

SFG3307

Tajikistan

Agency for Land Reclamation and Irrigation

**ZARAFSHON IRRIGATION REHABILITATION AND MANAGEMENT
IMPROVEMENT PROJECT**

GENERIC ENVIRONMENTAL MANAGEMENT PLAN

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List of Abbreviations

ADB	Asian Development Bank
ALRI	Agency on land reclamation and irrigation
ATC	Agricultural Training Center
CAWMP	Community Agriculture and Watershed Management Project
CPS	Country Partnership Strategy
CEP	Committee for Environmental Protection under the Government of Tajikistan
DATs	Debt Audit Teams
DRMU	Debt Resolution Management Unit
DC	Drainage canals
EAP	Environmental Action Plan
EA	Environmental Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
FFS	Farmer Field Schools
FIAS	Farmer Information Advisory Service
FPSP	Farm Privatization Support Project
GBAO	Gorno-Badakhshan Autonomous oblast
GDP	Gross Domestic Product
GOT	Government of Tajikistan
ICG	International Crisis Group
IPM	Integrated Pest Management
JDCs	Jamoat Development Committees
IS	Irrigation scheme
IWRM	Integrated water resources management
LRCSP	Land Registration and Cadaster System for Sustainable Agriculture Project
MAC	Maximum Allowable Concentrations
MIGA	Micro Investment Government Agency
MEWR	Ministry of Energy and Water Resources
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOH	Ministry of Health
NGO	Non-governmental Organization
OP	Operational Policy
PAU	Poverty Assessment Update
PMU	Project Management Plan
PMP	Pest Management Plan
POP	Persistent Organic Pollutants
RIRP	Rural Infrastructure Rehabilitation Project
RRS	Rayon under Republican Subordination
SEE	State Ecological Expertise
SCLM	State Committee of Land Management
UNDP	United Nations Development Program

WB World Bank
WUA Water User Association
WHO World Health Organization

Executive Summary

1. **Project objective.** The project development objectives are to strengthen the institutional base for irrigation planning and management in the Zarafshon river basin, and to improve the condition and management of irrigation and drainage infrastructure in the Zarafshon river basin and adjacent districts in the Syr-Darya basin.

2. **Project Beneficiaries will include:** River Basin management authorities, the Agency for Land Reclamation and Irrigation (ALRI), the Ministry of Energy and Water Resources (MEWR), Water User Associations, agricultural producers (farmers and rural households) who benefit from improved access to irrigation water.

3. **Project description.** The project has three main components:

4. **Component 1: Rehabilitation of Irrigation Infrastructure (10.07 million Euro)**

5. **Subcomponent Ia: Public Works for Small Scale Irrigation Canal Rehabilitation (1.00 million Euro).** Low-income people from the project districts will be employed to manually clean badly deteriorated irrigation canals or repair flood damaged sections of irrigation canals in a public works program to provide temporary employment to food insecure households. In addition to wage payments to beneficiaries, project expenditure will cover contributions to beneficiary social security taxes, engineering design and supervision costs, social mobilization and labor force administration costs, goods and materials for small repair works where needed and the procurement of low-cost tools for manual labor. The design of this sub-component draws heavily on the experience of the successful public works program in the World Bank PAMP II project.

6. **Subcomponent Ib: Large scale Irrigation Rehabilitation (8.27 million Euro).** To facilitate full restoration of selected irrigation schemes the project will finance mechanized and other works for irrigation systems rehabilitation. These works will include: (i) mechanized earthworks for the cleaning and restoration of larger-sized irrigation canals, (ii) irrigation canal and water control structures repair and rehabilitation, (iii) the supply and installation of irrigation system water control gates, (iv) repair of irrigation pipelines and the supply and installation of corresponding control fixtures and fittings, (v) the rehabilitation of selected irrigation pump stations, including civil works and electro-mechanical equipment supply and installation, (vi) rehabilitation on a pilot basis of selected irrigation tube wells, including testing, cleaning and developing of existing vertical wells, and repair, supply and installation of corresponding electro-mechanical equipment, (vii) the supply and installation of flow measurement devices at key irrigation system water control and management locations, (viii) selected pumped-to-gravity irrigation system conversion and/or connection works (where feasible), (ix) feasibility and design studies for irrigation water flow capture improvement schemes and pumped-to-gravity irrigation system conversion schemes, and (x) engineering planning, design and supervision services for the above items as appropriate.

7. ***Subcomponent Ic: Flood Emergency Works and Equipment (0.8 million Euro).*** This subcomponent will support: (i) emergency repairs of flood-related damage to irrigation infrastructure systems that may occur during the project period, (ii) selective river bank protection works to restore and safeguard vulnerable high-value irrigated agriculture lands subject to flooding and erosion, (iii) the provision of appropriate machinery for both emergency repairs and routine maintenance of irrigation scheme and related flood protection infrastructure systems, with machinery management and usage by designated agencies to be initiated towards the end of the project period, and (iv) engineering planning, design and supervision services for the above items.

8. ***Component II: Development and Strengthening of Irrigation Management Institutions (3.00 million Euro).*** Three principles guide the design and implementation of Component II: (i) water management at all levels should be organized in accordance with hydrologic or hydraulic boundaries, (ii) a three-part management structure should be established to manage irrigation water in the basin, and (iii) the irrigation main system should be operated on a volumetric basis, to include measured deliveries to all WUAs. Subcomponents comprise the following.

9. ***Subcomponent IIa: Irrigation Main System Management: Support for ALRI (1.2 million Euro).*** Based on the new institutional framework for water resource management, the project will assist the government to transform regional ALRI units into lean and responsive service providers responsible for the sustainable management and maintenance of the main system irrigation infrastructure and for water delivery to WUAs.

10. Specifically, this subcomponent will: (i) delineate hydraulic boundaries and establish system-based service organizations in the project area where these are not already in place; (ii) conduct a functional analysis of ALRI operational, administrative and financial management practices, and design and introduce streamlined processes and supporting digital applications for these processes; (iii) install a radio communication system in Panjakent ALRI District where cell phone coverage is unreliable, (iv) design and install a networked information system in the Panjakent ALRI office, (v) introduce volume-based management of main system canal flows and water deliveries to WUAs, utilizing measuring devices installed under subcomponent Ib; (vi) orient and train ALRI staff to work effectively with WUAs; and (vii) carry out a GIS-based inventory of hydraulic infrastructure in target districts and establish an irrigation asset database to serve as a basis for sound facilities maintenance. This database will be linked with a hydraulic facilities database at the RBO level. The project will also assist ALRI in development of the formal web-site and an effective grievance redress mechanism for the sector.

11. The various activities supported under this sub-component will be allocated among target districts according to: (i) the irrigated area in the district, (ii) the extent of publicly-supplied canal water vis a vis that supplied by private wells, (iii) the size of the systems, and (iv) ALRI district preferences. Implementation will include the provision of goods, training, study tours and technical assistance.

12. ***Subcomponent IIb: Local Level Irrigation System Management: Support for Water User Associations (1.00 million Euro).*** Building on the lessons learnt from past experience with WUAs in Tajikistan, including the experience gained under PAMP II, the project will create

and/or strengthen WUAs in selected project districts. The first step will be to ensure that existing WUAs are based on irrigation network hydraulic boundaries and to merge unviable WUAs into larger ones to achieve the economies of scale needed to ensure their financial viability. Larger WUAs, with a greater service area and more members, also provide a more efficient interface for ALRI to work with.

13. Subsequent tasks to be implemented under Subcomponent IIb include: (i) dividing WUAs into designated areas to ensure that Board Members know and represent all the farmers in their area and can speak for them at Board meetings; (ii) training WUA members in representative governance, as with a larger membership the WUA will shift to a Representative Assembly system of governance; (iii) training Board Members in leadership and budget preparation; (iv) training WUA office staff in accounting, financial management, record-keeping and reporting; (v) providing technical assistance and training to improve system operational practices, including internal irrigation scheduling; (vi) working with ALRI staff to optimize the scheduling of irrigation water delivery; (vii) establishing water measurement systems, including joint measurement with ALRI staff of bulk water deliveries; (viii) training operational staff in asset inventory use and maintenance of irrigation infrastructure. These activities will be designed to empower final water users to participate in responsible water distribution and integrate their voice in development of water use plans. Female WUA membership will be encouraged through information and training programs tailored to the concerns of female headed households.

14. WUA staff will be trained to cost, manage and supervise maintenance works and to enter into and monitor water service contracts with ALRI. In addition, the project will also finance selective rehabilitation and office construction for WUAs that do not yet have them. For this purpose, sub-grants will be selected in accordance with the eligibility criteria and procedures set forth in the Project Operational Manual (POM); Sub-Grants will be made available to eligible WUAs for any given subproject under a Sub-Grant Agreement between the PMU and the respective eligible WUA under terms and conditions approved by the World bank, including those set forth in the POM. The project will also work to involve WUAs in all stages of infrastructure rehabilitation.

15. ***Subcomponent IIc: Renovation and Equipping of Ancillary Structures (0.80 million Euro)***. This subcomponent will renovate and equip selected government buildings and other ancillary structures in order to facilitate effective operation of the new institutional framework. Specifically, it will (i) renovate and equip part of an existing ALRI building to house the new Zarafshon RBO, (ii) renovate the remainder of the associated ALRI office, (iii) construct a new ALRI pump and motor repair workshop in Panjakent, (iv) improve and re-equip existing local ALRI workshops to upgrade their capacity for minor repairs to pumps, motors, and piping, as well as to secure their capabilities for adequate repair and maintenance of machinery to be procured under Subcomponent Ic; and (v) construct or rehabilitate selected WUA offices.

16. **Component III: Project Management (0.89 million Euro)**. The existing PMU, established under the World Bank-financed FVWRMP, will be the main implementation agency. It will be responsible for: implementation and coordination, financial management and procurement, communication and awareness programs, environmental management and safeguards, monitoring and evaluation, and reporting to the GoT, EU Rural Development

Steering Committee and the World Bank. This component will also be responsible for the design, implementation, and analysis and reporting of the baseline and project completion surveys. The PMU will ensure that the communication and visibility measures required by the European Union are implemented.

17. **Project location.** The project will be implemented in 5 selected districts in the Zarafshon sub-basin and adjacent high potential agricultural areas, which are located in Sughd region (Province) of Tajikistan: Panjakent, Ayni, Mastchoi Kuhi, Gonchi and Shahrison. The project area with a population of 580 thousand people and an arable land area of approximately 90,000 ha is located in Zarafshon river basin and the larger Syrdaryo river basin of the northern Tajikistan. The area is characterized by rather dry climate with hot dry summers and cool winters. Sughd region, in total, has a population of about 2,455 thousand people, the vast majority of which lives in rural areas, about 1,848 thousand people versus about 607,2 thousand people urban settlers. Due to deforestation, improper irrigation and excessive use of agricultural lands land resources are affected by wind/water erosion and water logging. Most of the irrigation and drainage infrastructure is rundown and in danger of collapse.

18. **Potential impacts.** The project activities (small scale earth moving, civil works for strengthening of the embankments, repairing of water gates and intakes, cleaning up existing main and on farms irrigation canal structures and rehabilitation of water intakes; replacement of old pumps as well as rehabilitation of pumping stations), might generate some environmental risks and impacts: soil erosion; dumping of excavated sediments and other materials from irrigation and drainage canal structures and from the implemented civil works; labor safety issues; etc. No significant and irreversible adverse environmental and social impacts are expected – all of them are temporary and site specific. The project will also bring valuable environmental and social benefits, including: reduced water logging and losses; improved and expanded distribution of water for irrigation; increased agricultural yields; and poverty reduction of rural population.

19. **Triggered WB OPs.** The project will trigger mainly WB *OP 4.01 on Environmental Assessment* as it involves activities with some environmental and social impacts. The project will not trigger other OPs on Forests, Physical and Cultural Resources, or Natural Habitats as all activities will be implemented within the existing irrigation areas. The OP 4.09 on Pest Management is also not triggered as the project doesn't require purchasing and/or use of pesticides, and based on previous experience in the country, improved irrigation infrastructure will not lead to changes in the crops production which would require increased amount of pesticides. The main crop varieties that will be supported through the current irrigation and water management project will be field crops, fruits and vegetables, - no cotton is grown in the proposed project area. As the project area includes an irrigation and drainage network that draws water from Zarafshon River which is a tributary of the Amu Darya River and then discharges water back into the river and thence to the Aral Sea, it also triggers World Bank *OP 7.50 Projects on International Waterways*.

However, the proposed irrigation infrastructure investments are not expected to change the volume of extraction/discharge water or quality of water of the Zarafshon River and its tributaries, but rather will lead to more efficient irrigation and drainage. The project interventions are not expected to adversely affect water quality or quantity to downstream other riparian states. It is anticipated that the nature of the project activities (i) will not adversely

change the quality or quantity of water flows to the other riparian; and (ii) will not be adversely affected by the other riparian possible water use. Project interventions and investments are for improvements through rehabilitation and restoration of irrigation schemes and services to their original status. They are not for expansion of irrigation development areas, nor for augmentation of provided flow withdrawal capacities, nor for potentially detrimental hydraulic or agricultural system enhancements. There are, therefore, no expected adverse changes to the quantity and quality of water flows to downstream riparian states. The Exception from the requirement to notify other riparians under OP 7.50 has been granted by ECA Regional Vice President on April 1, 2017 on the basis that the nature of the Project activities meet the policy requirements mentioned in the paragraph above. Lastly, the project activities will not trigger the *Involuntary Resettlement OP/BP 4.12* as all activities will be done within existing irrigated areas as thus there will be no any land acquisition and/or other resettlement issues. Furthermore, the practice of initial project shows there will be no need for cutting fruit trees which belongs to private farmers.

20. **Project category.** In accordance with the Bank's safeguard policies and procedures, including OP/BP/GP 4.01 *Environmental Assessment*, the project relates to the Bank's B Category. For such projects it is necessary to conduct an Environmental Assessment and to prepare a site specific Environmental Management Plan. Taking into account the proposed rehabilitation activities would be similar at all Irrigation Schemes and Drainage Networks to be included in the project, it is proposed to prepare a Generic Environmental Management Plan (GEMP). Such GEMP was prepared for the Public Employment for Sustainable Agriculture and Water Resources Management project and will be used for this repeater project. Based on the GEMP there will be prepared site-specific EMPs, taking into account the concrete conditions of the selected irrigation scheme and/or drainage network as well as for the pumping stations, after the detailed design of each sub-project will be done.

21. **Purpose of GEMP.** The purpose of the GEMP is to provide the World Bank's and national rules and procedures for project Environmental Impact Assessments (EIAs), identify potential environmental impacts of the project (both positive and negative), specifying appropriate preventive actions and mitigation measures (including appropriate monitoring scheme) to prevent, eliminate or minimize any anticipated environment and social adverse impacts. The GEMP prepared by a local consultant for the initial project is based on the following: (i) analysis of the existing EA national legal documents, regulations and guidelines; (ii) World Bank safeguard policies, as well as other guiding materials; (iii) existing EMPs for similar World Bank projects; (iv) field investigations on the project site; and (v) results of consultations with the representatives of stakeholders and all interested parties. The GEMP was updated taking into account proposed minor changes for the repeater project (repairing of: pipeline networks; main pump stations; and drilling vertical drainage wells).

