant

Not later than 90 days after the Effective Date, the Recipient, through MAWR, shall appoint, in accordance with the provisions of Section III.C of Schedule 2 of the Financing Agreement, and thereafter maintain at all times during the implementation of the Project, the Works Verification Agent with the terms of reference and responsibilities satisfactory to the Association and set forth in the Project Operational Manual. The Works Verification Agent shall periodically audit and verify the volume and quality of works to be carried out under the Project and shall prepare Technical Audit Reports. Unless otherwise has been agreed with the Association, each Technical Audit Report shall cover the period of one fiscal year of the Recipient, and shall be furnished to the Association not later than forty-five (45) days after the end of the period covered by such report.

Name	Recurrent	Due Date	Frequency
A.3. Section I, Schedule 2. Compliance with Agreement and POM	**X**		Yearly

Description of Covenant

The Recipient, through MAWR, shall: (a) adopt the Project Operational Manual, satisfactory to the Association, and thereafter carry out the Project in accordance with the provisions set out in the Project Operational Manual; and (b) not amend, suspend, abrogate, repeal or waive any provision of said Manual without the prior written approval of the Association, provided, however, that in case of any conflict between the provisions set out in the Project Operational Manual and the provisions of this Agreement, the provisions of this Agreement shall prevail.

Name	Recurrent	Due Date	Frequency
B.1. Section I, Schedule 2. Compliance with laws on child and/or forced labor	**X**		Yearly

Description of Covenant

The Recipient shall carry out the Project in accordance with the Financing Agreement, appropriate social standards and practices and any applicable laws and regulations on child and/or forced labor, and shall, at the beginning of the cotton harvesting season during each year of Project implementation, instruct any involved local authorities within the Project Area to ensure strict compliance with such laws and regulations while organizing cotton harvesting.

Name	Recurrent	Due Date	Frequency
B.2. Section I, Schedule 2. TPM Consultant to perform monitoring activities	**X**		Yearly

Description of Covenant

The Recipient shall take all necessary actions, and ensure that necessary actions are taken, to enable the TPM Consultant to perform monitoring activities in accordance with the applicable terms of reference, including, but not limited to allowing and facilitating for the TPM Consultant to visit sites where the Project is being carried out, collect relevant data and communicate with Project stakeholder and participants.

Name	Recurrent	Due Date	Frequency
B.3. Section I, Schedule 2. Monitoring reports prepared by TPM Consultant	**X**		Yearly

Description of Covenant

The Recipient shall: (a) review and discuss with the Association monitoring reports prepared by the TPM Consultant; and (b) promptly take any actions, as may be requested by the Association upon its review of said reports, with respect to compliance with the undertakings relating to child and/or forced labor as set forth in this Agreement and the Project Operational Manual.

Name	Recurrent	Due Date	Frequency
B.4. Section I, Schedule 2. TPM Consultant's TOR on grievance redress mechanism	**X**		Yearly

Description of Covenant

The Recipient: (a) shall and shall cause respective local authorities to fully collaborate with the TPM Consultant in developing an effective grievance redress mechanism in connection with the Project activities, as set forth in the TPM Consultant's terms of reference; (b) shall review biannual reports of the TPM Consultant on grievances received, redress mechanism and any feedback provided; and (c) shall promptly implement or cause relevant local authorities to implement the recommendations provided in said reports.

Name	Recurrent	Due Date	Frequency
D.1. Section I, Schedule 2. Relevant Safeguards Instruments (part 1)	**X**		Yearly

Description of Covenant

The Recipient, through MAWR, shall implement the Project in accordance with the relevant Safeguards Instruments, and, to that end, shall: (a) if any activity under the Project would require the adoption of any Supplemental Social and Environmental Safeguard Instrument (SSESI):

Name	Recurrent	Due Date	Frequency
D.1. Section I, Schedule 2. Relevant Safeguards Instruments (part 2)	**X**		Yearly

Description of Covenant

(i) prepare: (A) such Supplemental Social and Environmental Safeguard Instrument in accordance with EAMP and RPF; (B) furnish such SSESI to the Association for review and approval; and (C) thereafter adopt such SSESI prior to implementation of the activity; and (ii) thereafter take such measures as shall be necessary or appropriate to ensure full compliance with the requirements of such SSESI;

Name	Recurrent	Due Date	Frequency
D.1. Section I, Schedule 2. Relevant Safeguards Instruments (part 3)	**X**		Yearly

Description of Covenant

(b) if any activity under the Project would involve Affected Persons, ensure that no displacement (including restriction of access to legally designated parks and protected areas) shall occur before resettlement measures under the Podshaota-Chodak RAP or the respective SSESI, including, in the case of displacement, full payment to Affected Persons of compensation and of other assistance required for

relocation, have been implemented.

Name	Recurrent	Due Date	Frequency
D.2. Section I, Schedule 2. prior to the contracting of works for each proposed site (part 1)	**X**		Yearly

Description of Covenant

Without limitation to the provisions of paragraph 1 above, prior to the contracting of works for each proposed site within the Project Area, the Recipient, through MAWR, shall: (a) submit to the Association for its prior approval:

Name	Recurrent	Due Date	Frequency
D.2. Section I, Schedule 2. prior to the contracting of works for each proposed site (part 2)	**X**		Yearly

Description of Covenant

(i) the proposed design and site for said works and, where required by the respective Safeguard Instrument or local legislation, as applicable, any related environmental licenses and permits;

Name	Recurrent	Due Date	Frequency
D.2. Section I, Schedule 2. prior to the contracting of works for each proposed site (part 3)	**X**		Yearly

Description of Covenant

and (ii) the proposed contract for said works to ensure that the provisions of the respective SSESI are adequately included in said contract; and (b) ensure that such works are carried out in accordance with the respective Safeguard Instrument.

Name	Recurrent	Due Date	Frequency
D.3. Section I, Schedule 2. Specific part of the Project Area requiring resettlement and/or land acquisition	**X**		Yearly

Description of Covenant

The Recipient shall ensure that no works for a specific part of the Project Area requiring resettlement and/or land acquisition are commenced until the Podshaota-Chodak RAP or the respective SSESI for said part of the Project Area is fully implemented.

Conditions

Source Of Fund	Name	Type
IDA	(a) Project Operational Manual	Effectiveness

Description of Condition

The Project Operational Manual satisfactory to the Association has been adopted by the Recipient.

Source Of Fund	Name	Type
IDA	(b) implementation capacity of the PIU and use of accounting software	Effectiveness

Description of Condition

The implementation capacity of the PIU has been strengthened by employment of additional financial management, monitoring and evaluation and safeguards specialists, and updating of its accounting software in accordance with the technical requirements and specifications set forth in the Project Operational Manual.

Source Of Fund	Name	Type
IDA	(c) Procurement Panel	Effectiveness

Description of Condition

The Procurement Panel has been established by the Recipient in accordance with the provisions of paragraph 4 of Section I.A of Schedule 2 to the Financing Agreement.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
IJsbrand H. de Jong	Team Leader (ADM Responsible)	Lead Water Resources Specialist	Lead Water Resources Specialist	GWA06
Fasliddin Rakhimov	Procurement Specialist (ADM Responsible)	Sr. Procurement Specialist	Procurement	GGO03
Djamshid Iriskulov	Financial Management Specialist	Consultant	Financial Management	GGODR
Alisher Khamidov	Safeguards Specialist	Consultant	Social Development	GSU03
Ekaterina Romanova	Safeguards Specialist	Social Development Specialist	Social Development	GSU03
Gulana Enar Hajiyeva	Safeguards Specialist	Senior Environmental Specialist	Environment	GEN03
Javaid Afzal	Safeguards Specialist	Senior Environmental Specialist	Environment	GEN03
Hiromi Yamaguchi	Team Member	Consultant	Operations	GFA03
Jasna Mestnik	Team Member	Finance Officer	Finance Officer	WFALA
Jeren Kabayeva	Team Member	Agricultural Spec.	Rural Development	GFA03
Nikolai Soubbotin	Counsel	Lead Counsel	Country Lawyer	LEGLE
Olivier Durand	Team Member	Senior Agriculture Economist	Agriculture Development	GFA03
Oydin Dyusebaeva	Team Member	Program Assistant	Program Assistant	ECCUZ
Togzhan Alibekova	Team Member	M&E Specialist	M&E	ECCKA
Valencia M. Copeland	Team Member	Program Assistant	Program Assistant	GFA03

Extended Team

Name	Title	Office Phone	Location
Kairat Nazhmidenov	Senior Agricultural Economist (FAO)		

Locations					
Country	**First Administrative Division**	**Location**	**Planned**	**Actual**	**Comments**
Uzbekistan	Ferghana	Ferghana	**X**		
Uzbekistan	Andijan	Andijan	**X**		
Uzbekistan	Namangan	Namangan	**X**		

I. STRATEGIC CONTEXT

A. Country Context

1. Uzbekistan is a lower middle-income, resource-rich, and double-landlocked country, strategically located in the center of Central Asia. Uzbekistan is the third largest country in Central Asia by land mass, and the largest in terms of population (32.1 million as of January 1, 2017). Despite slow growth in the Europe and Central Asia (ECA) region, Uzbekistan's economy continues to perform strongly. Real gross domestic product (GDP) growth, according to official estimates, averaged 8.2 percent per annum between 2008 and 2016, making Uzbekistan one of the fastest growing economies in the ECA region and the middle-income country grouping during this period. Poverty declined from 27.5 percent of the population in 2001 to an estimated 12.5 percent in 2016[1], driven by robust economic growth, rising wages, small-business development, and targeted Government support programs. Poverty remains concentrated in rural areas and, as a result of slow productivity growth in labor-intensive agriculture, the growth elasticity of poverty in Uzbekistan is lower than in comparable countries, suggesting that scope exists to make growth more inclusive and pro-poor.

2. Remittances from labor migrants also have helped many families in Uzbekistan keep poverty at bay. Net remittance inflows averaged 7.9 percent of GDP during 2010-14. However, a deepening recession in Russia in 2015-16 - second largest trading partner of Uzbekistan (after China) and its primary source market for remittances - combined with slowing growth among Uzbekistan's other major trading partners (China, Kazakhstan, Turkey and Korea) caused the export and remittances decline and a return of up to one million of Uzbek labor migrants in 2014-16. In US dollar terms, remittances declined by 43 percent in 2015 and 19 percent in the first 9 months of 2016. The prospect of declining remittances and returning migrant workers has prompted the authorities to focus on the creation of higher-productivity higher-wage jobs to absorb new labor force entrants.

3. Uzbekistan's high GDP growth rate was factor-driven, achieved through heavy reliance on energy and water. Increased emphasis needs to be placed on increasing efficiency, not least because the country has one of the most water and energy intensive economies in the world. Uzbekistan realizes that it can no longer maintain a "business as usual" approach and is looking at ways to adjust its growth model, increase domestic productivity, and ensure social and environmental sustainability. Sustaining progress over the medium to long term will require addressing significant environmental vulnerability, avoiding inequities, and adjusting to a less favorable external economic environment. This includes the management of natural resources (energy, land, and water), and the effects of climate change[2].

4. The Ferghana Valley (FV) is one of the most densely populated regions in Uzbekistan. According to the 2011 census, out of the country's total population of 29.1 million at the time, about 8.3 million (28.5 percent) lived in the FV. Socio-economic development of the region lags

1 Estimated and measured by the Uzbek national poverty line of minimum food consumption equivalent to 2,100 calories per person per day.

[2] Uzbekistan: Systematic Country Diagnostics, 2016. Washington, DC: World Bank, May 2016, p.44

behind other regions of the country. GDP per capita in 2012 of the three provinces located in the FV (Ferghana, Andijan, and Namangan) was below the country average by 11 percent, 32 percent and 52 percent respectively. Poverty levels and poverty density are also very high across the region, and the region is home to one fourth of all the poor in Uzbekistan, while an estimated 48 percent of the poorest quintile of Uzbekistan lives in the FV. The FV is one of the more agriculturally developed regions of the country, and the yields per ha of most crops are higher than the national average. Dehqan[3] farms are the main drivers of agriculture production in the valley, and account for 16 percent of the arable land, and over 60 percent of gross agricultural output. Wheat and cotton account for one-third each of the arable land in the FV, with outputs that constitute 2.2 percent (wheat) and 2.6 percent (cotton) of the Valley's GDP.

B. Sectoral and Institutional Context

5. The share of agriculture in Uzbekistan's GDP declined from 30 percent in 2000 to 15.8 percent in 2014 as the economy transitioned from agriculture to hydrocarbons and metals. With scarce land and water assets, a growing population, climate change risks and volatile export markets, modernization of the agriculture sector is indispensable to further improve its performance and to contribute to its integration into a more open and competitive economy while minimizing social disruptions. Low value-added crops continue to absorb a disproportionate share of land, water and labor resources. The cotton sector remains largely governed by state decisions and state-controlled companies in a monopolistic situation, which has been limiting innovation and efficiency. As a result, cotton continues to use Government resources through heavy and inefficient subsidies that distort farming decisions, offer non remunerative prices to farmers, limit private investments and may lead to an increased risk of unacceptable labor practices in cotton production, especially at harvest time (see Annex 6).

6. The Government has recently demonstrated resolve to move away from state interventions and production quotas to promote a market-driven and privately managed cotton value chain. The Government recently prepared the *"Action Plan for Improving Labor Conditions, Employment and Social Protection of Workers in Agricultural Sector in 2016-2018"* that proposes specific actions to improve agricultural efficiency by tackling specific inefficiencies in the cotton value chain and by establishing the proper market-driven incentives. The Government's vision is to replace gradually the cotton quota system with market incentives to help farmers increase productivity and diversify, while stimulating innovation and efficiency.

7. As a result, the cotton area has declined from 1.83 million ha in 1990 to 1.28 million ha in 2013. The wheat area increased from about 0.63 million ha to about 1.44 million ha during the same period. Although the area under horticultural crops has increased from 0.51 million ha to only 0.61 million ha (representing some 14 percent of total cultivated area), yields have increased substantially between 1990 and 2013. Horticultural export earnings have jumped in recent years, from US$373 million in 2006 to US$1.16 billion in 2010, and the value of horticulture exports now exceeds that of cotton. More notably, horticulture is an important source of income for the 4.7 million households that operate dehqan farms.

[3] A *dehqan* farm is a small farm (from 0.06 up to 0.25 ha) around personal houses, as opposed to other larger agricultural production units (of about 15 ha on average) that are subject to state planning and stringent regulations.

8. The Bank has supported diversification into horticulture in Uzbekistan through various channels: policy dialogue, analytic work (e.g., "Horticulture Policy Note for Uzbekistan" 2013), and investments (the on-going Second Rural Enterprise Support Project (RESP-II), and its Additional Financing (AF), and the Horticulture Development Project (HDP)). The GOU has requested assistance from the Bank in designing an Agricultural Modernization Program. The overall goal of this program is to maximize sustainable growth and jobs in the agriculture sector by strengthening relevant institutions, creating favorable conditions, building capacities and promoting investment in productive assets.

Irrigation and Drainage

9. Because of the arid environment in the country, irrigation is essential to sustaining agriculture and rural incomes, employment and livelihoods of the many poor that depend on it. More than 85 percent (4.3 million ha) of the cropland is irrigated from the Amu Darya and Syr Darya Rivers and their tributaries.

10. Large-scale irrigation and drainage (I&D) development in Uzbekistan started in the late 1950s. The extensive irrigation networks that were constructed since the 1950 are now aging. Operation and Maintenance (O&M) has over the past 25 years suffered from substantial under-funding with only about 15-25 percent of requirements covered by the Ministry of Agriculture and Water Resources (MAWR). Aging infrastructure amplifies existing weaknesses in irrigation management, leading to low efficiency, with as much as 70 percent of the water not reaching the crops. As a result of the deteriorating infrastructure and poor management, the country loses an estimated US$1.7 billion annually (about 8 percent of GDP)[4]. The annual decrease in agricultural production as a result of poor water management is estimated to be about US$2.0 billion[4].

11. Aging infrastructure, poor management and high inefficiency together with the dependence on pumping contribute to high O&M costs. More than 60 percent (US$350 million) of the budget of MAWR is allocated to paying for electricity to power pumping stations. Electricity for irrigation pumps accounts for 16 percent of the national electricity generation. It is estimated that a one percent increase in irrigation efficiency would lead to US$10m savings annually.

12. In response to these challenges, the GOU has implemented a number of reforms that are aimed at improving the sector's sustainability and financial viability, including the support for Water Consumer Associations (WCAs) and their establishment along hydraulic instead of administrative boundaries, introduction of participatory irrigation management (PIM), and efforts to recover the costs of O&M. These reforms, in combination with rehabilitation of I&D assets, have resulted in important improvements. In the Drainage, Irrigation and Wetlands Improvement Project (DIWIP, P009127, US$62 million, closed in June 2013) that was implemented in South Karakalpakstan, yields have gone up by 10-20 percent, and an additional 20,000 ha have been brought back in production. Under the Ferghana Valley phase I project

[4] *Water: Critical Resource for Uzbekistan's Future*; UNDP Uzbekistan: Tashkent, Uzbekistan, 2007.

(FVWRMP-I, US$66 million, closed on December 31, 2016), yields went up by well over 20 percent. In both project areas, high groundwater levels have declined and salinity reduced.

13. Estimates of the total required I&D infrastructure rehabilitation costs in Uzbekistan vary from US$23 to 31 billion[5]. It is clear that such requirements can only be met over a long period of time. The GOU has therefore adopted a phased approach to I&D modernization, with a focus on priority areas in the FV and South Karakalpakstan. While the initial projects focused on improving the drainage, the South Karakalpakstan Water Resources Management Improvement Project (SKWRMIP, P127764) and the proposed FVWRMP-II project focus on improving irrigation.

Water Resources Management

14. Uzbekistan is one of the most water-dependent countries in the world, with over 80 percent of the country's renewable water resources originating in neighboring countries. Annual water availability is close to 1,700 m3 per person and approaches stress levels. In the FV, water shortages can be acute at times, and particularly in the irrigation sector. Water shortage for irrigation in the valley is estimated at 3.34 billion m^3 (BCM) per year, which is about 29 percent of the total required amount of water.

15. Water shortages have worsened since the early 1990s, partly as a result of changes in the operation of Toktogul reservoir located in the Kyrgyz Republic. The reservoir is now operated to generate hydropower in winter, causing water shortages in summer. At the same time, high groundwater tables are affecting soil quality and agricultural production in the lower parts of the valley. The first phase of the FVWRMP was successful in lowering high groundwater levels in selected parts of the FV. A more rational and proactive management of groundwater will help in reducing winter flooding while reducing summer shortages.

16. The Syr Darya River that the project area withdraws its water from is shared by Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan. Water resource availability in Central Asia has important seasonal, geographic and economic dimensions, with downstream countries highly dependent on upstream countries for essential irrigation water. Hydropower resources are concentrated in the Kyrgyz Republic and Tajikistan, while thermal energy resources are concentrated in Uzbekistan, Turkmenistan and Kazakhstan. Energy-water linkages play a critical role in the future of Central Asia in terms of economic development, poverty alleviation and shared prosperity, food security, public expenditures and cooperative relations. These linkages are inextricable from perceptions of national security, regional stability and economic growth. Managing them requires managing complex technical and political issues and sometimes diverse development objectives. Yet history and experience elsewhere have demonstrated the potential for mutual benefits from sharing both energy and water resources across borders.

5 Irrigation and Drainage Sector Strategy Study, the Word Bank (2000); National Plan for Water and Salt Management, GEF WEMP (2002)

17. Five Central Asian states participate in the Interstate Commission for Water Coordination of Central Asia (ICWC), established in 1992, for the regulation of water resources in the Aral Sea Basin. Since 1999, the ICWC is part of the International Fund for Saving the Aral Sea (IFAS). Heads of Central Asian states occupy the post of IFAS president on a rotational basis. Strategic directions for the IFAS are formulated by the Council of Heads of the five states in the region.

C. Higher Level Objectives to which the Project Contributes

18. The Government's medium-term growth and development strategy is reflected in the Uzbekistan Development Strategy for 2017-2021. For agriculture, the strategy aims to reduce the acreage of cotton and cereal crops and planting horticulture crops on the released lands, investment in horticulture value chains, improvement of irrigated lands, introduction of modern water-saving technologies, and adoption of measures to mitigate the negative impact of global climate change.

19. The Bank's Country Partnership Framework (CPF) for 2016-2020 supports the GOU's efforts to accelerate the creation of higher-productivity, higher-wage employment to absorb new labor market entrants, reduce poverty and improve the inclusiveness of the economy of Uzbekistan. The proposed project is fully consistent with the second Focus Area of the CPF "Agricultural Competitiveness and Cotton Sector Modernization" because it identifies continued support for irrigation as a priority area of engagement. In addition, in supporting the improvement of public irrigation service delivery, the project supports Focus Area 3: Public Service Delivery.

20. Irrigated agriculture plays an important role in Uzbekistan in reducing poverty and promoting shared prosperity: (i) rural poverty remains high in Uzbekistan, and a large share of the poor depend on agriculture for employment and livelihoods. Building up the assets of the bottom 40 percent will help them participate in growth. Improving the performance of irrigated agriculture will contribute to improving the livelihoods and incomes of farming households – and, in turn, will contribute to reducing poverty and raising the incomes of the bottom 40 percent in the project areas; (ii) climate change is expected to lead to more frequent weather extremes, such as droughts and floods. Poor farming households tend to have the least capacity to cope with the adverse consequences of these events. Investments to improve the delivery of I&D services will provide more reliable access to irrigation water and thus will help reduce the production risks, and increase the climate resilience of farming households, especially the poor; (iii) improving the efficient and productive use of water will help Uzbekistan use its resources in a more sustainable manner, and will help reduce public expenditures; and (iv) exposing farmers to good agricultural practices will contribute to more sustainable agricultural growth. The Government's efforts to restore irrigation, improve water management and move to a more diversified agricultural system, contribute to sustainable growth and poverty reduction and is fully consistent with the Bank's twin goals of reducing poverty and creating shared prosperity in the poorest regions of Uzbekistan.

21. The Government's strategic objectives in addressing the water challenges in the FV include improved water availability in summer and reduced winter flooding by transferring some of these winter surpluses to meet summer demand through managed aquifer recharge with the

objective to increase natural infiltration of excess water flows to recharge groundwater. The water balance of the proposed project (see Annex 7) shows that this is a feasible option: out of the total net project impact of 83.9 MCM, an estimated 63.0 MCM (over 75 percent) originates from groundwater. The balance (20.9 MCM or less than 25 percent) is supplied through surface flow. The proposed project will also support the GOU's strategic objective to (i) mitigate the shocks of climate change and transboundary water regime changes by improving storage and increasing water productivity while reducing the vulnerability to unreliable transboundary supplies, (ii) improve the environmental conditions in the valley by reducing wastage and improving drainage, including by improving conveyance and application water efficiency, and (iii) strengthen water resources and irrigation management capacities of all stakeholders in the valley.

II. PROJECT DEVELOPMENT OBJECTIVES (PDO)

A. PDO

22. The project development objective is to improve the quality of irrigation and drainage service delivery to agricultural users within the project area.

1. Project Beneficiaries

23. A number of stakeholder groups have been identified:

- Farmers in the FV project area will benefit through improvements in the quality of I&D service delivery, training in O&M and water management, which will contribute to improved incomes and facilitate crop diversification. Crop intensification and diversification will also create alternative employment opportunities. In total, 180,000 farmers are expected to benefit.
- Dehqan farmers will benefit through training, Farmer Field Schools (FFS) and Demonstrations that will focus on higher value, non-cotton/non-wheat crops that are grown mostly by dehqan farmers. The project will also help dehqan and tomorka[6] farmers formalize their relationship with WCAs and obtain a more reliable access to irrigation.
- WCAs, water management staff working for district, region and basin water management institutions in the FV project area will benefit through training, and more accountable and transparent water management at higher levels of the irrigation system. WCAs will also benefit through lower costs for water delivery and higher O&M cost recovery.

2. PDO Level Results Indicators

24. Improving the quality of water delivery service to users incorporates the following dimensions: quantity, flexibility, reliability and equity. The success of the project will be monitored using the following key results indicators (see Annex 1):

- Improved quality of irrigation and drainage service delivery;
- relative irrigation deficit (water deficit/water demanded);

[6] garden plot, usually about 0.1Ha

- irrigation efficiency (water withdrawn used for crop production).

III. PROJECT DESCRIPTION

25. The project area covers 103,622 ha and is entirely located in the FV, encompassing three project areas that were selected based on a multi-criteria analysis (see Annex 3): Podshaota-Chodak in Namangan (29,507 hectares), Isfayram-Shahrimardan in Ferghana (54,375 hectares) and Savay-Akburasoy in Andijan (19,740 hectares) (see maps in Annex 9).

26. The FV is characterized by a significant water deficit. It is estimated that on-farm water supply in the valley is only 70 percent of the water requirement in summer. Climate change is expected to exacerbate the often unreliable supply from the valley's transboundary rivers. Despite water shortages, irrigation efficiency is low and only 30 percent of the water that is withdrawn is used for crop production. With an estimated 30-35 percent of the irrigated area in the FV relying fully or partially on pumping, irrigation inefficiency comes at a significant expense to Uzbekistan.

27. In order to prepare for a future with more pronounced climate variability and increased competition over water, Uzbekistan will need to modernize its irrigation service delivery. This includes further capacity strengthening and transfer of responsibility to WCAs for on-farm water management to help reduce wastage and improve cost recovery. Local public bulk water service providers will need to adopt a more client-oriented approach to service delivery that is based on performance indicators. They also need to become more professional in the management of the large number of assets so that O&M costs comes more predictable and transparent, and its financing becomes the subject of proper short-, medium- and long-term planning. Aging assets need to be modernized to ensure that water managers have the tools to improve service delivery. It is expected that improved irrigation delivery service and a more predictable and transparent asset management planning will help increase the willingness to pay for O&M.

28. The project will address these challenges by pursuing innovative energy and water efficiency improvements in four distinct ways. In the first place, more efficient technologies will be piloted that reduce non-beneficial evapotranspiration (NBET – evaporation of water that does not contribute to crop growth) and therefore improve net water availability. Water users will also be given incentives to use water more efficiently, e.g., by introducing on a pilot scale volumetric payments for O&M services in a number of WCAs. Secondly, opportunities for transferring excess winter river flow to summer months will be taken advantage of, e.g., through investments in improved storage and managed aquifer recharge. Thirdly, to reduce the costs of energy inefficiency, aging pumps will be replaced by modern, more energy efficient ones. Lastly, the quality of service delivery by public irrigation service providers and WCAs will be improved through institutional reforms that will establish modern asset management systems for identifying, prioritizing and budgeting management and maintenance activities and through introduction of service based performance management. The project will also provide legal assistance in reviewing the respective WCA aspects in the country's Water Code, and will offer possible improvements for effective WCA support to improve their performance.

A. Project Components

29. The project includes the following main components: (i) Irrigation Modernization; (ii) Support for Agricultural Modernization; and (iii) Project Management. PDO indicators include improved quality of irrigation and drainage service delivery, relative irrigation supply (ratio of irrigation supply over irrigation demand), and increased irrigation water efficiency.

Component A: Irrigation Modernization (US$191.40 million in total, including US$131.70 million IDA, and US$59.70 million GOU)

30. This component aims to increase water supply both from surface and groundwater sources and to reduce wastage through investments in the modernization of the water distribution system. Investments will increase the capacity to control and distribute water along the canal network. Intermediate indicators include (i) area provided with improved irrigation and drainage services; and (ii) direct project beneficiaries. This component will consist of the following sub-components:

31. *Subcomponent A-1: Rehabilitation of Surface Irrigation System:* the project will invest in canal lining in 283.35 km of main and inter-farm canals. In addition, an estimated 674 associated control and measuring structures will be improved along the main and inter-farm canals. The project will install a SCADA system to monitor flows in key points along the main canals.

