

**Ministry of Housing and Communal Services
of the Republic of Uzbekistan
"Kommunkhizmat" agency**

PROJECT

«Water Services and Institutional Support Program »

**Environmental and Social Management Framework
(ESMF)**



Tashkent, Uzbekistan
November 15th, 2019

ABBREVIATIONS AND GLOSSARY

AD	Agricultural Department
ARAP	Abbreviated Resettlement Action Plan
AZ	Aeration zone
BPS	Booster pump station
BSSP-AF	Bukhara and Samarkand Sewerage Project, Additional Financing
CB	Central Bank of Uzbekistan
CBCC	Capacity Building Component Contractor
CBO	Community-based organization (makhalla)
CC	Civil Code
CE	Citizen Engagement
COM	Cabinet of Ministers of the Republic of Uzbekistan
DBM	Design, Build, and Maintain
DCM	Decree of the Cabinet of Ministries
DDCSC	Detailed Design and Construction Supervision Consultants
DDR	Due Diligence Report
DEF	Declaration of Environmental Effects
DMF	Design and Monitoring Framework
DMF	Design and Monitoring Framework
DMH	District Metering Hubs
DMS	Detailed Measurement Survey
DSEI	Draft Statement of the Environmental Impact
EA	Executive Agency
EEC	Energy Efficiency Consultant
EHS	Environment, Health and Safety General Guidelines
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EM	Entitlement Matrix
EPP	Emergency Preparedness Plan

ESA	Environmental and Social Assessment
ESCA	Energy Savings Capture Account
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSS	Environmental and Social Safeguards Specialist
FGD	Focused Group Discussion
FS	Feasibility Study
GAP	Gender Action Plan
GHG	Greenhouse gas
GoU	Government of Uzbekistan
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
H&S	Health and Safety
HH	Household
ICWC	Integrated Commission for Water Coordination
IDA	International Development Association
IF	Infiltration feeding
IFIs	International Financial Institutions
API	Air pollution index
IPF	Investment Project Financing
IR	Involuntary Resettlement
IRP	Involuntary Resettlement Plan
KSA	Kommunkhizmat Agency
LAA	Land Acquisition Act
LAR	Land Acquisition and Resettlement
LARC	Land Acquisition and Resettlement Commission
LC	Land Code
LRSCD	Land Resources and State Cadaster Department
M&E	Monitoring and Evaluation
M&V	Measurement and verification

MCA	Makhalla Citizen's Assembly
MHCS	Ministry of Housing and Communal Services
MIS	Management Information Systems
MoH	Ministry of Health
MPS	Main pumping station
NGO	Non-governmental organization
NRW	Non-revenue water
OHS	Occupational and Health and Safety
PAP	Project Affected Persons
PCR	Physical Cultural Resources
PCU	Project Coordination Unit of the World Bank (PCU) of the Kommunkhizmat Agency under the Ministry of Housing and Communal Services of the Republic of Uzbekistan
R-PCU	Regional Project Coordination Unit
PMC	Project Management Consultant
PMU	Project Management Unit
POM	Project Operational Manual
R&R	Resettlement and Rehabilitation
RAP	Resettlement Action Plan
RoW	Right-of-Way
RPCU	Regional Project Coordinating Units
R-PCUs	Regional PCU
RPF	Resettlement Policy Framework
RUZ	Republic of Uzbekistan
SA	Social Assessment
SCB	Substation control buildings
SCEEP	State Committee for Ecology and Environmental Protection
SDGS	Social Development and Gender Specialist
SEC	State Environmental Consequences
SEE	State Environmental Expertise
SEI	Statement of the Environmental Impact
SES	Sanitary Epidemiological Station

SIA	Social Impact Assessment
SS	Social Specialist
STP	Sewage treatment plants
TA	Technical Assistance
TOR	Terms of Reference
USD	United State Dollar
USF	Urban surface facilities
UZS	Uzbek Sum
WB	World Bank
WBG	World Bank Group
WCU	Women's Committee of Uzbekistan
WDU	Water Distribution Units
WIS	Water Intake Station
WSS	Water Supply and Sanitation
WTP	Water Treatment Plant
OP	Operational Policy

Table of Contents

EXECUTIVE SUMMARY	7
1. PROJECT DESCRIPTION.....	13
1.1. THE OBJECTIVES OF THE PROJECT AND POTENTIAL BENEFICIARIES	13
1.2. PROJECT COMPONENTS	13
1.2.1 Structure of the programme (sub-projects).....	15
1.2.2. Component 2: Energy Efficiency Financing Facility.....	19
1.3. THE SCOPE AND OBJECTIVES OF ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF).....	25
2. REGULATORY FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL ASSESSMENT.....	26
2.1. NATIONAL ENVIRONMENTAL POLICY AND LEGISLATION.....	26
2.2. LEGISLATION OF THE REPUBLIC OF UZBEKISTAN AND WB POLICIES IN THE SPHERE OF SOCIAL ASSESSMENT, LAND ACQUISITION AND RESETTLEMENT	29
2.2.1 Social Assessment requirements.....	29
2.2.2 Land Acquisition and Resettlement	29
2.3. GOVERNMENT AGENCIES RESPONSIBLE FOR CONDUCTING ENVIRONMENTAL IMPACT ASSESSMENTS	30
2.4. MAIN STAGES OF ENVIRONMENTAL ASSESSMENT	32
2.5. NATIONAL REQUIREMENTS FOR ENVIRONMENTAL AND SOCIAL ASSESSMENT.....	35
2.6. THE REQUIREMENTS OF THE WORLD BANK'S SAFEGUARDS POLICIES	38
2.6.1 Project Categories and Project Selection (Screening).....	38
2.6.2. World Bank Safeguards Policies and their requirements	38
2.6.3 World Bank Project Categories and Screening.....	41
2.7. COMPARISON OF NATIONAL AND WORLD BANK REQUIREMENTS FOR ENVIRONMENTAL ASSESSMENT	42
2.7.1. Differences with regard to project environmental categories.....	42
2.7.2. Differences in terms of ESMP	42
2.7.3. Differences in terms of EA information disclosure and public consultation activities	42
2.7.4. Applicable environmental standards.....	42
3. BASELINE INFORMATION AND ANALYSIS	47
3.1. RELIEF, CLIMATE, HYDROGEOLOGY, SOIL, VEGETATION, FAUNA AND PROTECTED AREAS.....	47
3.1.1. Republic of Karakalpakstan - Nukus, Takhiatash, Kungrad and Khodjeyli.....	47
3.1.2. Syrdarya, Gulistan, Saykhunabad, Akaltyn, Sardoba, Mirzaabad, Bayaut, Khavast regions and Yangier city	55
3.1.3. Kattakurgan city.....	60
3.2. SOCIO-ECONOMIC CONDITIONS	67
3.3. ANALYSIS OF EXISTING UTILITY NETWORKS.....	72
3.4. SUMMARY FINDINGS OF FGDs IN THE PROJECT AREA.	92
3.5. STAKEHOLDER ANALYSIS	94
4. RULES AND PROCEDURES FOR ENVIRONMENTAL AND SOCIAL SCREENING AND ASSESSMENT	103
4.1 ESA PROCESS: STEP-BY-STEP	103
4.2. CRITERIA FOR SUBPROJECTS ENVIRONMENTAL SCREENING	104
4.3. TYPES OF ESA INSTRUMENTS	109
4.4. THE ROLE OF DIFFERENT INVOLVED PARTIES IN THE ENVIRONMENTAL SCREENING, ESA PROCESS AND MONITORING OF THE ESMP IMPLEMENTATION.....	109

5. ENVIRONMENTAL AND SOCIAL IMPACT ANALYSIS	111
5.1. POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS	111
5.1.1. <i>Assessment of Emergency Situations and Accidents</i>	116
5.1.2. <i>Alternative Option of Project Solutions (with and without project scenarios)</i>	117
5.1.3. <i>Impact During the Operational Phase</i>	118
5.1.5. <i>Impact of Climate Change On Water Resources</i>	132
6. PRINCIPLES AND INSTRUMENTS OF SOCIAL IMPACT ANALYSIS, MANAGEMENT AND MITIGATION	134
6.1. SUMMARY OF POTENTIAL PROJECT SOCIAL RISKS, IMPACTS AND MITIGATION INSTRUMENTS	134
6.2. LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT	141
6.3. SOCIAL IMPACT ASSESSMENT	144
6.4. LABOR ISSUES (LABOR INFLUX, FORCED AND CHILD LABOR)	145
6.5. GENDER AND DEVELOPMENT	147
6.6. CITIZEN ENGAGEMENT	149
6.7. ETHNIC MINORITIES	150
7. INSTITUTIONAL MECHANISMS AND CAPACITY FOR IMPLEMENTATION.....	151
8. MONITORING AND REPORTING ACTIVITIES	153
8.1. KEY SOCIAL MONITORING AND REPORTING REQUIREMENTS	153
8.2. ENVIRONMENTAL MONITORING.....	154
8.3. ENVIRONMENTAL AND SOCIAL MONITORING.....	161
9. EA CAPACITY BUILDING ACTIVITIES.....	163
10. GRIEVANCE REDRESS MECHANISM	165
10.1 GENERAL CONCEPTS OF GRM.....	165
10.2 NATIONAL LEGISLATION	165
10.3 ORGANIZATION OF A GRIEVANCE REDRESSES MECHANISM	165
10.4 DEADLINES FOR HANDLING COMPLAINTS	167
10.5 GRM RECORDS AND DOCUMENTATION.....	167
10.6 GRM DISCLOSURE AND RAISING PUBLIC AWARENESS	167
<u>11. ESMF DISCLOSURE AND PUBLIC CONSULTATION.....</u>	169