22. **Contents of the GEMP.** The GEMP ensures that the proposed prevention/mitigation measures and monitoring activities identified during the subprojects EA will be properly undertaken during the project implementation. The GEMP includes the following: (a) short description of applicable laws, policies on environment procedures for EA as well as EA institutions and responsibilities; (b) Environmental Guidelines (EG) specifying: (i) potential environmental and social impacts of the rehabilitation of irrigation canals, improvements of drainage infrastructure activities; (ii) proposed mitigation and monitoring measures to be applied

during the project implementation; (iii) description of the EMP Checklist which will be applied for activities related to pumping stations; (c) description of implementing arrangements, including supervision and monitoring, as well as reporting; and (d) analysis of the EA institutional capacity of the implementing agencies along with the proposed technical assistance to adequately implement the EA requirements for the subprojects to be supported. The GEMP also specifies necessary steps for preparing site-specific EMP of the selected Irrigation Schemes (ISs) and/or of the canals as well as for EMP Checklist for mentioned above activities. Furthermore, it specifies the project will support only rehabilitation of the on farm irrigation infrastructure when land acquisition is not necessary and there are no any resettlement issues.

23. **EA Institutional capacities to perform environmental safeguards.** The project will be implemented by the Fergana Valley Water Resource Management Project Management Unit (PMU). Overall responsibility for the proposed project will remain with the Agency for Land Reclamation and Irrigation (ALRI) and the Administration of Sughd Oblast. The Ferghana Water Resource Management Project Management Unit (PMU) will be the leading operational institution for the implementation of the proposed project and carry out all project implementation in accordance with the Operations Manual (OM). The PMU also will ensure that the EMP provisions are fully integrated into implementation of the project, including monitoring and reporting required by the World Bank. Proper implementation of the EMP provisions and field monitoring are the main responsibilities of the PMU at the regional level. Contractors will be responsible for implementation of the rehabilitation works in accordance with environmental requirements specified in the bidding documents and the EMP. PMU will work closely with CEP in implementing the EMPs. The existing PMU has previous experience in dealing with safeguards issues as it implemented several WB including the first project. The WB supervision missions done in 2015 show the EMPs implementation is at satisfactory level. The main safeguards responsibilities within the initial project were assigned to the PMU which conducted site inspections prior to, and during the rehabilitation activities to ensure compliance with the contract conditions and the EMP. The supervision and monitoring of proper implementation of the measures required by the EMP was the responsibility of the Regional PIU (RPIU), - located on the project site. The RPIU conducted regular site visits to verify that the appropriate environmental preventive actions and/or mitigation measures have been implemented. Such environmental monitoring included observations of soil and water within and around the rehabilitation sites as well as of potential impacts on vegetation and on workers safety. Furthermore, in these supervision and monitoring activities have been involved also the local Ecological Inspectors. The status of compliance with agreed environmental preventive and mitigation measures was periodically reported by the RPIU to the PMU which included them in their regular reports on project implementation.

24. **EA capacity building and public outreach campaign.** In order to ensure proper implementation of the various environmental activities (preventive actions/mitigation measures, monitoring and evaluation) recommended in the EMPs, the project will continue supporting the necessary institutional strengthening in the Sugd Oblast CEP and relevant institutions in the irrigation and water resource management (ALRI, RBOs, MEWR) on environmental management. This institutional strengthening will comprise the delivery of training and development of essential public outreach and awareness campaigns. A training program to develop and expand professional skills and capacity in environmental management issues for

staff involved in project implementation will be organized under the project through the PMU. The training program will reinforce existing capacity within the Sugd Oblast CEP (and district-level staff) by providing specialized training to enhance environmental assessment, management and monitoring skills and practices. The project will organize a community outreach and public awareness campaign on environmental management issues with special attention given to preventing water and soil pollution, and labor safety measures in conducting civil works. For this purpose the project will hire an environmental NGO with relevant experience in conducting capacity building and information dissemination activities.

29. **GEMP disclosure and consultation.** The Project Management Unit (PMU) has disseminated the updated GEMP to the Agency for Land Reclamation and Irrigation (ALRI), Administration of Sughd Oblast, Ministry of Agriculture, Committee for Environmental Protection under the Government of Tajikistan, and other relevant ministries for their review and comments, and also, on September 26, 2016, the document was posted on website of the Aarhus center in Dushanbe and disseminated via tajcnet@googlegroups.com for its access to wide public. On October 4-5, 2016 the PMU organized a consultation on the draft document. Consultations were held in Panjakent and Devashtich districts. Representatives of local governments, environmental departments, jamoat leaders, WUAs, students, health centers, farmers (including from other project districts as Ayni, Istravshan, etc.), agricultural and land use units, water departments, etc. attended the workshop. After the consultation, the document was revised to consider inputs from consulted parties. In October, 2016 the final draft GEMP was posted on the website of the Agency for Land Reclamation and Irrigation (ALRI) (www.alri.tj) and submitted to the World Bank for its disclosure. The document was further updated to include more details on the proposed activities in April 2017.

Introduction

1. Tajikistan is the smallest and poorest of the Central Asian countries, with a population of 8.8 million and a GNI/capita of US\$1,080 in 2014. It has grown steadily since the global financial crisis, with average annual GDP growth of 7.1 percent from 2010-2014. While this growth has been broadly based on the performance of sectors such as construction and services, it is highly variable as it relies heavily on remittances, which amount to as much as 50 percent of GDP. Fluctuating commodity prices for aluminium and cotton exports are a further source of (exogenous) instability, as is the price of imported energy. The country's economic performance thus remains highly vulnerable to exogenous shocks. A weak banking sector and the lack of well-targeted social programs increases this vulnerability, for both businesses and households. Despite this vulnerability, poverty has fallen significantly in response to a decade of growth, with poverty rates now estimated at 32 percent according to official statistics.

2. The recent slowdown of global economic growth and contraction of the Russian economy will reduce the pace of economic growth and poverty reduction, although current forecasts suggest that this slowdown will be moderate. GDP growth is expected to slow from 6.7 percent in 2014 to 4.2 percent in 2015 and then recover to 5.5 percent by 2017. Poverty rates will also fall more slowly, to an estimated 27 percent by 2017, due largely to a 30 percent fall in remittances during 2015. Exchange rate instability will increase in response to these adverse global trends, however, as will the systemic risks in the banking sector. A small budget surplus and low public debt provide some margin for government to increase public expenditure in response to these trends, but this response will have to be well conceived and implemented if it is to stimulate growth and offset lower rates of poverty reduction.

3. Continued structural reform is needed to create a more sustainable basis for economic development, less dependent on remittances as the engine of growth. Measures to improve infrastructure, better match education to the economy's needs and streamline regulation are the priorities in this context, in order to improve investment and create more employment.

4. With 23 percent of GDP and 66 percent of employment¹, the agriculture sector has a major influence on the performance of the Tajik economy. The sector continues to grow steadily in response to structural reform, with annual growth averaging 9 percent from 2009-2013². This growth has been driven by land reform, liberalization of the domestic market for cotton, the reduction of local government interference in farmer decisions and a nascent increase in the commercialization of agriculture. More than 137,000 small-scale private farms have now largely replaced the collective farms that dominated agriculture at independence. Grains production has been rapidly increasing in the last decade, as a risk mitigation strategy against disruptions of wheat and flour supply from Kazakhstan. A more profitable and sustainable balance between cotton, other crops and livestock is also emerging and there is increasing investment in the production and processing of high value fruit and vegetable crops.

¹ TajStat 2014

² World Bank Indicators, measured in constant (US\$2,000)

5. Continued agriculture sector growth is also critical for poverty reduction, as 77 percent of Tajikistan's poor live in rural areas. Although sector growth has contributed to a significant observed fall in rural poverty, estimated at 28 percent in 2014, its impact is still offset by adverse trends in remittance income. Farm incomes need to rise further, as a function of their productivity, in order to reduce the sector's vulnerability to exogenous shocks. While agriculture sector reform has significantly raised the incentive for farmers to increase output, productivity levels remain low by regional and western standards. Average yields for the top three crops (fodder, potato, wheat) in the area are lower compared to their regional competitors; e.g. wheat yields in Tajikistan is estimated at a range of 2.1-2.3 t/ha, compared to 4.7-4.9 t/ha in Uzbekistan³.

6. Low quality irrigation and irrigation inefficiency, estimated only in a range of thirty percent, are among the underlying constraints in achieving higher crop productivity. Country's irrigation system is highly water and energy intensive with more than ninety percent of water withdrawals allocated for use in agriculture and forty-four percent of cultivated land reliant on pump irrigation. However, the actual mix between pumped and gravity irrigation is unknown⁴, as many pump stations no longer work, and primary drainage and irrigation canals have silted up due to lack of public funds for cleaning. Regular maintenance of secondary and tertiary canals has stopped due to ill-defined property rights over this infrastructure.

7. The Agency for Land Reclamation and Irrigation (ALRI), recently established to replace a former Ministry of Melioration and Water Resources, is a key agency responsible for operation of approximately 400 pump stations, with approximately 1,500 pumps, of which less than half are functional. Management at the system level is little changed from its pre-1990 configuration. ALRI management is still based on traditional administrative boundaries (oblast and rayon), is paper-based, relies on qualitative rather than quantitative information on water flows and water deliveries, and employs centrally-directed command and control practices.

8. ALRI units employ a grab-bag of financial management practices, which are often unlinked and unstandardized, making an accurate picture of system operating expenditures virtually impossible to obtain. Water measurement capabilities are extremely limited, and as a result, data-based management is little practiced. Finally, the political mandate to provide very expensive high-lift pumped water supplies to many areas puts the goal of self-financed irrigation services out of reach in many instances.

9. Small farmer-owned pumps are extensively used in some areas – often lifting water from scheme canals to adjacent lands. The institutional capacity to assume responsibilities over on-farm infrastructure is weak at local level, due to the slow development of Water User Associations (WUAs) and poor links between WUAs and the local and regional public institutions responsible for water management. Limited budget resources and an outmoded policy and institutional framework hamper government's ability to respond to these constraints at national level.

³ FAO 2014

⁴ WB Report 72293-TJ

10. In response to the need for improved water resource management, the Government of Tajikistan (GoT) has begun a reform of the water sector in order to promote a more sustainable and productive use of water resources. Presidential Decree No. 12, of November 2013 “On structural improvement of the executive organization of the Republic of Tajikistan” provides the foundation and legal basis for water sector reform - based on the principles of Integrated Water Resources Management (IWRM). It has resulted in formation of the Ministry of Energy and Water Resources (MEWR), following a merger of the management function of the former Ministry of Land Reclamation and Water Resources and former Ministry of Energy. Another important milestone in implementation of the water sector reform in the country was achieved in December 2015 through the GoT approval of the Water Sector Reform Program for 2016-2020.

11. World Bank support for water sector reform and improved irrigation began in 2010 with a one-year EU funded emergency project (PAMP) to improve food security in the aftermath of the global financial crisis, which also initiated the introduction of IWRM. This was followed in 2012 by a repeater project (PAMP II) funded by the Bank and the Global Agriculture and Food Security Program (GAFSP). The longer time frame for PAMP II (7 years) allows a greater emphasis on building local, regional and national capacity for the introduction of IWRM. Together, these two projects have facilitated the rehabilitation of irrigation and drainage infrastructure throughout Khatlon province, located in the south of the country, the largest and most important region for agriculture production, and in the Districts of Republican Subordination. In combination with projects by the European Union and the Swiss Development Corporation, the PAMP II project is also working actively to improve the legal and institutional base for IWRM at local, regional and national level.

12. Effective continuation of this reform program will require substantial further support from the international community. Government lacks the means to fund public investment from its own resources and needs further support for policy and legislative reform and capacity building of national, regional and local institutions. Moreover, northern Tajikistan has yet to benefit substantially from donor programs to build a capacity for IWRM and to rehabilitate irrigation and drainage infrastructure.

13. The proposed project will draw on the substantial experience acquired by PAMP II and recently completed Ferghana Valley Water Resources Management Project, to (i) strengthen the institutional base for irrigation planning and management in the Zarafshon river basin and (ii) to improve the condition and management of irrigation and drainage infrastructure in the Zarafshon river basin and adjacent districts. The project will also provide support to the Ministry of Energy and Water Resources to implement activities complementary to the Technical Assistance component directly funded by the EU in Zarafshon river basin.

14. The purpose of the GEMP is to provide the World Bank’s and national rules and procedures for project Environmental Impact Assessments (EIAs), identify potential environmental impacts of the project (both positive and negative), specifying appropriate preventive actions and mitigation measures (including appropriate monitoring scheme) to prevent, eliminate or minimize any anticipated environment and social adverse impacts. The GEMP prepared by a local consultant for the initial project is based on the following: (i) analysis of the existing EA national legal documents, regulations and guidelines; (ii) World Bank

safeguard policies, as well as other guiding materials; (iii) existing EMPs for similar World Bank projects; (iv) field investigations on the project site; and (v) results of consultations with the representatives of stakeholders and all interested parties.

National Environmental Assessment Regulatory Framework

15. *Overview.* Tajikistan has developed during last decade most of the needed environmental laws and regulations (*see table 1*).

Table 1: Selected environment-related legislation

Air quality

- Law on Air Protection
- Law on Hydrometeorological Activity

Mineral resources

- Law on Mineral Waters
- Water Code

Land management

- Land Code
- Law on Land Administration
- Law on Land Valuation

Forests

- Forestry Code

Animals and factories

- Law on Protection and Use of Animals
- Law on Protection and Use of Factories
- Law on Factories Quarantine

Health and safety

- Law on Securing Sanitary and Epidemiological Safety of the Population
- Law on Veterinary Medicine
- Law on Salt Iodization
- Law on Quality and Safety of Food
- Law on Industrial Safety of Hazardous Installations
- Law on Radiation Safety

Waste and chemicals management

- Law on Production and Consumption Waste
- Law on Production and Safe Handling of Pesticides and Agrochemicals

Updates on legislation

- The Law on Environmental Education (No. 673 as of December 29, 2010);
- The Law on Environmental Information (No. 705 as of March 25, 2011);
- The Law on Environmental Monitoring (No. 707 as of March 25, 2011);
- The Law on Environmental Audit (No. 785 as of December 26, 2011);
- The Law on Specially Protected Natural Areas (No. 786 as of December 26,

2011);

- The Law on Food Safety (No. 890 as of August 1, 2012);
- The Law on Atmospheric Air Protection (No. 915 as of December 28, 2012);
- The Law on Pastures (No. 951 as of March 19, 2013);
- The Law on Ensuring Sanitary and Epidemiologic Safety of Population (No. 49 as of December 8, 2003, wording as of RT Laws No. 441 as of October 6, 2008, No. 481 as of December 31, 2008, No. 793 as of December 26, 2011 and No. 1010 as of 22.07.2013)

16. These laws along with the Regulations approved by the GoT create a favorable legal framework for environmental protection in the country as well as for usage and protection of its natural resources.