32. *Subcomponent A-2: Rehabilitation and Construction of Pump Stations.* The project will modernize 10 pump stations. The works will include installation of smaller energy-efficient pumps to more accurately match demand; replacement of electrical systems including control and protection equipment; repair of pump station buildings and repair of water intake structures and water control equipment. In addition, the project will undertake the construction of one new pump station and associated 9.5 km delivery pipeline in the Isfayram-Shahimardan project site.

33. *Subcomponent A-3: Construction of Wells.* The project will drill 243 new wells in two project sites, Ferghana and Namangan Provinces, at a total cost of US$28.8 million. The project will also conduct two "managed aquifer recharge" pilots that will recharge groundwater by in-stream impoundment and monitor inflows and yield. The investment required for this pilot is US$0.92 million. The Podshaota River has been selected for this pilot.

34. *Subcomponent A-4: Flood Control and Bank Protection.* The project will support a total of 17.9 km of bank protection works to prevent flood flows from eroding the river banks and damaging farmlands in Namangan and Andijan provinces. This will be financed by the GOU. The Kandiyon mudflow reservoir in the Namangan province with a capacity of 2.3 million cubic meters will be converted into a water storage reservoir.

Component B: Support for Agricultural Modernization (US$21.5 million total, including US$2.7 million IDA, US$2.4 million GOU and a proposed EU Grant of US$ 16.4 million)

35. This component will promote intensification and diversification of agriculture and improved water management. The Project will use a combination of direct training activities, information dissemination, technology demonstrations, experience sharing activities and

interactions with other sources of information, financial and technical support. Intermediate results indicator includes the adoption of improved agricultural technology promoted by the project, asset management processes established by project BAISs, AISs and WCAs, and increased collection rate by the WCAs in the project area.

36. *Subcomponent B-1: Agricultural intensification and diversification*: support for farmers in the project areas in maximizing economic and financial returns of irrigation investment by: (i) using land and water more efficiently; (ii) improving land and labor productivity; and, (iii) ensuring environmental and social sustainability and climate change mitigation and adaptation. A specific focus will be given to the sustainable intensification of cotton production that could free up land for further diversification into other less-water intensive crops. This sub-component will promote crop intensification and diversification, assist farmers to access lines of credit, improve cotton harvest mechanization and pursue international standards for sustainable cotton production. EU financing (€5.7M) will be used to help farmers maximize and sustain returns of investments in irrigation through capacity building activities in support of agricultural productivity increase and diversification.

Subcomponent B-2: Improved Water Management. Based on the good results of FVWRMP-I, the project will scale up support for WCAs to further strengthen their capacities. WCAs will be trained in a number of topics, including proper O&M, including asset management, regular system maintenance, prioritization of maintenance works and predictive planning and system assessment and monitoring. WCA Support Groups will be established in each project region to support and strengthen capacity of WCAs in the project area. The project will also provide training to the water management staff working for district, region and basin water management institutions in the project area. Training curriculum includes technical assistance in introducing modern methods for asset management and capacity strengthening at appropriate levels. EU financing will be used to strengthen capacities of local water consumer associations (€5.8 million).

37. Finally, innovative approaches will be piloted. The project will pilot volumetric payment of ISFs within a number of WCAs that have expressed interest. Based on successful pilots under the RESP-II, the project will also pilot the use of solar energy for pumping. These will be financed by the EU (€2.5 million), as well as outreach activities as per EU requirements (€1.0 million).

Component C: Project Management (US$12.1 million total, including US$10.5 million IDA, and US$1.6 million GOU)

38. This component will support strengthening the MAWR's and the Project Implementation Unit's (PIU) capacity for project management, monitoring and evaluation (M&E) (including, inter alia, the areas of procurement and financial management) through the provision of goods, consultant services, training, and financing of incremental operating costs. This component will also finance a Procurement Panel and an annual technical audit of civil works by the Works Verification Agent. This component will also develop a comprehensive management information and data collection and reporting system on key performance outputs and impact indicators through, inter alia, baseline surveys; participatory assessments; mid-term reviews; and final evaluations.

39. Staffing of the PIU will be strengthened, prior to project effectiveness, to include a number of technical, financial management, M&E and safeguards (social and environmental) experts. An independent M&E consultant will be recruited to establish a Management Information System (MIS) and arrange for data collection and reporting. Detailed implementation arrangements will be spelled out in the Project Operational Manual. (POM). In view of the larger project area, Vilayat-level PIUs will be established in each of the three Vilayats that are covered by the project.

B. Project Financing

1. Lending Instrument

40. The project will be processed as an Investment Project Financing financed through an IDA credit of US$144.9 million, a GOU contribution of US$63.7 million and a proposed EU Grant of €15 million. The costs of the project are expressed in 2015 constant prices. Unit prices in Uzbek Soum have been converted to US dollars at the official exchange rate of UZS 3,650= US$ 1.0. In the event that the EU Grant will not be approved, the Government of Uzbekistan will undertake appropriate steps to identify alternative sources of finance.

41. The costs of civil works are based on estimates of quantity of works and unit rates determined by a feasibility study and are based on the cost of ongoing works and on costs from recently signed civil works contracts. Unit prices of goods are based on prices quoted by local and foreign suppliers. Rates of national staff salaries and international consultants are based on prevailing local and international consultant rates. Price contingencies are based on the forecasted annual local and foreign inflation rates and devaluation, and applied to all cost items. Physical contingencies of 10 percent are included in the cost of civil works and zero percent physical contingencies are applied to all other cost items. They will be financed by IDA.

42. Government co-financing will be in the form of contributions to civil works, tax exemptions. PIU under MAWR will be exempted from paying VAT, Import VAT, Excise tax, Custom duties and Road fund charges on vehicles on goods, works, non-consulting services, consultants' services (including audit services) and incremental operating costs, which are procured under the project.

43. A request for an EU Grant of €15 million (US$16.4 million equivalent at April 30, 2017) has been submitted to the EU for approval. It is expected that the Grant will be approved in October 2017. The EU Grant, if approved, will finance activities under Component B: Support for Agricultural Modernization. The activities that will be submitted for EU financing are specified in Annex 2. In the event that the EU Grant will not be approved, the Government of Uzbekistan will undertake appropriate steps to identify alternative sources of finance.

2. Project Cost and Financing

Farghana Valley Water Resources Manamgement Project - Phase II
Components by Financiers
(US$ Million)

	The World Bank		EU*		The Government		Total	
	Amount	%	Amount	%	Amount	%	Amount	%
Component A: Modernization of the irrigation system	131.7	68.8	-	-	59.7	31.2	191.4	85.1
Component B: System Modernization, Institutional Strengthenning, & Demonstration**	2.7	12.5	16.4	76.5	2.4	11.0	21.5	9.5
Component C: Project Management and Operations	10.5	86.6	-	-	1.6	13.4	12.1	5.4
Total PROJECT COSTS	144.9	64.4	16.4	7.3	63.7	28.3	225.0	100.0

* A proposed EU Grant in the amount of €15 million is expected to be approved in October 2017.
** EU requirements (evaluation, audit, communication and outreach) are included under Component B.

C. Lessons Learned and Reflected in the Project Design

44. During implementation of FVWRMP-I a number of important lessons have been learned. Many of these relate to the need to design and implement a balanced package of investments and soft activities.

45. The technical design of previous projects has been adequate in general, as evidenced by the fact that the technical interventions are producing the expected results: groundwater levels in the FV have declined as a result of the predecessor FVWRMP-I project, while salinity levels are lower. However, construction contracts have faced delays as a result of limited capacity of some of the contractors. FVWRMP-II will ensure that stricter requirements are incorporated into the construction contracts and stricter construction supervision and contract management is enforced.

46. While technical interventions have in general produced the intended results, soft components have fared less well. E.g., adoption of new technologies and practices demonstrated in FFS has been lower than expected. In addition, it was found that some of the training and demonstration activities were designed and implemented without adequate consultation with stakeholders. FVWRMP-II will only demonstrate those technologies that have a confirmed relevance and affordability to farmers. The design and implementation of training and demonstration activities will be conducted in a resolutely participatory manner, including an annual evaluation and needs assessment that will inform the subsequent year's training program.

47. Similarly, the intended policy reforms of previous projects have often not or only partially been implemented. E.g., only limited progress has been made in the adoption of a new Water Act, despite the fact that a draft has been prepared by UNDP and submitted to the Cabinet of Ministers in late 2014. The proposed project aims to support important agricultural reforms. Learning the lessons from the past, project support has been designed in such a way that their implementation is more likely. E.g., agricultural reforms will be financed through a separate proposed EU Grant, and the project will work with local authorities in the implementation of flexible land pilots.

48. Limited success was achieved in the strengthening of WCAs, providing a further indication that the implementation of soft components in Uzbekistan is facing challenges. In the FVWRMP-I, this was partly due to limited funding allocated to support the project WCAs, which was barely enough for provision of training only. The proposed project will allocate adequate resources to strengthen WCA and farmers' capacities, and these activities will be financed through a proposed Grant that will be submitted for EU approval in October 2017.

Another reason for limited success of WCA training was that trainees did often not have an opportunity to put the newly acquired capacities (e.g., preparation of technical and financial reports) in practice as many of the WCAs do not own computers or don't have access to reliable electricity. The proposed project will provide computer/office equipment for the well performing WCAs as a way of providing incentives to improve performance. A study into the performance of WCAs[7] was conducted that provided important generic lessons and a plan of action for more systematic support to WCA, including strengthening of transparency and accountability of WCAs.

49. Female participation in irrigation water management is traditionally limited, despite the fact that women are often the primary users of water (as dehqan farmers and tomorka owners and/or workers). Without a targeted approach that aim to provide skills to women and engage them in project activities, women's participation in irrigation water management will remain low. To ensure adequate participation of women, the proposed project will pay attention to, and actively pursue, the inclusion of women in all processes, including decision-making, and, if necessary, create processes that encourage their engagement.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

50. Implementation arrangements for the project build on those that were adopted for FVWRMP-I. MAWR, with branches at the district and regional levels, is responsible for water planning in the country and for O&M of the main I&D systems down to the farm level. MAWR also administers international river systems with respect to water sharing and water quality control. Within MAWR, a Deputy Minister responsible for water resources acts as the project head with overall responsibility for implementation of the project. The Deputy Minister responsible for water resources is also responsible for liaising with other ministries and Government agencies.

51. Responsibility for project implementation including procurement, financial management and contract management will be delegated to the existing PIU and headed by a project director, supported by technical and administrative staff in Tashkent. The PIU will maintain regional project offices (RPIU) in each of the three Vilayats in the FV that will be headed by a regional director. The PIU will be assisted by national and international consultants on construction supervision, procurement, M&E, social and environmental safeguards, and capacity strengthening.

52. The PIU will outsource most of the project activities, as outlined in the procurement plan (see Annex 4), including construction contract management under component A and capacity strengthening under component B. To that end, the PIU will prepare TORs for each of the consultancy assignments identified in the procurement plan. All training activities will be integrated into one single capacity strengthening contract. All training will be prepared,

[7] Swinkels (2016): Exploratory assessment of factors that influence quality of local irrigation governance in Uzbekistan

conducted and evaluated in an iterative manner, including needs assessment, implementation and feedback/evaluation.

53. An Oblast Coordination Committee (OCC) will be established in each of the three project areas and chaired by the respective Vilayat Hokims. The Regional PIU director or his designate will act as secretary. Members include the Hokhims of concerned districts located in Ferghana, Namangan and Andijan project regions, representatives of the Departments of Agriculture, Forest and Livestock; the environmental agency (Goskompriroda) and two farmers' representatives. Meetings will be open for stakeholders on an observer basis. The main task of the OCC will be to coordinate the implementation of the project at Vilayat level, exchange information about project activities (in particular on progress in the implementation of civil works and training), communicate the prohibition on the use of child and/or forced labor to project stakeholders, and recommend necessary actions when project implementation problems occur. The OCC will meet at least quarterly, or at the request from the chairperson or the secretary.

54. The PIU will work closely with WCAs and Mahalla Committees in the project area to first inform and then ensure implementation of the CE activities under this project. WCAs and Mahalla Committees will be responsible for engaging its members in their designated territories, and M&E consultants will review these through regular reporting and share the finding with the PIU.

B. Results Monitoring and Evaluation

55. The PIU will be responsible for project monitoring. M&E consultants will be recruited by the PIU for independent monitoring and evaluation of project progress, project impact, and the achievement of the PDO. To that end, the PIU and M&E consultants will be responsible for setting up the project's MIS and arrange for data collection and reporting. PDO indicators and intermediate results indicators and annual and end target values are presented in Annex 1. The results will be presented to the PIU and the Bank in semi-annual and annual progress reports, as well as the project mid-term review (MTR) and completion reports.

56. M&E consultants will also monitor compliance with social and environmental safeguards, gender and Citizen Engagement requirements, and the impact of crop diversification and cotton harvest mechanization on employment opportunities in the project area (in particular on vulnerable groups). They will monitor implementation of the overall Environmental Management Plan (EMP), the Resettlement Policy Framework (RPF) and Resettlement Action Plan(s) (RAPs)[8], and will monitor implementation arrangements for specific sub-project EMPs as well as impact assessment and supervision of their implementation. These consultancies will also help to reinforce overall transparency and governance during project implementation by preparing timely documentation and sharing these documents with all interested parties. A baseline survey will be conducted during the first project year and additional surveys are scheduled to be held during mid-term review and at project completion.

[8] Implementation of the EMP, RPF and RAP(s) will be responsibility of the PIU.

57. Communities will contribute to M&E through participation in surveys as well as in ongoing processes of feedback and monitoring. This process will ensure that beneficiaries are actively engaged in reporting on project progress and are involved in facilitated dialogues on project issues. The project will finalize the design of the community monitoring process in collaboration with target communities (this might include semi-annual water scorecards, community audit meetings, or other collective mechanisms that aim to measure citizen perceptions of project progress).

58. In addition to regular monitoring of project results, the project will participate in an on-going TPM and FBM. The TPM, which will be financed through a separate trust fund (MDTF), will focus on child and/or forced labor issues in connection with the project activities or within the project area and will be conducted during the cotton harvesting season. The FBM is dedicated to reports on occurrences of child and/or forced labor in connection with the project activities year round. Feedback will be collected from both project beneficiaries and other stakeholders. The FBM is different from the GRM that will be established to collect grievances related to project implementation, including those on involuntary resettlement. The TPM and FBM has been implemented by the International Labor Organization (ILO) in 2015 and 2016, and will also be implemented during the proposed project (with the possibility of extension thereafter). Activities under the TPM and FBM include, among others things, (i) capacity building and learning; (ii) periodic unannounced site visits; and (iii) periodic assessment of local context and conditions. The WB and ILO work closely with the national counterparts – the Coordination Council consisting of Ministry of Labor and Social Services, the Federation of Trade Unions and the Chamber of Commerce – on these mechanisms and issues related to child and/or forced labor.

C. Sustainability

59. The project addresses sustainability at four distinct levels:

(i) Financial viability of I&D: A key concern associated with I&D is the insufficient allocation of resources to public I&D services and the inadequate recovery from farmers of private O&M costs. As a result, many irrigation schemes are faced with a vicious cycle of inadequate resources, poor I&D service delivery and limited willingness of farmers to pay. The project will address these concerns by (a) increasing efficiency of irrigation water; (b) making I&D service delivery more accountable to those who pay for these services, among others ways by piloting volumetric measurements and SCADA; (c) strengthening capacities of WCAs and local authorities responsible for irrigation and water management; and (d) involving users and local authorities more closely in the design and implementation of the project to ensure local ownership.

(ii) Institutional sustainability: Local authorities are responsible for agricultural extension and water service delivery after project closure. During preparation of the project, local authorities and staff from MAWR have participated actively. The project is designed to involve as much as possible the national and local stakeholders (for example, through demonstrations and FFSs). Strengthening of transparency and accountability of WCAs in accordance with a recently

completed study will foster more effective and sustainable operation of these Associations while improving day-to-day water management.

(iii) Environmental and social sustainability: An Environmental Assessment and Management Plan (EAMP) and Social Assessment prepared during the project preparation have identified measures to mitigate the project's adverse environmental and social effects. Most of the proposed mitigation measures will be reflected in the construction contracts, and adequate resources have been allocated for implementation of additional measures. An RPF and RAP for the first stage of the project in Namangan region have been prepared. Additional RAPs will be prepared during project implementation as the project designs in other project areas are finalized and the resettlement impact is clear. The resettlement will be implemented according to these resettlement instruments prior to the start of civil works. The mainstreamed approach to citizen engagement in the project is also a critical factor in ensuring that the project is socially sustainable.

(iv) Climate change: During project preparation, the Bank team has taken advantage of a detailed climate change study undertaken in Uzbekistan. Many of the recommendations have been incorporated into the project, including (a) improved institutional framework and enhanced capacities for managing water resources; (b) investments in I&D systems to improve the efficiency and productivity of water use; and (c) improved reliability of I&D service delivery.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

60. The overall risk rating of the project is Substantial. The following key risks have been identified:

(i) *Political and Governance risk:* Coordination between the central Government, MAWR, PIU, local Governments and authorities responsible for water management is a key factor for the success of the project. Past experience confirms that important decisions that affect local Governments and local water management authorities are taken at the central level without adequate involvement of local parties.

(ii) *Technical Design:* The project intends to promote managed aquifer recharge. There is a risk that, despite good potential, the GOU does not wish to promote use of groundwater. In addition, more rational irrigation management may not materialize as a result of external pressures on water managers that are associated with the requirements to grow cotton and wheat for state procurement.

(iii) *Sector Strategy*: The GOU has adopted an ambitious cotton harvest mechanization strategy. By 2020, 70 percent of the cotton is to be harvested mechanically. Lessons from global experience suggest that successful implementation of cotton harvest mechanization requires a significant amount of time. In addition, it requires important cotton husbandry changes. There is therefore a substantial risk that the ambitious targets will not be met.

(v) *Fiduciary risk:* Delays in procurement may slow-down the speed of implementation. Recent experience of World Bank financed projects in the water sector reveals that the sector is particularly vulnerable to fraud and corruption. Additional measures on fraud and corruption have been incorporated into the project design, including a Procurement Panel and an annual technical audit of civil works by the Works Verification Agent.

(vi) *Environment and Social risks:*
- *The project has triggered a number of safeguard policies, including environmental assessment (OP/BP 4.01), resettlement (OP/BP 4.12) and international waterways (OP/BP 7.50).* While adequate safeguards compliance has been observed in FVWRMP Phase-I, close monitoring will be required in view of the sensitive nature of the safeguards issues.
- *Recruitment practices resulting in possible child and/or forced labor* may be used in the project area for cotton harvesting. Risk management: The project aims to reduce the risks associated with such practices in the project area through promotion of crop intensification and diversification, training, outreach and awareness raising about national laws and international conventions on prohibition of child and/or forced labor, and participation in the TPM and FBM (both financed through an MDTF). In addition, a number of covenants related to child and/or forced labor have been incorporated into the FA.

(vii) *Stakeholder risk:* There is a risk that water management staff at Region and District level (AIS, BAIS) will not take full advantage of the project in the implementation of more rational water management, as they face pressures from local Governments to prioritize the state procurement crops (cotton and wheat). There is also a risk that WCAs may not be interested in improved O&M due to: (a) the high costs of O&M costs, including pumping, (b) lack of incentives to improve production and productivity due to an unreliable irrigation water supply and a poor quality of I&D service provision and (c) poor representation and weak responsiveness of WCA leadership to its members. Finally, there is a risk that the GOU is not fully committed to strengthening WCAs and transferring to them the responsibility for on-farm O&M.

61. *Climate change and disaster screening*: The team has prepared the climate change and disaster screening tool, and found that Uzbekistan is vulnerable to climate and geophysical hazards, including in particular extreme temperature and earthquakes. Uzbekistan has a modern network of seismological monitoring, including 45 seismic stations, 20 geophysical stations and 4 local stations for specific sites. In 2005, the country has also set up a special fund for capital repairs With support from UNDP, a "Strengthening Earthquake Risk Mitigation Capacities in Uzbekistan" technical assistance was implemented, which contributed to the establishment of the Earthquake Simulation Complex in Tashkent. The analysis of the safety of dams that are associated with the project incorporates an assessment of the seismic risks, and an O&M plan and an emergency preparedness plans (EPP) are in place.

62. Regarding extreme temperatures, data analysis supports the conclusion that the historical trend in temperature will accelerate in Uzbekistan in the near future. A recent study[9] found that, in Uzbekistan, the implications of climate change for agriculture could be substantial, including

[9] World Bank. 2012. *Looking Beyond the Horizon: Adapting Agriculture to Climate Change in Four Europe and Central Asia Countries*. Washington, DC: World Bank

lower yields, decreased water availability due to a decline in soil moisture, increased evapotranspiration, and reduced yield of reservoirs through increased evaporation. FVWRMP-II will help Uzbekistan better cope with the implications of climate change by improving water availability and the quality of irrigation service delivery, promoting groundwater storage and supporting diversification to make to most out of each drop of water.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

63. Financial and economic analysis was undertaken to assess the economic viability of the project and to assess financial impact on the farm production. The main economic benefit of the Project will be generated through restoring the level of agricultural productivity and production for which the irrigation system was designed.

64. The overall indicative ERR of the Project is estimated as 14.3 percent with a positive Economic NPV (USD 323.2 million). This means that the project has a good economic return and it is viable from economic point of view. The estimated ERR and ENPV for the three project areas are: Podshaota-Chodak ERR - 17.7 percent and ENPV - USD164.3 million, Isfayram-Shahrimardan ERR – 16.8 percent and ENPV – USD152.3 million, and Savay-Akburasoy ERR - 11.6 percent and ENPV – USD39.6 million.

65. A sensitivity analysis of ERR and ENPV was conducted that shows that a decline in the benefits by 20 percent and an increase in the costs by the same proportion would reduce the base case ERR to about 9.4 percent-9.9 percent for the overall project; to about 13.1 percent-13.7 percent for Podshaota-Chodak; to about 6.2 percent-6.6 percent for Isfayram-Shahrimardan and to about 12.3 percent-12.7 percent for Savay-Akburasoy. Sensitivity analysis also assessed the effect of various lags in the realization of benefits. It shows that a 1-year delay in generation of the benefits of overall project would not lead to a significant decrease in its economic viability: ERR would still be well above the discount rate (6 percent) and ENPV would still be positive. The results of the sensitivity analysis suggest that the investments in the project in overall and in its individual areas are economically viable and robust.

B. Technical

66. A multi-criteria analysis was adopted to identify the project areas and investments. Project preparation included the development of an IWRM plan that developed the overall objectives that water management in the FV needs to satisfy. In each province, priority areas and investments were identified that would address best the identified constraints and help most in achieving the objectives. Out of this exercise a number of interventions that were in line with the PDO were identified and those that were considered economically feasible were then assessed further through a multi-criteria analysis. Through a participatory process, project interventions were identified. They were then grouped into coherent investment portfolios that were then turned into project subcomponents. For a more detailed description of the selection process see Annex 3.

C. Financial Management

67. The PIU will be responsible for the overall financial management (FM) arrangements of the proposed project. Regional branches of the PIU will not be involved in FM of the project. The PIU has extensive experience in the implementation of World Bank financed projects. The FM arrangements at PIU, including budgeting, accounting, financial reporting, auditing, and internal controls, is judged Satisfactory provided a number of agreed actions have been implemented. The PIU operates a computerized accounting system, based on the 1-C software that is used by many World Bank-funded projects in the Country and will be suitable for project accounting and reporting after customizing accounting for specific project needs. The PIU has a well experienced financial management staff, consisting of the chief accountant and a financial/disbursement specialist. The overall residual financial management risk for the project is moderate.

68. The PIU has a POM under the recently closed FVWRMP-I, including a Financial Management Manual (FMM) which is satisfactory to the Bank. The existing FMM section of the POM would be updated for the proposed project to reflect the specific activities of the project, like Audit Terms of Reference, frequency of submission and format of IFRs.

69. The following Disbursement Methods may be used under the Financing: (i) Advance to Designated Account (DA) held by the PIU at a commercial bank acceptable to the World Bank; (ii) Reimbursement; (iii) Direct Payment; and (iv) Special Commitment. Withdrawal applications for the replenishments of the DA will be sent to the World Bank at least on a quarterly basis. More details on FM arrangements are provided in Annex 4. Retro-active financing up to an aggregate amount not to exceed US$500,000 may be made for payments made for eligible expenditures prior to the date of the Financing Agreement but on or after May 5, 2017.

D. Procurement

70. Procurement for the proposed project will be carried out in accordance with the World Bank's "Guidelines": Procurement of Goods, Works and non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 and revised 2014 (Procurement Guidelines) and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 and revised 2014 (Consultant Guidelines) and provisions stipulated in the Financing Agreement. If there is conflict between the Government decrees, rules and regulations and the Bank Procurement and Consultant Guidelines, then Bank Guidelines shall prevail. In addition, the project will also follow "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants dated October 15, 2006 and revised in January 2011". More detailed information concerning the procurement under the project, as well as the Procurement Plan, are presented in Annex 4.

71. Procurement arrangements at the project level were reviewed as part of preparation for the proposed project. A procurement capacity assessment was conducted based on previous experience on projects implemented by MAWR and discussions with management and staff of MAWR. The overall risk is substantial. MAWR continues to face a lack of procurement expertise especially in ICB and serious weakness in bid/proposals evaluation. The project will

include works and goods contracts with varying complexity that would require a high level of capacity in contract administration. MAWR will maintain a project implementation team including dedicated procurement and contract management specialists. To strengthen procurement capacities, the following main measures have been discussed and agreed (see annex 4, page 56 for more details):

(i) Recruitment of a Procurement Panel with terms of references acceptable to the Bank.
(ii) An annual technical audit of civil works by the Works Verification Agent with terms of reference and responsibilities acceptable to the Bank.
(iii) Strengthening procurement provisions in the POM in support of the PIU's procurement capacity.

E. Social (including Safeguards)

72. Project preparation benefited from a detailed social assessment (SA, see Annex 5) that analyzed potential social impact of interventions proposed under this project. As the FV has the highest population density in the country, the project activities will have a broad direct and indirect impact. The project is expected to have positive social impacts such as potential increase in income, employment and living conditions, including of women and vulnerable groups, due to improved irrigation systems and increased agricultural productivity. The positive impacts also include strengthened capacity of farmers and WCAs in modern agricultural and water management practices. Strategies to include local community members in project processes aim to empower and build capacity for improved water resource management practices and innovations. Support for the GOU's strategy to mechanize cotton harvest will significantly reduce risks of child and/or forced labor. The project will raise awareness about child and/or forced labor, and participate in the TPM/FBM thus raising the population's knowledge of decent work practices and labor rights.

73. The SA identified the following main project beneficiaries: commercial and dehqan farmers, including female farmers, WCAs, and staff of irrigation management entities. Most beneficiaries in the project area are employed in the agricultural sector. Nearly half of the agricultural workers in the project areas are also engaged in work on household garden plots. While official unemployment rates are low, the rates of hidden unemployment and underemployment are high (estimated 18.5 percent of the working age population). The SA suggests that some 65 percent lives on less than 2 dollars a day.

74. ***Citizen Engagement.*** Citizens were engaged in identifying priority areas for project activities through consultations with different groups of stakeholders and feedback from direct and indirect project beneficiaries on proposed project activities. Given the nature of water vulnerability in the FV and the proposed project interventions in localized irrigation, this engagement will be significantly enhanced during implementation by including local community members at all stages, including detailed design, monitoring, and evaluation/lesson learning. More specifically, in component A, the project will support local communities to engage in efforts to improve efficiency in water usage. In Component B, selected WCAs will pilot the introduction of volumetric O&M payments. WCAs will actively engage its members in preparation of water consumption schedules and will conduct awareness campaigns about the proposed civil works. The project will also promote service oriented management that will

include feedback from farmers on the quality of irrigation and drainage services, level of energy consumption and quality of works. Finally, also in Component B, a demand driven approach will guide the specifics of the capacity strengthening activities.