List of Tables

Table 1.2. Expected results of the Program.....	14
Table 1.2.2 Emissions of pollutants into the atmosphere from a fuel-burning TPP during power generation 128.0 million kWh.....	23
Table 2.6.2: World Bank safeguards policies and their relevance to the project	38
Table 2.7.1. Comparative table between World Bank safeguards requirements and Uzbek national environmental legislation	44
Table 3.1.1. Summary data on fresh water reserves and their use in the Republic of Karakalpakstan as of 01.01.2012.....	51
Table 3.1.2. Summary data on fresh water reserves and their use in the Syrdarya region as of 01.01.2012 ...	58
Table 3.2.1. Population of regions, thousand, January 1, 2019.....	67
Table 3.2.2. Population Density, 1/sq.km (as of January 1 of respective year)	67
Table 3.2.3. Population of the project districts, thousand, January 1, 2019.....	67
Table 3.2.4. Labor market indicators in the project districts, averages for January-June 2019	68
Table 3.2.5. Share of regions in the total volume of industrial production (% of country total)	69
Table 3.2.6. Sectoral employment by regions	69
Table 3.2.7. Poverty level in project districts.....	71
Table 3.3.1. Population access to centralized water supply and sewerage systems in project districts, as % to total number of houses/apartments.....	72
Table 3.5.1. Major Stakeholder Groups	94
Table 3.5.2. Stakeholder Roles and Capacities	98
Table 4.2: Screening of categories for proposed types of sub-projects and suggested EA instrument	106
Table 5.1. Potential environmental and social risks and impacts of the project.....	121
Table 6.1.1: Summary Potential Project Social Risks, Impacts and Mitigation instruments	135
Table 8.2: Environmental Management Plan	155
Table 9.1: Tentative plan for capacity building and training program.....	164
Table 10.3: Grievance redresses mechanism of the project and its levels	166

List of Figures

Figure 1.2.2: Energy Savings Capture Account (ESCA) concept).....	22
Figure 2.3.1. Organizational structure of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection.....	30
Figure 2.4.1. Procedure for organizing and conducting environmental and social impact assessment.....	37
Fig.3.1.1.1. Political and administrative division of the Republic of Karakalpakstan.	47
Figure 3.2.1. Poverty rate by region of Uzbekistan.....	71
Figure 3.3.2. The scheme of territories that need either the construction of new sewerage networks or the reconstruction of existing ones.....	76

EXECUTIVE SUMMARY

MAIN PROVISIONS

Background. The Government of the Republic of Uzbekistan is preparing for a proposed investment loan from the World Bank, for the *Water Services and Institutional Support Program (WASIS)*. This program will finance priority policy, institutional, and infrastructure activities at both the national and regional levels, to promote sector sustainability and accelerate progress towards achievement of the Government's development objectives. Moreover, the proposed program will support the ongoing sector reform process through comprehensive and consistent support to address existing challenges and constraints more broadly including support to performance improvement process; strengthening the central-level policy and planning framework; and institutional capacity for monitoring and regulation.

Construction and operation of the project will result in some environmental and social impacts, and therefore appropriate environmental and social assessments are required under World Bank policy and legislation of Uzbekistan. However, since the details and location of the project investments are not yet known, their impact cannot be determined. Therefore, in accordance with World Bank Operational Policy 4.01, this model of Environmental and Social Management Framework (ESMF) was prepared.

The objective of the ESMF is to establish principles, guidelines and procedures for assessing the environmental and social impacts of future subprojects on World Bank investments, to provide recommendations for reducing, mitigating and/or compensating for potential negative impacts and for strengthening institutional capacity. It also addresses the institutional, legal and regulatory framework within which the project should be implemented.

Objectives of the programme development (project): (i) improve coverage, quality and efficiency of water supply and sanitation services in selected project areas; and (ii) strengthen the regulatory capacity of the sector.

The programme will finance activities organized around the following four components.

Component 1: Sector Policy, Regulations and Institutions. This component will address: (1) metering and demand management; (2) medium-term planning, budgeting and tariff calculations; (3) monitoring, reporting and evaluation processes, including benchmarking; (4) strengthening utility creditworthiness and performance-based financing frameworks; and (5) communications and public awareness, amongst other activities. Component 1 will also include project management costs and preparation of future investments (feasibility studies, climate risk and vulnerability assessments, economic and financial analysis, environmental and social impact assessments of future projects, etc.).

Component 2: Energy Efficiency Financing Facility. The component is designed to support service improvements and financial sustainability of all 14 regional potable water utilities (Suvokavas) and repaid through 'captured' energy cost savings over defined payback periods. The EE investments will be integrated within Suvokavas medium-term investment and performance plans and complemented with technical assistance to build institutional capacity for identification and implementation of additional EE investments.

Component 3: Investments in Regional Infrastructure Investments (IDA US\$205 million). This component will finance resilient infrastructure investments to expand access, improve efficiency and quality of water services in targeted areas within three regions of Uzbekistan.

Sub-component 3.1. Reconstruction and expansion of sewerage systems in Nukus, Takhiatash, Khodjeyli and Kungrad of Karakalpakstan (IDA US\$60 million).

Sub-component 3.2. Rehabilitation and reconstruction of water supply and sewerage systems in Syrdarya region (IDA US\$73 million)

Sub-component 3.3. Rehabilitation and reconstruction of water supply and sewerage systems in Kattakurgan town in the Samarkand region (IDA US\$63 million).

Sub-component 3.4. Detailed design and construction supervision (IDA US\$9 million).

The component will include consultancy services on detailed design and construction supervision to assist the PCU and the Kommunkhizmat Agency in terms of effective and timely implementation.

Component 4: Professionalization of Participating Water Utilities (three regional Suvokavas under Component 3), designed as a ‘pool of funds’ accessible to the Suvokavas to support continued professional capacity development. This Component will allow a prompt response to support the utilities to respond to emerging needs and priority areas of reform. This will include goods and services for modern systems, procedures, equipment and training necessary to improve operational efficiency and service quality, financial and investment planning capacity, metering, non-revenue water and demand management, financial reporting and citizen engagement. These activities, combined with the infrastructure investments under Component 3, will lead to solid results – advancing progress towards universal access to sustainable water services in the respective regions.

Location of the project. *Sub-component 3.1* will be implemented in 4 cities of the Republic of Karakalpakstan. The cities of Nukus (306,000 inhabitants), Takhiatash (66,000 inhabitants), Khodjeyli (106,000 inhabitants) and Kungrad (72,000 inhabitants) are located in the north-west of Uzbekistan in the Republic of Karakalpakstan. All settlements are located close to each other except for Kungrad city which is located 110 km north of Nukus city.

Sub-component 3.2 will be implemented in the Syrdarya, Gulistan, and Saikhunabad districts and Yangiyer city of the Syrdarya region. Syrdarya district, with a total population of 87,200 people, is located in the northern part of the Syrdarya region. It includes two towns - Baht and Syrdarya as well as 43 small villages. Gulistan district, with a total population of 59,200 is located in the southern part of the Syrdarya district and consists of 39 villages (with Dehkanabad as a district center). The Saikhunabad district with a total population of 70,000 is located in the south-western part of the Syrdarya region and includes 39 villages. Yangiyer town, with a total population of 39,100 people, borders with Khavast and Bayaut districts and situated in about 33 kilometers to the south of Gulistan city. In terms of sewerage system construction, the proposed Sub-component provides (i) the construction of treatment facilities in the district centers of Bayaut, Gulistan, Mirzaabad, Akaltyn, Saykhunabad, Sardoba, Syrdarya and Havast districts of the Syrdarya region; (ii) the construction of sewage pumping stations; (iii) the construction of sewerage networks.

The project is expected to improve the quality and coverage of sanitation services for more than 400,000 beneficiaries living in the project area.

Sub-component 3.3 will be implemented in Kattakurgan city, with a population of 85,600. It is located in 78 kilometres from Samarkand.

Project environment category and proposed safeguards instruments. In accordance with the Bank's environmental policies and procedures, including OP/BP/GP 4.01 "Environmental Assessment", the project is classified as Category B. This Environmental and Social Management Framework (ESMF) specifies all rules and procedures for the subprojects Environmental and Social Impact Assessment (ESIA). None of the project or subproject activity that would receive financing will cause significant environmental impact that may put them under the Category A projects that, in turn would require full ESIA. However, most of the projects might cause some adverse environmental impact and would fall under the Category B projects, for which the Bank requires a Environmental and Social Impacts Assessment (ESIA) and/or preparation of an Environmental and Social Management Plan (ESMP).

Potential environmental and social impacts. Activities under Component 3 of the project will support a wide range of demand-driven investments in the rehabilitation and construction of water supply and sanitation systems and will not only have positive social and economic impacts, but also environmental impacts. The socio-economic impact of the project will be positive as the Project will significantly improve the living standards of the population through the access of households, businesses and public facilities (schools, clinics etc.) to safe and stable potable water supply and sewerage systems in many cities and rural districts. Problems related to water supply and lack of sanitation in homes negatively affect quality of life for all family members and especially for women and children. These problems increase labor costs and time required for water delivery and storage, washing, cleaning, bathing, and other chores. Responsibilities for removal of solid and liquid domestic wastes are also held mainly by women, creating additional problems for

residents of multistoried buildings without working sewerage. At the same time, a number of different adverse environmental and social impacts, such as (a) increased waste pollution, may arise from construction activities to improve infrastructure and services; b) noise; c) air pollution with dust, exhaust gases from fuel combustion products; c) health and safety hazards and other problems resulting from construction activities; d) increased contamination of groundwater and surface water as a result of inadequate avoidance and mitigation measures; e) soil degradation and pollution; f) threats to human health as a result of improper handling of heavy machinery during construction activities; (g) temporarily limited access to private and community assets (land, business facilities, roads, markets etc.) construction activities; (h) temporarily limited or interrupted access to potable water sources during the pipelines construction and connection activities; (i) raising of prices for improved water supply and sanitation; j) bad practices of utilities use by some groups of population (for example watering of gardens and yards from potable water pipelines, unregistered connections to water pipelines, damage of sewerage systems by disposing of inappropriate waste etc.) k) other risks and impacts associated with civil works, capacity of local utilities providers. These impacts will be typical for construction or rehabilitation activities and can be mitigated through the application of best construction practices, community engagement into the planning of project activities and development of appropriate mitigation measures.