17. *Framework environment law.* The “framework environment law” / Law on Environment Protection was adopted in 2011 (21 July, 2011, № 208). The previous Law on Nature protection was adopted in 1993 and amended in 1996, 2002, 2004 and 2007. Then in 2011 it was replaced by new law. The Law stipulates that Tajikistan's environmental policy should give priority to environmental actions based on scientifically proven principles to combine economic and other activities that have an impact on the environment with nature preservation and the sustainable use of resources. The Law defines the applicable legal principles, the protected objects, the competencies and roles of the Government, the State Committee for Environment, the local authorities, public organizations and individuals. The Law stipulates also measures to secure public and individual rights to a safe and healthy environment and requires a combined system of ecological expertise and environmental impact assessment of any decision on an activity that could have a negative impact on the environment. The Law also defines environmental emergencies and ecological disasters and prescribes the order of actions in such situations, defines the obligations of officials and enterprises to prevent and eliminate the consequences, as well as the liabilities of the persons or organizations that caused damage to the environment or otherwise violated the Law. The Law establishes several types of controls over compliance with environmental legislation: State control, ministerial control, enterprise control and public control. State control is affected by the Committee for Environment Protection, the Sanitary Inspectorate of the Ministry of Health, the Inspectorate for Industrial Safety and the Mining Inspectorate. Public control is carried out by public organizations or trade unions and can be exercised with respect to any governmental body, enterprise, entity or individual.

18. *Water Code.* Stipulates the policies on water management, permitting, dispute resolution, usage planning and cadaster. It promotes rational use and protection of water resources exercised by all beneficiaries and defines the types of water use rights, authority and roles of regional and local governments for water allocations among various users, collection of fees, water use planning, water use rights and dispute resolution. The Code delegates Water User Associations to operate and maintain on-farm irrigation and drainage infrastructure.

19. *Land Code.* The current Land Code (1992) defines the types of land use rights, the authority and the role of regional and local governments for land allocation, collection of land taxes, land use planning, land use right mortgaging and settlement of land disputes. It defines the rights of

land users and lease holders, and also defines the use of a special land fund for the purpose of land privatization and farm restructuring. The Code regulates land relations and it is directed at the rational “use and protection of land and fertility of the soil...” The land may be used in a rational manner only and the Code allows local authorities to decide what constitutes “rational” land use. It includes also mechanisms that make it possible to take the land-use permit away from farmers, including in situations where land use causes land degradation.

20. *EA laws and regulations.* There are two laws in the country that stipulate all aspects of the EA: (a) Law on Environment Protection; and (b) Law on Ecological Expertise. The Chapter V, Articles 35-39 of the Law on Environment Protection (2012), introduces the concept of state ecological review (literally, state ecological “expertise” – SEE) which seeks to examine the compliance of proposed activities and projects with the requirements of environmental legislation and standards and ecological security of the society. The mentioned laws stipulate the mandatory cross-sectoral nature of SEE, which shall be scientifically justified, comprehensive, and objective and which shall lead to conclusions in accordance with the law. SEE precedes decision-making about activities that may have a negative impact on the environment. Financing of programs and projects is allowed only after a positive SEE finding, or conclusion, has been issued. The following activities and projects subject to state ecological review: a) draft state programs, pre-planning, pre-project, and design documentation for economic development; b) regional and sectoral development programs; c) spatial and urban planning, development, and design; d) environmental programs and projects; e) construction and reconstruction of various types of facilities irrespective of their ownership; f) draft environmental quality standards and other normative, technology, and methodological documentation that regulates economic activities; g) existing enterprises and economic entities, etc.

21. The laws stipulate that all types of economic and other activities shall be implemented in accordance with existing environmental standards and norms and shall have sufficient environmental protection and mitigation measures to prevent and avoid pollution and enhance environmental quality. The EA studies analyzing the short- and long-term environmental, genetic, economic, and demographic impacts and consequences shall be evaluated prior to making decisions on the sitting, construction, or reconstruction of facilities, irrespective of their ownership. If these requirements are violated, construction will be terminated until necessary improvements are made, as prescribed by the Committee for Environmental Protection and/or other duly authorized control bodies, such as sanitary, geological, and public safety agencies. An Environmental Impact Assessment (EIA) study is a component of the State Ecological Expertise, as set out in the 2011 amendments to the Environmental Protection Law and in the Law on the State Ecological Expertise (2012). The EIA is the responsibility of the project proponent. The State Ecological Expertise for all investment projects is the responsibility of the Committee for Environmental Protection under the Government of Tajikistan (CEP) and its regional offices. Furthermore, according to the 2012 Law on the State Ecological Expertise, all civil works, including rehabilitation, should be assessed for their environmental impacts and the proposed mitigation measures reviewed and monitored by the CEP.

22. The legal and regulatory system for the EIAs also include:

- Procedure of Environmental Impact Assessment (adopted by the Resolution of the Government of the Republic of Tajikistan No. 509 as of 01.08.2014).

- Procedure to implement State Ecological Expertise (approved by the Resolution of the Government of the Republic of Tajikistan No. 697 as of December 3, 2012).
- Guidelines on the composition and order of development of content and structure of the documentation to be submitted for review (SEE), as well as coordination and approval of all projected budget or investment estimations, design drawings or documentation that must be developed in coordination with the SEE, buildings and structures and EIA chapters, Strategic Environmental Assessment SEA and feasibility documents; and
- List of objects and types of activity for which preparation of documentation on Environment Impact Assessment is mandatory (adopted by the Resolution of the Government of the Republic of Tajikistan No. 253 as of June 3, 2013).

23. The elaborated existing normative legal base is intended for determination of legal basis for implementation of projects and their compliance with state requirements for environmental protection and mitigation of environmental impact. In accordance with national regulations the projects involving only rehabilitation of on farm irrigation infrastructure are not subject to State Ecological Expertise.

24. *International environmental treaties to which Tajikistan is a party.* Tajikistan became party to a series of international treaties and in particular:

- Vienna Convention for the Protection of the Ozone Layer, 1996 and updated by:
 - Protocol on Substances that Deplete the Ozone Layer (Montreal), 1998;
 - London Amendments to Montreal Protocol on Ozone Depleting Substances, 1998;
 - Copenhagen Amendments to Montreal Protocol on Ozone Depleting Substances, 2009;
 - Montreal Amendments to Montreal Protocol on Ozone Depleting Substances, 2009;
 - Beijing Amendments to Montreal Protocol on Ozone Depleting Substances, 2009.
- UN Convention to Combat Desertification (CCD), 1997.
- UN Convention on Biological Diversity (CBD), 1997; Related updates to CBD are:
 - Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2004.
 - Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, signed in 2011 and ratified in 2013.
- Ramsar Convention (joined 2000);
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (joined 2001); A related update is:
 - Bukhara Deer Memorandum, 2002.
- UN Framework Convention on Climate Change, 1998; A related update is:
 - Kyoto Protocol, accessed on December 29, 2008, and entered into force on March 29, 2009.
- Stockholm Convention on Persistent Organic Pollutants (ratified 2007); Related updates:
 - 2009 amendments listing 9 new POPs, August 26, 2010;
 - 2011 amendment listing endosulfan, October 27, 2012; and
 - 2013 amendment listing HBCD, November 26, 2014.
- Aarhus Convention (joined 2001); A related update is:

○ Kiev Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, on May 21, 2003.

• Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 2016.

• UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage (joined 1992).

25. Taking into consideration international treaties have the superiority under the national legislation, mentioned above Conventions constitute also a legal basis in the relevant areas of environmental protection in the country.

26. *EA administrative framework.* The Environmental Protection Law states that a SEE should be conducted by the Committee for Environment protection, which is designated as a duly authorized state environmental protection body. A small unit in the Committee is entrusted with guiding and managing both EIA and SEE. EIA preparation is the responsibility of the proponents of public- and private-sector projects, who, in addition to complying with various environmental standards, procedures, and norms, shall meet the standards of other sectors and environmental media line agencies, such as sanitary-epidemiological, geological, water, etc.

27. *Public participation.* Article 12 of the Environment Protection Law proclaims the right of citizens to live in a favorable environment and to be protected from negative environmental impacts. Citizens also have the right to environmental information (Article 13), as well as to participate in developing, adopting, and implementing decisions related to environmental impacts (Article 13). The latter is assured by public discussion of drafts of environmentally important decisions and public ecological reviews. Public representative bodies have an obligation to take into consideration citizens' comments and suggestions. The Law on the EE also provides the rights to the citizens to conduct a Public Environmental Expertise (art. 7). On 17 July 2001 Tajikistan acceded to the 1998 Aarhus Convention, the provisions of which have priority over domestic law that also stipulates the rights for Public EE.

In accordance with national regulations public participation is not mandatory but rather an opportunity for interested parties in EA decision making process and only in the case of projects with significant environmental impacts which require a full EIA study. In the case of small scale activities as it is the proposed project public participation is not required.

28. *Implementation and compliance.* A number of legal acts establish liability for violations of environmental laws, which can be enforced by several State bodies. In particular, the 1998 Code of Administrative Violations establishes administrative liability for organizations, their officers and individuals for a range of violations, from the careless treatment of land to violation of the rules for water use or water protection or failure to comply with a State ecological expertise. The most common administrative sanction is a fine of up to 10 minimal monthly salaries for individuals and up to 15 minimal salaries to officers of organizations. The 1998 Criminal Code covers crimes against ecological safety and the environment, such as violations of ecological safety at work, poaching, and spoiling land, violation of rules for the protection and use of underground resources. The maximum fine is up to 2,000 minimal monthly salaries and the maximum sentence is up to eight years in prison. The EA enforcement and compliance are the main responsibility of Environmental Inspectors of the State Committee for Environment.

World Bank Environmental Assessment Requirements

29. *Overview.* The World Bank requires environmental assessment (EA) of projects proposed for financing to help ensure that they are environmentally sound and sustainable, and thus improve decision making (OP 4.01, January 1999). EA is a process whose breadth, depth, and type of analysis depend on the nature, scale, and potential environmental impact of the proposed project. EA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; identifies ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation. The Bank favors preventive measures over mitigatory or compensatory measures, whenever feasible.

30. *Main aspects of the project EA.* EA takes into account the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and cultural property); and trans-boundary and global environmental aspects. It also takes into account the variations in project and country conditions; the findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements. The Bank does not finance project activities that would contravene such country obligations, as identified during the EA.

31. *Project environmental categories.* The Bank classifies the proposed projects into one of four environmental categories, depending on the type, location, sensitivity and scale of the project and the nature and magnitude of its potential environmental impacts. The four EA Categories are A, B, C, and FI. *Category A projects* is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may be sensitive, irreversible, and diverse, with attributes such direct pollutant discharges large enough to cause degradation of air, water, or soil; large-scale physical disturbances of the site and/or surroundings; extraction, consumption, or conversion of substantial amounts of forest and other natural resources; measurable modifications of hydrological cycles; hazardous materials in more than incidental quantities; and involuntary displacement of people and other significant social disturbances. The impacts are likely to be comprehensive, broad, sector-wide, or precedent-setting.

Category B projects has potential adverse environmental impacts on human populations or environmentally important areas - including wetlands, forests, grasslands, and other natural habitats - which are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects.

Category C. An EIA or environmental analysis is normally not required for Category C projects because the project is unlikely to have adverse impacts; normally, they have negligible or minimal direct disturbances on the physical setting.

Category FI is applied to all proposed projects that involve investment of Bank funds through a participating financial intermediary (PFI) to be used for sub-projects of which the environmental impacts cannot be determined during appraisal of the World Bank project.

32. *World Bank's Safeguard Policies and their relevance to project.* There are key 10 Environmental and Social World Bank Safeguard Policies which are intended to ensure that potentially adverse environmental and social consequences of projects financed by Bank are identified, minimized and mitigated. World Bank Safeguard Policies have a three-part format: Operational Policies (OP) - statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank, Bank Procedures (BP) - mandatory procedures to be followed by the Borrower and the Bank, and Good Practice (GP) - non-mandatory advisory material. World Bank's Safeguard Policies and their relevance to sub-projects to be funded under the Competiveness Enhancement Project's New Credit Line Component are indicated in the *Table 2* below.

Table 2. World Bank's Safeguard Policies and their relevance to the project

Safeguard Policies	Relevance
<i>Environmental Assessment (OP/BP 4.01)</i> This Policy aims to ensure that projects proposed for Bank financing are environmentally and socially sound and sustainable; to inform decision makers of the nature of environmental and social risks; To increase transparency and participation of stakeholders in the decision-making process	Yes (refer to the description below)
<i>Natural Habitats (OP/BP 4.04)</i> This Policy aims to safeguard natural habitats and their biodiversity; avoid significant conversion or degradation of critical natural habitats, and to ensure sustainability of services and products which natural habitats provide to human society	No – as the project will only deal with the rehabilitation of existing irrigation infrastructure there will be no important wildlife and wildlife habitats in the vicinity of the project activities
<i>Forestry (OP/BP 4.36)</i> This Policy is to ensure that forests are managed in a sustainable manner; significant areas of forest are not encroached upon; the rights of communities to use their traditional forest areas in a sustainable manner are not compromised	No (it is expected no sub projects that might trigger this policy will be supported)
<i>Pest Management (OP 4.09).</i> This policy is to ensure pest management activities follow an Integrated Pest Management (IPM) approach, to minimize environmental and health hazards due to pesticide use, and to contribute to developing national capacity to implement IPM, and to regulate and monitor the distribution and use of pesticides	No (as the project will not support any activities which directly or indirectly will lead to purchasing and/or pesticides usage).
<i>Physical Cultural Resources (OP/BP 4.11)</i> This policy is to ensure that: Physical Cultural Resources (PCR) are identified and protected in World Bank financed projects; national laws governing the protection of physical cultural property are complied with; PCR includes archaeological and historical sites, historic urban areas, sacred sites, graveyards, burial sites, unique natural values; implemented as an element of the Environmental Assessment	No (it is expected there will be no physical cultural resources in the vicinity of the project sites)
<i>Indigenous Peoples (OP/BP 4.10)</i> IP – distinct, vulnerable, social and cultural group attached to geographically distinct habitats or historical territories, with	No (this Policy is not applicable for Tajikistan).

separate culture than the project area, and usually different language. The Policy aims to foster full respect for human rights, economies, and cultures of IP, and to avoid adverse effects on IP during the project development.	
<i>Involuntary Resettlement (OP/BP 4.12)</i> This policy aims to minimize displacement; treat resettlement as a development program; provide affected people with opportunities for participation; assist displaced persons in their efforts to improve their incomes and standards of living, or at least to restore them; assist displaced people regardless of legality of tenure; pay compensation for affected assets at replacement cost; the OP Annexes include descriptions of Resettlement Plans and Resettlement Policy Frameworks	No (the project will support only rehabilitation of the on farm irrigation infrastructure, rehabilitation of pumping stations when land acquisition is not necessary and there are no any resettlement issues. Secondly, the site assessment shows there is no need for cutting of fruit trees along the irrigation/drainage canals which might cause of potential loss of revenues for their owners).
<i>Safety of Dams (OP/BP 4.37)</i> This Policy is to ensure due consideration is given to the safety of dams in projects involving construction of new dams, or that may be affected by the safety or performance of an existing dam or dams under construction; important considerations are dam height & reservoir capacity	No (the project will not support any activities which might have impact on dams safety)
<i>Projects on International Waterways (OP/BP 7.50)</i> The Policy aims to ensure that projects will neither affect the efficient utilization and protection of international waterways, nor adversely affect relations between the Bank and its Borrowers and between riparian states	Yes (Although the project implementation would improve the transboundary water resources use and quality, per stipulations of the Bank OP/BP 7.50, the project triggers Operational Policies on International Waterways. Since the proposed works will involve rehabilitation and improvement of existing irrigation and drainage systems and no new schemes will be developed, the project team has obtained an exemption from the Bank)
<i>Disputed Areas (OP/BP 7.60)</i> The Bank may support a project in a disputed area if governments concerned agree that, pending the settlement of the dispute, the project proposed for one country should go forward without prejudice to the claims of the other country	No (the project will not support any activities in disputed areas)
<i>Disclosure Policy (BP 17.50)</i> supports decision making by the borrower and Bank by allowing the public access to information on environmental and social aspects of projects and has specific requirements for disclosure	Yes (the EMP will be disclosed and consulted in the country before appraisal and will be also disclosed on the WB website)

33. *Assigned project category.* The Project has been assigned World Bank environmental category B, since it involves moderate indirect environmental impacts that can be managed during implementation of the project. The EA process for the project is addressed through this EMP. Key considerations and methodology are taken into account during the EA process includes: (a) Compliance with existing environmental regulations in Tajikistan; (b) Taking into consideration the economic and social evaluations (in the light of their linkage to the environmental concerns); (c) Analysis of significant expected impacts, balancing positive and negative effects and assessment of realistic alternatives; (d) Public participation and consultation with affected people, organizations and stakeholders; and, (e) Disclosure of EA information.