75. These information/awareness building and demand-side processes will be supplemented by a GRM which will cover all aspects of project implementation, including, inter alia, grievances related to involuntary resettlement (required by the RAP). The GRM will also include a pro-active element through which the PIU will seek comments from beneficiaries once a year, as well as establishing the systems for receiving and processing unsolicited comments/ complaints. GRM data will be collected, compiled and reported in quarterly reports including an analysis of the different types of complaints. Together with the semi-annual scorecards mentioned above, feedback will be discussed during Bank implementation support missions with a view to respond to feedback and adapting project procedures causing harm to beneficiaries.

76. ***Gender.*** Women make up nearly a half of the population of the project area. At the same time, women's economic activity, particularly in the formal economy, is much lower than that of men. The project will pay particular attention to the involvement of women in irrigation water management and farming activities through WCAs work, Farmers Field Schools, and demonstration plots. The project will also provide training in financial literacy to enable female farmers and farm workers to apply to available credit lines through other projects and credit/ banking entities (the project will not offer its own credit lines). The local Makhalla (village) committees will have a strong role in providing specific outreach to women and providing advice on tailoring trainings to the needs of women under component B. The project will include gender-disaggregated measures for the project's beneficiaries, and incorporate citizen perceptions of project activities and processes.

77. **Involuntary Resettlement (OP/BP 4.12).** This policy is triggered in this project due to anticipated land acquisition and resettlement under Component A – Irrigation Modernization. Rehabilitation of irrigation systems, construction of pumping stations and wells, as well as improvement of bank protection (financed by the GOU) and flood control may require permanent or temporal land acquisition and physical resettlement. An RPF has been prepared and is applicable to the entire project area. The RPF describes the WB's resettlement policy and any differences with the national laws and sets out policies and procedures applicable to resettlement under the project. It also provides a framework for preparing site-specific RAPs for any future resettlement that is not currently identified and may be finalized during implementation. The RPF was prepared in accordance with the WB OP/BP 4.12. It was publically consulted and then cleared by the WB. The final RPF was made publicly available through publication in the national newspaper[10] in Uzbekistan on December 22, 2015 and the World Bank Infoshop on December 24, 2015. For the sub-project in the Podshaota-Chodak area in Namangan region, where the extent of the impact was known before appraisal, a RAP was prepared. The RAP was also consulted with the project Affected Persons (PAPs). The RAP was disclosed in-country on February 1, 2016 and on the WB Infoshop on February 25, 2016.

[10] "Pravda Vostoka" #24 (28199) on December 22, 2015

F. Environment (including Safeguards)

78. **Environmental Assessment (OP/BP 4.01).** This policy is triggered in order to address environmental aspects associated with civil works to be carried out under Component A. As these works will focus on rehabilitation of existing infrastructure and be of relatively small scale, the project is classified as Category B. The potential impacts may include excessive dust and noise generation; damage to soil and loss of the fertile layer due to excavations; excessive fumes due to the use of heavy construction machinery; generation of construction and domestic wastes on the construction sites and on the affiliated facilities (e.g. construction camps); and impacts on water regime of natural waterways which are the source of irrigation supplies to be improved as a result of the project. In addition, the agricultural intensification and diversification that will be supported through capacity building and assistance to farmers to access credit lines has the potential to raise environmental and social issues. The client has prepared an EAMP, which considered the above impacts in detail and suggested adequate mitigation measures. Because the range and diversity of likely activities to emerge from this support is narrow, the EAMP provided general guidance for the preparation of site-specific EMPs to be developed during project implementation.

79. The EAMP has been disclosed by the client in several locations of the project area in May, 2015, at public consultation meetings. The stakeholders invited for these consultations included representatives of beneficiary communities, local Governments, environmental authorities and NGOs. The received feedback has been recorded and detailed minutes enclosed to the final EAMP, which was posted on MAWR official web-site and WB Operational Portal on April 15, 2016.

80. Under the current FVWRMP Phase I, the MAWR demonstrated commitment to ensure proper environmental management of the project activities and involved all required expertise, both national and international, for promptly addressing project environmental risks and monitoring the progress and impacts. In view of this good experience during implementation of FVWRMP Phase I, the project will continue supporting MAWR and its PIU. The PIU should be adequately staffed with a full time environmental specialist who will be responsible for all aspects of the implementation of EAMP provisions and project's overall environmental compliance. The PIU Environmental Specialist will be assisted by national or international environmental consultants which will be part of Project Management Consultant team and M&E team and coordinate with the PIU Environmental Specialist during project life.

G. Other Safeguards Policies Triggered

81. **Pest Management OP 4.09.** This policy is triggered because of the potential change/increase in pest management needs associated with the agricultural diversification and intensification. Because the project will directly support these agricultural modernization activities, and because the crops involved are likely to be of types that are typically heavily treated with pesticides, a Pest Management Plan has been prepared as part of EAMP. The PMP discussed in detail the potential impacts of increased use of pesticides, and indicated the project will support training to be provided to farmers to raise awareness of the good pest management practices/IPM principles.

82. **Project on International Waterways OP 7.50.** The main sources of irrigation supplies in the project area are natural waterways, which are tributaries to the Syr Darya River. The Syr Darya River is an international waterway shared by Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan, and OP7.50 has therefore been triggered[11]. The Bank is satisfied that (i) the project will not cause appreciable harm to any of the riparians in the Syr Darya River basin; and (ii) none of the project activities are expected to have any adverse effects on the quantity or quality of water flows to any riparian in the Syr Darya basin.

83. **Dam Safety OP 4.37**. This policy is triggered as the project area is downstream from and is dependent on, among others, the Andijan and Kerkidon reservoirs. In addition, the project proposes to rehabilitate Kandiyon Mudflow Reservoir and transform it in to a water retention reservoir. In total, the FS identified seven dams that are located in the project area. The project will support organizing a Possible Failure Mode Analysis (PFMA) workshop as part of the next 5-year dam safety inspection. An O&M plan and an Emergency Preparedness Plan were prepared in compliance with OP4.37, and have received a Bank no objection on October 3, 2016.

H. World Bank Grievance Redress Service

84. Communities and individuals who believe that they are adversely affected by a World Bank-financed project may submit complaints to existing project-level grievance redress mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

[11] The Bank, on behalf of the Government of Uzbekistan, officially notified Kazakhstan, Kyrgyz Republic, and Tajikistan of Uzbekistan's intention to implement FVWRMP-II. No response was received from the Kyrgyz Republic and from Tajikistan. Kazakhstan raised concerns about the impact of the project on water quantity and water quality in the lower Syr Darya. The Bank has carefully reviewed the concerns expressed by Kazakhstan and conducted a thorough staff assessment that was endorsed by the Bank's legal and safeguards departments. The findings of the assessment confirmed that the proposed project would not cause appreciable harm to Kazakhstan.

Annex 1: Results Framework and Monitoring

Country: Uzbekistan

Project Name: Ferghana Valley Water Resources Management - Phase II (P149610)

Results Framework

Project Development Objectives

PDO Statement

The project development objective is to improve the quality of irrigation and drainage service delivery to agricultural users within the project area.

These results are at Project Level

Project Development Objective Indicators

Indicator Name	Baseline	Cumulative Target Values							
		YR1	YR2	YR3	YR4	YR5	YR6	YR7	End Target
Improved quality of irrigation and drainage service delivery (Number)	1.50	1.50	1.50	1.50	1.50	2	2	2.50	2.50
Relative irrigation deficit (water deficit/water demand) (Percentage)	30.00	30.00	30.00	30.00	25.00	25.00	20.00	20.00	20.00
Irrigation efficiency (Water withdrawn used for crop production) (Percentage)	30.00	30.00	30.00	30.00	30.00	35.00	35.00	35.00	35.00

Intermediate Results Indicators

Indicator Name	Baseline	Cumulative Target Values							
		YR1	YR2	YR3	YR4	YR5	YR6	YR7	End Target
Grievances registered related to delivery of project benefits that are resolved (Percentage)	0	80	80	80	80	80	80	80	80
Percentage of beneficiaries reporting improved engagement (in planning and feedback) and responsiveness to Farmer Field Schools (Citizen Engagement Indicator) (Percentage)	0	0	80	80	90	90	100	100	100
Farmers adopting improved agricultural technology (Number) - (CRI[12])	0	0	0	120	300	600	800	1,000	1,000
Farmers adopting improved agricultural technology – female (Number - Sub-Type: Breakdown) - (CRI)	0	0	0	20	50	100	150	250	250
Asset management processes established by project BAISs, AISs and WCAs (Text)	0	0	0	0	0	0	25	49	49
Female beneficiaries (Percentage)	0	0	5	10	15	20	20	20	20
Operational water user associations created and/or strengthened (number) (Number)	0	0	0	3	6	12	23	46	46

[12] CRI: Corporate Results Indicators

Increased collection rate by the WCAs in the project area (Percentage)	40	40	40	40	45	50	55	60	60
Area provided with irrigation and drainage services - Improved (ha) (Hectare (Ha) - Sub-Type: Breakdown) - (CRI)	0	0	0	0	40,000	60,000	80,000	103,000	103,000
Land area under sustainable landscape management practices' (Hectare)	0	0	0	0	40,000	60,000	80,000	103,662	103,662
Number of people receiving rural advisory services (Number)	0	0	0	400	1,000	1,400	1,800	2,000	2,000

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Improved quality of irrigation and drainage service delivery (MASSCOTE[13])	This indicator is to be measured through the following set of sub-indicators: 1. Flexibility; 2. Reliability; 3. Equity; and 4. Water Measurement This indicator was designed as part of the Rapid Appraisal Process by the Irrigation Training and Research Center (ITRC). The value range is from 0-4, with 0 indicating low quality, and 4 high.	Annual	Field data collected by an independent trained irrigation expert	PIU
Relative irrigation deficit (water deficit/water demand)	Ratio of total annual volume of water deficit (water requirement minus water supply) over total annual irrigation requirement	Annual	RAP Data	PIU
Irrigation efficiency (Water withdrawn used for crop production)	This indicator measures the crop evapotranspiration as percentage of the total amount of water supplied.	Annual	Surveys, project documents	M&E Consultant

[13] Mapping System and Services for Canal Operation Techniques, http://www.fao.org/docrep/010/a1114e/a1114e00.htm

Intermediate Results Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Grievances registered related to delivery of project benefits	Grievances will cover all aspects of project implementation, including, inter alia, grievances related to involuntary resettlement. The GRM will also include a pro-active element through which the PIU will seek comments from beneficiaries once a year, as well as establishing the systems for receiving and processing unsolicited comments/ complaints.	Quarterly	PIU, M&E Consultant progress reports	PIU
Percentage of beneficiaries reporting improved engagement (in planning and feedback) and responsiveness to Farmer Field Schools (Percentage)	This is a Citizen Engagement Indicator that measures the percentage of beneficiaries reporting improved engagement (in planning and feedback) and responsiveness from Farmer Field Schools	Semi-annual	PIU, M&E Consultant progress reports	PIU
Farmers adopting improved agricultural technology	This indicator measures the number of farmers of the project who have adopted an improved agricultural technology promoted by the project.	Semi-annual	Surveys, project documents	PIU, M&E Consultant
Farmers adopting improved agricultural technology – female	This indicator measures the number of female farmers of the project who have adopted an improved agricultural technology promoted by the project.	Semi-annual	Surveys, project documents	PIU, M&E Consultant
Asset management processes established by project BAISs, AISs and WCAs	Asset management plans will be prepared for the WCAs (46) and the 3 BAIS and AIS	Annually	BAIS, AIS and WCAs	PIU, M&E Consultant
Female beneficiaries	Based on the assessment and definition of project beneficiaries, specify what percentage of the beneficiaries are female.	Semi-annual.	Surveys, project documents	PIU, M&E Consultant
Operational water user	This indicator measures the number of water user	Annual	BAIS, AIS	PIU

associations created and/or strengthened (number)	associations created and/or strengthened under the project that are operational.			
Increased collection rate by the WCAs in the project area	This indicator measures an incremental increase in collection rate by the WCAs in the project area, expressed in percentage to the baseline value	Annual	WCA Financial Reports	PIU
Area provided with new/improved irrigation or drainage services (ha)	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).	Semi-annual	MAWR, BAIS, AIS, WCAs	PIU
Area provided with new irrigation or drainage services (ha)	This indicator measures the total physical area of land provided with improved irrigation and drainage services as a result of project investments, expressed in hectare (ha). The "improved I&D" refers to the upgrading, rehabilitation, and/or modernization of irrigation and drainage services in the project area with existing irrigation and drainage services.	Semi-annual	MAWR, BAIS, AIS, WCAs	PIU
Land area under sustainable landscape management practices (Hectare)	This indicator measures the total area under sustainable land management practices that have been introduced under Component B	Semi-annual	MAWR, WCAs	PIU
Number of people receiving rural advisory services	This indicator measures the total number of people who received rural advisory services under Component B	Semi-annual	MAWR, WCAs	PIU

Annex 2: Detailed Project Description

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

1. The FV is the most intensively cultivated area of Central Asia. It is the valley where the Syr Darya is formed from the Naryn and Karadarya rivers running from the mountains located at the east of the valley and it is completely surrounded by high altitude mountains except for the western extreme of the valley, where the rivers enter into Tajikistan. Elevation varies from around 500 m in the eastern side of the Valley to less than 400 m in the south-western extreme. The valley has numerous small sub-basins formed by the streams draining from the surrounding mountains in addition to its aquifers only partly used. During the Soviet Period the FV lived a period of massive irrigation expansion mostly dedicated to growing cotton. In the upper foothills, due to the higher slope and the poorer quality of the soils as compared to the bottom of the valley, orchards were established. The irrigation network consists mostly of gravity-fed canals and pump stations and canals, where gravity is not possible, with a limited number of control and distribution structures, this is due to the limited number of water users represented by the large state farms in existence when the systems were built. This dense network of canals and the pumping stations have received limited maintenance during the last two and a half decades and it is falling into disrepair, with some parts of the systems requiring complete overhaul.

2. Since the demise of the Soviet Union, the irrigation systems have gone through profound changes not only in regard to the production systems they support, but also in the management systems. Nowadays there is a large number of smaller water users, with new cropping patterns. Management of the irrigation systems have also suffered from under-investment and diminishing technical capacity. Due to the need for pumping in large irrigated areas, overall energy consumption for irrigation is high. All of this has resulted in production systems with very low productivity in resource utilization. The Ferghana Valley Water Resources Management Phase II Project, (FWRMP-II) aims at implementing targeted interventions to restore selected systems within the FV addressing both infrastructural problems as well as organizational issues in order to improve productivity of resource utilization.

3. Through a participatory process three irrigated areas have been identified to be included in the project, one in each of the three provinces of the FV, i.e., Andijan, Ferghana and Namangan. The project area covers 103,622 ha as shown in the map in Annex 9 and are:

(i) The Podshaota-Chodak project area (29,507 hectares) in Namangan region located in the northeast of the FV. Administratively, the project area consists of Yangikurgan district in its entirety and part of Chodak district. It is located on the right bank of Syr Darya River;
(ii) The Isfayram-Shahrimardan project area (54,375 hectares) in Ferghana region located in the south of the FV. The project area covers the southern part of Isfayram-Shahrimardan AIS. Administratively, the project area include the entire Ferghana and Kuva districts, Ferghana city, and parts of Altiarik and Tashlak districts;
(iii) The Savay-Akburasoy project area (19,740 hectares) in Andijan region located in the southeast of the FV. Administratively, the project area is part of Kurgantepa,

Jalalkuduk, and Hujaobod and Bulokboshi districts of Andijan region and located on the left bank of Karadarya River.

4. There are about 181 thousand farms in the project area, out of which 3,044 (1.7 percent) are private farms managing about 83.1 percent of the farm area (99.7 thousand ha), while there are 177.9 thousand dehqan farms (98.3 percent) operating about 16.9 percent area (about 20.2 thousand ha). About 29.8 percent of the area (30.9 thousand ha) is allocated to orchards (stone fruits and grapes), followed by 29.8 percent (30.8 thousand ha) wheat, and about 14.9 percent area is allocated to cotton grown on about 15.4 thousand ha. In addition, vegetables (greens and potato) are grown on about 10.6 thousand ha (10.2 percent), and 10.4 percent of the area (10.7 thousand ha) is allocated to fodder crops, mainly for household animal needs. The rest of the area (4.9 percent or 5 thousand ha) is allocated to other crops.

5. According to the 2011 population census, some 8.3 million people (or 28.7 percent of the country's population) lives in the FV. It is expected that over time and as a result of population increase, further economic development and climate change, water availability in the FV will decline increasing the already existing water deficit. Climate change is also expected to exacerbate the often unreliable supply from the valley's transboundary rivers, many of which have comparatively small catchment areas and are already prone to high run-off variability.

6. Despite water shortages, due to the deteriorating infrastructure and poor management practices, irrigation efficiency is low and it is estimated that only 30 percent of the water that is withdrawn from the basin within the FV is effectively used by the crops. An estimated 30-35 percent of the irrigated area in the FV relies fully or partially on pumping. Many of these pumps, which were installed during the Soviet period decades ago, have reached the end of their economic life and are characterized by a high energy use and frequent break-downs. High energy and water inefficiency come at a significant expense to Uzbekistan and replacing these by more efficient pumps will help reduce operational costs while improving reliability.

7. The on-farm irrigation system in the three project areas is aging and vast parts of it are in a state of serious disrepair. There is limited water control and most irrigation control structures are no longer functional, or even in existence. The lack of water control and management within the on-farm system has meant that farmers do not receive the proper amount of water at the proper time. In addition, as a result of hands-on involvement of regional authorities mindful of meeting cotton and wheat quota, irrigation management has been described as "routine emergency management". The concept of reliable service delivery and equitable water distribution based on demand is virtually non-existent.

8. *Component A: Irrigation Modernization (US$ 191.40 million in total, including US$131.70 million IDA, and US$59.70 million GOU)*

9. This component will include a combination of measures to increase water supply both from surface and groundwater sources plus an increase in conveyance efficiency through investments in the modernization of the water distribution system. They are expected to ensure a more effective response to the challenges that irrigated agriculture is facing in the FV, and to provide

the tools to those who are responsible for water service delivery, including AIS, BAIS and WCAs. This component will consist of the following sub-components:

10. *Subcomponent A-1: Rehabilitation of Surface Irrigation System.* Through this sub-component the project will invest in canal lining in 283.35 km of main and inter-farm canals. In most cases the interventions are limited to repairing lining in critical sections of the canal network. The main objectives of canal lining are to address high seepage losses in specific reaches of the canals and to improve water control by decreasing travel time to tail ends in the lower reaches of the network. In addition, through this component an estimated total of 674 associated control structures will be improved along the main and inter-farm canals. This has as objective to improve water level control in these canals to guarantee better water delivery service to lower level canals. A number of measuring devices are also included in order to improve management and accountability throughout the system. This subcomponent will also install a SCADA system to monitor flows in key diversion points along the main canal. Providing this information to the system managers will enable them to better match canal flows with actual demands in real-time throughout the entire irrigation season.

11. *Subcomponent A-2: Rehabilitation and Construction of Pump Stations.* This sub-component will undertake the modernization of 10 pump stations that have been prioritized in the three project sites. After discussions with the MAWR on the potential options to introduce innovative technologies in order to improve water delivery service from the pump stations, it was decided that the works to be undertaken by the project will include the installation of a number of smaller energy-efficient pumps to more accurately match demand; replacement of electrical systems including control and protection equipment; repair of pump station buildings and repair of water intake structures and water control equipment. In addition, the project will undertake the construction of one new pump station and associated 9.5 km delivery pipeline in the Isfayram-Shahimardan project site, to feed a transboundary canal that in recent years carries insufficient water to feed the area it used to irrigate.

12. *Subcomponent A-3: Construction of Wells*. Through this sub-component the project will drill 243 new wells in two project sites, Ferghana and Namangan Provinces. Wells were part of the original system design during the Soviet era with the dual objective of increasing water supply to the canal system and extend the reach of canal distribution beyond the gravity fed area covered by the canals that take water from surface sources. Over 3,600 of these pumps have been installed in the FV. Many of these old wells need to be rehabilitated and this work will be undertaken directly by the Government through its own public resources. The hydro-geological institute has officially confirmed to the PIU that the proposed number of wells are well within the recharge capacity of the aquifer and therefore the expected volumes that will be pumped are sustainable. Under this sub-component, the project will also conduct two "managed aquifer recharge" pilots that will recharge groundwater by in-stream impoundment, and monitor the inflows and yield. The Podshaota river has been selected for these pilots.

13. *Subcomponent A-4: Flood Control and Bank Protection.* This sub-component aims at addressing the damages caused by seasonal high flows in the river and occasional mudflows that affect the irrigation systems and the local communities. The project will support a total of 17.9 km of bank protection works to prevent flood flows from eroding the river banks and damaging

farmlands in Namangan and Andijan provinces. These works will be financed by the GOU. The Kandiyon mud flow reservoir in the Namangan province with a capacity of 2.3 million cubic meters will be converted into a water storage reservoir.

Component B: Support for Agricultural Modernization (US$21.5 million total, including US$2.7 million IDA, US$2.4 million GOU and a proposed EU Grant of US$16.4 million)

14. *Subcomponent B-1: Agricultural intensification and diversification (including crop intensification and diversification, training/Farmer Field Schools/demonstration plots, cotton harvest mechanization, and support for accessing lines of credit).* This subcomponent will support the Government's efforts to modernize the agriculture sector by promoting intensification, facilitating mechanization and stimulating diversification. It will more specifically support farmers in the targeted areas in maximizing economic and financial returns of irrigation investment by: (i) using land and water more efficiently; (ii) improving land and labor productivity; and, (iii) ensuring environmental and social sustainability and climate change mitigation and adaptation. The project will mainly use a combination of direct training activities, information dissemination, technology demonstrations, experience sharing activities and interactions with other sources of information, financial and technical support (other projects, research institutes, etc.). Intermediate results indicators include (i) the number of technologies demonstrated in the project areas; (ii) adoption of improved agricultural technology promoted by the project disaggregated by gender; (iii) number of training days disaggregated by gender; and (iv) number of farmers trained, including female farmers. The Component will be organized around the five set of activities:

15. The FVWRMP-II project intends to create suitable synergies and complementarities with the HDP that will operate in the FV to strengthen farmers' capacities in the field of horticultural production. HDP will target (i) vegetables, open field (fresh market vegetables, vegetables for processing, production and storage of potato seeds) and greenhouse (tunnel); (ii) early vegetables under various kind of cover (agri-fiber), and fruits (existing orchards); (iii) new fruit crops (nuts of various types; berries including raspberries) and new cultivars; (iv) nursery management demonstrations; (v) post-harvest handling practices; and (vi) farm machinery and equipment demonstration (for horticulture). Alternatively, training and demonstration activities under the project will complement those of HDP by targeting crops other than horticultural. The project will also facilitate access by farmers to credit lines that will be established under HDP as well as to other existing and suitable financing opportunities, in support of agricultural modernization.

16. The project activities will target about 103,622 ha of cropped area in three regions (Andijian, Ferghana, and Namangan) distributed in 10 districts and 2 peri-urban areas (of Ferghana and Kuvasay city).

Table 1: Cropped area and average cropping intensities in FVWRMP-II project areas

	Subproject areas			**Total project cropped area, ha**
	Savay-Akbura (Andijian)	**Isfayram-Shahrimardan (Ferghana)**	**Podshaota-Chodak (Namangan)**	
Total cropped area, ha	19,470	54,375	29,507	**103,622**
Share in cropped area	19.1%	52.5%	28.5%	**100%**
Average cropping	82.7%	85.9%	88.7%	**86.1%**

intensity				

Source: FVWRP-II Feasibility Study, August 2014

17. The project cropped area has a cropping pattern as described in Table 2. As shown, some 10.7 thousand ha (10.4 percent of the area) are allocated to fodder crops, mainly for households` livestock needs.

Table 2: Cropping pattern in FVWRMP-II project areas

Crops	**Podshaota-Chodak (Namangan)**		**Isfayram-Shahrimardan (Ferghana)**		**Savay-Akburasoy (Andijian)**		**Total project area**	
	Cropped Area (ha)	**% share in total cropped area**	**Cropped Area (ha)**	**% share in total cropped area**	**Cropped Area (ha)**	**% share in total cropped area**	**Cropped Area (ha)**	**% share in total cropped area**
Cotton	514	1.7%	8,263	15.2%	6,642	33.6%	15,419	14.9%
Wheat	8,259	28%	15,476	28.5%	7,096	35.9%	30,831	29.8%
Barley	11	0.04%	48	0.1%	32	0.2%	91	0.1%
Rice	-	0%	-	0%	277	1.4%	277	0.3%
Maize (grain)	1,360	4.6%	1,180	2.2%	249	1.3%	2,789	2.7%
Potato	2,272	7.7%	1,386	2.5%	502	2.5%	4,160	4%
Vegetables	2,505	8.5%	3,124	5.7%	788	4%	6,417	6.2%
Watermelon	184	0.6%	295	0.5%	60	0.3%	539	0.5%
Maize (fodder)	783	2.7%	6,737	12.4%	720	3.6%	8,240	8%
Fodder	706	2.4%	1,513	2.8%	289	1.5%	2,508	2.4%
Oilseeds	1,256	4.3%	101	0.2%	70	0.4%	1,427	1.4%
Grapes	3,398	11.5%	861	1.60%	462	2.3%	4,721	4.6%
Fruits	8,258	28%	15,391	28.3%	2,553	12.9%	26,202	25.3%
Total Cropped Area	29,507	100%	54,375	100%	19,740	100%	103,622	100%
Total command area	**33,271**	**27.7%**	**63,280**	**52.8%**	**23,411**	**19.5%**	**119,962**	**100%**

Source: FVWRP-II Feasibility Study, August 2014

18. In the project target area, almost 87,000 ha of cropped land is shared by 3,044 private farms with an average farm area of 33 ha; while about 178,000 dehqan farmers share the remaining 17, 000 ha of cropped land with an average farm size of 0.12 ha. The project will consider a diversified approach whereas the capacity strengthening of the private farmers/farms will be pursued on specific technological topics, which will be shown and promoted on purposely established Demonstration Plots; while in the case of dehqan farmers/farms, these will receive more intensive support through the FFS activities. Such a diversified approach will allow a farmers'/ farm's specifically tailored capacity strengthening effort.

19. The PIU will include an Agricultural Officer who will be in charge of coordinating the following subcomponents: (i) Crop intensification and diversification; (ii) Assistance to farmers to access lines of credit; (iii) Cotton Harvest Mechanization; and (iv) International standards for sustainable cotton production.

20. ***Crop intensification and diversification*** *(€5.7 million proposed EU contribution).* This activity will promote crop production intensification and diversification through a range of capacity strengthening activities, using FFS and on-farm demonstrations. The project will adopt an interactive approach to demonstrate new technology and crop husbandry practices, to monitor their adoption by farmers and to assess their suitability to the local socio-economic farming conditions. It will promote exchange of experience among farmers and close interactions between farmers and research institutes. Farmers training using the FFS approach will be demand-driven and will be adapted to each category of farmers, especially between medium- and large-scale private farming entrepreneurs (3,044 farmers), and dehqan smallholder farmers. New technologies to be promoted will cover a large range of topics aiming at: (i) improving or optimizing water management, soil fertility, crop rotation, etc.; and (ii) introducing new varieties, water saving techniques, with a strong dimension of climate change mitigation and adaptation. Particular attention will be paid to the training needs of female private and dehqan farmers, farm workers and rural women. Providing them with certain skills relevant irrigation and high-value crops, will help increase their economic activity. Training and demonstrations on diversification will use existing resources, especially under the Bank-supported Horticulture Development Project (HDP). To further stimulate intensification, the project has agreed with local Hokims to give, on a pilot basis, more flexibility to farmers in land use for cotton production.