Scope of Resettlement Policy Framework. It is anticipated that no land acquisition will take place during construction of the new facilities and that the impacts will be minimal. However, it is possible that additional land may be required for construction work during the construction of sewerage and water supply networks, pumping stations and treatment facilities. In case it is determined that construction will take place on private land, or that it will result in impacts on private property or direct economic impacts, then land acquisition will need to be undertaken in accordance with the Laws of the Republic of Uzbekistan and in line with World Bank Operational Policy OP 4.12. In the event that private property, structures or leased land, is not officially registered for use, all these facilities will be subject to OP 4.12 and a plan for involuntary resettlement will need to be prepared (IRP). The project is expected to have several subprojects that will become known only during the implementation phase. While the broad category of activities/ impacts is foreseen, exact magnitudes can become known only after detailed designing of the subprojects. Social Impact Assessments (SIA) will be undertaken in respect to each subproject in order to determine the magnitude of displacement and prospective losses, as well as to identify vulnerable groups for targeting, ascertain the costs of resettlement, and prepare a resettlement action plan (RAP) for implementation.

Towards preparing a RAP, project preparation has developed a Resettlement Policy Framework (Annex 10). The key objective of the Resettlement Policy Framework was to appropriately identify, address and mitigate adverse socioeconomic impacts that may occur due to the implementation of subprojects that involve the involuntary acquisition of land and the subsequent resettlement of affected families. The RPF is based on relevant National laws and Decrees as well as the World Bank OP-4.12. The guidelines of the resettlement policy framework apply all the investments financed by WASIS. The policy framework applies to all economically and/or physically displaced persons regardless of the total number affected by the severity of impact and whether or not they have legal title to the land. Particular attention will be paid to the needs of such vulnerable groups as women headed households, low-income households, households headed by elderly with no support and households headed by physically challenged people.

Triggered WB Operational Policies and EA national legislation. The project triggers WB Operational Policy (OP) 4.01 on *Environmental Assessment*, as it will generate a series of negative environmental and social impacts. As the project will not support sub-projects such as agricultural production and planting or modernization of orchards, which may lead to increased use of agrochemicals, the *OP 4.09 on Pest Management* is not triggered. Similar, the *OP 4.04 on Natural Habitats* and *OP 7.36 on Forests* will not be triggered as the project focuses on existing infrastructure in rural areas and no impacts on natural habitats and/or forests are expected. Regarding *OP 4.11 on Physical Cultural Resources* was decided not to trigger it, and, respectively, all proposed subprojects that might affect such resources will be excluded from the project financing. The *OP 4.12 on Involuntary Resettlement* is triggered due to the potential need to acquire small plots of land (temporary or permanent), restrict access and economic resettlement in connection with activities under Components 1 for upgrading and investing in rural infrastructure. Lastly, the *OP 7.50 on International Waterway* is triggered as the project might support water supply and sanitation subprojects which would have impacts on international water courses. At the same time, such activities will be of rehabilitation nature and will not go over the initial schemes and, thus, the potential impacts will be minimal

and mostly positive in terms of reducing water abstraction and/or discharges. Respectively, the task team applied for and received an exclusion from notification requirements under this OP.

Environmental and Social Management Framework (ESMF). The ESMF will guide the ESIA process and cover the following: rules and procedures for environmental and social screening of subprojects to be supported under the demand-driven investments in water supply and sewerage system infrastructure component; guidance for conducting subprojects ESIA and/or preparing simple ESMPs, as well as the related ESMP Checklists; mitigation measures for possible impacts of different proposed activities and types of subprojects to be supported by the project; main requirements for ESIA, that identify subprojects to be financed through the Project, to be done under the Component 3; requirements for monitoring and supervision of implementing of ESIA/ESMPs, implementation arrangements. The ESMF has also an overview of the capacity of the PCU and local involved institutions for E&S risk management. Based on this review, the ESMF specifies capacity building activities that would include all these parties as well activities on strengthening of capacity of participating local institutions on mitigating potential environmental and social risks and conducting subproject-level ESIA. A special attention in this regard will be on developing the capacity of regional water utilities («Suvokava») ESA capacities. Lastly, the ESMF document provides a negative list that will include infrastructure investments with large-scale irreversible social or environmental impacts (Category A subprojects), including the sub-projects located in protected areas, critical habitats or culturally- or socially-sensitive areas, along with sub-projects which might have impact on international waterways, - all of these will be not supported under the project.

ESMF implementation arrangements. The main agency implementing the project is the "Kommunkhizmat" agency under the Ministry of Housing and Communal Services (MHCS) of the Republic of Uzbekistan. The Project Coordination Unit (PCU) was established at the national level to coordinate and implement the project in the Republic of Karakalpakstan, Syrdarya and Samarkand regions. At the regional level, the project will be implemented through Regional Project Coordination Unit (R-PCUs), which will work in close cooperation with the relevant regional khokimiyats.

The responsibilities of the PCU include issues related to project preparation

The PCU established under the Kommunkhizmat Agency will support the MHCS to ensure that the program is delivered in accordance with its objectives and design in a timely and efficient manner. The PCU will report to the Kommunkhizmat Agency.

The PCU will be responsible for day-to-day project management and coordination, procurement, financial management, submission of withdrawal applications, monitoring and evaluation, safeguards management and interaction with the Bank, Suvokavas, and other stakeholders. The PCU shall be staffed with enough qualified specialists to ensure effective implementation of the program. At local level, three regional PCU offices will be established in each region. A PCU regional coordinator in each regional PCU office will be supported by engineers, safeguards specialists, M&E specialist, and translator.

The PCU will be supported by a Project Management Consultant (PMC), EE Consultant (EEC), and Detailed Design and Construction Supervision Consultants (DDCSC). These consultants will be contracted by the PCU and will have specific responsibilities, to support respective areas of implementation, to be specified in their terms of references. The PMC will be an international firm, staffed with a team of International Specialists who will work side-by-side with the PCU on daily basis to support overall management of the program. The PMC will also be tasked with training and professional development activities to ensure strengthening of the Kommunkhizmat Agency's institutional capacity for investment planning, design and implementation.

The EEC will facilitate implementation of Component 2 and provide specialized support to the PCU. The EEC will be responsible for energy auditing, identification of EE measures, supervision of the Component 2 investments, measurements and verification of energy and cost savings.

The detailed design and construction supervision consultants will provide support to the PCU / Kommunkhizmat Agency for preparation of detailed engineering designs, tender documentation, bid evaluation support (as needed), construction supervision and contract administration (acting as the Engineer on behalf of the Employer on construction contracts).

The PCU will also be responsible for interaction with environmental authorities, ensuring effective implementation of safeguards documents and will carry out spot checks, environmental supervision and monitoring, assessment of compliance with environmental standards at workplaces, and advising regional coordination units (R-PCUs) of Karakalpakstan, Syrdarya and Samarkand regions on environmental and social protection issues. Each R-PCU will also include one environmental specialist who will be responsible for ensuring that project activities are carried out in accordance with the WB's Safeguards Operational Policy and national EA rules and procedures.

Citizen engagement: Citizens engagement will be regulated by the PCU and by R-PCUs. The Project proposes the following mechanisms for citizen engagement: assessment, focus group discussions, grievance management, joint planning, citizen satisfaction survey, joint survey and monitoring. Special attention should be paid to the needs of women in activities aimed at increasing citizen participation. In order to ensure equal opportunities for all citizens to have their voices heard, each citizen engagement activity should take into account the specific constraints faced by women, such as lack of awareness of legal rights, mobility, family care responsibilities, social and cultural norms, power imbalances in the community, etc. This can be achieved by developing a gender action plan for specific projects based on targeted social assessments.

These aspects were given increased attention and emphasis in ESMF. The document sets out principles for strengthening social accountability and inclusion through public information; citizen participation in planning and monitoring services. The ESMF provides also guidance on social inclusion and gender issues, emphasizing women's participation in resettlement planning and providing specific assistance to economically weak, female-headed and vulnerable households to restore their livelihoods and income that may be affected by resettlement. The ESMF also emphasized that specific social media strategy (e-mail, websites, telegram apps, Facebook) will be developed during the project implementation to facilitate information dissemination, public consultation and public participation.

The Grievance Redress Mechanism (GRM) is an important component of the safeguards, so special attention will be paid to finding a solution to engaging with stakeholders. To register such applications, a special journal will be created containing information on the applicant, the date of application submission and the measures taken to review it.

All grievances received from the population will be registered in a log book which will be available at the site office of Contractor and in makhalla committees of the project area. Besides, the logbooks in district khokimiyats, where the grievances from the population are usually registered, will be also screened in case of project related grievances. Any person who has been affected by or is concerned about Project activities has the right to participate in the GRM, to have unhindered access to the journal and to be informed of the results of the application. A Grievance Service (GRS) will be established during the Project implementation period to address issues related to Project activities, such as social and environmental issues, road safety and occupational health and safety issues that have arisen for local communities and other stakeholders as a result of construction activities. Emphasis will be placed on preventing public discontent and all grievances will be addressed in a timely and impartial manner.