Baseline Environmental Analysis

34. *Project geographic location.* The project will be implemented in 5 selected districts of Sughd region, one of the four administrative divisions of Tajikistan. The region is located in the northwest of the country, with an area of some 25,400 square kilometers and shares a border with the Jizakh, Namangan, Samarkand and Fergana provinces of Uzbekistan, and the Osh and Batken regions of Kyrgyzstan. The Syr Darya River flows through it. Sughd is separated from the rest of Tajikistan by the Gissar Range. The southern part of the province is the east-west valley of the upper Zarafshon River. North, over the Turkestan Range, is the Ferghana Valley. The province has 30% of Tajikistan's population and one-third of its arable land.

35. Three project districts – Ayni, Kuhistoni Mastchoh and Panjakent are the southern districts of Sughd and belong to the Zarafshon sub-basin, the other ones – Devashtich (Gonchi) and Shahrison – are more centrally located in the region and belong to Syrdaryo basin. The agro-climatic areas here are characterized by insufficient moisture and warm (typical for Panjakent and Ayni) and relatively low humidity and moderate heat, typical for Shahrison. Climate is dry, with hot dry summers and cool winters. The cold period lasts 110-190 days, the warm period – 260-140 days. Due to deforestation, improper irrigation and excessive use of agricultural lands combined with unregulated chemical inputs the region's land resources are affected by salinization, wind/water erosion and water logging. Most of the irrigation and drainage infrastructure is in danger of collapse. The selected districts are located in Zarafshon sub-basin and Syrdaryo basin. The amount of annual precipitation varies from about 200 to 700 mm per year. Average air temperature in July is + 16-18⁰C, and -9...-5⁰C in January. The climate in the near Syrdaryo and Istravshan-Isfara areas is continental, relatively dry; the annual average precipitation varying from 300 to 350 mm. The vegetation is represented by mountain forests and light forests, mountain-steppes, tugais, and semideserts. The animal world is rich in birds, reptiles, and mammals. The Zarafshon glaciation knot is located in the high-mountain area of the region. There are numerous dam lakes, the largest of which are Iskanderkul and Kulikalon. The vegetation is dominated by juniper forests and light forests, high-grass semisavannas, and mountain steppes. The animal world mainly consists of high-mountain steppe species – snow leopard (*Uncia uncia*), Siberian ibex (*Capra sibirica*), wild boar (*Sus scrofa*), marmot (*Marmota*), and birds.

36. *Population and socio-economic conditions.* Sughd region has a population of 2,455 thousand people⁵, or about 30% of Tajikistan's population (status for 1st January of 2015). The vast majority of its residents - 1848,3 thousand people - live in rural areas and about 607,2 thousand (24,7%) are urban settlers. Cultivated land of Sughd region is up to 286.4 thousand ha, which is equivalent to 38% of the cultivated land in Tajikistan. The region's industry is presented by 459 enterprises. There are such important objects in Sughd as uranium deposit, reservoir, textile enterprise Spitamen, gold mining plant, Konimansur. The district's production ratio is 31.5% of the total industrial production of the republic. The main socio-economic characteristics of the project districts are shown in *Table 3* below.

Table 3. Statistics data on some socio-economic aspects of the project districts

Districts				Panjakent	Ayni	Mastchoi Kuhi	Devashtich /Gonchi	Shahrison
Item, unit								
Total	Arable	Land	Area	33,386	3,211	2,783	38,466	15,710

⁵ Source: http://stat.tj/en/img/65a709121baf8a64bf15d33f398aafde_1435737014.pdf

Reported, ha					
Total Irrigated Arable Land Area, ha	19,875	2,927	2,637	14,645	5,568
Irrigated Arable Land under Dehkan farms, ha	11,123	1,130	2,151	11,818	3,808
Population, thousand people	278.8	78.8	23.8	159.7	38.2
Number of jamoats	14	7	2	8	2
Number of dehkan farms	4,720	1,006	814	1,771	2,073

Source: District level data, 2016

37. *Land resources and land use.* Total area of Sughd region is 25,2 thousand km². Fully 44% of the rice harvest comes from Zarafshon and Fergana valleys in Sughd. The region is endowed with 38 % of irrigated lands in the country and, together with the Khatlon region, they account for 83 percent of all irrigated lands in Tajikistan. The north of the country produces apricots, pears, plums, apples, cherries, pomegranates, figs, and nuts. Grown crops include mainly grains, wheat, barley, maize, rice, beans, potato, vegetables, fruits, grapes, fodder etc. Livestock is prevalent throughout the area, in the form of ruminants (mostly cows, yaks, goat and sheep) and small-scale poultry. There is no real fodder production, animals graze randomly along canals, roads, and meadows and live off crop residues in late fall/winter/early spring. Soils are presented mainly by grey-brown serozems (gray soils), brown-carbonate, and mountain steppe soils.

38. *Land degradation.* Soil erosion and landslides are significant problems in Tajikistan. Erosion is a widespread natural phenomenon due to the relief and climate of the country, but it is accelerated by poor land management practices, such as the cultivation of land on steep slopes; excessive cuttings of forests, shrubs and bushes including wind shelters; overgrazing; and improper irrigation. Deep erosion, reduction of forests area, biodiversity annihilation recorded particularly in Devashtich (Gonchi), Shahrison, Aini, and Panjakent districts. Economic losses are generated due to a reduction of water supply for both domestic and agricultural needs. Agriculture productivity declines due to swampy fields. Water distribution efficiency also drastically diminishes.

39. *Water resources.* The rivers of Tajikistan are important sources of fresh water for the Aral Sea. The glaciers and permanent snow feed the rivers of the Aral Sea basin with over 13 km³ of water a year. The major rivers of project area are the Syrdaryo (total length 2,400 km), which flows for 195 km across the Fergana Valley in the north, and the Zarafshon, which runs through central Tajikistan. Zarafshon River is used extensively for general economic development and irrigation purposes. The total length of river is 877 km., of which 310 km lie within Tajikistan's borders. The annual river runoff is more than five million m³ and the river basin covers 12,300 km². Tajikistan uses only about 8% of the river's discharge. Virtually all the remainder is used to irrigate more than 600,000 hectares in Uzbekistan. The Zarafshon River may contain mercury from gold processing. Overall, the surface water quality both in Syrdaryo and Zarafshon is affected both by point pollution of domestic or industrial origin as virtually no waste water is treated, and by diffuse pollution from agriculture⁶. The extent of irrigation waste pollution in Syrdaryo makes water from the river not suitable for drinking.

⁶ Source: Environmental Performance Review, Tajikistan. UN, 2004, 2013

40. *Environmental pollution.* Outside of the major environmental problems described above, the region suffers also from inadequate industrial and domestic solid waste collection and dumping infrastructure, and contaminated drinking water⁷. In general, chemical and bacteriological contamination is a serious problem across the region. Poor water quality for human consumption remains the major cause of periodic outburst of infectious diseases such as typhoid, malaria, hepatitis, and diphtheria across the region. Industrial environmental pollution is another major concern in the region since some of the biggest national industrial complexes are located in this region causing concerns in particular about collection and treatment of waste, including radioactive ones.

41. *Fertilizers and pesticide usage; pollution of drainage waters.* Before independence (1991), use of pesticides was rather intensive, with a mean annual application of 24.1 kg per ha, mostly on cotton fields. The highest levels of pesticide application have been recorded in Vakhsh Valley where it reached 48 kg per ha. But due to the collapse of the Soviet agriculture system and the civil war there was drastic reduction in the use of pesticides in Sughd oblast as in the entire country. Furthermore, there is a shortage of institutional capacity to collect and maintain statistics of pesticide use. The total mineralization on drainage waters was higher than MAC. In 2012 it was used 103,3 thousand tons of organic fertilizers and 13,6 thousand tons – mineral ones⁸.

Project Description

42. The project will strengthen water resource management and improve agriculture production in Zarafshon river basin and adjacent high potential agricultural areas in Syr-Daryo river basin. The project area is located in Sugd region (Province) of Tajikistan: Panjakent, Ayni, Mastchoi Kuhi, Devashtich (Gonchi) and Shahrison districts. The project area with a population of 580 thousand people and has an arable land area of approximately 90,000 ha. The area is characterized as rather dry climate with hot dry summers and cool winters. Zarafshon sub-basin is well suited to the introduction of IWRM as its hydrological boundaries coincide with the current administrative boundaries for water resource management. Selected, high agricultural potential areas in the adjacent districts of Devashtich, and Shahrison will also receive support to rehabilitate irrigation and drainage infrastructure, based on evaluations made during project design.

25. **Project objective.** The project development objectives are to strengthen the institutional base for irrigation planning and management in the Zarafshon river basin, and to improve the condition and management of irrigation and drainage infrastructure in the Zarafshon river basin and adjacent districts in the Syr-Darya basin.

26. **Project Beneficiaries will include:** River Basin management authorities, the Agency for Land Reclamation and Irrigation (ALRI), the Ministry of Energy and Water Resources (MEWR),

⁷ National Environmental Action Plan (NEAP) of the Republic of Tajikistan. Governmental Decision No. from June, 2006 Ibidem.

⁸ Data source: http://stat.tj/en/img/f0c2ee52c71ec4fe9e97ec83e578b4_1415164587.pdf (2014)

Water User Associations, agricultural producers (farmers and rural households) who benefit from improved access to irrigation water.

27. **Project description.** The project has three main components:

28. **Component 1: Rehabilitation of Irrigation Infrastructure (10.07 million Euro)**

29. **Subcomponent Ia: Public Works for Small Scale Irrigation Canal Rehabilitation (1.00 million Euro).** Low-income people from the project districts will be employed to manually clean badly deteriorated irrigation canals or repair flood damaged sections of irrigation canals in a public works program to provide temporary employment to food insecure households. In addition to wage payments to beneficiaries, project expenditure will cover contributions to beneficiary social security taxes, engineering design and supervision costs, social mobilization and labor force administration costs, goods and materials for small repair works where needed and the procurement of low-cost tools for manual labor. The design of this sub-component draws heavily on the experience of the successful public works program in the World Bank PAMP II project.

30. **Subcomponent Ib: Large scale Irrigation Rehabilitation (8.27 million Euro).** To facilitate full restoration of selected irrigation schemes the project will finance mechanized and other works for irrigation systems rehabilitation. These works will include: (i) mechanized earthworks for the cleaning and restoration of larger-sized irrigation canals, (ii) irrigation canal and water control structures repair and rehabilitation, (iii) the supply and installation of irrigation system water control gates, (iv) repair of irrigation pipelines and the supply and installation of corresponding control fixtures and fittings, (v) the rehabilitation of selected irrigation pump stations, including civil works and electro-mechanical equipment supply and installation, (vi) rehabilitation on a pilot basis of selected irrigation tube wells, including testing, cleaning and developing of existing vertical wells, and repair, supply and installation of corresponding electro-mechanical equipment, (vii) the supply and installation of flow measurement devices at key irrigation system water control and management locations, (viii) selected pumped-to-gravity irrigation system conversion and/or connection works (where feasible), (ix) feasibility and design studies for irrigation water flow capture improvement schemes and pumped-to-gravity irrigation system conversion schemes, and (x) engineering planning, design and supervision services for the above items as appropriate.

31. **Subcomponent Ic: Flood Emergency Works and Equipment (0.8 million Euro).** This subcomponent will support: (i) emergency repairs of flood-related damage to irrigation infrastructure systems that may occur during the project period, (ii) selective river bank protection works to restore and safeguard vulnerable high-value irrigated agriculture lands subject to flooding and erosion, (iii) the provision of appropriate machinery for both emergency repairs and routine maintenance of irrigation scheme and related flood protection infrastructure systems, with machinery management and usage by designated agencies to be initiated towards the end of the project period, and (iv) engineering planning, design and supervision services for the above items.

32. **Component II: Development and Strengthening of Irrigation Management Institutions (3.00 million Euro).** Three principles guide the design and implementation of Component II: (i) water management at all levels should be organized in accordance with hydrologic or hydraulic boundaries, (ii) a three-part management structure should be established to manage irrigation water in the basin, and (iii) the irrigation main system should be operated on a volumetric basis, to include measured deliveries to all WUAs. Subcomponents comprise the following.

33. **Subcomponent IIa: Irrigation Main System Management: Support for ALRI (1.2 million Euro).** Based on the new institutional framework for water resource management, the project will assist the government to transform regional ALRI units into lean and responsive service providers responsible for the sustainable management and maintenance of the main system irrigation infrastructure and for water delivery to WUAs.

34. Specifically, this subcomponent will: (i) delineate hydraulic boundaries and establish system-based service organizations in the project area where these are not already in place; (ii) conduct a functional analysis of ALRI operational, administrative and financial management practices, and design and introduce streamlined processes and supporting digital applications for these processes; (iii) install a radio communication system in Panjakent ALRI District where cell phone coverage is unreliable, (iv) design and install a networked information system in the Panjakent ALRI office, (v) introduce volume-based management of main system canal flows and water deliveries to WUAs, utilizing measuring devices installed under subcomponent Ib; (vi) orient and train ALRI staff to work effectively with WUAs; and (vii) carry out a GIS-based inventory of hydraulic infrastructure in target districts and establish an irrigation asset database to serve as a basis for sound facilities maintenance. This database will be linked with a hydraulic facilities database at the RBO level. The project will also assist ALRI in development of the formal web-site and an effective grievance redress mechanism for the sector.