21. During the project period FFS activities will be implemented in the areas of the dehqan farms' population. The entire area under dehqan farms (17,000 ha) would be targeted, around which a total of 800 FFS may be established. Considering a number of 25 participants for each FFS, around 5000 direct beneficiaries organized around some 200 FFS will receive assistance each year. It is assumed that other farmers would also benefit indirectly though facilitation of information flow and farmer-to-farmer dissemination.

Table 3: Number of proposed FFS in FVWRMP II project area for Dehqan farms

District	No. of dehqan farms in project area	Average farm area, ha	Cropped area, ha	% of total area	Total FFS	Total participants	FFS in first year	Participants in first year
Savay-Akbura (Andijian)	31,672	0.11	3,160	19%	151	3,764	38	941
Isfayram-Shaimardan (Ferghana)	99,622	0.10	7,995	48%	381	9,524	95	2,381
Podshaota-Chodak (Namangan)	46,638	0.14	5,634	34%	268	6,712	67	1,678
Total	**177,932**		**16,789**	**100%**	**800**	**20,000**	**200**	**5,000**

Source: FVWRP-II Feasibility Study, August 2014

22. While all preliminary activities will be carried out during the first year of the project, the FFS cycles will actually run during project years 2, 3, 4 and 5 at a pace of about 200 FFSs per year. Once the year batch of FFSs has completed its activities, the FFSs will be encouraged to continue their operations in the following years of the project life-time and the project's monitoring and evaluation system will include these for results measurement and impact assessment. The last batch of 200 FFSs will be monitored during the last year of the project.

23. The establishment of FFS will accordingly follow the below steps:

1) Development of a training curriculum. The training curriculum and program will be developed following a farmers` training needs assessment; FFS activities will in fact consider farmers' specific training requests following a demand driven approach. The development of the training modules will be prepared jointly by technical specialists, agriculture and water resources' specialists and experienced farmers involved in the project. In each of the three project provinces a start-up workshop (1) will be organized for the development of the training curriculum. Following each training, post-training survey on effectiveness, utility and quality of the trainings will be collected in order to respond to farmers' feedback and improve quality of FFS. A verification workshop (2) would be made at completion of FFS activities each year. The training curriculum can be fine-tuned each year based on the results of an annual feedback/evaluation and assessment and account taken of the outcomes from the verification workshops. Accordingly, the same cycle will be repeated each year until completion of the FFS cycles foreseen in year five of the project. The first curriculum-development workshop will be organized during the first year of the project. This is very important as it will provide the key information for the subsequent training of trainers step.

2) Selection of trainers and training of trainers (ToT). A group of 50 people selected in the project area (local specialists, farmers with higher education and working experience in this field) will be trained through a two-week workshop. The ToT will be provided by a qualified international consultant/company that will provide/recruit a minimum of two national and international ToT experts (FFS Master Trainers) to operate the ToT process and coach the selected trainers. The training should allow the trainees to study and implement all the activities that they are supposed to conduct with farmers in a FFS. The FFS curriculum development step will provide key information for the FFS Master Trainers for the ToT training program. Special attention to facilitation techniques may or may not be needed depending on previous training and experience of the trainees. Each year, after the periodical assessment of farmer training needs, a Service Provider will carry out training courses to refresh the knowledge acquired by trainers, and/or keep them up to date with new elements.

3) Training of farmers. The training process will be conducted according to the approved program and training modules. In general terms these activities will aim at improving farming practices (through better fertilizer use, better water management, improved crop protection), and increase crop diversification and intensification. A FFS should last for a full crop season so that all the dynamics of crop growing along the season can be analyzed. Each of the 50 trained staff (through the ToT) will eventually become responsible for the FFS activities and each trainer would be in charge of 4 FFSs and each FFS would be by him/her visited at least once a week during the cycle. Typically, special training sessions would occur before any principal operation e.g. sowing, weeding, crop protection, harvesting, etc. The field school meeting place is close to the farming plots where specific field demonstrations are also performed. Training material (e.g. hand-outs), should be prepared in advance by the trainers and be available for each participant.

Particular attention will be paid to the training needs of female private and dehqan farmers, farm workers and rural women. Providing them with certain skills relevant irrigation and high-value crops, will help increase their economic activity.

24. The farmers' training will follow the agreed curriculum (step 1) that may typically include:

- on farm water management;
- soil fertility management;
- integrated pest management (IPM);
- rotation methodologies;
- introduction to new varieties (of maize, legumes) and varietal comparisons;
- marketing aspects of the considered crops;
- introduction to organic farming;
- seed production methods.

25. The FFSs' trainers may on a case-to-case basis avail themselves of expertise for specific topics, which would be sourced from suitable external and specialized institutions.

26. In a FFS cycle the organization of a "Field Day" is also included, arranged by the FFS participants, for the purpose of presenting and exposing all activities and achievements to other farmers in the community who did not participate in the FFS. The field day could also be a forum for interactions and sharing experiences.

27. FFSs will also organize exchange visits. The aim is to build up relationships within the FFS groups. During the exchange visit in fact, farmers can compare progresses, achievements and even constraints. The exchange visit could be organized (according to the local situation) in: i) FFS to FFS within district; ii) FFS to FFS within region; iii) FFS to FFS inter-region. To some extent, exchange visits could also disseminate new findings to other farmers for their benefit.

28. **Crop intensification and diversification through capacity strengthening via demonstration plots (Private Farmers):** In each subproject area a minimum of 6 Demonstration Plots (DPs) will be established. Each DP is assumed to be one single contour or field between 5 and 10 ha. These DPs will be "topic-specific" and will focus each on a lead-technology. The six lead-technologies that will be eventually conducted in the district DPs will be discussed and agreed upon during a preparatory workshop (one in each district) that will be conducted during the first year. Participants to such workshops will include lead private farmers, district agriculture officers, researchers, and other key stakeholders. The workshops will be organized by the PIU and will be facilitated by an international company/organization. The DPs will be operated for the entire project duration starting from PY 2. For each of the six lead technologies, two annual seminars will be also conducted, one prior to the start of activities and one at the annual completion of these. Each DP (including the initial start-up workshop and the seminars) will be managed by one or more international company/organization. DPs` management will also include periodical data collection and plot monitoring. Periodical follow up with farmers on collected data will be planned so that farmers can share their views with the interpretation of field results. In this respect a plan of organized visits open to all interested private farmers will be facilitated. It is envisaged that eventually all the 3,044 private farmers

will have the opportunity to interact repeatedly with the DPs during project life. Beneficiaries will be directly engaged in the sharing of lessons to other farmers.

29. It is assumed that the lead technologies will include:

- Demonstrations on cotton-wheat-secondary crop growing and different second cropping options, e.g.: maize, soybean, mungbean, lentil, sorghum, sunflower, pearl millet, including use of most suitable varieties of these crops;
- Demonstrations of on-farm water management (e.g. furrow irrigation control, use of siphons, etc.);
- Demonstrations on improved soil fertility (balanced fertilizer use, application of organic/green manure, etc.);
- Demonstrations on IPM;
- Demonstrations specifically for cotton: recommended package of practices for mechanized cotton harvesting, i.e. suitable varieties, seeding rate, row spacing, optimum fertilization, plant growth regulators and chemical defoliation practices;
- Demonstrations on special innovative technologies (e.g. Conservation agriculture/No-till);

30. Demonstration plots should be representative of the layout and land characteristics of each subproject area; and a good status of irrigation and drainage facilities should be also guaranteed. Establishing proper DPs will require investment and operational capital that will be provided by the project. The DPs will ideally be conducted on non-private land (e.g. district land sites, research institutions' stations, etc.). The costs for such investments (seed material, machinery and testing equipment) can be also shared with the HDP. In addition, some of the machinery that has been utilized for demonstration activities during FVWRMP-I can be considered for further utilization.

31. At the conclusion of a field demonstration a technical report should be prepared and distributed by the DPs` facilitators and specialists, containing information on soil analysis, irrigation, fertilizer application and other field operations, and final crop yields and training/extension activities undertaken. It should also contain information on the cost and benefit ratio of the demonstration to assess and promote to the farmers the profitability of the technologies demonstrated.

Table 4: Area of subprojects and of proposed Demonstration plots

District	No. of private farms in project area	Average farm area (ha)	Area (ha)	No. of DPs (from 5 to 10 ha each)	Total area of DPs (ha)
Savay-Akbura (Andijian)	615	32	19,363	6	30-60
Isfayram- Shaimardan (Ferghana)	1,647	32	54,375	6	30-60
Podshaota-Chodak (Namangan)	782	34	29,507	6	30-60
Total	**3,044**		**86,832**	**18**	**90-180**

Source: FVWRP-II Feasibility Study, August 2014

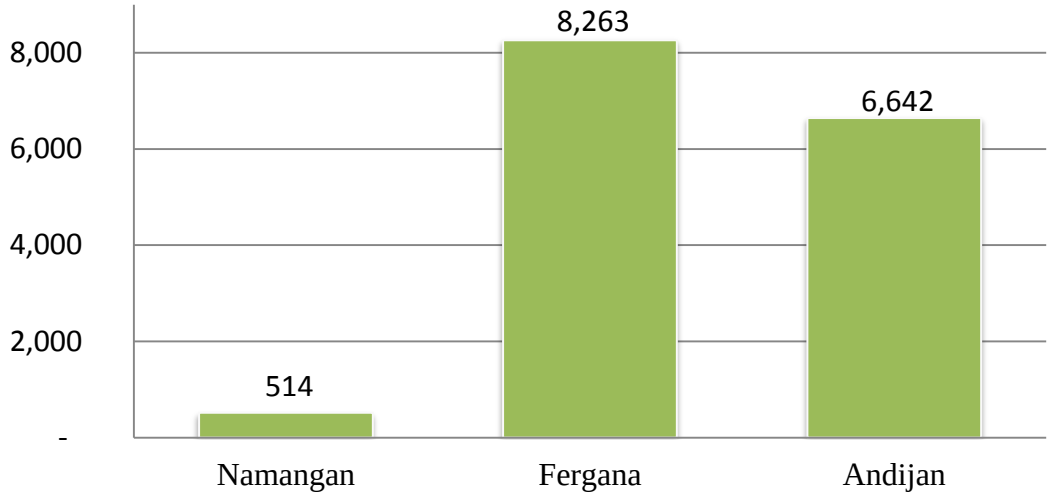
32. ***Assistance to farmers to access lines of credit:*** This project will assist and offer opportunities for farmers to invest in farming modernization and in all the activities that the above-mentioned project subcomponents will promote. Specifically, the project will provide assistance in accessing the lines of credit. The project will not provide any line of credit itself, but will take advantage of existing credit lines implemented under other projects (e.g. HDP, the proposed Livestock Project, the ADB-funded Horticulture Project, the IFAD-funded Livestock Project, and the GOU-funded Fund for Rehabilitation and Development), or other existing suitable financing sources. HDP's credit line will promote investment loans and leases to finance investments in the horticulture sector and in particular, through leases, will promote access to long-term finance for small farmers, who do not have sufficient collateral and thus are excluded from borrowing from the financial sector. The project will assist farmers to access available lines of credit through dissemination of information, training and assistance in preparation of credit applications. In this sub-component, a special focus will be in engaging female farmers in encouraging them to participate in demonstration plots and providing financial literacy trainings to enable female farmers to take advantage of credit lines.

33. Capital investment may include but not necessarily be limited to: modern machinery and implements; irrigation equipment; green housing/protected agriculture equipment; technology packages, etc. Activities will be coordinated by the PIU Agricultural Officer and assistance – for beneficiary identification and business planning - will be provided by the international company/organization in charge of the DPs. In the case of small/dehqan farmers and wherever feasible, first level assistance (mainly for identification) would be provided by the FFS trainers. In case of HDP credit lines/leasing, the two PIUs will proactively interact.

34. ***Cotton Harvest Mechanization***. The Government of Uzbekistan has announced its plans to mechanize 70 percent of cotton harvesting by 2020. In line with the Action Plan[14] adopted by the Government in January 2016, the project will support the mechanization of cotton harvest based on a targeted approach, which will encourage mechanization in fields that are at a higher risk of employing forced labor. The criteria for such fields will include distance from residential areas, soil quality, yields, etc. This targeted approach will also help maintain job opportunities near urban centers where cotton harvest can play an important role in incomes and livelihoods, especially for rural women. Where mechanization will be encouraged, farmer training, interaction with research and demonstrations in appropriate crop husbandry measures in preparation for cotton harvest mechanization will be conducted with a focus on suitable varieties, seeding rate, row spacing, optimal fertilization, plant growth regulators and chemical defoliation applications. Currently the project area occupied by cotton is around 15,419 ha. As shown in the graph below, project interventions will focus on the Ferghana and Andijan Regions where cotton is predominant in the irrigated farming system.

[14] "*Action Plan for Improving Labor Conditions, Employment and Social Protection of Workers in Agricultural Sector in 2016-2018*"

Figure 1: Cotton planting area in the subproject areas (ha)



Source: FVWRP-II Feasibility Study, August 2014

35. ***International standards for sustainable cotton production***. The project will help farmers adopt international practices and standards in sustainable cotton production as a way to better brand Uzbek cotton and increase its foreign market demand. The approach could follow for instance the principles established by the Better Cotton Initiative which promotes cotton production based on environment friendly crop protection practices, water use efficiency, soil conservation and fertility management, natural habitats protection, high fiber quality standards and decent work. The project will work in close collaboration with IFC-supported cotton processors and textile manufacturers, such as Indorama, to stimulate market demand for sustainable cotton, organize the chain of custody to ensure proper traceability and guide the implementation of the sustainability principles on the ground and their application by farmers. Irrigation schemes supported by the project, especially in the FV, will serve as clearly delineated locations to ensure strict traceability of cotton produced under environmentally and socially sustainable practices.

36. *Subcomponent B-2: Improved Water Management.* Three sets of activities would enhance impact on the improvement of water management: (i) strengthening capacities of local water consumer associations; (ii) strengthening capacity of water management staff working for district, region and basin water management institutions; and (iii) pilot and scale-up innovative approaches. FVWRMP, Phase I has had considerable success with the development of WCAs and has played an important role in improving the performance of WCAs. Annual budgets of WCAs, overall revenues, fee collection rate and satisfaction of members with WCAs have increased considerably. These good results suggest that a more comprehensive and continued support for WCAs would significantly improve water management at on-farm and field level, while saving important public resources that would otherwise be spent on O&M. FVWRMP, Phase II provides an opportunity to scale up this support to further strengthen capacities of WCAs and consolidate results to help ensure the sustainability of the project's investments. Further, the Government, with the help from UNDP, has recently drafted the Water Code, which now awaits discussion in Parliament. The project will provide technical assistance in reviewing the respective WCA aspects in the Code, and will offer possible improvements for effective

WCA support. In addition, in absence of a dedicated Law on WCAs, the project will conduct analytical work in support of preparation of such a Law. The project would also increase awareness of the Government and maintain continuous dialogue with officials regarding reforms (i) on assigning higher priority to ISFs within preferential cotton account credits, (ii) forgiving debts to well performing WCAs, and (iii) introducing measures for household plots to pay ISFs. A more detailed list of activities in support of improvement of water management is presented below.

(i) Strengthening capacities of local water consumer associations *(€5.8 million proposed EU contribution)*

37. *WCA Support Groups in Ferghana, Andijan and Namangan:* The purpose of this activity is to establish a WCA Support Group in each project region in order to support and strengthen capacity of the WCAs located in the project area. Each Support Group will comprise two persons: a WCA local coordinator mainly responsible for assisting WCAs with institutional, legal and financial matters; and an engineer/water management specialist mainly responsible for water management, maintenance and asset management. The Support Group staff will be trained under the project to equip them with knowledge and skills to provide technical and institutional support to WCAs. For this purpose, at early stage of the project, a Technical Assistance Team would be recruited to provide technical expertise in WCA development. This team would include a mix of long- and short-term international and national consultants, including a WCA Development Specialist, Financial Specialist, Legal Specialist, and O&M Specialist. Some of the consultants would be in the country full time for the first year, and then work 3 months a year over the next 2 years of project implementation. By the end of third year it is expected that the local staff in the WCA Support Groups would have the expertise to manage all aspects of WCA establishment, training and development.

38. Training: The project will carry out training needs assessment of WCA staff, prepare a detailed training plan, and then prepare training material for each training course. A list of proposed training modules is provided in the POM. At present a number of training materials already exists that can be used as a base by the project and adjusted as needed. In addition to institutional, technical, financial and operational aspects, the WCAs in the project area have expressed a particular interest for training concerning legal issues pertaining to their status and operations, including legal guidance on taxation matters and fee collection enforcement. To address these concerns, the project will allocate a small amount of funding for hiring local legal and tax consultants as needed.

39. Provision of equipment to WCAs: The project envisages provision of light earth moving machinery, computer equipment, printers, office furniture, and water measuring equipment. In addition the project will support the rehabilitation of WCA offices. However, WCAs will need to meet specified qualifications in order to receive machinery, computer equipment and office furniture as well as have their offices rehabilitated. To provide a transparent selection process, seven criteria will be used to screen and prioritize WCAs for provision of this support. The eligibility criteria will include: (i) formal establishment of the WCA, including legal registration; (ii) WCA staff hired and training programs undertaken; (iii) adequate governance and general management; (iv) WCA Board and management have prepared an irrigation schedule, including an ISF development plan that covers all costs; (v) WCA members have paid the agreed ISF, and

as a result a WCA has achieved a high ISF collection rate; (vi) WCA has paid all debts including payment of outstanding salaries and electricity bills; and (vii) WCA has demonstrated availability of electricity and parking.

40. Asset Management: Asset management under the project will entail an initial study by the international and local maintenance specialists to: (i) identify in detail on-farm irrigation and drainage assets; (ii) assess the condition of the assets and replacement costs; (iii) prepare asset management guidelines, detailing the basic principles of asset management, its processes and procedures and condition assessment for typical on-farm irrigation and drainage assets; (iv) develop training courses based on the asset management guidelines for WCA O&M staff; and (v) prepare asset management plans for the individual WCAs, that will also cover the farmers' ability to pay the level of O&M fees identified through the asset management planning process. New training modules in On-Farm Water Management and Asset Management will be developed. These modules will focus on WCA engineers and hydro-technical workers who are responsible for the allocation, scheduling and distribution of water to water users on a daily basis and the maintenance of the I&D system. Asset management training will enable WCA management to prepare medium to long-term asset management plans.

41. Most of the WCAs in the project area do not have ownership of the on-farm infrastructure as they have not been officially transferred to their balance sheets. The project will, therefore, provide support in conducting an inventory of all on-farm I&D canals and water control and measurement structures, as well movable equipment (such as motorcycles, excavators, and bulldozers) and an office (if there is one), furniture and office supplies. The inventory will record the type, location, purpose, and functional condition of all canals and structures. Following the agreement with the Government, the project will assist the WCAs with assigning a budget cost for each asset, and transferring all assets to their balance sheets. Finally the project will provide a GIS-based software to produce a reliable map of system layout and assets, which is an essential tool for effective maintenance planning and budgeting.

42. Asset management principles will first be thoroughly tested in some of the more progressive WCAs in order to gauge the value of this approach to sustaining irrigation and drainage systems. The asset management plans will be discussed at the WCA Board and later at the WCA General Meetings with the aim to highlight the value of the irrigation and drainage assets and the need to provide sufficient funding over time in order to sustain the on-farm system. These discussions will serve as a starting point for discussions within the WCA on financing the maintenance of the assets, and an agreement by water users to an increase in the O&M fee. Also, the PIU staff will facilitate visits by WCAs to WCAs where maintenance procedures are considered to be good. Comparative performance of the WCAs would be encouraged, with the better performing WCAs acting as benchmarks for others.

43. Review of Water Sector Legislation. The project activities will include the provision of international and national legal specialists to carry out a thorough review of the WCA related sections in the current draft Water Code in order to identify areas where the legislation can be strengthened to support the development of WCAs. The review would be based on international experience in the establishment of water users' organizations. In addition, the project will support the Government in drafting a dedicated Law on WCAs. The current structure of WCAs

offers a chance of transforming of WCAs into strong consumer organizations, and it is expected that adoption of a specific WCA Law would address inadequate legal basis that regulates establishment and operation of WCAs. Thus, for example, legal and financial status of WCAs is regulated by different legislations. It is envisaged that a new Law would permit the establishment of WCAs as a special form of legal entity, and will also improve the legislation that regulates financial aspects of WCA operations. Following adoption of the WCA Charter by the Ministry of Justice in late 2013, the WCA Management and Governance Bodies were merged into a single WCA Management Board thus restricting the farmers' influence on decision making process. The new Law would, therefore, need to provide a stronger accountability mechanism for their governance structure.

(ii) Strengthening capacity of water management staff working for district, region and basin water management institutions

44. The project will also provide training to the water management staff working for district, region and basin water management institutions in the FV, namely the Province Department of Agriculture and Water Resources (PDWAR); Basin Irrigation System Authorities (BAISs), including Ferghana Region BAIS, Andijan BAIS, and Namangan BAIS; Hydrogeology and Ameliorative Expedition (HGAE); Pump Stations, Energetics and Communications Authority (PSECA); Main Canal/Irrigation System Authorities (MCA/AIS), and the District Department of Agriculture and Water Resources (DDAWR). Training curriculum includes technical assistance in introducing modern methods for asset management (AM) and capacity strengthening at appropriate levels. AM will help institutions define in a systematic and transparent way the investment and timeframe required for managing, operating and maintaining irrigation and drainage. The project will also develop a canal management pilot that will demonstrate and train staff in the use of modern canal management tools and methods.

(iii) Pilot and scale-up innovative approaches *(€2.5 million proposed EU contribution)*

45. Introducing Volumetric Measurement: Inefficiencies in distribution of irrigation water at the on-farm level are leading to over-abstraction of water from the source, low levels of productivity per unit of water diverted, and waterlogging and salinization. To address this issue, the project will introduce a volumetric payment-for-O&M pilot. The pilot will be implemented in a number of WCAs that have expressed interest. Eligible WCAs will be those that grow exclusively horticulture crops (i.e., WCAs that grow cotton and wheat are not eligible). The pilot will use the crop pattern that has been worked out in collaboration between the BAIS and the WCA as the basis. That crop pattern has subsequently been converted into an irrigation schedule that indicates the duration of the supply to each outlet. Mirabs recruited by the WCAs are responsible for delivering the supply on the basis of the established irrigation schedule. Based on this irrigation schedule, the pilot will use the duration of the supply as a proxy for volume. These durations of supply are then converted into O&M payments. This conversion is done in a budget neutral manner, i.e., the average water user will not pay more for O&M services than in previous years. However, a farmer who is particularly wasteful in water use will pay more, while a farmer who installs drip irrigation will pay less.

46. Volumetric measurement equipment will need to be installed at the scheme inlet to determine if off-take flows are stable across supplies. Annual calibration is required, and WCAs need to be provided with basic flow measurement devices. Measurement of actual supplies can be done at the beginning of the season, or when a farmer requests a verification of his actual supply. Absence of objection from the water user signifies agreement that the targeted volume has been delivered. Throughout the irrigation season, durations of supply are delivered as per the irrigation schedule. Farmers can reduce the supply upon their request, and will be charged on the basis of the actual duration of their supply, as measured by the Mirab.

47. At the end of the season, total volumes delivered to the WCA will be calculated on the basis of the SCADA system that the project will install. This will provide a minimum of accountability to the farmers that the quantity of water used and invoiced corresponds to the quantity of water withdrawn, and that this amount in turn is consistent with the amount of water that the WCA was scheduled to receive as per the seasonal contract with the BAIS.

48. Pilot the use of solar energy for pumping: Based on successful pilots under the RESP-II project, the project will also pilot the use of solar energy for pumping, which will be part of the activities that are included in the proposed EU grant (€1 million). Electricity outages occur frequently in the FV, leading to an unreliable supply and low efficiency as a result. In addition, electricity costs account for a significant proportion of public expenditures for irrigation. At the same time, solar radiation in the FV is among the highest in the country. Initial experience in the use of solar energy for irrigation and drainage pumps has been acquired under the GEF-funded Sustainable Agriculture and Climate Change Mitigation Project. The results were encouraging, and support the attempt to expand the pilots into the FV. This activity will scale up the pilot experience and implement installation of solar energy infrastructure for drainage pumps in the FV. Monitoring of the experience in view of scaling up will be an important activity. Technical specifications will be prepared for ten pilots to be supplied and installed. Training and M&E will be included in this pilot.

49. Resources have been allocated for evaluation, audit and outreach activities as per EU requirements.

50. *Component C: Project Management (US$12.1 million total, including US$10.5 million IDA, and US$1.6 million GOU)*

51. This component will support project management and monitoring and evaluation (M&E) (including, inter alia, the areas procurement and financial management) through the provision of goods, consultant services, training, and financing of incremental operating costs. The component will also finance a Procurement Panel and an annual technical audit of civil works by the Works Verification Agent. This component will (i) develop a comprehensive management information and data collection and reporting system on key performance outputs and impact indicators through, inter alia, baseline surveys; participatory assessments; mid-term reviews; and final evaluations; and (ii) finance project management, including a project management consultant.

Monitoring and Evaluation

52. The PIU will be responsible for overall coordination of project monitoring. M&E consultants will be recruited by the PIU for independent monitoring of project progress, project impact, and the achievement of PDO. To that end, the PIU and M&E consultants will be responsible for setting up the project's MIS and arrange for data collection and reporting. The MIS will be based on the agreed project outcome indicators and annual performance targets presented in Annex 1. The findings will be presented to the PIU and the Bank in semi-annual and annual progress reports, as well as the project mid-term review (MTR) and completion reports.

53. M&E consultants will also monitor project compliance with social and environmental safeguards, and the impact of crop intensification/diversification and cotton harvest mechanization on employment opportunities in the project area (in particular on vulnerable groups). They will supervise implementation of the overall EMP and the RAP, and will undertake careful review and monitoring of Implementation Arrangements for specific sub-project social and EMPs as well as impact assessment and supervision of their implementation. These consultancies will also help to reinforce overall transparency and governance during project implementation. A baseline survey will be conducted during the first project year and additional surveys are scheduled to be held during mid-term review and at project completion.

54. Progress will also be monitored through regular implementation support missions conducted by the Bank and the Government. M&E findings will provide feedback during these missions, and progress reports will be prepared immediately preceding the implementation support missions. A mid-term review of the project will be undertaken.

55. In addition to regular monitoring of project results, the project will participate in a TPM and an FBM, implemented by the International Labor Organization (ILO).

EU Grant Activities

56. A number of the activities under Component B (as explained below) have been included in a proposal that is currently being prepared for EU Grant financing. It is expected that the final Grant proposal in the amount of €15 million will be submitted for EU approval in October 2017. Activities will be parallel financed, i.e., all of the activities under the proposed Grant will be financed only from the EU Grant. In the event that the EU Grant will not be approved, the Government of Uzbekistan will undertake appropriate steps to identify alternative sources of finance.

57. The specific objectives of the proposed grant under the project is to support farmers in the projects' targeted areas in: (i) maximizing economic and financial returns of irrigation investment through agricultural intensification and diversification; (ii) ensuring post-project operation and maintenance of the on-farm irrigation and drainage infrastructure to sustain water management improvement and productivity increase outcomes. Resources have been allocated for outreach activities as per EU requirements.