The grievance mechanism consists of two levels:

First level - Regional Grievance Committee (R-PCUs/PCU)

Second level - PCU

The grievance mechanism should not impede access to the country's judicial remedies (Court of Law). The grievance redress mechanism should be affordable (free) and easy to follow. The GRM will set out measures to provide independent assistance in resolving complaints when problems cannot be resolved at the project level. Ultimately, all applicants can go to court.

Disclosure of information by ESMF and public consultation. The Consultant supported the PCU in conducting public consultations and disclosures on ESMF to inform the public about targeted project investments and associated environmental and social impacts. The protocol, including questions and answers from the meetings, is included in this report. The public meeting was announced in the media 2 weeks before the meeting. Active NGOs, potential community representatives, and local authorities that may be affected

by the project were be invited. Draft documents were made publicly available on the relevant agency's website in local languages before the date of the public meeting.

It is necessary to revise the ESMF after the meetings in order to identify the results of the consultations, as necessary, and to document the consultation process in the final document. In the end, information disclosure workshops should be held to share the results with stakeholders.

1. PROJECT DESCRIPTION

1.1. THE OBJECTIVES OF THE PROJECT AND POTENTIAL BENEFICIARIES

The Government of the Republic of Uzbekistan is preparing a Program on Water Supply and Institutional Support Services for the proposed investment loan provided by the World Bank. This program will finance priority policy, institutional and infrastructural activities at both national and regional levels to promote sustainability of the sector and accelerate progress in achieving the government's development goals. Moreover, the programmatic approach will support the ongoing process of sector reform through comprehensive and coherent support to address existing challenges and constraints more broadly, including support for efficiency gains; strengthening policy and planning frameworks at the central level; and institutional capacity for monitoring and regulation.

The purpose of the program development is:

- Improve the coverage, quality and effectiveness of water and sanitation services in selected project areas;
- Strengthen the capacity of sectoral institutions to improve service delivery.

Funds have been allocated under the on-going Bukhara and Samarkand Sewerage Project – additional financing (BSSP-AF), to finance preparatory studies/activities in support of future priority investment programs, to help ensure readiness and quality of implementation.

The contracting organization for this task (the "Client") is the Project Coordination Unit (PCU) of the Kommunkhizmat Agency under the Ministry of Housing and Communal Services of the Republic of Uzbekistan (MHCS RUZ). The project is planned to be implemented in the service area of the relevant regional SUE "Suvokava" (or water supply companies).

The PCU established at the Kommunkhizmat agency will assist the MHCS in ensuring timely and effective implementation of the program in accordance with its goals and objectives. The PCU will report to the Kommunkhizmat agency.

The PCU will be responsible for the day-to-day management and coordination of the project, procurement, financial management, application for withdrawal, monitoring and evaluation, management of safeguards, and interaction with the Bank, Suvokava and other stakeholders. The PCU must be staffed with a sufficient number of qualified professionals to ensure the effective implementation of the program. At the local level, three regional PCU offices will be established in each region. The Regional PCU Coordinators will work with engineers, protection specialists, an M&E specialist and a translator.

The PCU will be assisted by a Project Management Consultant (PMC), an Energy Efficiency Consultant (EEC) and a Detailed Design and Construction Supervision Consultant (DDCSC). The PCU will contract with these consultants, and they will have special responsibilities to support the implementation of their respective areas, which will be outlined in their terms of reference. PMC will be an international firm, staffed by a team of international professionals who will work with PCU on a daily basis to support the overall management of the program. PMC will also be mandated to conduct training and development activities to ensure that the institutional capacity of the Kommunkhizmat Agency is strengthened and that investments are planned, developed and implemented.

1.2. PROJECT COMPONENTS

The Water Supply and Institutional Support Program will be linked to the Ministry of Housing and Communal Services with active interagency and regional cooperation. Consisting of four strategically developed components, the programme will finance priority policy, institutional and infrastructural activities to ensure sustainable water services delivery.

In particular, the programme will finance activities organized around the following four components

Component 1: Sectoral policies, regulations and institutions are designed to strengthen policies, regulatory frameworks and institutional capacities to promote sectoral reforms and facilitate sustainable service delivery. This component will allow for the operationalization of strategic priorities at the national level in

accordance with the Government Sector Reform Roadmap. The main directions have been defined, which include

- accounting and demand management
- medium-term planning, budgeting and tariff calculations;
- monitoring, reporting and evaluation processes, including comparative analysis;
- Strengthening the creditworthiness of public utilities and performance-based financing mechanisms;
- communication and public information, among other activities.

Component 1 will also include the cost of project management and preparation of future investments (feasibility studies, climate risk and vulnerability assessment, economic and financial analysis, environmental and social impact assessment of future projects, etc.).

Component 2: Energy Efficiency Financing is designed to support Suvokava's service improvements and financial sustainability through cost-effective energy efficiency (EE) investments. This mechanism will provide financing regardless of the standard distribution of public capital and should be self-sustaining, contributing to the accelerated development of the sector. It will be available to all 14 Suvokava and will pay for itself by "catching up" on energy cost savings during certain payback periods. Investments in EE will be integrated into medium-term investment plans and Suvokava's performance, complemented by technical assistance for institutional capacity building to identify and implement additional investments in EE.

Component 3: Investments in Regional Infrastructure will finance regional, critical infrastructure sub-projects based on integrated feasibility studies. That includes:

- Reconstruction and expansion of sewerage systems in Nukus, Tahiatash, Kungrad and Khodjeyli in the Republic of Karakalpakstan;
- Improvement of water supply in Syrdarya, Gulistan and Saikhunabad districts and Yangiyer city of Syrdarya province and construction of sewerage system in Syrdarya, Saikhunabad, Gulistan, Bayaut, Mirzaabad, Akaltyn, Sardoba, Khavast districts of Syrdarya region
- Reconstruction of water supply and sewerage systems in the city of Kattakurgan, Samarkand region.

Component 4: Professionalization of participating Water Canals (three "Suvokava" under Component 3) is intended as a "common fund" available to Suvokava to support the continuous development of professional capacity. This component will allow utilities to respond flexibly to emerging needs and priority areas of reform. It will include goods and services for modern systems, procedures, equipment and training necessary to improve operational efficiency and quality of service, financial and investment planning, accounting, water and demand management, non income generation, financial reporting and citizen engagement. These activities, combined with investments in infrastructure under Component 3, will lead to concrete results - promoting progress towards universal access to sustainable water services in the respective regions.

Table 1.2 Expected results of the Program
<p>Improve the coverage, quality and effectiveness of water supply and sanitation services in selected project areas, namely</p> <p>Reconstruction and expansion of sewerage systems in the Republic of Karakalpakstan:</p> <p>Nukus,</p> <p>Tahiatash,</p> <p>Kungrad</p> <p>Khodjeyli</p>

Improvement of water supply in the regions of Syrdarya province:

Gulistan district

Saihunabad district,

Yangier city,

Sewerage system construction in the regions of Syrdarya province:

Syrdarya district, Bayaut district, Gulistan district, Mirzaabad district, Akaltyn district, Saykhunabad district, Sardoba district, Syrdarya district and Havast district.

Reconstruction of water supply and sewerage systems in Samarkand region:

Kattakurgan city

Strengthen the capacity of sectoral institutions to improve service delivery.**1.2.1 Structure of the programme (sub-projects).*****"Reconstruction of sewerage systems in the cities of Nukus, Tahiataash, Khodjeyli and Kungrad in the Republic of Karakalpakstan".***

The existing sewerage infrastructure, built in the 1960s and 1970s, is in poor condition and needs urgent reconstruction or replacement. The sewage treatment plants (STP) in Nukus and Tahiataash have deteriorated significantly, especially in Khodjeyli and Kungrad, there is no functioning Sewage Treatment Plant, and therefore untreated wastewater is discharged into the discharge fields, which increases the risk of exposure of the population to polluted groundwater.

City of Nukus

The sub-project is aimed at increasing the volume of connection to the sewerage network up to approximately 50% (150 thousand consumers are expected to be connected). Proposed measures include: (i) rehabilitation of 59 km of sewerage network; (ii) expansion of the sewerage network by 30 km to connect an additional 65,000 residents; (iii) rehabilitation of 9 existing pumping stations and construction of 7 new pumping stations; (IV) partial reconstruction of the pressure sewerage pipeline from the main sewerage pumping station to the sewage treatment plant (depending on the length of the new location of the sewage treatment plant); and (v) reconstruction of the existing sewage treatment plant or construction of a new sewage treatment plant located closer to the city border.

City of Takhiatash

The sub-project is aimed at increasing the volume of connection to the sewerage system up to approximately 35% (23 thousand consumers are connected). Proposed measures include: (i) rehabilitation of 14 km of sewerage network; (ii) expansion of sewerage network by 20 m to connect additional 15,000 residents; (iii) reconstruction of 4 and construction of 4 additional pumping stations; and (iv) construction of a new sewage treatment plant with a capacity of about 7,000 m³/day (at the new site). In addition, on-site sanitation facilities (septic tanks and improved pit latrines) should be maintained for the rest of the population, which are not connected to a centralized sewerage system

City of Khodjeyli

The sub-project aims to eliminate the most urgent deficiencies (e.g. public health risk due to leakages of collectors or networks and uncontrolled discharge of wastewater into the city). Proposed measures will be identified during the preparation of the report and may include indicative measures: (i) rehabilitation of up to 3 km of sewerage network; (ii) reconstruction of 2 pumping stations; (iii) construction of a new sewage treatment plant, the first stage, with a capacity of about 500 m³/day (e.g., pre-cleaning and/or low-cost systems should be considered); (iv) expansion of the sewerage network by 18 km and construction of 2 new pumping stations.

In addition, on-site sanitary conditions should be maintained (construction of septic tanks and improved pit latrines) for the rest of the population, which are not connected to the centralized sewerage system.

City of Kungrad

The sub-project aims to eliminate the most urgent deficiencies (e.g. public health risks due to leakage of wastewater from collectors or networks and uncontrolled discharge of wastewater into the city).