35. The various activities supported under this sub-component will be allocated among target districts according to: (i) the irrigated area in the district, (ii) the extent of publicly-supplied canal water vis a vis that supplied by private wells, (iii) the size of the systems, and (iv) ALRI district preferences. Implementation will include the provision of goods, training, study tours and technical assistance.

36. **Subcomponent IIb: Local Level Irrigation System Management: Support for Water User Associations (1.00 million Euro).** Building on the lessons learnt from past experience with WUAs in Tajikistan, including the experience gained under PAMP II, the project will create and/or strengthen WUAs in selected project districts. The first step will be to ensure that existing WUAs are based on irrigation network hydraulic boundaries and to merge unviable WUAs into larger ones to achieve the economies of scale needed to ensure their financial viability. Larger WUAs, with a greater service area and more members, also provide a more efficient interface for ALRI to work with.

37. Subsequent tasks to be implemented under Subcomponent IIb include: (i) dividing WUAs into designated areas to ensure that Board Members know and represent all the farmers in their area and can speak for them at Board meetings; (ii) training WUA members in representative governance, as with a larger membership the WUA will shift to a Representative

Assembly system of governance; (iii) training Board Members in leadership and budget preparation; (iv) training WUA office staff in accounting, financial management, record-keeping and reporting; (v) providing technical assistance and training to improve system operational practices, including internal irrigation scheduling; (vi) working with ALRI staff to optimize the scheduling of irrigation water delivery; (vii) establishing water measurement systems, including joint measurement with ALRI staff of bulk water deliveries; (viii) training operational staff in asset inventory use and maintenance of irrigation infrastructure. These activities will be designed to empower final water users to participate in responsible water distribution and integrate their voice in development of water use plans. Female WUA membership will be encouraged through information and training programs tailored to the concerns of female headed households.

38. WUA staff will be trained to cost, manage and supervise maintenance works and to enter into and monitor water service contracts with ALRI. In addition, the project will also finance selective rehabilitation and office construction for WUAs that do not yet have them. For this purpose, sub-grants will be selected in accordance with the eligibility criteria and procedures set forth in the Project Operational Manual (POM); Sub-Grants will be made available to eligible WUAs for any given subproject under a Sub-Grant Agreement between the PMU and the respective eligible WUA under terms and conditions approved by the World bank, including those set forth in the POM. The project will also work to involve WUAs in all stages of infrastructure rehabilitation.

39. ***Subcomponent IIc: Renovation and Equipping of Ancillary Structures (0.80 million Euro)***. This subcomponent will renovate and equip selected government buildings and other ancillary structures in order to facilitate effective operation of the new institutional framework. Specifically, it will (i) renovate and equip part of an existing ALRI building to house the new Zarafshon RBO, (ii) renovate the remainder of the associated ALRI office, (iii) construct a new ALRI pump and motor repair workshop in Panjakent, (iv) improve and re-equip existing local ALRI workshops to upgrade their capacity for minor repairs to pumps, motors, and piping, as well as to secure their capabilities for adequate repair and maintenance of machinery to be procured under Subcomponent Ic; and (v) construct or rehabilitate selected WUA offices.

40. **Component III: Project Management (0.89 million Euro)**. The existing PMU, established under the World Bank-financed FVWRMP, will be the main implementation agency. It will be responsible for: implementation and coordination, financial management and procurement, communication and awareness programs, environmental management and safeguards, monitoring and evaluation, and reporting to the GoT, EU Rural Development Steering Committee and the World Bank. This component will also be responsible for the design, implementation, and analysis and reporting of the baseline and project completion surveys. The PMU will ensure that the communication and visibility measures required by the European Union are implemented.

Potential environmental and social impacts

43. *Positive impacts*. The project will bring a series of positive environmental and social impacts:

(a) *Improved Agricultural Productivity.* Agricultural productivity in the project area, as in the whole country has declined in recent years, in large part because of the significant deterioration of the irrigation and drainage systems. The direct results of this deterioration have been decreasing delivery of irrigation water, increasing water losses, decreasing fertility of soils, expanding areas of fallow agricultural land and rising groundwater levels. The infrastructure improvements planned under the project would restore and improve productivity by increasing delivery of irrigation water (reducing water losses), improving the fertility of soils and expanding the area of agricultural lands returned to production.

(b) *Increased Farm Income, Alleviation of Poverty.* The project activities will provide a series of economic and social benefits resulted from expected increases in crop yields, increases in farm family incomes, improved employment opportunities and an overall reduction in rural poverty in the project area.

(c) *Reduction in Water Losses.* Estimates are that significant amounts of the water currently entering the irrigation system are lost as a result of infiltration, evaporation and inefficient, non-rational use of water. These water losses from the system contribute to the high levels of groundwater, the salinity of the soils and the occurrence of waterlogging in low-lying areas. The irrigation and drainage improvements of the project would reduce these water losses, reduce seepage losses from irrigation canals and over-supply of irrigation, with a beneficial effect for the project area: a lower water table, a lower risk of salinity, and less stagnant water pools in the village causing health problems.

(d) *Improved Water Resources Management.* The project would also help improve water resources management. This will be done first of all through the TA component of the project. This component will finance preparation of a Water Basin Management System including: the delineation of water basins, an outline of new roles and responsibilities and the institutional infrastructure needed to manage these water basins. Secondly, drainage system improvements undertaken by the project should have positive impacts on the large areas of poorly drained agricultural land in the project area. Reducing soil salinity would lead to improved yields of most salt-sensitive crops, help prevent significant erosion and increase agricultural productivity.

44. Envisaged irrigation infrastructure improvement interventions, such as cleaning and restoration of deteriorated irrigation canals and water control structures, rehabilitation of selected irrigation pump stations, cleaning and developing of existing vertical wells, supply and installation of flow measurement devices at key irrigation system water control and management locations, selective river bank protection works, and others should increase efficiency of the irrigation system, thereby generating water savings and providing users with a reliable water supply. Further, the project aims to improve efficiency of water use and to substantially reduce technical losses and high water consumption rates. Water conservation will be also promoted through improved demand-management measures, i.e., use of the innovative water-saving technologies where relevant, such as installation water meters, use of drip-irrigation, adequate crop rotation schemes, etc.

45. The project interventions will not enlarge irrigation areas developed by previous provision of irrigation infrastructure and services, corresponding to the situation at the end of the Soviet era.

The estimated total project irrigation scheme area (34,300 Ha in total vs. 27,600 Ha of the currently irrigated project area) is completely within these project schemes. These are less than the originally developed irrigation areas due to the cumulative effects of damages and deterioration in the post-independence period. Project interventions both physical and operational are aimed at enabling restoration of proper irrigation facilities and practices over the full developed irrigation areas. Project interventions will be developed with the assumption that system capacities and water abstraction are restored up to a maximum of these original as-constructed and as-installed levels, as needed to adequately service the full developed irrigation areas. Peak capacities relate to maximum infrastructure flow capacities, and flows at that level occur annually only at times of peak requirements. Total annual withdrawals correspond to lower (average) flows and are normally quantified as volumes rather than flows. It is deduced that approximate tentative average values for this could be in the order of 7,000 m³/ha in current low efficiency conditions and 6,500 m³/ha in projected improved efficiency conditions under which non-beneficial evaporative losses are reduced.

46. The table below gives estimated total areas of the irrigation schemes designated for improvement through rehabilitation and restoration under the project. These project improvement areas correspond to developed irrigation areas, i.e. to areas developed by previous provision of irrigation infrastructure and services, corresponding to the situation at the end of the Soviet era. Also shown are the estimated total currently irrigated areas within these project schemes. These are less than the originally developed irrigation areas due to the cumulative effects of damages and deterioration in the post-independence period. Project interventions both physical and operational are aimed at enabling restoration of proper irrigation facilities and practices over the full developed irrigation areas.

River Basin	Total Project Irrigation Scheme Areas (ha)	Currently Irrigated Project Areas (ha)
Zarafshon / Amu Darya	24,500	18,300
Syr Darya	9,800	9,300
Total	34,300	27,600

47. Water abstraction estimations of as-constructed and as-installed total project irrigation scheme peak capacities for irrigation water withdrawals from river (gravity or pumped withdrawal) and aquifer (pumped withdrawal) systems are provided in the table below:

River Basin	Project Irrigation Scheme Peak Withdrawal Capacities (m ³ /s)	Type of Withdrawal (%) Gravity/Pumped
Zarafshon / Amu Darya	35	60/40
Syr Darya	15	80/20
Total	50	65/35

48. These values correspond to the approximate average as-designed peak water withdrawal requirement of about 1.4 L/s/ha applied to the developed project irrigation areas, as reflected by the irrigation infrastructure provisions in place and reviewed for the main project district

(Panjakent). Project interventions will be developed with the assumption that system capacities are restored up to a maximum of these original as-constructed and as-installed levels, as needed to adequately service the full developed irrigation areas.

49. Peak capacities relate to maximum infrastructure flow capacities, and flows at that level occur annually only at times of peak requirements. Total annual withdrawals correspond to lower (average) flows and are normally quantified as volumes rather than flows. Reliable records and/or estimations of current and/or projected annual withdrawal volumes are not presently at hand, but the following considerations could apply:

- For a closed hydraulic system (as is assumed to be the case here), net annual irrigation water abstractions will equal total withdrawal volumes supplied to irrigation networks less corresponding total disposal volumes returned via drainage networks. This net abstraction is equivalent to the total annual irrigation consumptive use volume lost to the system via net crop evapotranspiration and non-beneficial evaporative losses.

- It is deduced that approximate tentative average values for this could be in the order of (i) 7,000 m³/ha in current low efficiency conditions and (ii) 6,500 m³/ha in projected improved efficiency conditions under which non-beneficial evaporative losses are reduced.

50. Applying these values to the previously presented project scheme areas gives the following corresponding tentative net annual irrigation water abstraction estimates:

River Basin	Projected Net Annual Abstractions (Mm ³)	Current Net Annual Abstractions (Mm ³)
Zarafshon / Amu Darya	159	128
Syr Darya	64	65
Total	223	193

51. The information given above justifies that although the project triggers World Bank OP 7.50 on International Waterways, the proposed investments for the public works component are not expected to change the volume of extraction/discharge water or quality of water of the Zarafshon River and its tributaries, but rather will lead to more efficient irrigation and drainage. The project interventions are not expected to adversely affect water quality or quantity to downstream other riparian states. It is anticipated that the nature of the project activities (i) will not adversely change the quality or quantity of water flows to the other riparian; and (ii) will not be adversely affected by the other riparian possible water use. Project interventions and investments are for improvements through rehabilitation and restoration of irrigation schemes and services to their original status. They are not for expansion of irrigation development areas, nor for augmentation of provided flow withdrawal capacities, nor for potentially detrimental hydraulic or agricultural system enhancements. There are therefore no expected adverse changes to the quantity and quality of water flows to downstream riparian states.

52. *Adverse environmental impacts.* Potential negative impacts of the project would include: (i) soils pollution during channels rehabilitation activities, including dumping of excavated sediments and other materials from irrigation channels and drainage collectors as well as during the rehabilitation of pumping stations; (ii) increased surface water pollution; (iii) soil erosion

associated with the maintenance of existing practices of agricultural production; (iv) air pollution by dust and cement, as well as soil pollution by construction wastes due to improper activities for rehabilitation of concrete canals; (v) damage to trees or other vegetation along canals; (vi) occupational hazards during the rehabilitation of deep wells and pumping stations. As mentioned above, the rehabilitation of irrigation infrastructure activities will generally involve management of dredged sediment and construction debris but may also include (i) interference with access and movement; (ii) disturbance of agricultural activities resulting from access restriction, soil compaction, trenching; (iii) waste, noise, mud and dust at sites and on access roads.

53. *Potential Resettlement issues.* Based on the experience of the initial project it was concluded as the proposed activities will be implemented exclusively on the existing irrigation, drainage channels and pumping stations there will be no temporary or permanent loss of agricultural lands and/or involuntary resettlement. Furthermore, the conducted supervision of activities under the initial project show during the rehabilitation of on farm and drainage irrigation channels there were no tree cuttings. Per existing national Irrigation Schemes Regulation, the land strips along the canals are the alienation zones designed only for the irrigation operational works and no any other activities there are permitted, including no planting trees and bushes. Thus the project didn't affect fruit or other trees. As all conducted civil works were located within existing irrigation areas there were no impacts on protected areas, critical habitats or culturally or socially sensitive areas as well as on rare or endangered species.

Generic Environmental Management Plan

54. *Scope of GEMP.* Taking into account the proposed activities on all selected irrigation schemes are similar, for the purpose of EA of selected irrigation schemes and of pumping stations and flood channel repairing it is proposed to apply the updated Generic Environmental Management Plan that was prepared for the initial project. Based on the updated GEMP sites specific EMPs will be prepared, taking into account concrete conditions of the selected irrigation scheme of the drainage collector, as well as of pumping stations. The purpose of the GEMP is to identify potential environmental impacts of the project (both positive and negative), specifying appropriate preventive actions and mitigation measures (including appropriate monitoring scheme) to prevent, eliminate or minimize any anticipated adverse impacts on environment.

55. *Mitigation measures.* Table 4 present the summary of the main potential impacts on the environment and on the health of population, along with the proposed mitigation measures. The plan identifies these measures according to the phase of project implementation in which the potential impacts are likely to occur:

- the rehabilitation phase, which covers the actual civil works financed by the project in the irrigation and drainage systems and involves the immediate rehabilitation impacts and sediment/waste disposal impacts described in above; and
- the operational phase, which covers the rest of the project after actual rehabilitation works has been completed and involves the continuing and longer-term impacts on water and soil quality, biodiversity and habitat, and public health.

56. Most of stipulated measures are related to capacity building since most of the potential impacts are indirect and could be prevented and/or mitigated by strengthening institutional and human capacities, by applying best practices in rehabilitation/construction activities.