58. Interventions will build on important lessons learned from the first phase of the project and from other Bank's irrigation investments such as DIWIP. Past investments have shown the

importance of investing in: (i) farming system modernization to maximize agriculture returns of irrigation investments; (ii) strengthening and equipping WCAs to sustain proper water management and irrigation infrastructure operation and maintenance. Technical interventions on the irrigation systems have also shown significant impact on improving water availability, on lowering ground level and reducing salinity, on the efficacy of vertical drainage wells for storing water and increasing water availability during summer months.

59. Sustainable crop intensification and diversification (€5.7M): The project will help farmers maximize and sustain returns of investments in irrigation through capacity building activities in support of agricultural productivity increase and diversification. Grant activities will target most of the 3,000 private farms and try to reach out to the 178,000 dehqan farmers in the three targeted areas. It will support: (i) capacity strengthening of selected farmers through demonstrations, farmer field schools, and the provision of goods and training on, inter alia, irrigation and drainage management and improved agricultural practices; (ii) technical assistance to help farmers access lines of credit and to pilot innovative financing schemes for input supply. The objective is to introduce improved agronomic, salinity reduction and water management practices in support of crop diversification and intensification. A specific focus will be given to the sustainable intensification of cotton production that could free up land for further diversification into other less water-intensive crops and fodder production which is of high demand on local markets as livestock production is expanding.

60. This project will promote crop intensification and diversification through a range of capacity strengthening activities, using FFSs and on-farm demonstrations. New technologies to be promoted will cover a large range of topics aiming at: (i) improving or optimizing water management, soil fertility, crop rotation, etc.; and (ii) introducing new varieties that use less water, with a strong dimension of climate change mitigation and adaptation. Particular attention will be paid to the training needs of female private and dehqan farmers, farm workers and rural women. Training and demonstrations on diversification (non-cotton, non-wheat) will use existing resources, especially under the Bank-supported HDP.

61. The project will help farmers adopt best global practices and standards in sustainable cotton production as a way to better brand Uzbek cotton and increase its foreign market demand. The project will work in close collaboration with IFC-supported cotton processors and textile manufacturers. Irrigation schemes supported by the project will serve as clearly delineated locations to ensure strict traceability of cotton produced under environmentally and socially sustainable practices. Where cotton harvest mechanization will be encouraged, farmer training, interaction with research and demonstrations in crop husbandry measures in preparation for cotton harvest mechanization will be conducted with a focus on suitable varieties, seeding rate, row spacing, optimal fertilization, plant growth regulators and chemical defoliation applications.

62. Capacity building activities will include assistance to farmers to access lines of credit. The project will not provide any credit itself, but will take advantage of existing credit lines implemented under other projects, or other existing suitable financing sources.

63. Strengthening capacities of local water consumer associations (€5.8M): The project will provide comprehensive support for the 46 WCAs of the targeted areas to significantly improve

water management at on-farm and field level. The project will strengthen capacities of WCAs to ensure the sustainability of the project's investments. Activities will include establishment of WCA Support Groups at the appropriate institutional level within the project area, introduction of a performance monitoring and experience exchange system that is linked to capacity strengthening efforts, support for the preparation of enabling WCA legislation, higher priority to Irrigation Service Fees (ISFs) within preferential cotton account credits, forgiving debts to well performing WCAs, and enforcement measures for household plots to pay ISFs. The project will also introduce modern methods for asset management that will help define in a systematic and transparent way the investment and timeframe required for managing, operating and maintaining irrigation and drainage systems.

64. WCAs will be trained in proper O&M, including asset management, regular system maintenance, prioritization of maintenance work and predictive planning and system assessment and monitoring. The training will be hands-on and will prepare annual and long-term O&M plans and rules for prioritization of emergency, regular and routine O&M. The project will also develop a canal management pilot that will demonstrate and train staff in the use of modern canal management tools and methods. Provision of modern tools and maintenance equipment will help WCAs undertake on-farm maintenance activities. The subcomponent will also finance study tours to expose water resources and irrigation and drainage stakeholders to a range of best water management practices.

65. The Grant will also complement IDA investments in rehabilitating irrigation infrastructure by piloting and scaling-up the following innovative approaches:

66. Introduction of Volumetric Payment of O&M fees (€2.5M): Inefficiencies in distribution of irrigation water at the on-farm level are leading to over-abstraction of water from the source, low levels of productivity per unit of water diverted, and waterlogging and salinization. To address this issue, the project will introduce a volumetric payment-for-O&M pilot. The pilot will be implemented in a number of WCAs that have expressed interest. Eligible WCAs will be those that grow exclusively horticulture crops (i.e., WCAs that grow cotton and wheat are not eligible). The pilot will use the crop pattern that has been worked out in collaboration between the BAIS and the WCA as the basis. That crop pattern has subsequently been converted into an irrigation schedule that indicates the duration of the supply to each outlet. Mirabs recruited by the WCAs are responsible for delivering the supply on the basis of the established irrigation schedule. Based on this irrigation schedule, the pilot will use the duration of the supply as a proxy for volume. These durations of supply are then converted into O&M payments. This conversion is done in a budget neutral manner, i.e., the average water user will not pay more for O&M services than previously. However, a farmer who is particularly wasteful in using water will pay more, while a farmer who installs drip irrigation will pay less.

67. Pilot on Solar Energy for Irrigation and Drainage Pumps (€1.0M). Electricity outages occur frequently in the FV, leading to an unreliable supply and low efficiency as a result. In addition, electricity costs account for a significant proportion of public expenditures for irrigation. E.g., 60 percent (US$350 million) of the budget of the MAWR is allocated to electricity payments. At the same time, solar radiation in the FV is among the highest in the country. Initial experience in the use of solar energy for irrigation and drainage pumps has been acquired under the GEF-funded

Sustainable Agriculture and Climate Change Mitigation Project. The results were encouraging, and support the attempt to expand the pilots into the FV. This activity will scale up the pilot experience and implement installation of solar energy infrastructure for drainage pumps in the FV. Monitoring of the experience in view of scaling up will be an important activity.

Annex 3: Multi-Criteria Analysis

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

1. The design of the FVWRMP-II is based on an extensive feasibility study that was conducted by an international consultant. The main objectives of the consultancy service were to:

- Prepare an Integrated Water Resources Management (IWRM) plan for the FV;
- Assemble a long list of potential investments in modernization of I&D infrastructure, including capacity strengthening, institutional reforms and environmental mitigation measures in Ferghana, Namangan, and Andijan Oblasts.
- Select an optimal set of irrigation and drainage (I&D) interventions based on the above strategic plan; and
- Prepare a detailed feasibility level study with tender designs of FWRMP-II, which would meet the appraisal requirements of an internationally funded project.

2. *Task 1 - Preparation of a Ferghana Valley Integrated Water Resources Management Plan*: on the basis of available data and information, the consultant prepared a strategic and comprehensive Ferghana Valley Integrated Water Resources Management Plan that formed the basis for the prioritization of investment options. To this end, the consultant divided the Valley into several "hydro-geological zones", each containing (as much as possible) homogenous sub-zones with similar water sources, problems, and institutions. For each zone, the consultant articulated a "problem statement (PS)" or "development objective (DO)" that helped pre-select the preliminary "long list" of promising interventions.

3. PSs/DOs were prepared by first defining 10 hydro-geological zones to delineate physical conditions of the three provinces, followed by a SWOT analysis undertaken with stakeholders using data collected from the field. Two sets of characteristics have been identified: a set of common characteristics applicable for the FV as a whole and a set of hydro-geological characteristics, specific to zones. The common characteristics are: dependence on transboundary water, poor I&D infrastructure, and social, institutional and environmental concerns. The hydro-geological characteristics are: groundwater table, groundwater mineralization, soil salinity, land surface slope and water availability. Based on hydro-geological characteristics, the FV has been divided into 10 zones.

4. The following PSs/DOs for the FV were identified: (i) increase water delivery efficiency; (ii) increase water availability in summer and reduce flooding in winter; (iii) improve the environment; (iv) mitigate shocks from cross border water regime changes; and (v) increase water application efficiencies.

- **Development Objective A: Increase in the Delivery Efficiency: t**he delivery efficiencies of the canals and the pumps has severely declined overtime resulting in conveyance and seepage losses of the distribution system, and erosion of the capacity of the pumps to lift the designed quantities of irrigation supplies. In areas based on gravity flows, yields have declined as a result of under irrigation. If the situation continues, the cropped area will reduce and yields will decline further. There are two main interventions to accomplish the development objective: (i) rehabilitation of the canals in the gravity

flow area, and (ii) rehabilitation of pumps and the associated distribution system in the pump irrigated area.

With the rehabilitation of the distribution system it is anticipated that the yields would improve, and the cropped area would not decline further. In the pump irrigated areas, the adverse impact has been on both – the decline in the cropped area and yields. It is evident that if the pumps are not rehabilitated the situation will further exacerbate. With rehabilitation of pumps and the associated distribution system, it is anticipated that the investment will have both horizontal and vertical increase in the production. In addition to this these interventions, the expenditures on the routine and periodic operation, maintenance and repair cost will significantly decrease.

- **Development Objective B: Increase in water availability in summer and reduce flooding in winter: t**he development objective B will be achieved through two interventions, namely, (i) development of boreholes/tubewells, and (ii) increase in storage capacity, including groundwater. The aim is to exploit the potential to increase reliable irrigation supplies through tapping alternate source of irrigation supplies mainly through borehole/tubewell development, and augmenting the canal supplies through harvesting excess river flows in groundwater storage during the peak supplies in the river system. Assured supplies is the main driving factor to shift the cropping pattern in favor of high value crops – both the tree crops and vegetables. It is expected that the additional supplies will not increase the cropped area, and will enable crop diversification.

- **Development Objective C: Environment Improvement:** the development objective C will be achieved through (i) rehabilitation of the drainage system to reduce waterlogging and salinization; and (ii) flood protection works to reduce the flood damages to the cropped areas, and irrigation, drainage, and other infrastructure along the rivers and stream corridors. The rehabilitation of drainage system will not only help arrest the environmental degradation in the valley and negative externalities outside the valley, it will also reclaim previously cropped land. The flood works will provide stability to the system and encourage farmers to invest in the farms and to diversify cropping patterns.

- **Development Objective D: Mitigation of Shocks from Cross Border Water Regime Flow**
  Changes: the development objective D will be achieved through increasing storage capacity, including groundwater. This intervention has commonality with the development objective B. The impact of this intervention is twofold. One - that has been mentioned above in the development objective C, and the second to minimize the vulnerability and uncertainty from the cross border flows. This will remove peaks in the supply regimes of the system.

- **Development Objective E: Increase Water Application Efficiencies:** The present on-farm water management practice is characterized by low water application efficiencies. This intervention is based on the promotion of the best practices through a pilot intervention as demonstration to farmers about the benefits of improved practices. The water saved through optimum irrigation water application efficiencies is not expected to

increase the cropped area but will improve the yield levels. This will also encourage crop diversification in favor of high value crops.

5. *Task 2 - Assembling of a long list of potential investments*: on the basis of the problem statement and development objective articulated under task 1, the consultant assembled a long list of potential investments in physical rehabilitation and upgrading of I&D infrastructure covering all hydro-geological zones in Ferghana, Namangan, and Andijan Oblasts. This included options for capacity strengthening, institutional reforms and environmental mitigation and protection measures necessary to protect valuable environmental assets. The long-lists was prepared on the basis of information provided by the BAIS.

6. The three BAISs responsible for Andijan, Ferghana, and Namangan provinces identified and prepared 13 projects, five in the Andijan Province (AP), and four each in Ferghana and Namangan provinces.

7. *Task 3 - Selection of an optimal set of irrigation and drainage (I&D) interventions:* the consultant prepared an optimal set (or short-list) of I&D investments through a Multi-Criteria Assessment (MCA). Key selection indicators included economic viability, and social and environmental sustainability. The interventions proposed by the BAIS were evaluated through a two-stage process, and those with an internal rate of return (IRR) of less than 12 percent were rejected. A second level screening prioritized the proposed investments based on a multi- criteria analysis (MCA).

8. The second level assessment criteria of the MCA reflected the constraints and development objectives articulated in Task 1, and included:

- Economic criteria (monetized): (a) capital and annual O&M unit costs per hectare; (b) incremental production (e.g. product of incremental water productivity in US$/CM and incremental water saved/drained in MCM/year); (c) incremental livestock production (from increased fodder); (c) avoided/reduced replacement or maintenance costs; (d) hydropower benefits if any.
- Social criteria (monetized or qualitatively described): (a) inter-farm equity of water allocation; (b) farmer/rural income redistribution and employment effect; (c) degree/stage of participation by WUAs; (d) associated resettlement needs (if any); (e) added short-term local employment during the construction phase.
- Environmental criteria: (a) environmental maintenance flows; (b) improved public health from improved water quality; (c) critical environmental safeguards if any (dam safety, international waters, pest management, physical cultural heritage).

9. The key consideration during task 3 was that coherent packages of proposed investments were selected in such a way that they capture synergies and contribute to achieving the Valley's overall development objective *more than the sum of the impacts of individual investments*. Future developments were taken into consideration into the design of project interventions, rather than simply rehabilitating the infrastructure back into its original state.

10. The findings of this task were endorsed by a workshop bringing together Oblast and national level water specialists and other stakeholders. The output of this task was a coherent

package of investments that has the demonstrated highest contribution towards achieving the development objectives articulated in Task 1. The consultant also made recommendations on how the packages would be contracted out, depending among others on the magnitude of the works and the need for ICB or NCB tenders, the availability of funding, etc.

Annex 4: Implementation Arrangements

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

Project Institutional and Implementation Arrangements

1. Implementation arrangements for the project build on those that were adopted for FVWRMP and that have demonstrated to be efficient and effective. The MAWR, with branches at the district and regional levels, is responsible for water planning in the country and for O&M of the main I&D systems down to farm level. The MAWR also administers international river systems with respect to water sharing and water quality control. MAWR is also responsible for the formulation and promotion of policies and strategies related to the development of agriculture in Uzbekistan. Within MAWR, a deputy Minister responsible for water resources acts as the project head with overall responsibility for implementation of the project. The deputy Minister responsible for water resources is also responsible for liaising with other ministries and Government agencies.

2. Responsibility for day-to-day project implementation will be delegated to the existing PIU and headed by a project director, supported by technical and administrative staff in Tashkent. The PIU will maintain regional project offices (RPIU) in each of the three Vilayats in the FV that will be headed by a regional director. The PIU will be assisted by national and international consultants on construction supervision, procurement advice, M&E, social and environmental safeguards, capacity strengthening and irrigation. The PIU will also be responsible for procurement and financial management, and contract management. PIU staffing is presented in table 1.

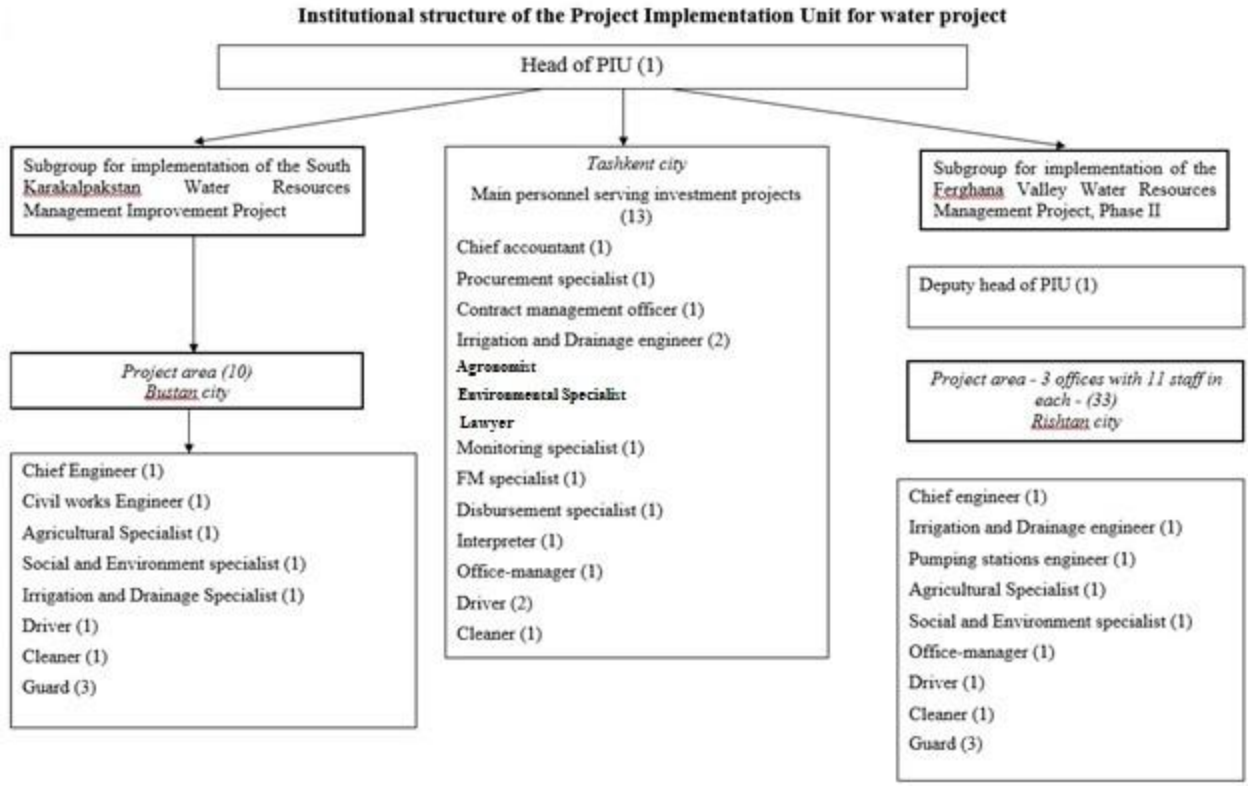


Table 1: PIU staffing

3. The PIU will outsource most of the project activities, as outlined in the procurement plan (see Annex 4), including construction supervision and contract management under component A and capacity strengthening under component B. To that end, the PIU will prepare TORs for each of the consultancy assignments identified in the procurement plan. All training activities will be integrated into one single capacity strengthening contract, including FFS, Demonstrations, training of staff from AIS, BAIS, PDWAR, HGAE, UNS, PSECA, DDAWR and BVOs, and training of WCAs and farmers. All training will be prepared, conducted and evaluated in an iterative manner, including needs assessment, implementation and feedback/evaluation.

85. An OCC will be established in each of the three project regions and chaired by the respective Vilayat Hokims. The Regional PIU director or his designate will act as secretary. Members include the Hokhims of concerned districts located in Ferghana, Namangan and Andijan project regions, representatives of the Departments of Agriculture, Forest and Livestock; the environmental agency (Goskompriroda) and two farmers' representatives. Meetings will be open for stakeholders on an observer basis. The main task of the OCC will be to coordinate the implementation of the project at Vilayat level, exchange information about project activities (in particular on progress in the implementation of civil works and training), communicate the prohibition on the use of child and/or forced labor to project stakeholders, and recommend necessary actions when project implementation problems occur. The OCC will meet at least quarterly, or at the request from the chairperson or the secretary.

Financial Management, Disbursements and Procurement

Financial Management

4. The PIU under MAWR will be responsible for the overall financial management (FM) arrangements of the proposed project. Regional branches of the PIU will not be involved in FM aspects of the project. The PIU has extensive experience in the implementation of the World Bank financed projects. An FM assessment of the PIU was carried out and concluded that FM arrangements at PIU, including systems of budgeting, accounting, financial reporting, auditing, and internal controls, are Satisfactory to the Bank subject to completion of agreed actions. The overall residual financial management risk for the project is moderate.

5. The following capacity building actions have been agreed to be implemented:

Actions for capacity building	**Responsible**	**Completion date**
Update the Financial Management Chapter of the Project Operational Manual to reflect the proposed project related internal control, budgeting, external auditing, financial reporting and accounting policies and procedures	PIU	By Effectiveness
Customize the existing accounting software currently used to support proposed project accounting and reporting. The accounting software should meet the World-Bank-financed projects requirements including ability to generate Interim Financial Reports, withdrawal applications, statements of expenditure, and annual financial statements.	PIU	By Effectiveness

6. **Staffing:** Financial management staffing is adequate in the PIU under MAWR in terms of skills, experience and number of persons. From an FM perspective, the PIU has an FM Specialist and one Chief Accountant who have solid knowledge in implementing Bank financed projects.

7. **Budgeting and planning:** The annual budget of the project will be based on the procurement plan that is approved by the World Bank. All changes to the procurement plan will be reviewed by the PIU Director and approved by the World Bank. The Director, the FM specialist, and the procurement specialist will be involved in the preparation of the annual budget that will form the basis for allocating funds to project activities and requesting counterpart funds from the GOU, if appropriate. The budgets will be prepared according to the Interim Financial Report (IFRs) format (disbursement categories, components and activities, and broken down by quarter).

8. **Accounting:** The project accounting will be maintained based on the National Accounting Standards of Uzbekistan. For reporting purposes, cash basis of accounting with the disclosure of commitments will be used under the project. The exiting Financial Management Manual properly reflects accounting policies and procedures and will be used under the proposed project. All supporting documents will be maintained in files for ready access by auditors and Bank staff. The project's chart of accounts will track all transactions and report them according to source of financing project components, and type and category of expenditure.

9. **Internal Controls:** The PIU's internal controls system was assessed to be capable of providing timely information and reporting on the project. The existing FM Manual is well prepared and fully documents accounting and financial reporting policies and procedures. The PIU will conduct monthly formal reconciliation of the World Bank disbursement data with

project's accounting records via Client Connection. The PIU has adequate internal control procedures in place over operational expenses. The PIU has a POM developed under an on-going Bank financed project, including an FMM which is satisfactory to the Bank. Controls for safeguard of assets, segregation of duties, authorization of transactions, review and approval of invoices and contract management are well elaborated in the FMM.

10. The existing FMM section in the POM will be updated for the proposed project to reflect the specific activities of the project, like Audit Terms of Reference, frequency of submission, format of IFRs, and so forth.

11. **Co-financing**: Government Co-financing will be in the form of contributions to civil works and tax exemptions. The PIU will be exempted from paying VAT, Import VAT, Excise tax, Custom duties and Road fund charges on vehicles on goods, works, non-consulting services, consultants' services (including audit services) and incremental operating costs which are procured under the project. Apart from Government Co-financing, the EU is expected to provide a €15 million (US$16.4 million equivalent) grant which will be used to fully finance certain activities under Component B that will not be financed by the IDA Credit. For the proposed EU grant, if approved, an additional DA will be opened.

12. **Financial Reporting:** The PIU will produce a full set of IFRs every calendar quarter throughout the life of the project. The format of IFRs has been agreed during the assessment and includes (i) Project Sources and Uses of Funds, (ii) Uses of Funds by Project Activities, (iii) Designated Account Statements, (iv) Disbursement Summary, and (v) a Statement of Expenditure Withdrawal Schedule. IFRs will be produced by the accounting software. These financial reports will be submitted to the Bank within 45 days of the end of each calendar quarter.

13. **External Audit:** The proposed project audit will be conducted (i) by independent private auditors acceptable to the Bank, on terms of reference acceptable to the Bank, and selected by the PIU; and (ii) according to the International Standards on Auditing (ISA) issued by the International Auditing and Assurance Standards Board of the International Federation of Accountants (IFAC). The terms of reference will include activities involving (i) audits of financial statements, (ii) assessments of the accounting system, and (iii) a review of the internal control mechanisms. The following table identifies the required audit reports that will be submitted by the PIU together with the due date for submission.

Audit Report	**Due date**
Project Financial Statements The Project Financial Statements include Project Sources and Uses of Funds, Uses of Funds by Project Activities, SOE Withdrawal Schedule, DA Statement, Notes to the Financial Statements, and Reconciliation Statement.	Within 6 months of the end of each fiscal year and also at the closing of the project

Table H-2: Audits

14. The financial statements and auditor's opinion will be disclosed to the public within two months of their receipt from the auditors, by posting the reports on the PIU website. Following

the Bank's formal receipt of these statements from the borrower, the Bank makes them available to the public in accordance with the World Bank Policy on Access to Information.

Disbursements

15. **Flow of Funds and Disbursement arrangements:** The Credit will disburse through transaction-based disbursement methods that include: (i) advances to the DA, replenishments to the DA on the basis of Statements of Expenditures (SOEs); (ii) payments against Special Commitments; (iii) reimbursement of eligible expenditures pre-financed by the Borrower (against SOEs); and (iv) direct payments to third parties. Withdrawal applications will be signed by two persons: (i) an authorized representative of the Borrower (Ministry of Finance); and (ii) another designated official in the MAWR. The project will be required to adopt e-disbursements.

16. **Retro-active Financing:** withdrawals up to an aggregate amount not to exceed US$500,000 may be made for payments made for eligible expenditures prior to the date of the Financing Agreement but on or after May 5, 2017.

17. *Financial Management Support*. FM support will be provided during project preparation and implementation and will consist of the following: a) risk-based FM implementation support visits will be conducted within six months from the project effectiveness date, and then at risk determined intervals, covering the following: i) project accounting and internal control systems; ii) budgeting and planning arrangements; iii) disbursement arrangements and funds flows; iv) review of supporting documentation for selected project transactions; b) The Bank will also review project's quarterly IFRs as well as the annual audited project financial statements and accompanying management letters.

Procurement Arrangements

18. A country procurement assessment was conducted in 2003 (by the World Bank and ADB) and it identified certain weaknesses in the public procurement system in Uzbekistan. The recent assessments under the Country Integrated Fiduciary Assessment (CIFA) and Public Expenditures Financial Accountability Assessment (PEFA) studies indicate that there is still ample room for changes and improvement in the public procurement environment and the same weaknesses largely remain today: (i) absence of a unified legislative framework; (ii) inefficient and non-transparent procurement practices; (iii) absence of a single institution with oversight or regulatory authority for public procurement; (iv) weak capacity for reviewing bidders' complaints; (v) complicated internal review/approval of bid evaluation reports which leads to low accountability and delays; (vi) no comprehensive anti-corruption measures; and (vii) low skills/capacity of the staff handling public procurement at various administrative level. One of the issues worth mentioning is the difficulty to obtain bank guarantees from local banks, specifically for bid security purposes, which affects the local participation in bidding under Bank projects. Private sector suppliers and contractors remain unsatisfied with the rules governing public procurement and have little confidence in the system's fairness. Though the Government has started extensive reforms of its public procurement system, at present, the overall procurement environment is considered "High risk".