First of all, the reconstruction of the leaking sewerage network and promotion of sanitation on site will be carried out, while the rehabilitation and expansion of the system, including the construction of the sewage treatment plant, will be included in a later stage.

The proposed measures will be determined during the feasibility study. Approximately these measures include (i) Rehabilitation of a 22-kilometre sewerage network; (ii) Reconstruction of 7 pumping stations; and (iii) Construction of 1 new STP.

“Improvement of water supply in Syrdarya, Gulistan, Saikhunabad districts and Yangiyer city of Syrdarya region”

The proposed sub-project will improve the coverage of water supply services in the remaining 3 district of the region (Syrdarya, Gulistan and Saikhunabad district) and the city of Yangiyer due to the fact that the project will be implemented in the region: (i) construction of water intake facilities with a capacity of 63,500 m³/day; (ii) construction of 36 km of trunk pipelines; (iii) 88 km of water supply networks; and (iv) procurement and installation of water meters for general needs and consumers.

It is expected that the sub-project will improve water supply for approximately 270,000 residents in the sub-project areas. Institutional strengthening activities will continue for the Syrdarya provincial SUE "Suvokava" within the framework of the proposed project.

Syrdarya district

The sub-project aims to increase the speed of the water supply connection by up to 100 % and to increase the continuity of the supply up to 24/7. Proposed measures include: (i) reconstruction of 30 wells; (ii) rehabilitation of 89 km of distribution network and 1.3 km of main water lines; and (iii) rehabilitation of 773 meters of fencing in sanitary protection zones, and (iv) procurement and installation of large and consumer level water meters.

Gulistan district

The sub-project aims to increase the speed of the water supply connection by up to 100 % and to increase the continuity of the supply up to 24/7. Proposed measures include: (i) reconstruction of 15 wells; (ii) rehabilitation of 81 km of distribution network; and (iii) procurement and installation of flow meters and water meters.

Saikhunabad district

The sub-project aims to increase the volume of water supply connection up to about 100% and increase the continuity of supply up to 24/7. Proposed measures include: (i) reconstruction of 34 wells; (ii) reconstruction of 124 km of distribution network; and (iii) purchase and installation of flow meters and water meters.

Yangiyer city

The sub-project is aimed at increasing the volume of connection to the water supply and increasing the continuity of water supply up to 24/7 by connecting the existing water pipeline from the city of Gulistan (northern pumping station) to the city of Yangiyer. Currently, only about 2/3 of the total length of 33 km of the main pipeline is operational.

Proposed measures include: (i) replacement of pumps at the Gulistan North Pumping Station; (ii) reconstruction of about 10 km of main water line from Gulistan to Yangiyer; (iii) reconstruction of 133 km of distribution network; and (iv) purchase and installation of household water meters and consumers water meters.

“Construction of a sewerage system in the district centers of the Syrdarya region”

The proposed sub-project provides (i) the construction of treatment facilities in the district centers of Bayaut, Gulistan, Mirzaabad, Akaltyn Saykhunabad, Sardoba, Syrdarya and Khavast districts of the Syrdarya region with a total capacity; (ii) the construction of sewage pumping stations; (iii) the construction of km of sewer networks.

The project is expected to improve the quality and coverage of sanitation services for more than 400,000 beneficiaries living in the project area.

Syrdarya district

The Syrdarya region, with a total population of 87,200 people, is located in the northern part of the Syrdarya region and includes two cities - Bakht and Syrdarya, and 43 villages.

There is no sewerage system in the area, and the population relies on cesspools that can cause shallow groundwater pollution.

The sub-project aims to connect up to about 50 percent of the district's population to the sewerage system (connecting 150,000 consumers).

Proposed measures include:

1) Syrdarya district center of the Syrdarya region

(i) construction of treatment facilities with a capacity of 6.0 thousand m³ / day; (ii) construction of sewer pumping stations in the amount of 5 pcs .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 500 mm with a length of 18.4 km; (iv) construction of pressure sewer networks from pumping stations, with a diameter of 200 mm and a length of 6.9 km; (v) the purchase of machines and mechanisms in an amount of 5 units.

2) Bakht city of the Syrdarya region

(i) construction of treatment facilities with a capacity of 1.0 thousand m³ / day; (ii) construction of sewer pumping stations in the amount of 2 pcs .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 9.0 km; (iv) construction of pressure sewer networks from pumping stations, with a diameter of 160 mm and a length of 4.2 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

Gulistan district:

Gulistan district, with a total population of 59,200 people, is located in the south of the Syrdarya region and consists of 39 villages (Dekhkanabad as a district center).

There is no sewerage system in the area, and the population relies on cesspools that can cause pollution of the aquifer.

Proposed measures include:

(i) construction of treatment facilities with a capacity of 0.6 thousand m³ / day; (ii) construction of sewer pumping stations in the amount of 2 pcs .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 13.6 km; (iv) construction of pressure sewer networks from pumping stations, with a diameter of 160 mm and a length of 3.4 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

Saykhunabad district:

Saykhunabad district with a total population of 70,000 people is located in the southwestern part of the Syrdarya region and includes 39 villages.

There is no sewerage system in the area, and the population uses cesspools.

Proposed measures include:

(i) construction of treatment facilities with a capacity of 1.0 thousand m³ / day; (ii) construction of sewer pumping stations in the amount of 2 pcs .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 14.8 km; (iv) construction of pressure sewer networks from pumping stations, with a diameter of 160 mm and a length of 4.1 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

Bayaut District:

The Bayaut district with a total population 80,200 people is located on the left bank of the Syrdarya River in its middle reaches. It occupies the extreme south-eastern part of the Syrdarya region between the Syrdarya River and the Khavast-Syrdarya railway. There is no sewerage system in the area, and the population uses cesspools.

Proposed measures include:

(i) construction of treatment facilities with a capacity of 0.6 thousand m³ / day; (ii) construction of sewer pumping stations in the amount of 2 pcs .; (iii) construction of gravity sewer networks to the pump station, with a diameter of 160 mm to 300 mm with a length of 12.4 km; (iv) construction of pressure sewer networks from pumping stations with a diameter of 160 mm and a length of 3.3 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

Mirzaabad district:

Mirzaabad district with a total population 41,500 people is located in the western part of the Syrdarya region. It borders in the north with the Republic of Kazakhstan, in the west with the Akaltyn region, in the east with the Gulistan region, in the south with the Mehnatabad region.

Proposed measures include:

(i) construction of treatment facilities with a capacity of 0.4 thousand m³ / day; (ii) construction of sewage pumping stations in the amount of 1 pc .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 4.9 km; (iv) construction of pressure sewer networks

from pumping stations, with a diameter of 160 mm and a length of 1.8 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

Sardoba district:

Sardoba district with a total population 31,900 people is located in the southeastern part of the Syrdarya region. It borders in the south and west with the Jizzakh region, in the east with the Mirzaabad and Khavast districts, and in the north with the Akaltyn region.

Proposed measures include:

(i) construction of treatment facilities with a capacity of 3.0 thousand m³ / day; (ii) construction of sewage pumping stations in the amount of 3 pcs .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 16.8 km; (iv) construction of pressure sewer networks from pumping stations, with a diameter of 160 mm and a length of 5.7 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

Khavast district:

The Khavast district with a total population 80,000 people is located in the southern part of the Syrdarya region. It borders in the south with the Republic of Tajikistan and the Jizzak region of Uzbekistan, in the west with the Mehnatabad region, in the east and north with the Bayaut region of the Syrdarya region.

Proposed measures include:

(i) construction of treatment facilities with a capacity of 0.5 thousand m³ / day; (ii) construction of sewage pumping stations in the amount of 1 pc .; (iii) construction of gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 3.2 km; (iv) construction of pressure sewer networks from pumping stations, with a diameter of 160 mm and a length of 1.5 km; (v) the purchase of machines and mechanisms in an amount of 2 units.

"Reconstruction of water supply systems and sewage treatment facilities in Kattakurgan, Samarkand Region"

This sub-component will finance (i) rehabilitation of water intake facilities Kattakurgan; (ii) reconstruction and construction of pumping stations, water conduits, tanks, rehabilitation and expansion of the distribution network; (iii) construction of a new sewage treatment plant, pumping station, reconstruction and expansion of the sewerage network in Kattakurgan, Samarkand region; (iv) equipment and measures to reduce water losses, including purchase of water meters

Kattakurgan city

The sub-project is aimed at increasing the volume of connection to the sewerage system up to about 98% of the population and ensuring appropriate wastewater treatment.

Proposed measures include: (i) rehabilitation of 6.2 km of sewerage network; (ii) expansion of sewerage network by 35 km to connect additional 50,000 subscribers; (iii) construction of one new sewerage pumping station; (iv) construction of a new sewage treatment plant with a capacity of about 30,000 m³/day; and (v) purchase of operation and maintenance equipment as well as laboratory equipment.

1.2.2. Component 2: Energy Efficiency Financing Facility

Water supply and wastewater management services in Uzbekistan are energy intensive. In 2017, the «Suvokava» consumed around 640 million kWh of electricity, which represents around 1.2% of countries total electricity consumption. Indicators of specific electric power consumption per 1 m³ of water rise are on average 0.52 kWh in Uzbekistan, which is two to three times higher than that of modern pumping equipment. The total energy costs for the «Suvokava» at 2017 prices was around US\$ 19.5 million, comprising 20 to 50% of the utilities total operating costs. Furthermore, such costs will increase substantially as the currently suppressed energy tariffs are liberated and expected to rise over the coming years. At the same time, most wastewater treatment plants require renovation. It should be noted that the disproportion between water consumption (1.6 billion m³) and wastewater disposal (0.9 billion m³) leads to flooding of settlements in some areas, as well as deterioration of the sanitary and environmental situation.