Table 4. Project activities, potential impacts and proposed mitigation measures

Phase	Issue	Preventive Action/ Mitigation Measure	Cost	Institutional Responsibility	Supervision
I. Construction/Rehabilitation					
a. Cleaning of on farm irrigation channels (secondary and tertiary)	Construction impacts Sediment management	Environmental covenants; Environmental Management Guidelines for workers; Collection of sediments, silts Appropriate disposal of the wastes and sediments	No additional costs	PMU, PCU Involved workers	PMU, PCU site inspections to ensure compliance
b. Cleaning of Drainage collectors (on-farm)	Dumping of excavated sediments from drainage canals; Damage to adjacent vegetation; Water pollution	Minimize damage to vegetative cover; Collection of sediments, silts Proper disposal of sediments;	No additional costs	Contractors	Site inspections
c. Rehabilitation of irrigation channels	Waste water discharges, Surface and ground water pollution Air emissions of dust and cement Noise Solid wastes Accidental spillages Occupational hazards	Wastewater, including those from aggregate processing and concrete batching, must not enter streams without settling ponds Dust from the handling or transporting of aggregates, cement, etc., should be minimized by sprinkling or other methods. Prevent air pollution by dust, emissions from transport vehicles; Limit construction activities in time (from 8 a.m. to 18 p.m.) Appropriate waste management during construction works; Prevention of spillage of contaminants, debris, or other pollutants, into streams or underground water resources. Such pollutants include untreated sewage and sanitary waste and petroleum products;	The costs will be covered by contractors	Contractors	Site inspections

		Apply good practices for occupational health and safety.			
d. Pumping stations and vertical drainage wells repairs	<p>Waste water discharges</p> <p>Air pollution with dust and cement</p> <p>Accidental spillage</p> <p>Noise</p> <p>Construction waste (asbestos slates, non-serviceable doors and windows, destroyed hydro-mechanical and electrical equipment, etc.)</p>	<p>Wastewater, including those from aggregate processing and concrete batching, must not enter streams without settling ponds; Sediment pools arrangement</p> <p>Dust from the handling or transporting of aggregates, cement, etc., should be minimized by watering appropriate sites, roads (during the transportation of materials) or other methods, if needed; Prevent air pollution by dust, emissions from transport vehicles;</p> <p>Appropriate waste management during construction works; Prevention of spillage of contaminants, debris, or other pollutants, into streams or underground water resources. Such pollutants include untreated sewage and sanitary waste and petroleum products;</p> <p>Adhere to the applicable IFC (2007) guidelines for asbestos-containing materials (ACM):⁹</p> <p>(i) ACM will not be used as a new material in rehabilitation works or new buildings. (ii) Existing asbestos-cement roofing sheets will be removed and disposed of following the internationally-recognized <i>Standard Practice for Maintenance, Renovation and Repair of Installed</i></p>	The costs will be covered by contractors - to be included in the Project Costs	Contractors	PMU Site inspections

⁹ International Finance Corporation. Environmental, Health, and Safety Guidelines, 2007. http://www1.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/sustainability+framework/environmental%2C+health%2C+and+safety+guidelines/ehsguidelines

		<p><i>Asbestos Cement Products</i> (American Society for Testing and Materials [ASTM] E 2394).¹⁰</p> <p>(iii) Timely disposal of construction waste</p> <p>Identify landfill area in coordination with environmental departments</p> <p>Limitation of works time</p> <p>Apply good practices for occupational health and safety, including regular training, orientation and instructions.</p>			
II. Operation					
<i>Irrigation schemes</i>	<p>Water pollution from drainage from saline soils</p> <p>Agrochemical contamination</p> <p>Surface soil loss, Salinization</p> <p>Water logging from poor drainage</p> <p>Water pollution</p> <p>Disturbance of aquatic ecosystems</p> <p>Soil erosion, runoff and sedimentation</p>	<p>Training in improved water and soil management practices</p> <p>Proper practices</p> <p>Environmental studies, information dissemination,</p> <p>Information dissemination, small-scale investments</p> <p>Trainings on soil conservation</p>	<p>To be covered by ALRI PMU and Water Users Associations</p>	<p>ALRI PMU</p>	<p>Environmental Protection Committee site inspections</p>

¹⁰ ASTM International. ASTM E2394-11, Standard Practice for Maintenance, Renovation and Repair of Installed Asbestos Cement Products. West Conshohocken, PA, 2011. <http://www.astm.org/Standards/E2394.htm>. This standard describes work practices that protect worker and community health within the resources available in developing and industrialized countries. As much as possible it relies on readily-available tools, equipment, and supplies, and techniques that require careful and diligent workmanship but not the services of highly-skilled tradesmen. The standard is written for construction workers and tradesmen, for those involved in the preparation of contracts and tenders, and for government officials involved in developing regulations to protect worker and community health.

57. *Recommended Preventive Actions and Mitigation Measures during rehabilitation phase.* The GEMP recommends a combination of preventive actions to minimize potential project impacts. First, all contracts should have standard environmental, health and safety covenants required by Tajikistan legislation and World Bank procedures. These covenants will be based on the stipulations of the table above with the proposed mitigation measures and will be formulated by the PMU Environmental Specialist. Second, all contractors will need to follow environmental requirements stipulated in the EMP. Third, EMP information dissemination and training for contractors should be a condition of all contracts.

58. *Environmental requirements during Operation and Maintenance Phase.* During this phase, the potential negative impacts due to project activities will come also from civil works to be executed as part of the regular maintenance of the scheme. In order to minimize potential O&M-related negative environmental impacts, the preventive measures specified in the GEMP should be followed, and then the monitoring activities should be followed, that also should be part of the contract documents.

59. *Information dissemination and training activities.* The GEMP recommends preventive actions rather than mitigation measures to address these potential sources of water pollution. In this regard it is important to ensure that farmers in the project area receive information and training, on proper irrigation and agricultural practices in order to minimize impacts of drainage from saline soils, on proper management and disposal of sediments, fuels and wastes generated at concrete rehabilitation sites.

Environmental Monitoring and Reporting

49. *Generic Monitoring Plan.* Environmental monitoring during the project implementation, which is to be performed by the PMU, has to provide information about key environmental aspects of the subprojects, particularly the project environmental impacts and the effectiveness of taken mitigation measures. Such information enables to evaluate the success of mitigation as part of project supervision, and allows corrective action(s) to be implemented, when needed. In this regard the GEMP identifies monitoring objectives and specifies the type of monitoring, and their link to impacts and mitigation measures. Specifically, the monitoring section of the EMP provides: (a) a specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements; and, (b) monitoring and reporting procedures to: (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation. A Generic Monitoring Plan is presented in the *Table 5*.

Table 5. Generic Monitoring plan

A) Environmental monitoring Plan – main requirements

PRE-CONSTRUCTION PERIOD				
Monitoring Aspect	Monitoring Activity / Details / Outputs	Timing	Executing Unit	Reporting Responsibility
Bid documents	Confirm that bid documents contain environmental clauses tailored to the project conditions as well as this EMP	Preparing the bid documents	PMU	PMU
Initial Environmental Examination	Confirm that the IEE covers all the ISs, DCs, pump stations and vertical drainage wells	Project implementation	Environmental consultant	PMU
Site specific EMP (SSEMP)	Confirm that contractors prepared and submitted for approval the SSEMP	At least 10 days before taking possession of any work site	Contractor	Environmental consultant / PMU

CONSTRUCTION PERIOD				
Monitoring Aspect	Monitoring Activity / Details / Outputs	Timing	Executing Unit	Reporting Responsibility
Noise	Ensure that maximum and equivalent noise levels on the sites are in compliance with the Sanitary Norms and Rules. Ensure that there is no complaints about noise levels	During project implementation	Contractor PMU/Env consultant	Contractor
Dust and VOC	Ensure that air quality on the sites is in compliance with the Sanitary Norms and Rules (weekly instrumental measurements). Ensure that there is no complaints about dust/VOC and other pollutants	During project implementation	Contractor PMU/Env consultant	Contractor
Construction waste	Confirm that solid construction waste is regularly transferred to approved disposal sites.	During project implementation	Contractor PMU/Env consultant	Contractor
ACM	Ensure that Standard Practice for Maintenance, Renovation and Repair of Installed Asbestos Cement Products is used during removal and disposal of asbestos – concrete roofing.	During project implementation	Contractor PMU/Env consultant	Contractor
Old equipment	Ensure that metal scrap to be sent to collection stations	During project implementation	PMU/Env consultant	ALRI regional departments

B) Environmental monitoring plan – per project activities and parameters

Project activities	Parameter	Location	Method/ Equipment	Frequency	Purpose	Cost	Responsibility
I. Construction/Rehabilitation							
a. Cleaning of On farm irrigation channels	EMP environmental requirements Sediments and Wastes disposal	Rehabilitation sites	Visual Site inspections	Once during and once upon completion	Ensure compliance	Covered by PMU	PMU
b. Cleaning of Drainage collectors	EMP environmental requirements Sediments and Wastes disposal; Impacts on vegetative cover.	Rehabilitation sites	Visual Field investigations; Ecological Inspection Environmental enforcement and compliance reports; MoH data;	Once at beginning of construction	Determine quality for sediment management and minimization of vegetative cover impacts	Covered by PMU	PMU; CEP
c. Rehabilitation of Irrigation channels	Waste generation and management (m ³); Dust; Noise; Spillages; Accidents. Dust	Rehabilitation sites	Visual inspections; Ecological Inspection Environmental enforcement and compliance reports; MoH data; Contractors records on implemented civil works.	Once a month and at the completion of works	Determine fulfillment of environmental requirements during civil works in terms of prevention of air pollution; solid waste management and occupational hazards	Covered by contractors	PMU; CEP

d. Rehabilitation of Pumping stations and deep wells	Waste generation and management (m ³); Dust; Noise; Spillages; Accidents. Dust	Rehabilitation sites	Visual inspections; Ecological Inspection Environmental enforcement and compliance reports; MoH data; Contractors records on implemented civil works	Once a month and at the completion of works	Determine fulfillment of environmental requirements during civil works in terms of prevention of air pollution; solid waste management and occupational hazards	Covered by contractors	PMU; CEP
II. Operation							
Irrigation schemes and drainage canals	Soil salinity and humus content Groundwater levels Public health statistics	Rehabilitated on farm and drainage canals	Soil sampling/ analysis Water gauge measurement Review of public health Reports	Semi-annually	Determine any improvements in soil quality Determine water levels Monitor public Health	Covered by CEP; WRMD MOH	CEP; WRMD MOH

50. *Monitoring responsibilities.* The PMU should conduct site inspections prior to, during and upon completion of rehabilitation activities to ensure full compliance with the contract conditions and the EMP. Final payment to the contractor should be contingent on the final inspection, with particular attention to the requirement to restore the site to its original condition upon completion of rehabilitation activities. The environmental monitoring of the rehabilitation sites will include regular observations of soil and water and vegetation within and around the rehabilitation sites; the involvement of the environmental inspectors in monitoring and evaluation will help in developing systematic environmental monitoring on rehabilitated sites. In addition, in the project areas the PMU will be responsible for the environmental and social monitoring activities identified above as part of the preventive actions and mitigation measures proposed to address potential adverse impacts. This monitoring will be incorporated into the overall project monitoring plan required by the World Bank as part of project performance.

51. *Supervision.* The PMU will be responsible for monitoring proper implementation of the various preventive actions and mitigation measures (e.g. rehabilitation of natural sites) required by the EMPs. This will entail periodically making site visits to verify that the appropriate preventive actions and/or mitigation measures have been implemented. The PMU also will conduct random evaluations of project sites to determine the effectiveness of measures taken and the impacts of project activities on the surrounding environment. If approved, during the sub-project's operation phase, PMU, along with the rayon Ecological Inspector and other environmental agencies, when required, perform environmental supervision and monitoring to control compliance with agreed design and mitigation measures to ensure that it is in full compliance with the EMP. In the case of non-compliance, the PMU and Environmental Inspector investigate the nature and reason(s) for non-compliance, and a decision has to be made on what is needed to bring conducted activities into compliance, or whether financing should be suspended.

52. *Reporting.* The status of compliance with agreed environmental mitigation measures is to be reported by the PMU in their regular (semiannually) reports on project implementation. The results of project monitoring and supervision will be recorded and maintained by the PMU throughout the life of the project. The PMU will report the results of its monitoring program in the periodic progress reports it submits to the World Bank; Bank supervision missions will review the results of the monitoring program on a regular basis.

Adjusting GEMP to concrete selected irrigation scheme and preparing site specific EMPs

53. *Necessary steps in adjusting GEMP to selected irrigation schemes.* As mentioned above, after selection of concrete IS and preparing detailed technical design and before civil works will start, based on the GEMP there will be prepared a site specific EMP, taking into account should the concrete situation of one or another IS and/or DC. For that purpose, it is necessary to undertake the following:

Step 1: Sub-projects site assessment and screening. The PMU Environmental Specialist will conduct a site assessment which would include a description of the key environmental features of

the selected canals to be rehabilitated per attached Attachment 1 template, specifying whether critical natural habitats, forests, or rare and endangered species are likely to be impacted, whether major water courses or groundwater sources will be affected, the type of natural resource abstraction and use the project will entail, waste materials and polluting substances likely to be generated during construction and operation, etc. The attachment need also to specify if any of fruit trees will be affected and or any of private lands. Based on the site description the PMU will decide which IS and CDS might be or not included in the project.

Note: any IS and CDS which potentially can affect natural habitats and/or might generate resettlements issues (including those related to affecting the private fruit trees) will be not accepted to be financed under the project.

Step 2: Based on the field investigations and filled up template prepare a site specific EMP with mitigation measures and monitoring activities: The project beneficiaries will use these EMPs to guide sub projects mitigation and monitoring activities which should be included in the contract documents.

Step 3: Consultation. The PMU will organize a hearing for consultation and comment on the prepared site specific EMP by project-affected groups and local non-governmental organizations and take their views into account before taking a decision on its approval. The PMU provides relevant materials (process descriptions, the mitigation and monitoring table, maps, permits, etc.) to participants in the consultation in a timely manner and in a form and in Tajik language.

Step 4: Environmental Review and Approval: The prepared site specific EMPs will be initially consulted and approved by the PMU and Rayon Ecological Committee. In doing so, the PMU representatives and Environmental Inspectors will carry out trips to project site as necessary, review environmental aspects of proposed activities and assure appropriateness of the EMP, and supervise their implementation.

Step 5. Integration of the EMPs into project documents. As mentioned above, the GEMP provisions will become part of the bidding documents for rehabilitation works and of the contracts with winners, and the required mitigation measures would constitute an integral part of the subproject implementation. The GEMP provisions should be included in contracts for selected IS and pumping stations, both into specifications and bills of quantities and the Contractors will be required to include the cost in their financial bids. All contracts should have standard environmental, health and safety covenants required by Tajikistan legislation and World Bank procedures which need to follow environmental requirements stipulated in the GEMP. Furthermore, GEMP information dissemination and training for contractors should be a condition of all contracts. Among the most important provisions to be provided to the contractors (though there are others) are the following: provisions on spill prevention and cleanup, dust and noise control, traffic management during construction, construction site cleanup and rehabilitation; and worker health and safety. Furthermore, based on site inspections prior to, during and upon completion of rehabilitation activities the PMU will decide about the final payment to contractor. Final payment to the contractor should be contingent on the final inspection, with particular attention to the requirement to restore the site to its original condition upon completion of rehabilitation activities. All Sub-loan agreements must include a condition requiring the project beneficiary to implement the GEMP provisions.