19. The capacity of the PIU under the MAWR to implement procurement under the project has been assessed as part of the project preparation. The assessment identified the following key

risks: (i) the Government decrees and rules and regulations have internal conflict in major provisions such as price verification which leads to considerable delays in project procurement and implementation; (ii) the requirement to clear each stage of procurement with eleven member Inter Ministerial Bidding Committee (IMBC) leads to significant delays and dilutes accountability of the PIU and MAWR in procurement and project implementation; (iii) the difficulty in obtaining bank guarantee for bid security and performance security by the local bidders and non-availability of alternative instruments for such purpose in the country banking system, in particular, Joint Ventures; (iv) there are number bid evaluation committees/stages and the interdepartmental tender committee consists of eleven members and the signing minutes take at least 2 months; (v) delays in bid evaluation with associated procurement and integrity risks; (vi) from bid opening to the start of contract implementation takes minimum of 6 to 12 months; and (v) the latter includes the considerable procurement delays caused by contract expertise by MFERIT. That involves contracts with the international contractors and consultants and imported goods contracts. The risks identified and mitigation measures are summarized in the table below:

1. ***Description of risk***	***Rating of risk***	***Mitigation measures***	***Residual risk***
The Government Decrees and rules and regulations have internal conflict in major provisions such price verification.	S	The Bank Procurement and Consulting Guidelines shall be followed.	M
The difficulty in obtaining bank guarantee for bid security and performance security by the local bidders and non-availability of alternative instruments for such purpose on the country banking system.	S	There is an ongoing dialogue with the commercial banks to find a solution at this stage	S
There are four Steering Committees made of around twelve high ranked officials, and it takes up to a couple of months to sign the minutes, approve bid evaluation reports (BERs), etc. in addition to delays in bid evaluation with associated procurement and integrity risks.	H	Appointment of a Procurement Panel, made up of two international/expatriate and one national consultants with terms of references acceptable to the Bank. The Procurement Panel will conduct bid evaluation for large contracts as specified in the procurement plan. This would ensure that the bidding process is followed thoroughly, following appropriate guidelines More specifically, tasks of the panel will include advising on the procurement process including short listing of consultants, pre-qualification of contractors, review of bidding documents/ request for proposal before issuance, evaluation of bids /proposals and recommendation of award. The procurement consultants of	S

		the panel should have proven knowledge and experience in international procurement including MDBs procurement procedures. The service of international/expatriate consultant would be on a part time basis and for the national procurement consultants for a longer duration.	
Price verification and Contract registration requirements are arduous and may seriously impact procurement and contract implementation	S	The Bank team will monitor contract award notification and publication of contract award details as per Bank Procurement and Consultant Guidelines. The team will further monitor receipt of signed prior review contracts and take timely action to ensure Bank Guidelines are followed.	M
Staff of implementing agency has limited experience with the Bank procedures, guidelines.	S	Training will be provided by the Bank's procurement specialist during project implementation. The team will support MAWR/PIUs to improve procurement management efficiency. The procurement specialists and operational officer would be based in the field and thus be able to provide timely support. Procurement supervision will be carried out on a timely basis as required by the client. The appointment of the procurement panel will contribute to further procurement capacity building with MAWR/PIUs.	M
Government officials may intervene in the procurement decisions under the project.	H	The Bank would follow-up closely that the Bank's procurement procedures are followed strictly and prevail in case of conflict. Any complaints shall be handled consistently and followed-up till fully addressed. Copies of bids shall be submitted to the Bank (Uzbekistan Country Office) within 12 hours after bid opening. Procurement provisions in the POM have been strengthened as explained in paragraph 24 below.	M

H: High; S: Substantial; M: Moderate and L: Low.

20. *Procurement Arrangement and Staffing*. There are three BAISs who are the beneficiaries of the project: Norin – Karadarya; Norin – Syr Darya and Syr Darya – Sokh; The project shall be managed by the PIU under MAWR, based in Tashkent is responsible for the day-to-day implementation of the project. Regional PIU offices which are mainly involved into the technical

aspects and monitoring of the project would have staff seconded by the BAIS and staff funded out of out of project resources. One procurement specialist will be hired by the PIU. In addition, the PIU will recruit a Procurement Panel that will advise on procurement matters to ensure efficient management of the procurement process, including short-listing of consultants, pre-qualification of contractors, review of bidding documents/ request for proposal before issuance, evaluation of bids/proposals and recommendation of award. The Procurement Panel will also review contract management during implementation and changes in the scope, quality and variations in the contracts. An annual technical audit of the civil works will be conducted by the Works Verification Agent to confirm the amount and quality of civil works implemented. Procurement training will be provided to the procurement specialists of the PIU and MAWR staff throughout project implementation. The Evaluation Committee members shall be also trained in the Bank procurement and evaluation procedures. The POM shall be developed by MAWR and shall reflect the detailed internal approval stages and the approval process and has to be revised to reflect the changed functions, including the procurement ones of the PIU and its branches. The price verification and reasonableness of recommended contract value will be carried out as part of bid evaluation and the contracts will be awarded and signed as soon as Bank's no-objection is issued and signed contract and Performance Security (whenever required) is submitted to the Bank within 6 weeks of the Bank's no-objection to the BER. In light of the lessons learned in World Bank financed projects in Uzbekistan, the POM will be strengthened to include integrity provisions. The revision will also secure that a proper complaint registration and handling mechanism is in place, so any complaint is treated fairly and openly. Any complaints concerning the procurement or other aspects of the project implementation have to be registered and dealt within a time frame agreed in the POM.

21. Following the Memorandum of Understanding (MoU) signed on May 13, 2016 between the Bank and the Government, the project will initiate advance procurement as soon as possible to enable contracting the major procurement packages prior to and soon after project effectiveness.

22. ***Record Keeping***: The procurement specialist of the PIU will be responsible for maintaining the procurement files/records. Separate files should be maintained for each contract (including both hard copy and electronic copy). All the procurement documents (including bids, technical and financial proposals of consulting services) should be kept until the end of the project and then transferred to the Government Archives. The originals of various valuable documents (such as bid security, performance guarantee, advance guarantee) will be kept in the safe by the PIU's accountant.

23. ***Procurement Supervision and Procurement Post Review***: Routine procurement reviews and supervision support will be provided by the Bank's procurement specialist based in the region/country office. In addition, two supervision missions are expected to take place per year during which ex-post reviews will be conducted for the contracts that are not subject to Bank prior review on a sample basis (e.g., 15 percent in terms of number of contracts). One ex-post review report will be prepared per fiscal year, including findings of physical inspections for not less than 10 percent of the contracts awarded during the review period.

24. On the basis of lessons learned from recent procurement in World Bank financed projects (in particular in the water sector), procurement provisions in the POM have been strengthened, including to: (i) stipulate the need to obtain the Bank's no objection where relevant; (ii) prohibit

vendors' mobilization prior to contract signature; (iii) instill the duty to report to the World Bank suspected fraud and corruption as per the Anti-Corruption Guidelines; (iv) review bid security forms to ensure they confer adequate rights on the Borrower; (v) prohibit conflict of interest situations such as those where a staff is hired to oversee transactions involving firms he has previously worked for; (vi) require the use of a Procurement Integrity Due Diligence checklist to safeguard against fraudulent bid securities, misrepresentation of the availability of personnel, and collusion; (vii) recruitment of a Procurement Panel with terms of reference and responsibilities to be further clarified in the POM, and (viii) establish a process for revising cost estimates and informing the Bank. In addition, copies of bids shall be submitted to the Bank (Uzbekistan Country Office) within 12 hours after bid opening.

25. ***Disclosure***: The following documents shall be disclosed on the MAWR website: (i) procurement plan and updates without estimated cost, (ii) invitation for bids for goods and works for all ICB and NCB contracts, (iii) request for expression of interest for selection/hiring of consulting services, (iv) contract awards of goods and works procured following ICB/NCB procedures, (v) list of contracts/purchase orders placed following shopping procedure on quarterly basis, (vi) short list of consultants, (vii) contract award of all consultancy services, (viii) list of contracts following DC or CQS or SSS on a quarterly basis, (ix) Monthly physical and financial progress of all contracts and (x) action taken report on the complaints received on a quarterly basis. The works bidding documents shall include a clause to put up a notice board in the construction site disclosing the contract details (description, contractor name and contract amount, starting date, completion date, physical progress and financial progress).

26. The following details shall be sent to the Bank for publishing in the Bank's external website and UNDB: (a) invitation for bids for procurement of goods and works using ICB procedures, (b) request for expression of interest for consulting services with estimated cost more than $ 300,000, (c) contract award details of all procurement of goods and works using ICB procedure, (d) contract award details of all consultancy services with estimated cost more than $ 300,000, and (e) list of contracts/purchase orders placed following SSS or CQS or DC procedures on a quarterly basis.

27. ***Procurement Plan***: MAWR has developed a Procurement Plan (see the summary below) covering procurement activities for the first 18 months of project implementation (see Appendix A). This Procurement Plan will be continuously updated as the project progresses and will be reviewed and approved by the Bank. The Procurement Plan will be published on the MAWR and Bank's external websites. The General Procurement Notice (GPN) and advertisement of procurement opportunities under the ICBs and major consultancy services will be published on the UNDB, PIU's website and Uzbek media. The Borrower wishes not to disclose the cost estimates while disclosing the procurement plan.

28. The items to be procured would include the followings:

(i) Procurement of Works: There will be three main works packages for (a) Rehabilitation of Podshaota Irrigation Infrastructure; (b) Rehabilitation of Isfayram-Shahimardon Irrigation Infrastructure and (c) Rehabilitation of Savay-Akburasoy Irrigation Infrastructure and Installation of SCADA system with up to five lots following the pre-

qualification (PQ) process. The Bank's latest Standard Bidding Documents (SBDs) will be used for procurement of goods following the ICB procedure.

(ii) Procurement of Goods: Goods procured under the project would include (a) IT equipment for PIU; (b) office equipment and furniture and (c) vehicles for the PIU. These goods will be procured following NCB and Shopping procedures. The Bank's latest SBDs will be used for procurement of goods following NCB procedure. Domestic preference according to the Procurement Guidelines will apply to goods contracts only.

(iii) Consulting Services: The major consulting services would include the following activities: (a) project management consultant, including design and supervision; (b) Procurement Panel; (c) annual technical audit; (d) Pilot Activities on MAR and conjunctive use; (e) Institutional Strengthening, Monitoring and evaluation; (f) financial audit. QCBS, LCS, CQS and IND procedures shall be applied.

Environmental and Social (including safeguards)

29. The project has been designed to support the rehabilitation and/or modernization of existing irrigation network infrastructure and to strengthen flood control in three project areas of Andijan, Namangan and Ferghana. It is expected that the proposed interventions, including rehabilitation and lining of main canals and related infrastructure, rehabilitation of pumping stations, and capacity strengthening will improve the efficiency of water use in the project area from the current 30 percent to 35 percent. The water balance undertaken by the Borrower, concluded that the net impact under the project scenario on water withdrawal from the Syr Darya basin is 83.9 MCM, an estimated 0.4 percent of the average annual runoff of 20,582 MCM at the Uzbek-Tajik border.

30. The implementation of civil works will be associated with such environmental implications as excessive dust and noise; damage to soil and loss of fertile layer due to excavations; excessive fumes due to the use of heavy construction machinery; generation of construction and domestic wastes on construction sites and on affiliated facilities (camps, material plants, etc.); and impacts on water regime of natural waterways which are the source of irrigation supplies to be improved as a result of the project. Agricultural intensification and diversification will be supported through capacity building and assistance to farmers to access available credits lines, provided by the sources other than the project. The implementation of agricultural credit activities can potentially raise environmental and social concerns, such as impacts on soil and water, generation of animal wastes, etc. Another issue is that the project, while not directly supporting purchase of pesticides, will trigger potential change/increase in pest management needs associated with the agricultural diversification and intensification.

31. **As per the World Bank Operational Policy 4.01 'Environmental Assessment'**, the Borrower has developed an Environmental and Social Assessment and Management Plan, which considered in detail the above impacts, including an analyses, through a thorough water balance, of the impact on the Syr Darya River, an international waterway shared by Republic of Uzbekistan, Republic of Kazakhstan, Kyrgyz Republic and Republic of Tajikistan. **In accordance with the World Bank Operational Policy OP 7.50**, the GOU has notified all riparian states by the letters on February 22, 2016. With regard to the other impacts of civil works, the EAMP has identified environmental mitigation and monitoring program and

determined institutional responsibilities and indicative budget to ensure that the mitigation measures are duly implemented. For the potential environmental and social implication of agricultural credit activities, the document serves as a framework, providing guidelines for screening procedures and suggesting a template EMP, to be used for specific activities once those are chosen by credit applicants. Because the project will directly support agricultural modernization activities, and because the crops involved are likely to be of types that are typically heavily treated with pesticides, a Pest Management Plan has been prepared to address these aspects as a discrete section of the EMP, **in accordance with the World Bank Operational Policy OP 4.09 'Pest Management'**. The PMP envisages trainings and capacity building activities on introduction of IPM principles, to be delivered to the farmers in the project area.

32. The implementing agency for the project is Ministry of Agriculture and Water Resources (MAWR), which is responsible for establishing functional mechanisms for the implementation of environmental mitigation measures and monitoring program, and for setting up Grievance Redress Mechanism (GRM) to handle concerns and complaints of people who believe they are adversely affected by the project.

33. The EAMP has been disclosed by the Borrower in several selected locations of the project of Namangan, Andijan and Ferghana in May, 2015, at the public consultation meetings. Stakeholders invited for those meetings included representatives of beneficiary communities, local Governments, environmental authorities and water management authorities. The received feedback has been recorded, and detailed minutes enclosed to the final EAMP. The final EAMP was made publicly available through posting on MAWR official web-site on March 6, 2016 and the World Bank Project Operational Portal on April 15, 2016.

34. **Involuntary Resettlement (OP/BP 4.12).** This policy is triggered in this project due to anticipated land acquisition and resettlement under Component A – Irrigation Modernization. Rehabilitation of irrigation systems, construction of public stations and wells, as well as improvement of bank protection (financed by the GOU) and flood control may require permanent or temporal land acquisition and physical resettlement. As the extent of involuntary resettlement is not fully known for some of the proposed sub-projects at this point, an RPF has been prepared and is applicable to the entire project area. The RPF describes the WB's resettlement policy and any differences with the national laws and sets out policies and procedures applicable to resettlement under the project. It also provides a framework for preparing site-specific RAPs for any future resettlement that is not currently identified and may be finalized during implementation. The final RPF was prepared in accordance with the WB OP/BP 4.12. It was publically consulted and then cleared by the WB. The final RPF was made publicly available through publication in the national newspaper[15] in Uzbekistan on December 22, 2015 and the World Bank Infoshop on December 24, 2015. For the sub-project in the Podshaota-Chodak area in Namangan region, where the extent of the impact was known before appraisal, a RAP was prepared. The RAP was also consulted with the project Affected Persons (PAPs).The RPF was disclosed in-country on February 1, 2016 and on the WB Infoshop on February 25, 2016.

[15] "Pravda Vostoka" #24 (28199) on December 22, 2015

35. The implementing agency for the project is Ministry of Agriculture and Water Resources (MAWR), which is responsible for establishing functional mechanisms for the implementation of activities as outlined in the RPF and RAP, prepare new site-specific RAPs as appropriate. The implementing agency is to monitor proper implementation of resettlement process, including compensation payment, and ensuring compliance with the WB policy OP 4.12 (on Involuntary Resettlement). It is also responsible for setting up GRM to handle concerns and complaints of people who believe they are adversely affected by the project, including but not limited to the resettlement issues.

36. **Dam Safety (OP 4.37)**: This policy is triggered as the project area is downstream from and is dependent on, among others, the Andijan and Kerkidon reservoirs. In addition, the project proposes to rehabilitate Kandiyon Mudflow Reservoir and transform it in to a water retention reservoir. In total, the FS identified seven dams that are located in the project area. In order to assess the safety of these dams, a Bank mission has visited the project area and has requested copies of the dam safety inspection reports, O&M manuals, emergency preparedness plans (EPPs), and design reports. In addition, the Bank has recommended organizing a Possible Failure Mode Analysis (PFMA) workshop as part of the next 5-year dam safety inspection. An O&M plan and an Emergency Preparedness Plan were prepared in compliance with OP4.37, and have received a Bank no objection on October 3, 2016.

Appendix A

Uzbekistan Ferghana Valley Water Resources Management Phase-II Project

PROCUREMENT PLAN (Date of PP: May 5, 2017)

GOODS AND WORKS

No	Description	Procurement Method	WB Review (Prior/ Post)	PQ (Yes/ No)	Draft PQD to WB	Date of Contract Completion
WORKS						
1	Rehabilitation of Padshaota Irrigation Infrastructure (Package 1)	ICB	Prior	Yes	July 1, 2017	Nov 14, 2023
2	Rehabilitation of Isfayram-Shahimardon Irrigation Infrastructure (Package 2)	ICB	Prior	Yes	Nov 14, 2017	Mar 3, 2024
3	Rehabilitation of Savay-Akburasoy Irrigation Infrastructure and Installation of SCADA system (Package 3)	ICB	Prior	Yes	Jan 1, 2017	Oct 21, 2023
4	Drip Irrigation Demo with Solar Pumps	ICB	Post	No	TBD	TBD
5	Office refurbishment	Shopping	Post	No	n/a	Jun 18, 2018
GOODS						
6	IT equipment for PIU-WI	Shopping	Post	No	n/a	Nov 19, 2018
7	Office equipment for WCAs	NCB	Post	No	n/a	Mar 12, 2018
8	Vehicles for PIU	Shopping	Post	No	n/a	May 3, 2018
9	Office furniture and conditioners for PIU	Shopping	Post	No	n/a	May 3, 2018

CONSULTANCY

Description	Procurement Method	WB Review (Prior/ Post)	Draft RFP (incl. TOR, Short List) to the WB	Date of Contract Completion
Procurement Panel	IC	Prior	Jul 1, 2017	Aug 31, 2020
Technical Audit	LCS	Prior	Jun 15, 2017	Aug 31, 2024
Project Implementation and Construction Supervision	QCBS	Prior	n/a	Sep 1, 2024
Sustainable use and monitoring of ground water	QCBS	Prior	Oct 2, 2017	Jan 23, 2023
Establishment of Demo Pilots	ICB	Post	Jul 1, 2017	Aug 20, 2020
M&E Consultancy including Update and implementation of environmental and social safeguard documents	QCBS	Prior	Dec 31, 2017	Sep 4, 2024
Institutional Strengthening and Training (Capacity Building)	QCBS	Prior	Mar 12, 2018	Nov 15, 2022
Financial Audit 2017-2018	LCS	Post	Dec 29, 2017	Jul 30, 2019
Financial Audit 2019-2021	LCS	Post	Dec 29, 2018	Jul 30, 2021
Financial Audit 2022-2024	LCS	Post	Dec 29, 2022	Jun 25, 2023

1. Thresholds for procurement methods and Bank's prior review: The following methods of procurement shall be used for procurement under the project:

Expenditure category	Contract value threshold (US$)	Procurement method	Contracts subject to prior review (US$)
Goods	≥ 1,000,000	International Competitive Bidding (ICB)	ICB contracts >=1,500,000
	<1,000,000	National Competitive Bidding (NCB)	Post review
	< 100,000	Shopping (SH)	Post review
	NA	Direct Contracting (DC)	All DC contracts
Works	≥ 5,000,000	ICB	ICB contracts >=5,000,000
	< 5,000,000	National Competitive Bidding (NCB)	Post review
	< 200,000	SH	Post review
	NA	DC	All DC contracts
Consultant services (including training)	≥ 200,000	Quality and Cost Based Selection (QCBS) / Quality Based Selection (QBS) / Least Cost Selection (LCS) / Fixed Budget Selection (FBS)	Selections >=500,000
	< 200,000	Selection Based on Consultants' Qualifications (CQS)	Post review
	NA	Single Source Selection (SSS)	All
	NA	Individual Consultants (IC)	≥ $200,000 for individuals

ICB – International Competitive Bidding
NCB – National Cmpetitive Bidding
QCBS – Quality and Cost Based Selection
QBS – Quality Based Selection
FBS – Fixed Budget Selection
LCS – Least Cost Selection
CQS – Selection Based on Consultants' Qualification
SSS – Single Source Selection.
IC – Individual Consultant selection procedure

Short list of National Consultant ceiling – USD 200,000
NA – Not Applicable

Annex 5: Summary of the Social Assessment

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

1. **The project preparation benefited from a detailed social assessment[16] (SA) that carefully researched profiles of beneficiaries, potential social impacts and risks of interventions proposed under this project.** The project area – Ferghana Valley – has the highest population density in the country. The three subproject areas –Podshaota-Chodak, Isfayram-Shakhimardan, Savay-Akburasay[17] - encompass about 975 thousand people, or about 183 thousand households. About 61 percent of the total population area impacted by the project reside in Isfayram-Shakhimardan area. Looking at all three sub-project areas, the majority of the population (70 percent) reside in urban areas, mostly due to the re-classification of rural areas into urban centers in 2009. At the same time the population maintains a rural life style and depends on the agricultural sector for its livelihood. The population in the project areas is ethnolinguistically homogenous and is Uzbek. The SA identified the following main project beneficiaries: commercial and dekhan farmers, WCAs, and their staff, and employees of irrigation management entities, as well as civil servants; however indirect beneficiaries include a much broader group, the residents of the FV.

2. **Agriculture is the main source of employment in the project area.** The proportion of workers directly engaged in agricultural activities exceeds 50 percent. Even in small towns in the project area about third of the population is involved in the agriculture. The population is involved in farm work as permanent or seasonal workers on commercial and/or dekhan farms. Commercial farmers grow largely state procured crops – cotton and wheat. They have large land plots (over 50 HA) that they do not own, but rather lease for 30 or more years. Dekhan farmers have smaller land holdings (on average 0.11HA), but own their land and are free to grow crops of their choosing, focus on horticulture or livestock. Unlike commercial farmers, dekhan farmer tend to rely on family members labor, rather than hired workers. Nearly half, or 10.7 percent of the working-age population, of the agricultural workers of the area are engaged in work on dekhan and tomorka plots. Dehqan farms have proven the most efficient form of land use in the subproject areas. Dekhan farms effectively use their small plots. In the project area, dehqan farms occupy on average only 13.7 percent of cultivated land, they produce, however, as much as 63 percent of agricultural GRP of three regions in the FV – Namangan, Ferghana and Andijan.

3. **While official unemployment rates are quite low in the project area, hidden unemployment and underemployment are high**. The share of the temporarily or seasonally

[16] The Social Assessment was prepared in the spring of 2015 by TEMELSU International Engineering Services Inc.

[17] The "Podshaota-Chodak" subproject area of 33.3 thousand ha, including 29.5 thousand ha of irrigated land, is located in the northeast of the FV. The subproject area consists of Yangikurgan district in its entirety and part of Chodak district of Namangan province. No cotton is grown in this sub-project area.

The system of "Isfayram-Shakhimardan" subproject area of 63.3 thousand ha, including 55 thousand ha of irrigated lands, covers the southern part of the Valley and includes the entire Ferghana district, Ferghana city and Kuvasay district with subordinate Rural Assemblies of Citizens (RACs), and parts of Kuva, Altyaryk and Tashlak districts; 75% of this subproject sub-area is taken by the two state-preferred crops – cotton and wheat.

The "Savay-Akburasay" subproject area of 23.4 thousand ha, including 19.4 thousand ha of irrigated lands, is located in the southeast of the FV and provides water to Kurgantepa, Jalalkuduk, Khodjaabad and Bulakbashi districts of Andijan province. The state order crops – cotton and wheat take up 92% of cultivated land in this sub-project area.

employed (both in the agricultural and non-agricultural sectors) makes up 11 percent of the overall working-age population. Hidden unemployment along with underemployment is widespread among those who work on dehqan plots. Most of the agricultural workers who engage in work on dekhan plots consider themselves unemployed, as these land plots are too small to provide full-time work, especially if all family members are engaged in dekhan farming. According to the survey carried out as part of the SA, the unofficial unemployment rate is around 7.7 percent, when accounting for hidden unemployment it reaches 18.5 percent of the working-age population. Official statistics on income and expenditure of the population are not available. The SA revealed, however, that 47.4 percent of the population in the project area are concentrated in the two bottom income quintiles. Around 65 percent of the population lives on less than 2 dollars a day[18]. Those involved in the agriculture sector tend to earn 1–1.5 times less that those employed in non-agricultural sectors. According to the SA, 9.7 percent of the project area households are low-income[19] families; another 21 percent of the households are at risk of slipping into the low-income category. The factors that contribute to households' risk to descend into poverty are as follows: a large size of household, lack of vocational or higher education of the household heads, households' dependence on garden plots or temporary agricultural work as the sole source of income.

4. **Women make up nearly half of the population of the project area, yet their economic activity, particularly in the formal economy, is much lower than that of men.** It is estimated that in the agricultural sector, women earn only 65 percent of men's average income. Women tend to be employed as temporary workers during periods of high labor demand such as cotton harvest, or work in their dekhan farms or tomorkas. They are also responsible for selling their harvest in the market. Despite the low indicators of female employment, the contribution of women to the household income is quite significant. The average income provided by women in the surveyed households amounts to 36 percent of the cumulative income of households. Women tend to work informally, without set contracts, and thus are at a disadvantage in receiving social and retirement payments, as their compensations are significantly smaller than that of their male peers. Retired women, especially if they lose a provider, are especially economically and socially vulnerable.

5. **Social vulnerability is strongly related to the economic status of the households.** The project area is ethnolinguistically homogenous and ethnic minorities (Kyrgyz and Tajik comprising less than 10 percent) are well integrated. Low-income households are most vulnerable to socio-economic stresses. The SA revealed that 35 percent of households in the project area are vulnerable. Female-headed households and the long-term unemployed are particularly vulnerable. About 18 percent of those identified as vulnerable include retirees and people with disabilities. Mahalla provides social support to vulnerable households, but that coverage is rather limited.

6. **Cotton is one of the main crops grown in the project area, which also has an impact on employment and labor practices**. As mentioned earlier, commercial farmers grow largely cotton and wheat, which follows the state procurement quotas. There is some trend to diversify

[18] Current exchange rate without PPP corrections.
[19] 1.5 minimum wage per a household member a month is taken to assess the income status of households.

crops away from cotton, but it is done on a rather limited scale compared to other regions of the country. Commercial farmers do not have the option to grow other types of crops if their land plots are designated for these state-prioritized crops. It should be noted that out of the three project sub-areas, cotton is not cultivated in Podshaota-Chodak area. Overall, commercial farmers do not exhibit high labor intensity. On average, the number of workers in a commercial farm is 12 people, or 3.8 workers per hectare. The peak labor demand on farms is around the harvest period, especially in cotton farmers since cotton is overwhelmingly picked manually. Farmers are often unable to attract a sufficient labor force for a short period of time. Faced with the pressure of meeting procurement quotas, the farmers turn to the local administration for assistance in finding labor. The SA revealed that between 49 and 58 percent of workers during the cotton harvest season are sent by local authorities. The farmers believe that without the assistance of local authorities in securing cotton pickers meeting the procurement quota is impossible. The question as to which extent labor mobilized by local administration is voluntary, remains problematic. Consequently, the issues of child and forced adult labor is of concern in the project area.

7. **Given the range and focus of project activities, the project is expected to have broad direct and indirect impacts**. The positive social impacts include, but are not limited to: potential increase in income, increased employment opportunities and improved living conditions of various population groups (including women and the vulnerable) due to improved irrigation systems and soil quality, and increased agricultural productivity. The surveyed farmers stated that increases in agricultural productivity correspond with improvements in irrigation and drainage. Currently, they view poor irrigation as the main constraint to growth. Dekhan farmers in particularly, indicated poor condition of the irrigation system coupled with a shortage of irrigation water as the main obstacle in increasing the productivity of their land plots. According to official statistics, a constant 30 percent shortage of irrigation water is experienced by the Savay-Akburasay subproject area, for example. The problem of irrigation water shortages grows so acute that 10.8 percent of the farmers resort to using drainage water, which inevitably results in the further worsening of land quality. The consequences of irrigation water shortages on dehqan and the private farms of the region inevitably result in remarkable reductions of incomes and living standards. Conversely, improved irrigation will result in increased yields and, consequently, income and living standards, particularly of the low-income groups - the two lower quintiles, who depend on agriculture the most.

8. **Increase in employment is expected not only in the agriculture sector, but also in other sectors of the economy** (processing, storage, transportation and sales). Also, a rise in employment is expected in the service sector: working for agricultural producers, repairs and maintenance of farming machinery and irrigation/drainage systems (including jobs available at WCAs). A further boost in the population's income and employment is anticipated if the project promotes both: the efficiency of technologies to be introduced and the cooperation of small-scale producers in the context of storage, processing and sale of agricultural output.

9. **The project is expected to have a profound effect not only on agricultural production, economic returns and well-being, but also on living standards in the Project Area.** One of the positive contributions of the project will be the prevention of damage to houses and outbuildings, social infrastructure (healthcare and education establishments), and physical

infrastructure (roads, water pipelines, etc.) via the implementation of anti-mudflow measures. Moreover, the project will allow the local authorities to reduce repair costs, allowing them to reallocate their resources to resolving other social development issues.