Energy use in «Suvokava» is not optimal due to (i) the use of inefficient aged pumping equipment; (ii) inadequate equipment maintenance due to limited availability of funds; (iii) limited knowledge and expertise of Suvokava staff with respect to efficient equipment and operating practices; (iv) relatively high non-revenue water (NRW) that requires excess energy for pumping and distribution; (v) lack of institutional and technical capacity for implementing energy efficiency projects; and (vi) lack of motivation and incentives for the Suvokava staff to devote efforts to improve energy efficiency and reduce energy costs.

Improved efficiency can help the «Suvokava» substantially reduce operational costs and achieve better financial results. Based on international experience, it is estimated that annual cost savings of US\$6 to 10 million could be achieved through increased energy efficiency (EE) at recent energy prices and these savings will increase significantly as energy costs escalate. However, the implementation of EE in Suvokavas is hindered by several barriers, the most important ones being the limited technical capacity and lack of availability of financing to implement EE measures.

The principal objectives of this component are to: (i) develop and implement a financing facility for sustainable financing of cost-effective investments in energy efficiency in the «Suvokava»; and (ii) provide technical assistance to develop the capacity of the Suvokavas, PCU and MHCS (Design Institute) to assure sustainability of the financing mechanism.

Sub-objectives include: (i) providing financing independent of central government sector investments, thereby allowing acceleration of progress towards sector development objectives; (ii) contributing to the accomplishment of the utility five-year performance improvement plans; (iii) improving financial management and accountability of the Suvokavas and building their capacity to identify and implement additional EE improvement projects.

The **Component 2** consists of two sub-components: Sub-component 2.1 – Financing Facility through an Energy Savings Capture Account and Sub-Component 2.2 – Technical Assistance for Capacity Building.

The facility will be implemented by MHCS through its PCU. Initial funding will be provided by the World Bank to finance the first phase of EE investments in selected utilities. Cost savings resulting from these EE investments will be identified, verified, and set aside in the Energy Savings Capture Account (ESCA), which will thereafter be used to finance future investments in EE activities (eventually operating as a sustainable rolling fund).

The PCU will select an experienced Energy Efficiency Consultant (EEC) with technical assessment, financial transactions, and professional management capabilities. This EEC will work in coordination with the Design Institute within MHCS and will have the responsibilities for identifying, assessing and designing the EE options and managing the implementation of these options and for verifying the cost savings. The EEC will also be responsible for technical assistance for capacity building of the Suvokavas and the MHCS Design Institute.

Sub-Component 2.1 – Financing facility through an Energy Savings Capture Account

Overview of Facility Structure

Initial investments under this sub-component will be provided to the Ministry of Finance by the World Bank, and the Ministry of Finance by the terms of the loan to the Ministry of Health and Social Security. Responsibility for the management of the financing mechanism will be assigned to the PCU within the framework of the Uzbekkommunalloyiha Project Institute (MHCS). The Project Co-ordinator will use these funds to invest in energy efficiency projects (in accordance with regular investment project financing requirements). The cost savings from these investments will be measured, verified and documented

The MHCS will establish a new account called the Energy Savings Capture Account (ESCA). The cost savings from the EE projects will be deposited into the ESCA each year for a specified period. The funds in the ESCA will then be utilized for additional investments in future EE activities. The EEC will assist in the implementation and management of the financing facility including the ESCA.

The facility will be open to all 14 Suvokavas; applications will be reviewed by the PCU with the assistance of the EEC, based on defined eligibility criteria and assessment of financial returns. The PCU will develop, with the assistance of the EEC, the procedures for project approval and disbursement of the funds for implementation of the EE activities, and for the measurement and verification of the cost savings resulting from the projects. These procedures will be reviewed by the World Bank team to assure they are adequate to monitor the investments and verify the results. The PCU will be responsible for ensuring that investments for the projects meet all national and World Bank requirements.

Eligibility Criteria

All 14 Suvokavas will be eligible for the investment projects. The eligible investment projects will include EE options such as (i) replacement of inefficient pumps with efficient pumps; (ii) leak reduction; (iii) load management by shifting pumping loads from peak to off-peak electricity tariff periods; (iv) improved metering and monitoring; (v) optimizing the operation of multiple pumps; (vi) reducing and leveling pressures in the distribution network; (vii) installation of variable speed drives on pumps; (viii) use of renewable energy (such as solar power and biogas from sludge) for pumping or for energy generation to reduce purchased energy costs; and (ix) other EE and cost reduction measures approved by the World Bank.

To be eligible for investments under the Financing Facility, each proposed investment project:

- Must provide a minimum of 15% savings in energy consumption and costs
- Have a simple payback period of less than 5 years.
- Be limited to a maximum amount of US\$3.0 million.

Be supported by a detailed energy audit conducted by an experienced technical team (funded by the TA under the supervision of EEC).

Institutional and Implementation Arrangements

The overall management, oversight and coordination responsibility for the EE financing facility will rest with MHCS. The PCU will be strengthened with additional resources and support from the EEC, to increase capacity for implementing this innovative component of the project. The PCU will develop and implement monitoring and reporting procedures for each investment project. The PCU will also be responsible for the Technical Assistance sub-component. The PCU will be assisted by the EEC, which will be selected through competitive bidding, to provide technical and consulting support to the PCU with respect to energy auditing, identification of EE measures, selection of equipment and service providers, supervision of the project implementation and measurement and verification (M&V) of the energy and cost savings. The energy audits will be partially or fully funded using the technical assistance funds.

The “Baseline Energy Consumption and Energy Cost” for the «Suvokava» will be established during the energy audit and will be agreed upon by the «Suvokava» and the PCU. After the implementation of the investment project, the energy and cost savings will be identified and verified. MHCS will then ensure Suvokava allocate enough funds, for payment of the lower energy bill and to pay the difference between the baseline amount and the lower energy bill (the verified energy cost savings) into the ESCA. If the energy costs escalate in subsequent years, appropriate adjustments will be made to the baseline and the cost savings.

The Figure below illustrate the ESCA concept and institutional and implementation arrangements for the financing facility.

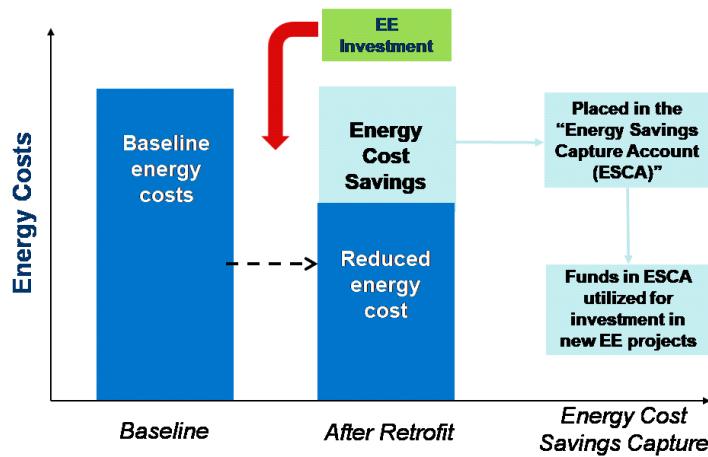


Figure 1.2.2: Energy Savings Capture Account (ESCA) concept)

The responsibilities of the EEC will include supporting the PCU in the following areas:

- Identification of energy efficiency opportunities
- Selection of an audit team and supervision of a detailed energy audit
- develop technical solutions
- project eligibility verification
 - Identify equipment and service providers for project implementation
 - implementation supervision
- Conduct measurement and verification of savings.

The EEC will also have the responsibility for building the capacity of the PCU, Suvokavas and MHCS Design Institute to ensure sustainable implementation of the facility.

Sub-Component 2.2 - Technical assistance for energy efficiency management

The «Technical Assistance» (TA) sub-component will finance support services, primarily the EEC contract and others as necessary, with an overall aim to ensure successful implementation of the EE financing facility including strengthening institutional capacity to support its sustainable usage. It will include:

- TA to MHCS to assist the development of an EE strategy for Suvokavas to reduce their operational costs and improve their financial viability.
- TA to the PCU to build the PCU's capacity for project design and monitoring and for coordinating the TA to the Suvokavas.
- TA to the Suvokavas to improve their knowledge and understanding of EE and load management technologies and options, for assessment of the financial and implementation issues, and for preparing project proposals for investment.
- TA to the MHCS Design Institute to provide an understanding of EE and load management technologies and options for Suvokavas, procedures for auditing and identifying EE options, and measurement and verification (M&V) of the results of EE projects.
- TA to equipment and service providers who may be providing services to the Suvokavas for detailed energy audits, assessment of the financial aspects of EE measures, implementation and commissioning, and M&V.

- The TA may also include partial or full funding of detailed energy audits for Suvokava investment projects to ensure readiness of the first series of investments.

The TA will also include:

- Support for communications, such as technical briefs, brochures, case studies of successful projects, etc.
- Annual national conferences on EE in the «Suvokava».
- Structured seminars.
- Formal training on topics such as pumping technologies, energy auditing (including instrumentation and metering), and load management, EE financial analysis, and M&V.
- Practical training with the participation of experts conducting detailed energy audits, etc.

Energy efficiency helps to reduce operating and maintenance costs, increase productivity, and save money through lower energy consumption. It will also contribute to environmental improvement and climate change mitigation.

Successful implementation of the energy efficiency financing mechanism for the 14 SUE "Suvokava" will allow to install new modern pumps on the water supply network and sewage pumping stations, new blowers, aerators in aeration tanks for biological treatment of sewage treatment plants. These measures will lead to a significant reduction in electricity consumption, as well as a reduction in water losses, a reduction in the loss of water due to guaranteed timely collection and treatment of wastewater, which helps to reduce the discharge of polluted wastewater into surface and groundwater.