Step 6: Supervision, Monitoring and Reporting: Once project implementation starts, the PMU environmental specialist, and rayon environmental inspectors will supervise the implementation of the project activities and mitigation measures through the course of rehabilitation and operation and specify corrective measures as necessary. The PMU will provide semiannually to the World Bank a summary of the sub-projects financed and their environmental impacts in order to assess and prevent any cumulative effects of similar investments. The PMU will make available to World Bank project supervision missions all environmental assessments documents prepared for selected irrigation schemes to be financed. The PMU will be responsible for supervision of proper implementation of the various preventive actions and mitigation measures (e.g. rehabilitation of natural sites) required by the GEMP. This will entail periodically making site visits to verify that the appropriate preventive actions and/or mitigation measures have been implemented. The PMU also will conduct random evaluations of project sites to determine the effectiveness of measures taken and the impacts of project activities on the surrounding environment. In the case of non-compliance, the PMU and Environmental Inspector investigate the nature and reason(s) for non-compliance, and a decision has to be made on what is needed to bring conducted activities into compliance, or whether financing should be suspended.

54. Preparing EMP Checklist for rehabilitation of pumping stations. As the project would involve typical small scale rehabilitation of pumping stations for the purpose of EA of these activities it will be used a generic EMP checklist-type format (“EMP Checklist”), developed by the World Bank to provide “pragmatic good practice” and designed to be user friendly and compatible with safeguard requirements. The checklist-type format attempts to cover typical preventive and mitigation approaches to common civil works contracts with temporary and localized impacts. This format provides the key elements of an Environmental Management Plan to meet Environmental Assessment requirements of the World Bank (under OP/BP/GP 4.01). The EMP Checklist document is presented in the Annex 2 and has three sections: (a) *Part 1* constitutes a descriptive part (“site passport”) that describes the project specifics in terms of physical location, the project description and list of permitting or notification procedures with reference to relevant regulations. Attachments for additional information can be supplemented if needed; (b) *Part 2* includes the environmental and social screening in a simple Yes/No EMS format; and (c) *Part 3* is a site-specific monitoring plan for activities carried out during the rehabilitation activities.

Stakeholders Analysis

55. Project Beneficiaries and involved parties. The project will be implemented in selected 5 districts of Sughd region. The main beneficiaries would be the rural population groups (vulnerable population, farmers and agriculture producers), the project will be also targeting the poor population residing in the project area. Currently, this population is estimated at 200 thousand people (Based on TLSS, 2009). The project also will involve in its implementation a large number of different stakeholders:

- *Oblast and raion khukumats* - local state administrations. The *khukumats* are headed by *Chairmans* who are appointed as local representatives of the President and serve to implement national policy and administer services and regulations on behalf of the state.

- *Jamoats* - de jure these institutions are established to exercise local self-government. The *jamoats* consist of small apparatus. The *jamoats* have no budgeting authority and virtually no independent responsibility for service delivery, though they are supposed to organize community-based delivery of certain basic public services. The local institutions of government in the project areas, the raion hukumates and the village *jamoats*, should benefit from and have an interest in the well-being of their communities.
- *Makhallas* - traditional organizational structures at the community level that gather and deal with social issues. Makhalla committees nowadays are established in each village.
- *Oblvodkhoz* and *raivodkhoz*es - local branches of the Agency for land reclamation and irrigation (ALRU). These branches are established in each administrative district following model that prevailed in the Soviet system and has been carried over to the new situation which characterized by “dual subordination” to both the central ministry and the district *khukumat*.
- *WUA, Water Users’ Associations* were established to improve the quality of water delivery and represent a group of farmers united for collective water management. The underlying institutional capacity of WUAs is inherently very weak. The WUAs are tightly controlled by local governments who view them as a vehicle for water use fee collection rather than as an agency for water delivery and water resource management. The primary institutional beneficiaries, and the means by which the project will reach the farmers, are the WUAs that will be established and strengthened under the project.
- *Local NGOs* will be actively involved in all farm and community-level activities to improve transparency, reduce reliance on local government and help build community capacity. Their involvement includes responsibility for community awareness programs, field-level monitoring and supervision of beneficiary selection and public works programs, and WUA capacity building.

56. *Agency for Land Reclamation and Irrigation (ALRI)* is responsible for the development and maintenance of irrigation canals, water reservoirs, pump stations, distribution of water among agricultural consumers, and collection of fees. It recently established to replace a former Ministry of Melioration and Water Resources, is a key agency responsible for operation of approximately 400 pump stations, with approximately 1,500 pumps, of which less than half are functional. Management at the system level is little changed from its pre-1990 configuration. ALRI management is still based on traditional administrative boundaries (oblast and rayon), is paper-based, relies on qualitative rather than quantitative information on water flows and water deliveries, and employs centrally-directed command and control practices.

8. ALRI units employ a grab-bag of financial management practices, which are often unlinked and unstandardized, making an accurate picture of system operating expenditures virtually impossible to obtain. Water measurement capabilities are extremely limited, and as a result, data-based management is little practiced. Finally, the political mandate to provide very expensive high-lift pumped water supplies to many areas puts the goal of self-financed irrigation services out of reach in many instances. The agency also establishes norms and limits for water consumers and monitors efficiency of water use; provides data on water consumption; issues “certificates” to individual irrigation, drainage, land-reclamation schemes and analyses data obtained in the process. The ALRI approves construction or rehabilitation of commercial projects that intend to use water in their production cycle. The agency's approval is also needed

for the construction or rehabilitation of any enterprise that uses water in its production cycle. Permits for the use of water for irrigation are issued to users (individuals and agricultural enterprises) by the ALRI rather than by the State Committee.

57. The Committee for Environment Protection. The Committee has an important role in decision making related to various environmental problems as unsustainable land use, deterioration of soil fertility, excessive use of water for irrigation, problems with water logging, and with obsolete/banned pesticides. As the central State executive body responsible for environmental protection, sustainable use of resources, forestry and hydrometeorology, among its most important functions are to: (a) Define the main strategies for the protection, study, conservation and sustainable use of natural resources, mitigation of the effects of climate change; (b) Prepare and publish biennial state-of-the environment reports; (c) Draft laws and other regulatory documents, including environmental standards, instructions and methodologies for the use of resources; (d) Issue individual permits for the use of specific resources and withdraw these if the user violates their terms; (e) Set quotas for the hunting and collection of certain species of animals and factories, as well as for the import of ozone-depleting substances; (f) Carry out ecological expertise of planned activities; (g) Define the system of specially protected territories and maintain State cadasters of such territories, forests, factories, water bodies and hazardous waste.

Implementation arrangements

58. EA roles and responsibilities. Overall responsibility for the proposed project will remain with the Agency for Land Reclamation and Irrigation (ALRI) and the Administration of Sughd Oblast. The Fergana Water Resource Management Project Management Unit (PMU) will be the leading operational institution for the implementation of the proposed project and carry out all project implementation in accordance with the Operations Manual (OM). The PMU also will ensure that the EMP provisions are fully integrated into implementation of the project, including monitoring and reporting required by the World Bank. Proper implementation of the EMP provisions and field monitoring are the main responsibilities of the CPU at the regional level. Contractors will be responsible for implementation of the rehabilitation works in accordance with environmental requirements specified in the bidding documents and the EMP. PMU will work closely with CEP in implementing the EMPs. The existing PMU has previous experience in dealing with safeguards issues as it implemented several WB including the first project. In addition to implementing the Fergana Valley Water Resource Management project and the original PAMP project, this PMU is now implementing the US \$57.9 million PAMP II project. It thus has considerable experience with the implementation of the activities in the proposed project and is working effectively, as shown by the satisfactory rating achieved during the most recent Supervision Mission in May 2015. The WB supervision missions show the EMPs implementation is at satisfactory level. The main safeguards responsibilities within the initial project were assigned to the PMU which conducted site inspections prior to, and during the rehabilitation activities to ensure compliance with the contract conditions and the EMP. The supervision and monitoring of proper implementation of the measures required by the EMP was the responsibility of the RPIU, - located on the project site. The RPIU conducted regular site visits to verify that the appropriate environmental preventive actions and/or mitigation measures have been implemented. Such environmental monitoring included observations of soil and water

within and around the rehabilitation sites as well as of potential impacts on vegetation and on workers safety. Furthermore, in these supervision and monitoring activities have been involved also the local Ecological Inspectors. The status of compliance with agreed environmental preventive and mitigation measures was periodically reported by the RPIU to the PMU which included them in their regular reports on project implementation.

59. *PMU's environmental responsibilities.* These responsibilities will include the following: The PMU through an Irrigation Engineer will assume responsibility for (a) the design and assessment of the physical works in accordance with Tajik environmental norms, regulations and requirements and (b) the physical implementation of the activities under the project. The PMU'S Irrigation Engineer will ensure that all preventive actions and mitigation measures identified by the EMPs are undertaken in a proper and timely manner and will take the necessary actions to monitor their effectiveness. The Irrigation Engineer will directly manage the information dissemination and training activities recommended by the GEMP, including scheduling training supervising completion of the special studies and managing efforts to raise public awareness.

60. *PMU's environmental responsibilities.* The PMU through its Environmental Specialist will ensure that for each selected ISs/DCs and pump stations and wells a site specific EMP is prepared per the stipulations presented above and that all mitigation measures and monitoring requirements are covered by financial plan for each sub-projects. The PMU will also: (a) implementation of mitigation measures stipulated in the EMP for each selected IS; (b) ensure implementation of the monitoring plan for each IS/DC/pump stations and wells, including establishing of baseline data and efficiency of mitigation measures. Furthermore, the PMU will: (a) prepare semi-annual reports on the progress of implementation of measures proposed by the EMP for selected ISs; (b) prepare semi-annual reports on the environmental impacts originated during implementation of IS/DC/pump stations and wells and analyze the efficiency of mitigation measures applied to minimize negative consequences; (c) prepare outline and requirements for Contractors reports regarding implementation of mitigation and environmental protection measures, Contractor's monitoring plan and to analyze offered reports; (d) present effects of mitigation and environmental protection measures applied in the course of rehabilitation activities for general public by means of specific publications or/and by annual public seminars.

Capacity building

61. *Proposed TA activities.* In order to ensure proper implementation of the various environmental activities (preventive actions/mitigation measures, monitoring and evaluation) recommended in the EMPs, the project will continue supporting the necessary institutional strengthening in Sughd Oblast CEP, existing local departments of Irrigation and Land Reclamation Agency and (possible future RBO) on environmental management. This institutional strengthening will comprise the delivery of training and development of essential public outreach and awareness campaigns.

62. *Training in environmental management issues.* A training program to develop and expand professional skills and capacity in environmental management issues for staff involved in project implementation will be organized under the project through the PMU. The training program will

reinforce existing capacity within the Sughd Oblast CEP (and district-level staff) by providing specialized training to enhance environmental assessment, management and monitoring skills and practices. The program will also provide environmental outreach and consultations with local population in order to improve the existing situation and to enable it to take full responsibility for keeping their irrigation networks in good condition long after rehabilitation. Trainees would be dehkans, specialists of the head-quarters and field offices of the CEP, ALRI, MEWR, MOA, Water User Associations (WUAs), if exist, and rayon officials.

63. *Public outreach campaign.* As the GEMP recommends preventive actions rather than mitigation measures to address these potential sources of water pollution, it is important to ensure that farmers in the project area receive information and training, on proper irrigation and agricultural practices in order to minimize impacts of drainage from saline soils, on proper management and disposal of sediments, fuels and wastes generated at concrete rehabilitation sites, and on safe pest management practices, including integrated pest management (IPM). Taking this into account the project will organize a community outreach and public awareness campaigns on water conservation and environmental management issues. A special attention will be also paid to labor safety measures in conducting civil works and in operating the rehabilitated irrigation schemes. In order to implement this project it will be necessary to attract not only state institutions but also hukumates, communities, jamoats, villages and individual households. The CEP has experience with such public awareness campaigns and appears willing to support project initiatives in this regard. Local environmental NGOs may also play a role in public awareness raising and will be considered in the development of local programs.

Budget

64. *Costs for TA activities.* The actual cost of implementing the EMPs was not estimated, provided all environmental requirements are incorporated into the project design and reflected in the works contracts then these costs would be borne by the contractors. No additional funding will be provided to ALRI and to State Ecological Inspectorate for monitoring compliance with agreed measures, enforcing laws, regulations and covenants; these costs would be borne by the institutions themselves. At the same time, as the EMP contains several TA activities, the project will provide special financing in this regard. In the *Table 6* below are presented estimated costs for the various activities under the TA program which will be built in the project budget.

Table 6. Budget estimates

Line item	Yr. 1	Yr. 2	Total
<i>1. Public awareness and information dissemination on sustainable water and land use</i>			
Public awareness program on water management to demonstrate modern irrigation and drainage technologies of on-farm water management	15000,00	15000,00	30000,00

Community program on sustainable land use practices, including information about full implications of mono-culture on soil fertility, land degradation and quality and quantity of crops	15000,00	15000,00	30000,00
2. Capacity building for Environmental management in implementing irrigation rehabilitation subprojects			
Trainings for the rayon inspectors on project environmental assessment and monitoring	6000,00	6000,00	12000,00
National workshop to review and exchange information on the environmental results of the project	3000,00	3000,00	6000,00
Grand total			78000,00

EA Disclosure and Public Consultation

65. *EA disclosure.* The PMU on September 26, 2016 has disseminated the draft summary EA report to different stakeholders for review and comment. On October 4-5, 2016 the PMU has publicly disseminated the 5-page announcement GEMP summary (with Annexes showing the Mitigation and Monitoring Plans) for public access in paper copies. The arrangements for an announcement regarding the availability of the GEMP summary, data of public consultation, contact information and where copies can be obtained, etc. had been done by the PMU. At the same time the GEMP summary and relevant annotation has been open for wide NGO community via website of Aarhus center of Tajikistan – www.aarhus.tj and via tajcnet@googlegroups.com network.

66. *EA Consultations.* The PMU organized and conducted a public briefing and consultation on the draft GEMP on October 4-5, 2016. The place, time and purpose of the consultation were announced one week in advance of the meeting. In addition to the public announcement of the meeting, invitations were sent to environmental and socio-agricultural NGOs, local representatives of the government bodies, such as CEP, MoA, MoH, MMWR, SCLA and others. There were presentations on GEMP issues which were discussed during the meeting. It was also noted that this draft GEMP document covered practically all potential impacts and possible mitigation measures. The draft document was revised after the meeting taking into account inputs from the consultation. The final version of the GEMP was made publicly available in Tajikistan in October 2016 and updated further in April 2017. The final GEMP was provided to the World Bank, and will be used by the government agencies in the implementation of the project.

ANNEXES

- Annex 1. Field site visit checklist for adjusting GEMP to selected IS
- Annex 2. EMP Checklist
- Annex 3. People met and consulted
- Annex 4. Minutes on the GEMP consultations

Annex 1. Field site visit checklist for adjusting GEMP to selected IS

Project Name: **Date/time of Visit:**

Irrigation Scheme: **Visitors:**

Current activity and site history

- Who is the site contact (name, position, contact information)?
- What is the area of the site to be used for project activities?
- What are current uses of the site?
- What were previous uses of the site (give dates if possible)?

Environmental Situation

- Are there sensitive sites nearby (nature reserves, cultural sites, and historical landmarks)?
- Are there water courses on the site?
- What is the terrain or slope?
- Does the site experience flooding, waterlogging or landslides? Are there signs of erosion?
- What are the neighbouring buildings (e.g. schools, dwellings, industries) and land uses? Estimate distances.
- Will the proposed site affect transportation or public utilities?