10. **Improved and reliable water supply may help reduce social tensions and conflicts among farmers, WCAs and community members**. The lack of irrigation water brings out disputes and conflict in the communities. 77 percent of commercial farmers and 72 percent of dekhan farmers end up in conflict situations over water. Such conflicts are more common for downstream farms. Most conflicts occur between farmers and WCAs. Farmers believe that the number of conflicts increases each year. At the same time, 97 percent of respondents of the SA believe that the cooperation is very important to solve water-related problems.

11. **One of the indirect positive project impacts may be improved public health**. This may include reduced rates of both physical and infectious illnesses due to the improvement of living conditions, and ending the widespread practice of using drainage water for domestic needs and livestock watering.

12. **The positive impacts also include the strengthened capacity of farmers and WCAs in modern agricultural and water management practices.** First, farmers admit that water distribution in the context of water shortage may become a source of conflict. Yet, WCAs play an important role in mitigating these conflicts and help with O&M of inter-farm canals. Strengthening the technical and human capacity of WCAs, in turn will only further improve their operation and positive role in local irrigational water management. Improving the performance of WCAs and the ways they interact with their members and make decisions, will have a positive effect on WCA's management, transparency and accountability. Second, farmers state that they often lack sufficient knowledge about agricultural practices and new technologies. Trainings and FFSs will provide opportunities for farmers to strengthen their knowledge and skills.

13. **The project will facilitate institutional development and provide progressive local development by strengthening the existing capacity of the local communities.** Within the framework of this project, social capital of local communities will be strengthened via community mobilization and fostering the participation of the people both as WCA members and as active contributors to the project implementation (including stakeholder consultations, social surveys, construction work conducted under the project etc.).

14. **Project's support for the GOU's strategy to mechanize cotton harvest will significantly reduce risks of child and/or forced labor.** The project will prepare a strategy to adopt a tailored approach to cotton mechanization under Sub-component B-4 that will focus on remote areas with low yields – where the risks of forced labor are the highest – which will also help mitigate potential negative impact of mechanization on rural women who may depend on cotton picking as their seasonal source of income. Additionally, the project will raise awareness about child and/or forced labor, and participate in the TPM/FBM thus raising the population's knowledge of decent work practices and labor rights.

15. **The project will participate in the TPM/FBM.** The TPM and FBM will be financed through a separate multi-donor trust fund (MDTF). The objective of the MDTF is to support

activities leading to the socially, environmentally, and financially sustainable production of cotton in Uzbekistan, including with respect to child and/or forced labor practices. The TPM and GRM will focus on child and/or forced labor issues in connection with the project activities or within the project area. The TPM will be conducted prior to and during the cotton harvesting season, while the FBM will be available year round. In 2014, the WB signed a Memorandum of Understanding (MOU) with the International Labor Organization (ILO) that stipulates that ILO is to carry out these activities. The MOU has been extended through the end of 2018, thereby ensuring implementation of the TPM and support to the FBM throughout the 2017 and 2018 harvests. The WB and ILO work closely with national counterparts – the Coordination Council consisting of Ministry of Labor and Social Services, the Federation of Trade Unions and the Chamber of Commerce – on these mechanisms and issues related to child and/or forced labor.

16. **Along with the positive social impacts of the project, the SA has highlighted several concerns and potential risks which have been considered. Mitigation measures included in the project design will also be paid attention to during implementation**. First, civil works may have adverse effects on households and their property. To that end safeguards policies have been triggered and respective documents prepared. Second, limited Government support may jeopardize success and sustainability of the project activities. Third, poor commitment of the WCAs and farmers to support maintenance of the irrigation-drainage system may slow or limit the project impact. Fourth, unreliable energy supply may present challenges to the irrigation structures that rely on electricity.

Annex 6: Child and/or forced labor Issues in Uzbekistan

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

1. **This Annex is prepared in view of concerns regarding the use of child and/or forced labor (as defined by international conventions and national legislation) in cotton harvesting in Uzbekistan.** This Note draws on the Social Assessments prepared for: the agriculture sector projects,[20] analytical pieces carried out by the World Bank teams,[21] the report of the 2013 ILO monitoring of Child labor,[22] findings of the Third Party Monitoring carried out by the ILO during the 2015 and 2016 cotton harvest seasons,[23] findings of the World Bank supervision missions and ongoing collaboration with the ILO and the National Counterparts – Federation of Trade Unions, Ministry of Labor and Social Services and Chamber of Commerce – on labor practices in the country. Given the continued engagement of ILO, WB and National Counterparts to combat child and/or forced labor (C/FL), including through the monitoring of the cotton harvest in 2015, 2016 and onwards, and support to agriculture sector modernization, this Note provides background on labor issues in the cotton harvest sector, highlights progress made in improving the labor situation, and addresses existing challenges.

2. **The GOU has signed and ratified several ILO conventions related to child and/or forced labor, and promulgated similar provisions in its national legislation.** These conventions include: Convention No. 138 on Minimum Age for Admission to Employment, Convention No. 182 on Worst Forms of Child Labor, Convention No. 29 on Forced Labor[24], and Convention No. 105 on Abolition of Forced Labor. In addition, the International Covenant on Civil and Political Rights (ICCPR), also subscribed to by the Government, prohibits forced labor (Article 8). Said legislation essentially prohibits any form of child25 and forced labor26, ensures fair employment conditions and aims at creating adequate working environments. The GOU's domestic legislation includes a number of provisions prohibiting forced and child labor. In

[20] South Karakalpakstan Water Resources Management Improvement Project (SKWRMIP), Horticulture Development Project (HDP) and Ferghana Valley Water Resources Management Project – Phase II (FVWRMP - II).

[21] World Bank. 2016. Social Impact Assessment of Cotton Harvest Mechanization in Uzbekistan.

[22] ILO 2014. *ILO High Level Mission Report on the Monitoring of Child Labor*. Geneva; December 2013.

[23] ILO 2015. Third Party Monitoring of the Use of Child Labor and Forced Labor during the Uzbekistan 2015 Cotton Harvest. An Assessment submitted to the World Bank by the International Labor Office. November 18, 2015; ILO 2017. Third-party monitoring of measures against child labour and forced labour during the 2016 cotton harvest in Uzbekistan. The report was made publically available on February 1, 2017. http://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipec/documents/publication/wcms_543130.pdf

[24] Uzbekistan is yet to ratify the Protocol to the Forced Labor Convention (1930), which was adopted by the International Labor Conference in 2014.

[25] For the purposes of Convention No. 182 on the Worst Forms of Child Labor, the term 'child' "shall apply to all persons under the age of 18" (Article 2). Article 3 provides that: "…the term 'the worst forms of child labor' comprises: (a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labor, including forced or compulsory recruitment of children for use in armed conflict; (b) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (c) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties; (d) work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children."

[26] For the purposes of Convention No. 29 on Forced Labor, the term forced or compulsory labor refers to "all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily" (Article 2).

particular, the Constitution, the Labor Code, the Criminal Code and some other local laws and decrees contribute to laying out a legal framework in such areas.

3. **The application of these conventions, as well as of existing national laws, however, has continued to be a challenge.** The international community, media and CSOs have consistently alleged that Uzbekistan has been mobilizing forced and child labor for cotton harvesting. Based on such reports, there appears to be a discrepancy between the law on the books and current practices.

4. **In the post-Soviet period up until 2014, almost all cotton in Uzbekistan was harvested by hand although there had been some degree of mechanization during the Soviet period.** An estimated 2.2 - 3 million people were involved in some aspects of the cotton harvest during 2014. This represents about 7-10 percent of the population of Uzbekistan and about 14-20 percent of the work force[27]. Farmers have not been able to meet the high labor demands of the cotton harvesting season. Factors include: diminished size of the available labor force, insufficient incentives for workers to engage in cotton picking, and strict Government procurement quotas. These factors, among others, create conditions where forced labor can propagate.

5. **The mobilization of labor for cotton harvesting is driven by the quota system organized by the GOU.** Since independence from the Soviet Union, Uzbekistan has followed a strategy of gradual transition from a planned to a market economy. State and collective farms organized during the Soviet period have been largely privatized since 2006. However, the transition from state collective farms to private leasehold farms disrupted the cotton supply chain, posing new challenges to the state organized cotton production system. New state organized methods were adopted for overseeing private leasehold farmers.

6. **The cotton and wheat supply chains remain dominated by the Government with farmers operating like "contract farmers".** Agricultural land is owned by the state, and private farmers (other than dehkhan farmers with household plots) are allocated farm land under long term leases for 30 to 50 years. These leases are often conditional on the acceptance of state quotas for planting cotton and wheat. At the same time, the state provides subsidized inputs for their production. During the transition from state collective farms to private farms, some machinery, such as the machine cotton harvesters, were not adequately maintained and hand picking of cotton has increasingly been adopted. It should be noted, however, that an increasing amount of land is allocated by the State for other agricultural purposes (notably, horticulture) and is no longer subject to the State quota system.

7. **The "State Order" system includes quotas on the production of cotton and wheat, as well as on areas planted.** Quotas for the production of cotton and wheat are set and updated on an annual basis by the Government[28]. Specific quotas for each oblast, region, and village are then determined by the respective regional and local authorities. Precise quota allocations go down to

[27] World Bank, 2016. Social Impact Assessment of Cotton Harvest Mechanization in Uzbekistan.

[28] Concerns regarding child and forced labor primarily focus on cotton-harvesting and typically do not include wheat harvesting. Contrary to cotton, which is largely hand-picked in Uzbekistan, wheat is primarily harvested by machines and thus does not require the engagement of a considerable workforce.

the level of individual farms. The cotton under the quotas has to be sold back to State controlled enterprises at a pre-defined State procurement price announced close to the harvest time, with the price based on a cost plus method plus an allowance for a nominal profit. This eliminates price risks for farmers, but fixes the price well below world market prices. At the same time, prior to the planting season, farmers receive Government subsidized loans to purchase inputs (e.g., fertilizer, pesticides) and to purchase farm machinery services needed for cotton production. Farmers who manage to produce cotton above the quota often sell on the "black market" for considerably higher prices.

8. **Regional and local authorities (Hokhimiyats) closely monitor cotton production and are personally held responsible for ensuring that State quotas are met.** Leaching (to reduce soil salinity) is monitored in the winter; planting area, varieties, and dates are determined by the State in the spring; and fertilizer application during the growing season is directed by MAWR officials. During the cotton-growing season, State officials visit farms to determine yield potential and adjust planning targets and production quotas. Oblast- and regional level authorities hold Hokhimiyat officials personally responsible for ensuring that cotton production quotas are met, and these officials may face grave consequences if their localities fail to meet the assigned quota.

9. **Farmers who fail to meet the assigned quota incur considerable financial penalties.** The majority of farmers are contractually obligated to dedicate a certain percentage of their land to cotton production, fulfill an annual quota of cotton, and sell it at a priced fixed by the Government. Reportedly, if a farmer does not meet the quota for three years in a row, the Hokhimiyat may reallocate his land to a different farmer, in addition to financial penalties. Indeed, it appears that land reallocation due to failures to meet cotton production quotas is not uncommon. In order to avoid the consequences of unmet quotas, some farmers buy cotton on the "black market" for high prices at their own expense and then sell it to the State controlled enterprises at the State procurement price.

10. **Pahta Schtabs, committees comprised of representatives of Mahallas, which are community organizations, and Hokhimiyats, typically function as headquarters for mobilizing workers for cotton harvesting.** They collaborate with the heads of Governmental organizations to mobilize Governmental employees to collect cotton during the harvesting season. As cotton is sensitive to weather conditions, it is critical to harvest it as quickly as possible, and large amounts of workers are needed for the task. Farmers are typically unable to mobilize such large numbers of seasonal workers for this temporary period of time. Thus, Pahta Schtabs take care of workers' mobilization depending on the needs of each farm and closely oversee the process (often receiving reports from farmers on their performance on a daily basis). Persons involved in the organization of labor typically include the staff of the Hokhimiyat, the district prosecutor, the district police, and the director of the district departments of public services.

11. **The Bank has been engaging with the Government and development partners on child and/or forced labor issues.** Over the last few years, the Bank and its development partners (UNICEF, ILO, UNDP, the EU, the US, etc.) have invested considerable efforts to have the Government comply with its international obligations and to address the issue of C/FL in the

country. Before 2013, UNICEF was designated by the Government as the main channel of dialogue on child labor issues, and the Bank and other donors relied on monitoring by UNICEF to inform their own understanding of the situation. After the 2012 cotton harvest season, ILO was brought into the discussion by the Government, which resulted in the Government agreeing in July 2013 for the first time to allow ILO to monitor cotton harvesting activities for child labor during the harvest season. On behalf of the Government, a National Coordination Committee (consisting of representatives from the Ministry of Labor and Social Services, Federation of Trade Unions and Chamber of Commerce) was established to coordinate the monitoring process. The National Coordination Committee became the Bank's main counterpart on issues of C/FL.

12. **Following the request to the Inspection Panel in September 2013 alleging that one of the Bank's projects contributed to the forced labor system in the cotton sector, the World Bank has adopted a multi-pronged approach to address child and/or forced labor issues in Uzbekistan.** This includes (i) pursuing continuous country dialogue and collaboration with international/multilateral agencies and donors to address these issues; (ii) performing sector analytic work and policy dialogue to promote diversification away from cotton and mechanization of cotton harvesting; (iii) promoting crop diversification and intensification, and supporting agricultural mechanization through a number of investment operations; and (iv) strengthening project-level mitigation measures and binding provisions, including implementing a Third Party Monitoring (TPM) and Feedback Mechanism (FBM) to help address child and/or forced labor issues in connection with project activities and within project areas. After a one year deferral of decision in order to assess progress made in the Bank's dialogue with the GOU on C/FL, in December 2014 the Inspection Panel issued its Final Eligibility Report and Recommendation recommending not to undertake a full inspection. It concluded that significant progress had been made in eliminating child labor in the cotton sector and that the WB and other development partners' continuing engagement in the agriculture sector in Uzbekistan supports "the diversification and modernization of the cotton sector so that child and/or forced labor can be firmly eradicated." On January 23, 2015, the Board approved the recommendation by absence of objection.

13. **Since 2013, the Bank has been working on a number of measures to foster socially, environmentally, and financially sustainable production of cotton in Uzbekistan, including the elimination of C/FL.** Key among these measures is setting up a system of Third Party Monitoring (TPM) and Feedback Mechanism (FBM) focused on child and/or forced labor associated with projects in the Bank's portfolio. To this end, the WB partnered with the International Labor Organization, as the leading organization on labor standards, and with which it signed a Memorandum of Understanding (MoU) on October 15, 2014 that stipulates that ILO will carry out monitoring in the World Bank-financed project areas as agreed with the GOU. The MoU was recently extended through the end of 2018, thereby ensuring implementation of the TPM and support to the FBM throughout the 2017 and 2018 harvests.

14. Studies of the cotton sector and monitoring of the cotton harvest carried out in the last several years revealed the following:

15. **Forced child labor in cotton harvesting was previously widespread, but has mostly disappeared in recent years.** A 2013 joint ILO-GOU mission to monitor the use of forced child

labor in the cotton harvesting season in September-October 2013 observed that there was no longer systematic use of children to pick cotton in the country. The ILO's official public statement at the completion of their monitoring activities is as follows: "In general terms, the monitoring observed widespread awareness of national laws and instructions not to allow the use of children under 18 years of age in the cotton harvest. Moreover, it would appear from the monitoring that there was no systematic recourse to forced child labor. While the law and practice are increasingly being applied, gaps remain in practice and child labor still has taken place during the cotton harvest to a limited extent."29 This finding has been confirmed by Embassies, international organizations and independent monitors. The Third Party Monitoring of the World Bank-financed project areas as agreed with the GOU, carried out by the ILO in close coordination with the national partners during the 2015 and 2016[30] cotton harvest seasons, further confirmed elimination of the systematic use of child labor in the cotton harvest. The report of 2015 stated, "the use of children in the cotton harvest has become rare and sporadic. Authorities have taken a range of measures to reduce the incidence of child labor and make it socially unacceptable[31]". The ILO report on the 2016 cotton harvest reiterated that finding by stating that child labor "*has become socially unacceptable*", and has been "*phased-out*".[32]

16. **Forced child labor has been reportedly substituted with forced adult labor. In order to comply with the State's cotton procurement system, the burden of cotton harvesting has apparently shifted from children to adults.** According to available information, the Hokhimiyats work with the administrators of different Governmental organizations (primarily schools, universities, hospitals, etc.) to compile a list of employees to be mobilized during the cotton harvesting season (these lists consist of "brigades" of around 150-200 people each). Administrators then require their employees to join cotton harvesting and Hokhimiyats provide the transportation. University students (3rd year and older, those over 18 years old) are also required by the university authorities to work in the fields during the cotton harvesting season. Such mobilization of upper level students is allegedly treated as professional training, even when students' majors have little to do with agricultural disciplines. Cotton harvesters are required by their administrators to sign statements of consent prior to taking part in cotton harvesting.

[29] ILO. *ILO High Level Mission Report on the Monitoring of Child Labor*. Geneva; December 2013.

[30] The 2016 Third Party Monitoring adopted a new methodology that was designed by the ILO and agreed with the national counterparts and the WB. The methodology assessed the degree to which commitments made by the Government of Uzbekistan to eliminate risks of child and forced labour were implemented, how the systems of risk reduction and management functioned in practice, and how effective these systems were in protecting vulnerable workers from improper labor practices. Seven ILO experts, each with one national counterpart from the Federation of Trade Unions of Uzbekistan, worked over a six-week period in two phases: a pre-harvest phase lasting two weeks between July 18 and August 19, 2016; and a harvest phase lasting four weeks between September 14 and October 28, 2016. During the harvest phase, ILO experts visited all 13 Provinces and Tashkent City for two weeks each. Over 800 sites were visited, half of which were World Bank-supported projects sites. Over 1,700 interviews were conducted with *Hokimiyats*, officials of ministries and accredited organizations, directors of educational and medical facilities, farmers, cotton pickers and brigade leaders, public and private sector organizations, professional and non-professional staff, students and pupils. Site visits were often random and unannounced, although depending on the object, some were by appointment.

[31] ILO 2015. Third Party Monitoring of the Use of Child Labor and Forced Labor during the Uzbekistan 2015 Cotton Harvest. An Assessment submitted to the World Bank by the International Labor Office. November 18, 2015.

[32] ILO 2017. "Third-party monitoring of measures against child labour and forced labour during the 2016 cotton harvest in Uzbekistan." The report was made publically available on February 1, 2017. P.2 http://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipec/documents/publication/wcms_543130.pdf

17. **Following the monitoring of the 2015 and 2016 cotton harvests, the ILO acknowledged that the GoU made significant progress in improving labor practices in the cotton sector yet some risks for forced labor remain.** The information campaign on labor practices increased awareness in the country about national and international legal framework about proper labor practices and work standards. Child labor during the cotton harvest became socially unacceptable. Policy commitment not to recruit medical and education staff for the benefit of cotton production also yield some positive results. At the same time, the ILO warned, however, that "*forced labor remains a risk for some categories of people, including staff of educational and medical facilities and Government employees*".[33] It noted that "*the existence of such risks has been recognized by the Government of Uzbekistan"*[34]*...*[and that] the Government continues to make policy improvements aimed at reducing risks of bad labor practices.

18. **Low yielding fields, remotely located from residential areas, as well as third and fourth passes35 appear to be at a greater risk for the use of forced labor.** A Social Impact assessment of cotton harvest mechanization carried out by the WB revealed that farmers with cotton fields that are located further from population points (50-120km) have difficulties attracting voluntary workers to pick cotton on their fields, also because their yields are low. Instead they rely on poorly motivated pickers from outside the areas such as those brought in from urban areas by Government organizations. Local pickers are most interested to pick cotton during the first two passes when the yields are high and, consequently, the opportunity to earn is much higher at that time.

19. **While the GOU has made some progress in eliminating child and/or forced labor in the cotton sector, more work remains.** In July 2015, the GOU issued an action plan on voluntary recruitment of labor force for the cotton harvest that sets guidelines on recruiting people. In August 2015, the Prime Minister approved the decision of the Cabinet of Ministers prohibiting child and/or forced labor in the cotton harvest. In December 2015, the GOU adopted an Action Plan that outlines a range of measure to modernize the cotton sector that will lead to significant changes in the labor recruitment practices in the sector. Additionally the GOU is committed to continuing its collaboration with the WB and the ILO on decent work practices. Further evidence incremental progress includes the decision by the EU Parliamentary Assembly to provide conditional support to the Textile Trade Protocol with Uzbekistan. Improvements were also made to the national Feedback Mechanism. The Federation of Trade Unions (FTU) and the Ministry of Labor (MoL) introduced changes to the FBM for the 2016 harvest, including the consideration of anonymous complaints, a streamlined process of registering and monitoring complaints, trainings to build capacity of lawyers and volunteers in regional FTU branches, engagement of volunteers to strengthen capacity, and an appeals process. As a result, the FTU's complaints system saw a nine-fold increase in the number of complaints filed during the 2016 harvest season relative to 2015. Continued engagement with the GOU on these issues is important to ensure that progress is sustained.

[33] Ibid. p. 2
[34] Ibid
[35] As the cotton grown in Uzbekistan does not ripe uniformly, cotton harvesting occurs in several waves or passes. Each pass lasts about 10 days. The first pass starts when around 75 percent of cotton bolls are open. After around ten days or so more bolls are open and the second round starts. The third round starts again after another ten days or more.

Annex 7: Riparian Notification

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

Project Rationale

The proposed project aims to reduce shortages in irrigation water supply in the project area and improve irrigation efficiency. It will sustain the benefits gained from the implementation of the Ferghana Valley Water Resources Management Project – First Phase (FVWRMP-I), which improved the drainage situation in parts of the valley that were most affected by high groundwater levels. The Ferghana Valley Water Resources Management Project – Second Phase (FVWRMP II) will improve the performance of irrigation in selected locations through agricultural modernization.

Experience in the implementation of the FVWRMP-I project demonstrates that combined support for infrastructure rehabilitation, reforms and capacity strengthening can have a significant impact on the performance of irrigated agriculture. Yields of all key crops in the project area went up dramatically, and over 40 percent of the project area saw a reduction of groundwater tables.

Project Components

FVWRMP-II contains the following main components:

Component A: Irrigation Modernization. This component aims at addressing the problems of water shortage in the project areas by financing the following five main activities: (a) Rehabilitation of Surface Irrigation System; (b) Rehabilitation and Construction of Pump Stations; (c) Construction of Wells; and (d) Flood Control and Bank Protection.

Component B: Support for Agricultural Modernization. To take full advantage of the improvements in irrigation modernization, this component will support Uzbekistan's efforts to modernize agriculture, promote agricultural diversification and intensification, support cotton harvest mechanization, and strengthen capacities. Subcomponents include (i) agricultural intensification and diversification consisting of (a) crop intensification and diversification, (b) assistance to farmers to access lines of credit (including assistance in the preparation of credit applications, dissemination of information, and training), (c) cotton harvest mechanization, (d) international standards for sustainable cotton production; and (ii) Improved Water Management.

Component C: Project Management. This component would (i) support the operation of the Project Implementation Unit (PIU), and finance overall project management, as well as technical assistance in such areas as detailed design, contract administration and construction supervision, procurement, financial management, and capacity strengthening; (ii) establish a Monitoring and Evaluation (M&E) system and arrange for data collection and reporting on key performance output and impact indicators through baseline surveys, participatory assessments and mid-term review and final evaluation; and (iii) finance services of independent auditors for auditing of project accounts and overall project management.

Project Location and Maps

The Project area covers 103,622 hectares and is entirely located in the FV, encompassing three regions: Andijan, Ferghana and Namangan. The proposed project areas are (see map below):

(i) The Podshaota-Chodak project area (29,507 hectares) in Namangan region located in the northeast of the FV. Administratively, the project area consists of Yangikurgan district in its entirety and part of Chodak district. It is located on the right bank of Syr Darya River;
(ii) The Isfayram-Shahimardan project area (54,375 hectares) in Ferghana region located in the south of the FV. The project area covers the southern part of Isfayram-Shahimardan AIS. Administratively, the project area include the entire Ferghana and Kuvasay districts, Ferghana city, and parts of Kuva, Altiarik and Tashlak districts;
(iii) The Savay-Akburasoy project area (19,740 hectares) in Andijan region located in the southeast of the FV. Administratively, the project area is part of Kurgantepa, Jalalkuduk, and Hujaobod and Bulokboshi districts of Andijan region and located on the left bank of Karadarya River.

The main irrigation water supplies to these proposed project areas are withdrawn from tributaries of the Syr Darya river basin, an important international waterway that is shared by Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan.

Implementation Arrangements

The Ministry of Agriculture and Water Resources (MAWR) is responsible for overall project implementation. MAWR, with branches at the sub-national level, is responsible for water planning in the country and for O&M of the main irrigation systems up to farm level. MAWR also administers international river systems with respect to water sharing and water quality control. Responsibility for day-to-day project implementation will be delegated to the already existing Project Implementation Unit (PIU) and headed by a Project Director, supported by a small group of technical and administrative staff in Tashkent.

Projects on International Waters (World Bank OP7.50)

Changes between the pre- and post-project situation relate to differences in (i) water consumption, (ii) irrigation water supply and (iii) return flow (see figure 1). Consumption includes crop evapotranspiration (ET) and non-beneficial evapotranspiration (NBET). The water balance conservatively assumes that there are no changes in the cropping pattern pre- and post-project. However, post-project consumption is higher because more water reaches the crops through higher efficiencies. Crop ET and NBET thus increase.

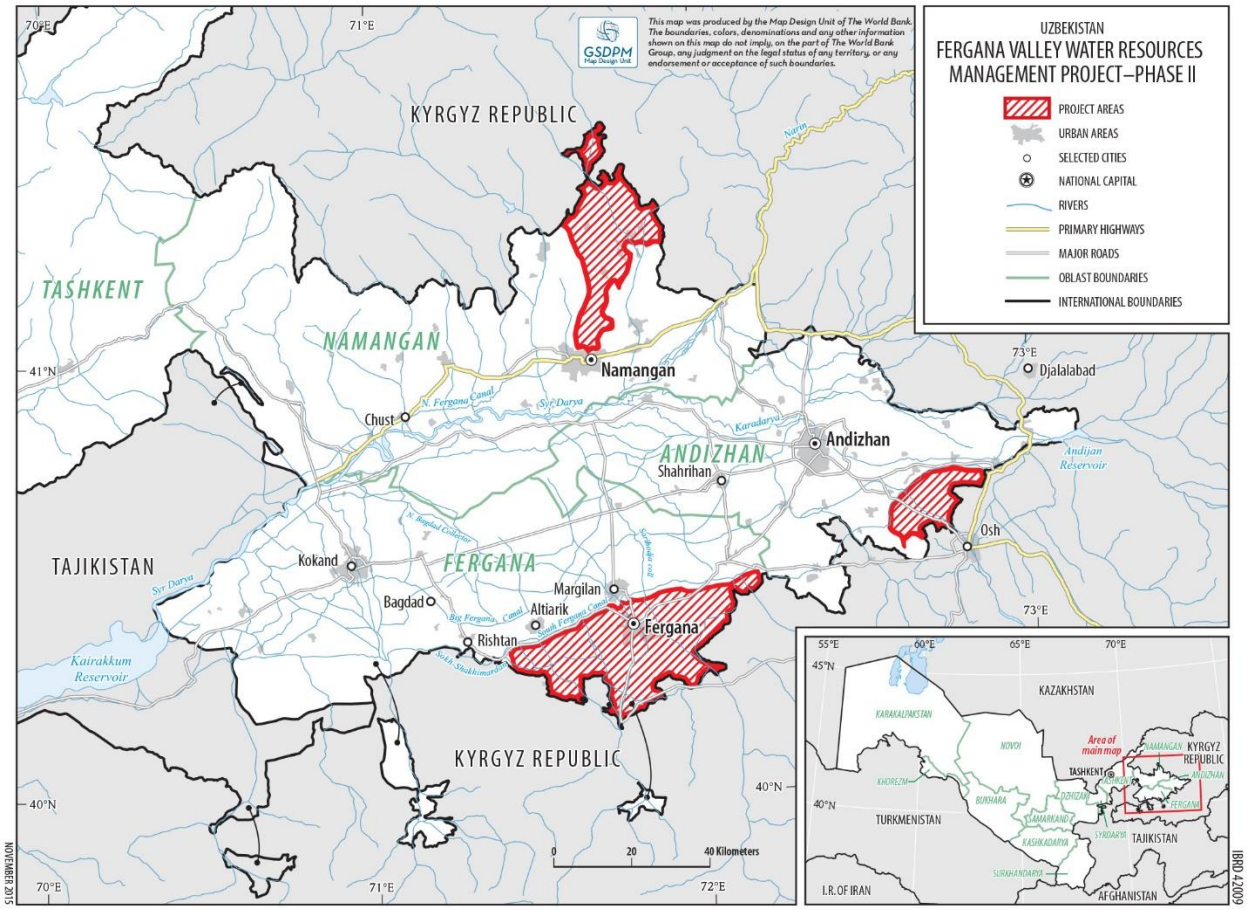


Figure 1: Map of project area

Supply is the amount of water that is withdrawn from the basin to meet crop ET and NBET, either from the rivers or from groundwater. Supply is closely related to water consumption, but also includes inefficiencies. Post-project supply increases because of increased withdrawal from the basin. These increased withdrawals off-set the efficiency increase from 30 percent (pre-project) to 35 percent (post-project).