As noted above, in 2017 SUE «Suvokava» consumed about 640 million kWh of electricity. In case of implementation of these measures, in case of increasing the efficiency of energy-intensive equipment even by 20% on average, electricity consumption will be reduced by 20% and will amount to 640.0 million kWh 0.20.= 128.0 million kWh. At operation of thermal station of thermal power station at electric power generation of 128,0 mln. kWh with application of fossil fuels (natural gas or coal) in atmospheric air products of combustion of fuel and greenhouse gas - carbon dioxide will be emitted (table 1.2.2).

Table 1.2.2 Emissions of pollutants into the atmosphere from a fuel-burning TPP during power generation 128.0 million kWh

Indicators	Fuel-burning TPP	
	Natural gas	Coal
Fuel consumption	30.0 mln. m3	45.0 thousand tons
Emissions of harmful substances, tonnes/year, including:	380.0	4874.5
Nitrogen oxides	123.9	125.8
Sulphur dioxide	-	719.4
Carbon monoxide	256.1	771.7
Coal ash	-	3257.6
Greenhouse gas emissions (CO2). t/year	62120.5	164869.0

When using natural gas as fuel, 38.0 t/year of harmful substances, greenhouse gas (CO₂) - 62120.5 t/year, when using coal - 4879.4 t/year of harmful substances and greenhouse gas - 164869.0 t/year are roughly emitted. Thus, the reduction of electricity consumption in case of successful mechanism of energy efficiency financing for 14 Substation control buildings (SCB) "Suvokava" will lead to saving of natural resources - natural gas and coal, reduction of pollution by emissions of harmful substances and greenhouse gas, which in turn will have a positive impact on the climate.

Electricity costs for the operation of water supply and sewerage systems can be reduced by replacing purchased electricity (electricity from the grid) with local electricity generation. Uzbekistan is a region with high solar activity (average number of sunny days per year reaches 260, more than 3,000 hours of sunshine, peak value of solar resources - 1,675 W/m²), therefore, mass application of solar photoelectric panels is especially important in the regions of the project zone.

Application of solar photovoltaic panels will allow not only to receive the electric power, but also to save fuel resources that will positively affect the environment and climate.

Advantages of introducing photovoltaic panels:

- Conservation of rivers, subsoil and natural resources;
- Increase in the level of environmental safety of the region (absence of emissions of greenhouse gases and solid particles that pollute the environment and, as a consequence, reduce the impact on the climate and atmospheric air);
- Accessibility and, consequently, the possibility of forming own energy base for individual entrepreneurs, as well as for individual communities, groups of companies and regions;
- A solar power plant can operate either on battery power or in a single power grid, which means that the energy produced can be sold.

An additional method of generating electricity can be the sludge generated by wastewater treatment in sewage treatment plants, which can be used as biofuel. In most developed countries, municipal wastewater collection and treatment is carried out in centralized aerobic wastewater treatment systems. Methane is released as a result of anaerobic decomposition of organic substances in the process of treatment and treatment of municipal wastewater. Although the amount of methane emissions from such systems is small, they also produce large amounts of solid organic matter, which can increase methane emissions. In developing countries, where there is little or no wastewater collection and treatment, anaerobic systems are mostly used, resulting in higher methane emissions.

Anaerobic sludge digestion systems are used to treat wastewater from solid organic matter and produce biogas, which can be used locally instead of the traditional fuels required to generate electricity and heat. Anaerobic digestion systems are the easiest and simplest way to produce biogas. The most cost-effective way to reduce methane emissions is to simply cover existing biogas collection tanks instead of spending money on new centralized aerobic treatment plants.

To produce biogas, biological installations are used in which organic compounds are bacteriologically broken down under anaerobic conditions. During decomposition, methane is used as a fuel for heat and electricity generation. It is a cheap and efficient energy that can be produced from sludge from waste water treatment plants.

The collection and use of methane in wastewater treatment plants is extremely beneficial:

- greenhouse gases and related atmospheric pollution are reduced;
- A local source of energy appears, which supports energy independence;
- Waste becomes a source of income;
- Renewable energy is created, which can be an alternative to the use of fossil fuels;

- Jobs related to the construction and operation of facilities are created;
- The image of a local government body with a policy of innovation and future growth is improved.

When fermented in aerobic stabilizers from one cubic meter of sludge is formed from 10-18 m³ of gas consisting of methane (70%) and carbon dioxide (30%), which are greenhouse gases. Methane can be used as a fuel and carbon dioxide can be used to produce dry ice. The residue of solids not destroyed by fermentation is called dumped sludge. Discharged sludge is colored in a characteristic black color due to accumulation of humic substances. This sludge easily gives off water and has a pleasant appearance. It contains mineral and organic substances necessary for normal development of plants, namely: about 12% of humic substances, 3% of total nitrogen, 3.78% of phosphoric acid, 0.22% of potassium oxide, 1% of calcium oxide (in % to dry matter).

Creation on the basis of the enterprise of additional energy by processing sludge of sewage in the form of biofuel with the generation of electricity and will allow a modern person as a person to rationally distribute and master budgetary funds and funds of investors, which will allow in the shortest possible time to achieve the set goal: "Reduction of the negative impact on the environment by reducing the volume of accumulated sludge of sewage on the territory of sludge fields of treatment facilities of district and municipal water utilities.

1.3. THE SCOPE AND OBJECTIVES OF ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

The main goal of the Environmental and Social Management Framework (ESMF) is to define the measures, ways and mechanism for avoiding, minimizing and/or mitigating potential negative environmental and related social impacts that may occur as the result of implementation of the project. Details of these subprojects will be known after the technical design preparation. The ESMF ensures that the identified subprojects are correctly assessed from environmental and social perspective to meet WB's Safeguards Policies alongside with Uzbekistan's Environmental and Social Laws and Regulations for adequate mitigation of residual and unavoidable impacts (if any).

ESMF provides guidelines for the development of appropriate mitigation and compensation measures for adverse impact caused by project activities. In this document the background/context, the policy and regulatory framework are described as well as environmental and social impacts of possible subprojects. This includes Environmental and Social Assessment (ESA) procedures and guidelines, institutional arrangements, consultation and disclosure procedures. The policy and regulatory framework considers the compliance with the national laws and WB requirements. ESA guidelines and procedures serve to define the responsibilities for sub-project preparation, screening, appraisal, implementing and monitoring. With the help of these guidelines the requirements for the sub project Environmental and Social Management Plans (ESMP) will be outlined.

The ESMF serves also to provide details on procedures, criteria, and responsibilities for subproject environmental and social screening, preparing, implementing and monitoring of subproject specific ESIA's. Towards preparing a RAP, project preparation has developed a Resettlement Policy Framework (RPF). The key objective of the Resettlement Policy Framework is to provide a framework to appropriately identify, address and mitigate adverse socioeconomic impacts that may occur due to the implementation of subprojects that involve the involuntary acquisition of land and the subsequent resettlement of affected families.

2. REGULATORY FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL ASSESSMENT

2.1. NATIONAL ENVIRONMENTAL POLICY AND LEGISLATION

Since the country's independence, the Republic of Uzbekistan has developed, revised and improved national environmental legislation, adopted new laws and regulations, developed programmes and action plans to address environmental issues and promoted sustainable use of natural resources. The country has adopted several subsidiary laws and legislation on environmental management and is a party to series of international and regional environmental agreements and conventions. The nature protection policy and the implementation of measures in the field of rational use of natural resources and environmental protection are based on the following basic principles:

- ✓ Integration of economic and environmental policies aimed at preserving and restoring the environment as a prerequisite for improving the living standards of the population;
- ✓ Transition from the protection of individual natural elements to the general and comprehensive protection of ecosystems;
- ✓ Responsibility of all members of society for environmental protection and biodiversity conservation.

Environmental law and policy

Nature protection issues under the project are regulated by the following legal acts:

- **Constitution**, articles 50, 54, 55, 93, 100. Article 55 of the Constitution of the Republic of Uzbekistan states: Land, its subsoil, water, flora and fauna and other natural resources are national treasures and are subject to rational use and protection by the State;
- **The Law "On Nature Protection"** of December 9, 1992 (updated on 18.04.2018) establishes the legal, economic and organizational framework for environmental protection, ensures sustainable development and certain principles, including the State Environmental Expertise (SEE). Article 12 of the Law "On Nature Protection" states: Residents of the Republic of Uzbekistan are obliged to use natural resources rationally, treat natural resources with care, and comply with environmental requirements. As stated in the law, in order to protect the climate from global changes, a business entity must comply with the restrictions on greenhouse gas emissions, as well as take measures to mitigate these emissions.
- **The Law on Water and Water Use** of 6 May 1993 (updated on 23 July 2018) provides for the rational use of water resources, protection of water resources, prevention and mitigation of negative impacts and compliance with national legislation; the Law provides for the responsibility of all natural and legal persons for the prevention of pollution of watersheds, reservoirs, snow and ice cover, glaciers, permanent snow cover with industrial, domestic and other wastes and emissions that may lead to the deterioration of ecological balance of the environment. State management of water protection and use is carried out through accounting, monitoring, licensing, control and supervision;
- **The Law "On the Protection and Use of Vegetation"** of December 26, 1997 (updated on September 21, 2016) regulates relations in the field of protection and use of vegetation (plants) growing in natural conditions, as well as wild plants grown for their restoration and genetic conservation;
- **The Law "On Protection of the Atmospheric Air"** of December 27, 1996 (updated on September 14, 2017) defines the issues of preservation of the natural state of the atmospheric air; legal regulation of the activity of state bodies, enterprises, institutions, organizations, public associations and citizens in the field of protection of the atmospheric air.
- **The Waste Act** 2002 г. (updated 10.10.2018) regulates waste management and empowers the State Environmental Committee to inspect, coordinate, assess the environment and establish certain parameters for those places where waste can be disposed of.
- **Law on Environmental Expertise** (2001) (updated on 14.09.2018) provides for mandatory examination of the impact on the environment and human health, and also serves as a legal basis for the examination;

- **The Law on Environmental Control** (2013) regulates relations in the field of environmental protection. The main objectives of environmental control are prevention, detection and suppression of violations of environmental legislation; monitoring of the environmental situation and factors that may lead to environmental pollution, irrational use of natural resources, threat to life and health of citizen;
- **The Law on the National Security Concept** (1997), provides the main structure for achieving environmental safety, etc;
- **The Law "On Protection of Agricultural Plants from Pests, Diseases and Weeds"** (2000) regulates relations connected with ensuring protection of agricultural plants from pests, diseases and weeds, prevention of harmful impact of plant protection means on human health and environment.