Licenses, Permits and Clearances

- Does the site require licenses or permits to operate the type of activity proposed? Are these available for inspection?
- What environmental or other (e.g., health, forestry) authorities have jurisdiction over the site?

Water Quality Issues

- Does the proposed activity use water for any purposes (give details and estimate quantity). What is the source?
- Will the proposed activity produce any effluent? (estimate quantity and identify discharge point);
- Is there a drainage system on site for surface waters or sewage? Is there a plan available of existing drainage or septic systems?
- How waste water is managed (surface water courses, dry wells, septic tanks)?

Soils

- What is the ground surface (agricultural land, pasture, etc.)?
- Will the project damage soils during construction or operations?
- Will the project affect the landscape significantly (draining wetlands, changing stream courses);

Biological environment

- Describe vegetation cover on the site.
- Is there information about rare or threatened flora and fauna at or near the site? If yes, would the project have an impact or increase risk to the species?
- Obtain a list of vertebrate fauna and common plants of the site (if available).
- Note potential negative impacts on biota if project proceeds.

Visual Inspection Procedures

- Try to obtain a site map or make a sketch to mark details.
- Take photos, if permitted.

- Walk over as much of the site as possible, including boundaries, to note adjacent activities.
- Note any odors, smoke or visual dust emissions, standing water, etc.

Resettlement issues

- Is there any fruit trees which will be affected during rehabilitation works?
- Explain if any of private land will be affected.

Annex 2. EMP Checklist

PART 1: INSTITUTIONAL & ADMINISTRATIVE				
Country				
Project title				
Scope of project and activity				
Institutional arrangements (Name and contacts)	WB (Project Team Leader)	Project Management	Local Counterpart and/or Recipient	
Implementation arrangements (Name and contacts)	Safeguard Supervision	Local Counterpart Supervision	Local Environmental Inspectorate Supervision	Contactor
SITE DESCRIPTION				
Name of site				
Describe site location	Attachment 1: Site Map <input type="checkbox"/> Y <input type="checkbox"/> N			
Who owns the land?				
Geographic description				
LEGISLATION				
Identify national & local legislation & permits that apply to project activity				
PUBLIC CONSULTATION				
Identify when / where the public consultation process took place				
INSTITUTIONAL CAPACITY BUILDING				
Will there be any capacity building?	<input type="checkbox"/> N or <input type="checkbox"/> Y if Yes, Attachment 2 includes the capacity building program			

PART 2: ENVIRONMENTAL /SOCIAL SCREENING				
Will the site activity include/involve any of the following:	Activity	Status	Additional references	
	Building rehabilitation	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B below	
	New construction	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B below	
	Individual wastewater treatment system	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section C below	
	Historic building(s) and districts	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section D below	
	Acquisition of land ¹¹	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section E below	
	Hazardous or toxic materials ¹²	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section F below	
	Impacts on forests and/or protected areas	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section G below	
Handling / management of medical waste	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section H below		
ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST		
A. General Conditions	Notification and Worker Safety	<p>The local construction and environment inspectorates and communities have been notified of upcoming activities</p> <p>The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works)</p> <p>All legally required permits have been acquired for construction and/or rehabilitation</p> <p>All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment.</p> <p>Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots)</p> <p>Appropriate signposting of the sites will inform workers of key rules and regulations to follow.</p>		
	B. General Rehabilitation and /or Construction Activities	Air Quality	<p>During interior demolition use debris-chutes above the first floor</p> <p>Keep demolition debris in controlled area and spray with water mist to reduce debris dust</p> <p>Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site</p> <p>Keep surrounding environment (side-walks, roads) free of debris to minimize dust</p> <p>There will be no open burning of construction / waste material at the site</p> <p>There will be no excessive idling of construction vehicles at sites</p>	
		Noise	<p>Construction noise will be limited to restricted times agreed to in the permit</p> <p>During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible</p>	
		Water Quality	<p>The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.</p>	
	Waste management	<p>Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities.</p> <p>Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers.</p> <p>Construction waste will be collected and disposed properly by licensed collectors</p> <p>The records of waste disposal will be maintained as proof for proper management as designed.</p> <p>Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)</p>		

¹¹ Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

¹² Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
C. Individual wastewater treatment system	Water Quality	<p>The approach to handling sanitary wastes and wastewater from building sites (installation or reconstruction) must be approved by the local authorities</p> <p>Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment</p> <p>Monitoring of new wastewater systems (before/after) will be carried out</p>
D. Historic building(s)	Cultural Heritage	<p>If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation</p> <p>Ensure that provisions are put in place so that artifacts or other possible “chance finds” encountered in excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.</p>
E. Acquisition of land	Land Acquisition Plan/Framework	<p>If expropriation of land was not expected and is required, or if loss of access to income of legal or illegal users of land was not expected but may occur, that the bank task Team Leader is consulted.</p> <p>The approved Land Acquisition Plan/Framework (if required by the project) will be implemented</p>
F. Toxic Materials	Asbestos management	<p>If asbestos is located on the project site, mark clearly as hazardous material</p> <p>When possible the asbestos will be appropriately contained and sealed to minimize exposure</p> <p>The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust</p> <p>Asbestos will be handled and disposed by skilled & experienced professionals</p> <p>If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately</p> <p>The removed asbestos will not be reused</p>
	Toxic / hazardous waste management	<p>Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information</p> <p>The containers of hazardous substances should be placed in an leak-proof container to prevent spillage and leaching</p> <p>The wastes are transported by specially licensed carriers and disposed in a licensed facility.</p> <p>Paints with toxic ingredients or solvents or lead-based paints will not be used</p>
G. Affects forests and/or protected areas	Protection	<p>All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities.</p> <p>For large trees in the vicinity of the activity, mark and cordon off with a fence large trees and protect root system and avoid any damage to the trees</p> <p>Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include by not limited to hay bales, silt fences</p> <p>There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.</p>
H. Disposal of medical waste	Infrastructure for medical waste management	<p>In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to:</p> <p>Special facilities for segregated healthcare waste (including soiled instruments “sharps”, and human tissue or fluids) from other waste disposal; and</p> <p>Appropriate storage facilities for medical waste are in place; and</p> <p>If the activity includes facility-based treatment, appropriate disposal options are in place and operational</p>

PART 3: MONITORING PLAN							
Phase	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)
During activity implementation							
During activity supervision							

Annex 3. People Met and Consulted

Persons met (Name , Position)
Latipov R. – Member of Environmental commission of the Parliament (Majlisy namoyandagon Majlisy oli)
Saidov I. – Chief specialist of the Institute of water problems, ecology and energy, Academy of sciences of Tajikistan
Nazarov T. – Head of the Scientific-Production Center “Tabiat”
Blagoveshenskaya S. – Expert on biodiversity, NGO “Kuhiston”
Mamadaliev B. – head, NGO “Tabiaty toza”
Akramov A. – dean of hydrological faculty, Tajik Agrarian University
Rahmatillaev R. – professor of Tajik Agrarian University
Jalilov A. – specialist on pest management, Ministry of agriculture
Akramov U. – deputy head of Specially protected areas department, Agency of Forestry of Tajikistan
Ergashev M. – agriculture expert, Academy of agricultural sciences
Karimov B. – Head of regulation and standards department, Committee for environmental protection, Tajikistan
Sadykova S. – Head of Aarhus center in Dushanbe

Annex 4. Minutes on the GEMP consultations

Republic of Tajikistan PUBLIC EMPLOYMENT FOR SUSTAINABLE AGRICULTURE AND WATER MANAGEMENT PROJECT

Date: October, 4-5, 2016

Location: Penjikent city, conference-hall of Khukumat; Devashtich city - conference-hall of Khukumat

The Meeting in Panjakent city was attended by:

Sl. No:	Name and Family name	Occupation
1	Shahobov Z.	Water and land department, Panjakent district
2	Samandarov A.	Village Aini, Panjakent district
3	Solehov A.	Village Zosun, Panjakent district
4	Holova S.	Student, Panjakent district
5	Nasrulloev I.	Head of mahalla, Panjakent district
6	Tursunov D.	farmer
7	Sanginov A.	Chairman of WUA
8	Khujaev A.	Chief accountant, WUA "Guzarbahor"
9	Halimov Sh.	Chairman of WUA "9- navadkori"
10	Isroilov S.	Head of production department IDBZOL
11	Zoirov M.	farmer
12	Sanginov F.	Chairman of agricultural organization
13	Pulatov M.	Department of environmental protection of Panjakent district, senior specialist
14	Fofiev D.	Senior specialist on religion and traditions, v.Ivan Tojik
15	Koziev M.	Farmer, farm "Ibodullo Ozimov". Panjakent district
16	Amirov A.	Farmer, farm "Mir Distov", Panjakent district
17	Rahimov R.	Chairman of jamoat Langar, Panjakent district
18	Sufiev A.	Head of Department of Sanitary Epidemiological Service in Panjakent district
19	Juraev S.	Chairman of WUA "Zarnisor", Panjakent district
20	Isrofilov U.	WUA "Zarnisor, member
21	Mahmadyorov P.	Chairman of WUA "Nishon Sarazm", Panjakent district
22	Sultonov N.	Chairman of WUA "Loik", Panjakent district
23	Sattorov I.	Deputy Chairman on water resources in Panjakent district
24	Anvarov N.	Senior engineer of farm, Ayni district
25	Zokirov Sh.	Education department, jamoat Amondara, Ayni district
26	Usmanov K.	Head of Department on water and land resources, Panjakent district
27	Sanginov A	Chairman of jamoat, Rarz village
28	Sanginov R.	Chairman of WUA "Rarz"
29	Rahmonov B	Specialist, PMU of Fergana valley water resources management
30	Nosirova T.	Environmental specialist, PMU of Fergana valley water resources management

The Meeting in Devashtich city was attended by:

Sl. No:	Name and Family name	Occupation
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1	Saburov Sh.	WUA "Gazantarak", chairman
2	Sharipova M.	Medical center #3, Zarnisor
3	Aliyorova O.	Medical center #3, Zarnisor
4	Alimov M.	WUA "Sarob", farmer
5	Mirov I.	Farmer, farm "Dashti kom"
6	Rahmonov S.	WUA "Ceksary"
7	Dadoboeva I.	Specialist of jamoat
8	Hakimova Sh.	Secretary, jamoat
9	Amonov Sh.	farmer, WUA "Umeda"
10	Huseinov S.	WUA "Navobod", farmer
11	Rajabaliev E.	Farmer, v.Miskinteppa
12	Hikmatulloev S.	Dekhkan farm "Khushtoir", farmer
13	Rahmonov T.	Farmer, v.Yahtan
14	Hamdamov P.	WUA "Hujatoir", farmer
15	Dodojonova G.	Specialist of vodocanal (Water department)
16	Fozil-Karim Shoira	Specialist of jamoat
17	Rasulova Z.	economist
18	Boimatova M.	accountant
19	Umarova M.	accountant
20	Gadoeva H.	Accountant, environmental department
21	Shukurova N.	Secretary of environmental department
22	Rajabzoda F.	Head of department of land and water supply "Chashmasor", Devashtoch dostrict
23	Halimov B.	Chairman of WUA "Yahtan"
24	Ergashev J.	Specialist of WUA "Chashmasor"
25	Nuriddinov H.	Farmer, dekhkan farm "Gazantarak"
26	Mamurov J.	Mahalla committee
27	Ochilov M.	WUA "Shahriston"
28	Ruziboev K.	Deputy chaiman of jamoat "Bunjakat"
29	Barotova G.	student
30	Hojimurodova M.	student
31	Toshev A.	Chaiman of mahalla
32	Bekturaev Sh.	Deputy chairman of "Shahriston"
33	Abdunazarov Sh.	Engineer of water department
34	Toshmatov J.	Chairman of mahalla, v.Vakhdat
35	Aslonov S.	Head of medical center, v.Gursa
36	Amonlikov E.	Head of medical center, v.Guliston
37	Muratov S.	WUA of village Sarobi
38	Ashurmatov A.	WUA "Obi hayot"
39	Hodiev A.	Deputy chairman of Devashtich district
40	Mahmadyorov U.	Head of agricultural department of the district
41	Rahmonov U.	Engineer, water supply department
42	Yusufov K.	Secretary of jamoat Gonchi city
43	Azizov A.	WUA "Kaurovud", farmer
44	Safarov R.	Water resources specialist of v. Kalinobod
45	Rahmonov B	Specialist, PMU of Fergana valley water resources management
46	Nosirova T.	Environmental specialist, PMU of Fergana valley water resources management
47	Odilova R.	Social expert
48	Saidova J.	Social expert
49	Holov I.	PMU of Fergana valley water resources management, representative

A meetings were held on October 4, 2016, at the conference hall of the Khukumat of Panjakent district, and on October 5, 2016, at the conference hall of the Khukumat of Devashtich district, preceded by the public invitation.

The following included the agenda of the meeting:

- Environmental Aspects of the ZARAFSHON IRRIGATION REHABILITATION AND RIVER BASIN MANAGEMENT PROJECT– presentation of the General Environmental Management Plan;
- Discussion on main activities and responsibilities of Environmental Mitigation and Monitoring matrixes

The representative and environmental specialists of the FVWRMP PMU presented the project and the issues with regard to the above points. Following is the brief summary of the participant's views with regard to the project.

- It would be necessary to include to EMP the additional measures for restoration of areas at the sites where rehabilitation works of irrigation channels and pump stations are planned after their completion;
- Participants recommended use sediments from the irrigation channels to create new or improve existing fields for crop growing;
- It was recommended to pay attention to landslide-prone areas and where it is possible apply relevant measures on disasters prevention;
- The participants unanimously concluded that the outputs of the proposed project components would strengthen sustainable development of the National agriculture, involving technologies, policies and actions directed at the integration of socio-economic principles related to the environmental protection. This would promote development and increase the agricultural production and would economically help the poorest farmers in a timely manner to reduce the negative impact of high and volatile food prices, prevent the risk of the decreased productivity of irrigated and rain-fed (dry-farming) lands, and prevent the degradation of soil fertility.
- It is expected that the project would promote sustainable and effective use of irrigated land and water, introduction of environmentally sustainable management practices, increased responsibilities for the environment.
- Based on the above the meeting considered the project to be technically feasible, environmentally sound, and socially acceptable and they would provide full cooperation for its successful implementation.
- The meeting also expressed that it was quite educative to organize such meetings. It was emphasized that more attention is required to be paid to educate the citizens to: (i) sensitize the people about the environmental impacts and their duties and responsibilities (ii) to review the general and technical principles of environmental procedures and the role of government and private agencies; and (iii) to educate the people about the existing legislation, norms and procedures of the Republic of Tajikistan and to suggest any modifications for improvements.
- It was concluded that this General environmental management plan is almost fully meets all environmental protection requirements of national legislation and WB policies, and takes into accounts the responsibilities of relevant stakeholders.



Public consultations in Panjakent city – October 4, 2016



Participants of public consultations on environmental and social issues of the upcoming project in Devashtich district – October 5, 2016.