Return flows include the water that is not used for crop ET or NBET and is returned to the river as drainage or seepage. The water balance states that return flows are equal to the difference between Crop ET and NBET on the one hand, and irrigation supply on the other.

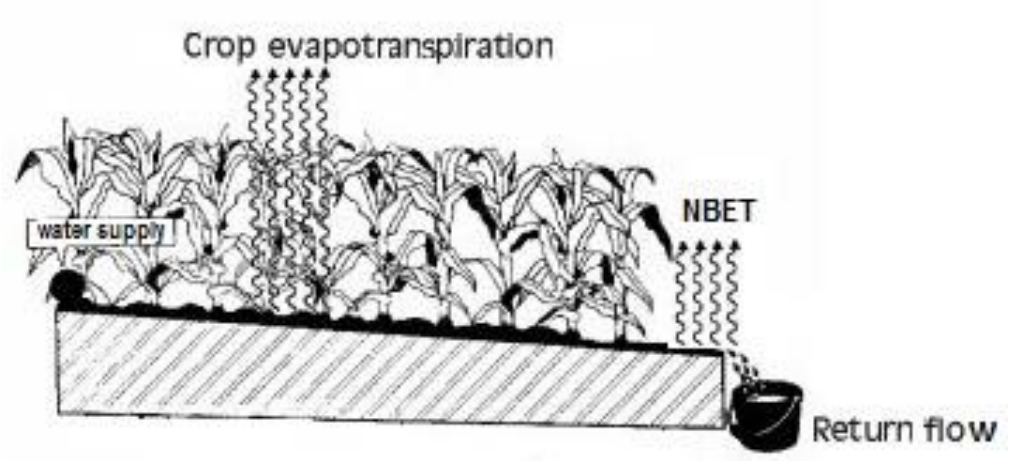


Figure 2: water balance

The present situation before FVWRMP II:
A water balance study (see Appendix B) undertaken for the project area indicates that the current reliable annual average discharge in Syr Darya river at the border between Uzbekistan and Tajikistan is 20,582 MCM.

The situation after FVWRMP II:
Overall water use efficiency is expected to increase as a result of the project from the current level of 30 percent to 35 percent. This will be achieved by various interventions including rehabilitation and lining of main canals and related water control infrastructure, rehabilitation of pumping stations and capacity strengthening of water managers and users. In addition, the project will lead to increased withdrawals from the Syr Darya basin, including through groundwater extraction. The improved water supply to the project area will lead to higher levels of water use (including beneficial Crop ET and NBET).

The net impact under the project design scenario on water withdrawal from the Syr Darya basin is 83.9 MCM, an estimated 0.4 percent of the average annual runoff of 20,582 MCM at the Uzbek – Tajik border.

Appendix B: Water Balance

Project Design Scenario

Elements of the Water Balance	Before Project (MCM/year)				After Project (MCM/year)				Comments / assumptions
Project Design Scenario	Podshaota-Chodak	Isfayram-Shahrimardan	Savay-Akburasoy	Total	Podshaota-Chodak	Isfayram-Shahrimardan	Savay-Akburasoy	Total	
Reliable annual flow in Syr Darya downstream of project area				20,582.0				20,498.1	A reduction of 0.4% of the current average flow
Actual crop evapotranspiration (ETc)	44.0	133.9	66.4	244.4	65.3	181.4	80.5	327.3	Crop ET increases as a result of increased water available to crops due to improved efficiency in water conveyance, distribution and application and increased withdrawals
Non-Beneficial Evapotranspirartion (NBET)	5.3	16.0	7.9	29.2	6.03	16.75	7.43	30.20	assume small incease in NBET
Total irrigation demand (supply)	149.2	453.8	225.0	828.0	185.8	516.4	229.1	931.3	Unchanged cropping pattern and improved overall efficiency
Return and escape flows (drainage)	99.9	303.8	150.7	554.4	114.5	318.2	141.2	573.9	Difference between irrigation demand and crop evapotranspiration and NBET
Overall efficiency (Water used as Crop ET at Plant level /total irrigation supply	30%	30%	30%	30%	35%	35%	35%	35%	
Project Impact					22.0	48.3	13.6	83.9	$(\text{supply-return flow})_{post}$ - $(\text{supply-return flow})_{pre}$

Annex 8: Economic and Financial Analysis

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II

1. Financial and economic analysis was undertaken to assess the economic viability of the project and to assess financial impact on the farm production. The main economic benefit of the project will be generated by restoring the level of agricultural productivity and production for which the irrigation system was designed. project investment is focused on three project areas covering about 103,245 ha of cropped area – 29,507 ha in Podshaota-Chodak AIS, 54,375 ha in Isfayram-Shahimardan AIS, and 19,363 ha in the Savay-Akburasoy AIS.

Financial Analysis

2. There are two types of farms in the three project areas, namely private farms with an average farm size of about 35 ha, and dekhan farms that are essentially about a 0.5 ha homesteads. To undertake the financial analysis, crop budgets were computed for each crop separately for private farms and dekhan farms working under With-Project (WP) and Without-Project (WOP) scenarios in each of the three project areas. The crop budgets include estimation of the revenue, production cost and gross margin per one hectare of irrigated land. The summary of the crop budgets for WOP scenario are presented in Table 1 below.

Table 1: Summary of WOP Crop Budgets (UZS 000)

	Cotton	Wheat	Barley	Rice	Maize (grains)	Potato	Vege-tables	Water melon	Maize (fodder)	Fodders	Oilseeds	Grapes	Fruits
Namangan Private Farms													
Yield (mt)	3.0	4.7	1.1	-	2.5	14.3	19.2	12.7	23.4	29.0	2.8	7.7	4.9
Revenue (UZS 000)	3,841	4,425	1,375	-	3,750	17,175	15,372	12,677	4,215	7,251	8,396	19,164	14,650
Expenditure	3,265	3,010	2,985	-	1,650	6,391	6,025	2,264	2,363	1,263	980	4,096	3,210
Gross Margin	576	1,416	(1,610)	-	2,101	10,784	9,347	10,413	1,852	5,988	7,415	15,069	11,440
Namangan Dehkan Farms													
Yield	-	6.2	-	-	5.3	26.7	33.3	28.6	10.1	6.5	2.8	10.9	10.1
Revenue	-	5,823	-	-	7,935	32,091	26,637	28,611	1,812	1,625	8,396	27,226	30,442
Expenditure	-	2,605	-	-	987	4,484	1,026	870	2,160	849	776	1,771	1,805
Gross Margin	-	3,218	-	-	6,949	27,607	25,610	27,741	(347)	777	7,620	25,456	28,637
Farghana Private Farms													
Yield	2.0	5.7	5.2	-	4.5	18.3	23.8	19.8	17.8	25.0	2.6	10.3	7.7
Revenue	2,591	5,412	6,510	-	6,679	21,943	19,037	19,836	3,199	6,244	7,812	25,740	23,176
Expenditure	3,265	2,950	2,985	-	1,615	3,991	3,164	2,194	2,363	1,263	980	4,060	3,210
Gross Margin	(673)	2,462	3,525	-	5,065	17,953	15,873	17,642	837	4,981	6,831	21,681	19,967
Farghana Dehkan Farms													
Yield	-	5.8	-	-	3.1	22.7	29.7	21.0	12.1	6.4	-	18.0	13.3
Revenue	-	5,453	-	-	4,646	27,234	23,796	20,961	2,171	1,603	-	44,962	39,854
Expenditure	-	2,802	-	-	1,183	4,484	1,026	870	2,160	849	-	1,771	1,805
Gross Margin	-	2,652	-	-	3,463	22,750	22,769	20,090	11	755	-	43,191	38,049
Andijan Private Farms													
Yield	3.0	5.5	4.5	3.8	3.7	19.3	28.1	23.6	16.3	12.9	2.4	11.2	7.2
Revenue	3,885	5,198	5,670	12,070	5,607	23,172	22,462	23,643	2,937	3,221	7,200	27,918	21,684
Expenditure	3,265	2,950	2,985	3,123	1,615	3,991	3,164	2,194	2,363	1,263	980	4,096	3,210
Gross Margin	620	2,248	2,685	8,947	3,992	19,181	19,298	21,449	575	1,958	6,220	23,822	18,475
Andijan Dehkan Farms													
Yield	-	6.3	4.6	4.2	5.4	21.0	33.3	22.4	32.0	9.3	2.6	16.1	14.4
Revenue	-	5,963	5,828	12,593	8,079	25,183	26,643	22,438	5,760	2,333	7,800	40,247	43,214
Expenditure	-	2,802	2,869	3,575	1,183	4,484	1,026	870	2,160	849	776	1,771	1,805
Gross Margin	-	3,162	2,958	9,018	6,896	20,699	25,617	21,567	3,600	1,485	7,024	38,477	41,409

3. Based on the prevailing cropping pattern and crop budgets, one ha model farm budgets were prepared for the two farm types in each of three project areas working under WP and WOP scenarios. The Model Farm Budgets of WOP scenario are presented in Table 2 through Table 4.

Table 2: WOP Model Farm Budgets in Podshaota-Chodak (Namangan), per one hectare (UZS 000)

	Crop	Private Farm				Dehkan Farm			
		Area	Revenue	Costs	Gross Margin	Area	Revenue	Costs	Gross Margin
1	Cotton	0.02	74	62	11	-	-	-	-
2	Wheat	0.27	1,198	815	383	0.2	896	401	495
3	Barley	0.0004	0.6	1.2	(0.7)	-	-	-	-
4	Rice	-	-	-	-	-	-	-	-
5	Maize (grains)	0.04	153	67	86	0.04	324	40	284
6	Potato	0.06	1,001	372	629	0.1	3,535	494	3,041
7	Vegetables (including g'house)	0.06	995	390	605	0.1	3,183	123	3,061
8	Watermelon	0.005	61	11	50	0.01	241	7	233
9	Maize (fodder)	0.03	118	66	52	0.005	8	10	(2)
10	Lucerne + other fodder	0.02	180	31	149	0.01	10	5	5
11	Oilseeds	0.05	393	46	347	-	-	-	-
12	Grapes	0.10	1,826	390	1,435	0.1	3,563	232	3,332
13	Fruits	0.23	3,442	754	2,688	0.3	9,240	548	8,692
14	**Total**	**0.89**	**9,442**	**3,007**	**6,435**	**0.9**	**21,000**	**1,859**	**19,141**
15	**Weighted Average**								**8,886**

Table 3: WOP Model Farm Budgets in Isfayram-Shahrimardan (Ferghana), per one hectare (UZS 000)

	Crop	Private Farm				Dehkan Farm			
		Area	Revenue	Costs	Gross Margin	Area	Revenue	Costs	Gross Margin
1	Cotton	0.16	404	509	(105)	-	-	-	-
2	Wheat	0.27	1,486	810	676	0.09	493	254	240
3	Barley	0.001	6	3	3	-	-	-	-
4	Rice	-	-	-	-	-	-	-	-
5	Maize (grains)	0.004	28	7	21	0.09	431	110	321
6	Potato	0.01	219	40	179	0.08	2,264	373	1,891
7	Vegetables (including g'house)	0.03	481	80	401	0.17	4,120	178	3,942
8	Watermelon	0.004	82	9	73	0.01	154	6	148
9	Maize (fodder)	0.11	362	267	95	0.07	156	155	1
10	Lucerne + other fodder	0.01	79	16	63	0.08	131	69	62
11	Oilseeds	0.002	15	2	13	-	-	-	-
12	Grapes	0.01	166	26	140	0.05	2,265	89	2,176
13	Fruits	0.27	6,176	855	5,321	0.12	4,938	224	4,715
14	**Total**	**0.88**	**9,504**	**2,624**	**6,879**	**0.77**	**14,952**	**1,457**	**13,495**
15	**Weighted Average**								**7,958**

Table 4: WOP Model Farm Budgets in Akburasoy (Andijan), per one hectare (UZS 000)

	Crop	Private Farm				Dehkan Farm			
		Area	Revenue	Costs	Gross Margin	Area	Revenue	Costs	Gross Margin
1	Cotton	0.33	1,296	1,089	207	-	-	-	-
2	Wheat	0.32	1,661	943	719	0.21	1,246	585	661
3	Barley	0.001	7	4	3	0.002	13	7	7
4	Rice	0.01	119	31	88	0.02	292	83	209
5	Maize (grains)	0.01	34	10	24	0.04	293	43	250
6	Potato	0.004	83	14	68	0.12	3,103	552	2,550
7	Vegetables (including g'house)	0.01	262	37	225	0.16	4,235	163	4,072
8	Watermelon	0.001	33	3	30	0.01	205	8	197
9	Maize (fodder)	0.03	92	74	18	0.03	158	59	99
10	Lucerne + other fodder	0.01	46	18	28	0.002	4	1	3
11	Oilseeds	0.003	24	3	20	0.001	11	1	10
12	Grapes	0.02	520	76	444	0.03	1,047	46	1,001
13	Fruits	0.08	1,695	251	1,445	0.28	12,304	514	11,791
14	**Total**	**0.83**	**5,872**	**2,553**	**3,319**	**0.90**	**22,912**	**2,063**	**20,849**
15	**Weighted Average**								**5,938**

4. As mentioned above, the crop budgets and per hectare model farm budgets were also prepared for the WP scenario. It is assumed that with the planned interventions the predominant impact will be an increase in the water availability and in value of the increased production, while an increase in the cropped area is not expected. The benefits of the investment for the project areas largely arise from incremental increases in farm productivity.

5. Despite the expectation of the stakeholders and particularly farmers at large that the farm productivity will increase by 25 percent to 30 percent due to increased water availability, a conservative estimate of 20 percent increase was used in the analysis.

6. In addition it is assumed that in the Podshaota-Chodak project area the crop yields will increase by about 15 percent, while in the Isfayram-Shahrimardan project area it will increase by 12 percent and in the Savay-Akburasoy project area it will increase by 12 percent. Table 5 below presents a summary of WP crop budgets that can be achieved with the implementation of the proposed project.

Table 5: Summary of WP Crop Budgets in the Project Areas (UZS 000)

	Cotton	Wheat	Barley	Rice	Maize (grains)	Potato	Vege-tables	Water melon	Maize (fodder)	Fodders	Oilseeds	Grapes	Fruits
Namangan Private Farms													
Yield (mt)	3.5	5.4	1.3	-	2.9	16.5	22.1	14.6	26.9	33.4	3.2	9.2	5.9
Revenue (UZS 000)	4,417	5,089	1,581	-	4,313	19,751	17,678	14,578	4,847	8,338	9,655	22,997	17,580
Expenditure	3,265	3,010	2,985	-	1,650	6,391	6,025	2,264	2,363	1,263	980	4,096	3,210
Gross Margin	1,152	2,079	(1,404)	-	2,663	13,361	11,653	12,315	2,485	7,075	8,675	18,902	14,370
Namangan Dehkan Farms													
Yield	-	7.1	-	-	6.1	30.8	38.3	32.9	11.6	7.5	3.2	13.1	12.2
Revenue	-	6,697	-	-	9,125	36,905	30,632	32,903	2,084	1,869	9,655	32,671	36,530
Expenditure	-	2,605	-	-	987	4,484	1,026	870	2,160	849	776	1,771	1,805
Gross Margin	-	4,092	-	-	8,139	32,421	29,606	32,033	(76)	1,020	8,879	30,901	34,725
Farghana Private Farms													
Yield	2.3	6.4	5.8	-	5.0	20.5	26.7	22.2	19.9	28.0	2.9	11.5	8.7
Revenue	2,902	6,061	7,291	-	7,481	24,576	21,321	22,216	3,583	6,993	8,749	28,829	25,958
Expenditure	3,265	2,950	2,985	-	1,615	3,991	3,164	2,194	2,363	1,263	980	4,060	3,210
Gross Margin	(363)	3,112	4,306	-	5,866	20,586	18,157	20,022	1,220	5,730	7,769	24,770	22,748
Farghana Dehkan Farms													
Yield	-	6.5	-	-	3.5	25.4	33.3	23.5	13.5	7.2	-	20.1	14.9
Revenue	-	6,108	-	-	5,203	30,502	26,651	23,476	2,431	1,796	-	50,357	44,636
Expenditure	-	2,802	-	-	1,183	4,484	1,026	870	2,160	849	-	1,771	1,805
Gross Margin	-	3,306	-	-	4,020	26,018	25,625	22,606	272	947	-	48,586	42,831
Andijan Private Farms													
Yield	3.3	6.1	5.0	4.2	4.1	21.2	30.9	26.0	17.9	14.2	2.6	12.3	8.0
Revenue	4,273	5,717	6,237	13,277	6,167	25,489	24,708	26,007	3,231	3,543	7,920	30,710	23,852
Expenditure	3,265	2,950	2,985	3,123	1,615	3,991	3,164	2,194	2,363	1,263	980	4,096	3,210
Gross Margin	1,008	2,768	3,252	10,154	4,553	21,499	21,544	23,814	868	2,280	6,940	26,614	20,643
Andijan Dehkan Farms													
Yield	-	6.9	5.1	4.6	5.9	23.1	36.6	24.7	35.2	10.3	2.9	17.7	15.8
Revenue	-	6,560	6,410	13,852	8,887	27,702	29,307	24,681	6,336	2,567	8,580	44,272	47,535
Expenditure	-	2,802	2,869	3,575	1,183	4,484	1,026	870	2,160	849	776	1,771	1,805
Gross Margin	-	3,758	3,541	10,277	7,703	23,218	28,281	23,811	4,176	1,718	7,804	42,501	45,730

7. Based on the above WP crop budgets, one hectare model farm budgets were estimated for the project areas in with-project scenario. They are presented in Table 6 through Table 8.

Table 6: WP Model Farm Budgets in Podshaota-Chodak (Namangan), per one hectare (UZS 000)

	Crop	Private Farm				Dehkan Farm			
		Area	Revenue	Costs	Gross Margin	Area	Revenue	Costs	Gross Margin
1	Cotton	0.02	85	62	22	-	-	-	-
2	Wheat	0.27	1,378	815	563	0.15	1,030	401	629
3	Barley	0.0004	1	1	(1)	-	-	-	-
4	Rice	-	-	-	-	-	-	-	-
5	Maize (grains)	0.04	176	67	109	0.04	373	40	332
6	Potato	0.06	1,151	372	779	0.11	4,065	494	3,571
7	Vegetables (including g'house)	0.06	1,144	390	754	0.12	3,661	123	3,538
8	Watermelon	0.005	71	11	60	0.01	277	7	270
9	Maize (fodder)	0.03	136	66	70	0.00	9	10	(0)
10	Lucerne + other fodder	0.02	207	31	175	0.01	12	5	6
11	Oilseeds	0.05	452	46	406	-	-	-	-
12	Grapes	0.10	2,191	390	1,801	0.13	4,276	232	4,044
13	Fruits	0.23	4,131	754	3,377	0.30	11,088	548	10,540
14	**Total**	**0.89**	**11,122**	**3,007**	**8,114**	**0.88**	**24,790**	**1,859**	**22,931**
15	**Weighted Average**								**10,972**

Table 7: WP Model Farm Budgets in Isfayram-Shahrimardan (Ferghana), per one hectare (UZS 000)

	Crop	Private Farm				Dehkan Farm			
		Area	Revenue	Costs	Gross Margin	Area	Revenue	Costs	Gross Margin
1	Cotton	0.16	453	509	(57)	-	-	-	-
2	Wheat	0.27	1,664	810	854	0.09	553	254	299
3	Barley	0.001	7	3	4	-	-	-	-
4	Rice	-	-	-	-	-	-	-	-
5	Maize (grains)	0.004	32	7	25	0.09	482	110	373
6	Potato	0.01	245	40	205	0.08	2,535	373	2,163
7	Vegetables (including g'house)	0.03	538	80	458	0.17	4,614	178	4,436
8	Watermelon	0.004	92	9	83	0.01	173	6	166
9	Maize (fodder)	0.11	406	267	138	0.07	175	155	20
10	Lucerne + other fodder	0.01	89	16	73	0.08	146	69	77
11	Oilseeds	0.002	17	2	15	-	-	-	-
12	Grapes	0.01	186	26	159	0.05	2,537	89	2,448
13	Fruits	0.27	6,917	855	6,062	0.12	5,531	224	5,307
14	**Total**	**0.88**	**10,644**	**2,624**	**8,020**	**0.77**	**16,746**	**1,457**	**15,289**
15	**Weighted Average**								**9,206**

Table 8: WP Model Farm Budgets in Savay-Akburasoy (Andijan), per one hectare (UZS 000)

	Crop	Private Farm				Dehkan Farm			
		Area	Revenue	Costs	Gross Margin	Area	Revenue	Costs	Gross Margin
1	Cotton	0.33	1,425	1,089	336	-	-	-	-
2	Wheat	0.32	1,827	943	885	0.21	1,371	585	785
3	Barley	0.001	8	4	4	0.002	15	7	8
4	Rice	0.01	131	31	100	0.02	321	83	238
5	Maize (grains)	0.01	38	10	28	0.04	323	43	280
6	Potato	0.004	91	14	77	0.12	3,413	552	2,861
7	Vegetables (including g'house)	0.01	288	37	251	0.16	4,658	163	4,495
8	Watermelon	0.00	37	3	33	0.01	226	8	218
9	Maize (fodder)	0.03	101	74	27	0.03	174	59	115
10	Lucerne + other fodder	0.01	50	18	32	0.002	4	1	3
11	Oilseeds	0.003	26	3	23	0.001	12	1	11
12	Grapes	0.02	572	76	496	0.03	1,152	46	1,106
13	Fruits	0.08	1,865	251	1,614	0.28	13,535	514	13,021
14	**Total**	**0.83**	**6,459**	**2,553**	**3,906**	**0.90**	**25,203**	**2,063**	**23,140**
15	**Weighted Average**								**6,780**

8. A comparison of WP and WOP model farm budgets shows that the return in the Podshaota-Chodak subporject would increase to about UZS 10.9 million per hectare from some UZS 8.9 million per hectare. Similarly in the Isfayram-Shahrimardan subproject, the income would increase from about UZS 7.9 million per hectare to UZS 9.2 million per hectare, and in the Savay-Akburasoy it would increase to about UZS 6.8 million per hectare from to UZS 5.9 million per hectare.

Economic Analysis

9. The economic analysis was undertaken in two stages. First the indicative Economic Rate of Return (ERR) and Economic Net Present Value (ENPV) were estimated for each of the project areas based on estimation of the benefits and the investment costs in each project area. This is followed by an estimation of the indicative Economic Rate of Return (ERR) and Economic Net Present Value (ENPV) of the overall project based on estimation of the overall benefits and the total investment costs of the project.

10. The key assumptions that were adopted in estimating the ERR include:

- All investments and benefits have been valued at late 2015 prices;
- In order to convert the project investment costs into economic values a factor of 0.8 has been used to represent taxes and duties;
- The life of the project has been assumed as 30 years to account for long term benefits of the proposed interventions;
- A standard conversion factor of 0.8 was applied to the non-traded goods;
- A factor of 0.7 was applied to estimate the shadow wage rate of labor;
- It is assumed that without any structural intervention supported nonstructural blending the productivity will decline each year by about 1 percent;
- The full development stage will be reach in about five years after the implementation

period;

- 6 percent discount rate was used in the analysis.

11. The overall indicative ERR of the project is estimated as 14.3 percent with a positive Economic NPV (USD 323.2 million). This means that the project has a good economic return and it is viable from economic point of view. The estimated ERR and ENPV for the three project areas are: Podshaota-Chodak ERR - 17.7 percent and ENPV - USD164.3 million, Isfayram-Shahrimardan ERR – 16.8 percent and ENPV – USD152.3 million, and Savay-Akburasoy ERR - 11.6 percent and ENPV – USD39.6 million.

12. Table 9 presents the sensitivity analysis of ERR and ENPV of the overall project and each of the project areas and it assessed the effect of variations in benefits and costs. A fall in the benefits by 20 percent and an increase in the costs by the same proportion would reduce the base case ERR to about 9.4 percent -9.9 percent for the overall project; to about 13.1 percent -13.7 percent for Podshaota-Chodak; to about 6.2 percent - 6.6 percent for Isfayram-Shahrimardan and to about 12.3 percent -12.7 percent for Savay-Akburasoy. Sensitivity analysis also assessed the effect of various lags in the realization of benefits. It shows that a 1-year delay in generation of the benefits of overall project would not lead to a significant decrease in its economic viability: ERR would still be well above the discount rate (6 percent) and ENPV would still be positive. The results of the sensitivity analysis suggest that the investments in the project in overall and in its individual areas are economically viable and robust.

Table 9: Summary of Sensitivity Analysis

		Base case	Costs Increase			Increase of Benefits		Decrease of Benefits			Delay of Benefits	
			+10%	+20%	+50%	+10%	+20%	-10%	-20%	- 30%	1 year	2 years
Overall project	ERR	14.3%	10.9%	9.9%	7.4%	13.2%	14.3%	10.8%	9.4%	7.9%	10.3%	8.8%
	ENPV (USD mln)	323.2	125.1	104.4	42.1	181.2	216.5	110.5	75.2	39.9	105.5	68.0
Padshaota Chodak (Namangan)	ERR	17.7%	14.8%	13.7%	10.8%	17.5%	18.8%	14.7%	13.1%	11.4%	14.0%	12.1%
	ENPV (USD mln)	164.3	84.4	77.2	55.6	107.9	124.3	75.2	58.9	42.5	73.9	57.3
Isfayram Shahi Mardan (Ferghana)	ERR	11.6%	7.6%	6.6%	4.2%	9.8%	10.8%	7.5%	6.2%	4.8%	7.2%	5.9%
	ENPV (USD mln)	39.6	7.2	3.0	-9.6	16.7	22.0	6.0	0.7	-4.6	5.2	-0.5
Savay-Akburasoy (Andijan)	ERR	16.8%	13.7%	12.7%	10.2%	16.0%	17.0%	13.6%	12.3%	10.8%	12.9%	11.2%
	ENPV (USD mln)	152.3	69.9	63.8	45.7	89.5	103.2	62.3	48.6	35.0	59.5	44.2

Annex 9: Map

UZBEKISTAN: Ferghana Valley Water Resources Management Project - Phase II