Legislation related to nature protection

Many important aspects of public administration, use and protection of nature and agricultural plants are regulated, for example, by the Cabinet of Ministers through different bylaws:

- "Procedure for the development and execution of draft standards for maximum permissible discharges of pollutants discharged into water bodies, including sewage" (RD118.0027719.5-91);
- "Procedure for granting permission for special water use (RD 118.0027714.6-92);
- State standard - Water quality. O'z DST 951:2011 - Sources of centralized domestic and drinking water supply. Hygiene, technical requirements and selection rules;
- "Temporary recommendations on control over groundwater protection in the Republic of Uzbekistan". State Committee on Nature Protection and Uzbekhydrogeology of the Republic of Uzbekistan, Tashkent, 1991.
- Resolution of the Cabinet of Ministers "On Approval of the Regulation on State Environmental Control" (No. 49, 3.04.2002);
- SanPiN RUZ № 0179-04 Hygiene standards. List of Maximum Permissible Concentrations (MPCs) of Pollutants in the Air of Residential Areas in the Republic of Uzbekistan, including Annex 1;
- SanPiN RUZ No. 0267-09 Permissible noise level in the residential area, both inside and outside the buildings;
- SanPiN No. 0120-01 "Sanitary standards of permissible noise levels at workplaces";
- SanPiN RUZ № 0088-99 Sanitary requirements for the development and approval of projects of maximum allowable discharges (MPD) of substances entering water bodies with waste water;
- SanPiN RUZ № 0321-15 Hygienic classification of toxicity and hazard;
- "Regulation on the procedure of burial of toxic chemicals and other toxic substances, as well as protection and maintenance of special grounds" (registered with the Ministry of Justice under No. 2438 of 20.03.2013);
- Resolution of the President of the Republic of Uzbekistan of 16.03.2017 NPP-2841.
- Rules for the reception of industrial wastewater and the procedure for the calculation of compensation payments for supernormal discharges of pollutants into the municipal sewerage networks of cities and other localities of the Republic of Uzbekistan (Annex 1 to PCM № 11 of 2010);
- GOST-23941-79 "Noise. Measurement methods";
- Methodical guidelines for measuring and hygienic assessment of noise at workplaces" No. 1844-78;
- SanPiN No. 0046-95 "Maximum permissible concentrations (MPC) of harmful substances in the air of the working zone";

- Procedure for the development and approval of design standards for maximum permissible concentrations in water bodies, including drainage water" (RD 118.0027719.5-91);
- Permit for special water use" (RD 118.0027714.6-92);
- Instruction on determining the damage caused to the national economy by groundwater pollution". (PP 118.0027719.5-91) (PARAS. 118.0027714.47-95);
- Sanitary Regulations No. 0289-10. Sanitary rules and hygienic requirements in the organization of construction and construction;
- Sanitary rules and standards for the maintenance and improvement of residential areas in the conditions of the Republic of Uzbekistan (Sanitary Rules and Regulations No. 0329-16)
- Temporary Recommendations on Groundwater Protection Control in the Republic of Uzbekistan". State Committee on Natural Resources and Uzbek Hydrogeology of the Republic of Uzbekistan, Tashkent, 1991
- Resolution of the Cabinet of Ministers of February 3, 2010 No. 11 Annex 1. Rules for the reception of industrial wastewater and the procedure for calculating compensation payments for excess discharges of pollutants into urban sewerage networks of cities and other settlements of the Republic of Uzbekistan.

The last Resolution sets out the requirements for the discharge of wastewater into the sewerage system. In order to discharge industrial and household wastewater from public organizations, a utility and environmental standard (UES) is being developed. Discharge of storm water is not allowed.

Connection of sewerage networks to the sewerage system of cities and other settlements of new subscribers, as well as newly commissioned facilities of existing enterprises is allowed only after the commissioning of local treatment facilities that ensure the treatment of industrial wastewater to the extent permitted for their reception on the treatment facilities of sewage of cities and settlements.

Permissible concentrations of pollutants discharged at treatment facilities of settlements should be determined taking into account the conditions of discharges of treated industrial wastewaters into a water object, established in the permit for special water use or in the limits of maximum permissible discharge for this water object, the corresponding type of water use, depending on the efficiency of removal of pollutants from industrial wastewaters at treatment facilities of settlements, the ratio between the volume of urban and production.

In accordance with the Law, industrial effluents, domestic and other sources of wastewater may be discharged into water bodies on the basis of a permit issued by the Committee on Ecology and Environmental Protection and the Ministry of Agriculture and Water Resources after coordination with the State Sanitary Inspectorate, bodies supervising the safe conduct of work in industry, mining and domestic sector, geology and mineral resources.

The permit is issued on the basis of documents justifying the necessity and possibility of using water bodies for wastewater discharge.

International agreements in the field of nature protection and prevention of trans boundary impact

Since independence, Uzbekistan has become a Party to bilateral and multilateral agreements and participates in regional environmental initiatives in Central Asia. An important incentive for strengthening dialogue and cooperation between the countries was the signing of a number of intergovernmental agreements, such as:

- Agreement between the Government of the Republic of Uzbekistan and the Government of the Kyrgyz Republic on cooperation in the sphere of environmental protection and rational nature management (12/24/1996)

- Agreement between the Government of the Republic of Kazakhstan, the Kyrgyz Republic and the Republic of Uzbekistan on cooperation in the sphere of environmental protection and environmental management (Bishkek, 03/17/1998);

- Agreement between Kazakhstan, Kyrgyzstan and Uzbekistan on the use of water and energy resources of the Syr Darya Basin (Bishkek; March 17, 1998) and etc.

- The decision of the Heads of Central Asian States on the “Main Directions of the Program of Concrete Actions to Improve the Ecological and Socio-Economic Situation in the Aral Sea Basin for the Period 2003-2010.” Signed 06.10.2002 in Dushanbe.

The global agreements in which Uzbekistan is a Party are as follows:

- UN Framework Convention on Climate Change (06/20/1993)
- Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (05/26/1993);
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (12/22/1995);
- Paris Convention on Protection of the World Cultural and Natural Heritage (12.22.1995);
- UN (Rio) Convention on Biological Diversity (05.06.1995)
- United Nations Convention to Combat Desertification (08/31/1995)
- Convention on International Trade of Endangered Species of Wild Flora and Fauna (07/01/1997);
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (05/01/1998);
- Ramsar Convention on Wetlands of International Importance Especially as Wildlife Habitat (30.08.2001), etc.
- UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention) (9.08.2007)
- Convention on the Law of the Non-Navigational Uses of International Watercourses (August 9, 2007).

2.2. LEGISLATION OF THE REPUBLIC OF UZBEKISTAN AND WB POLICIES IN THE SPHERE OF SOCIAL ASSESSMENT, LAND ACQUISITION AND RESETTLEMENT

2.2.1 Social Assessment requirements

The Social Assessment is the process of data collection and analysis, undertaken by the Borrower to identify the social dimensions of investment projects, provide spaces to incorporate stakeholders' views into project design, and to establish a participatory process for implementation, monitoring and evaluation. The World Bank might require the Borrower to conduct the full Social Assessment (usually also called as Poverty and Social Impact Analysis) in cases where large scale or serious sociological or socio-economic impacts are expected or there is a lack of baseline socio-economic data.

The Social Assessment (SA) for the Bank financed projects is usually based on combination of quantitative and qualitative methods of data collection (household surveys, in-depth interviews and Focused Group Discussions with representatives of key stakeholders' groups, background information/data review etc.). The Bank has no Operational Policies regulating Social Assessment process, however there is a huge pool of guidelines and sourcebooks that provide tools for the proper organization and conduction of the SA.

The national legislation of Uzbekistan does not contain any requirements regarding SA, so in case the SA will be requested, the EA will organize the process of SA based on Bank's recommendations.

The only national regulatory document that can be applied during the SA is the **Resolution of Cabinet of Ministers #44 dated 15 February 2013 “On Approval of the Regulations on the Procedure of Assignment and Payment of Social Benefits and Material Assistance to Low-Income Families”**. This resolution determines the procedure for the appointment and payment by Makhalla allowances for families with children under the age of 14 years, allowances for child care until the age of two years and allowance for low income families. This Resolution defines a minimum threshold of income, which gives the right to an allowance for poor (1.5 times the minimum wage per family member per month) and provides the methodology for the income calculation. Given the lack of other statutory poverty criteria, the above-mentioned methodology is to be utilized for the Social Assessment for calculation of the poverty level in the different sub-project areas.

2.2.2 Land Acquisition and Resettlement

The World Bank recognizes that involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and carried out. The Bank's Resettlement Policy OP 4.12, includes safeguards to address and mitigate the economic, social, and environmental risks arising from involuntary resettlement. The Uzbekistan's legislation does not define compensation as targeting the rehabilitation of the PAPs livelihood. It instead focuses on the mere compensation of directly measurable physical impacts or incomes.

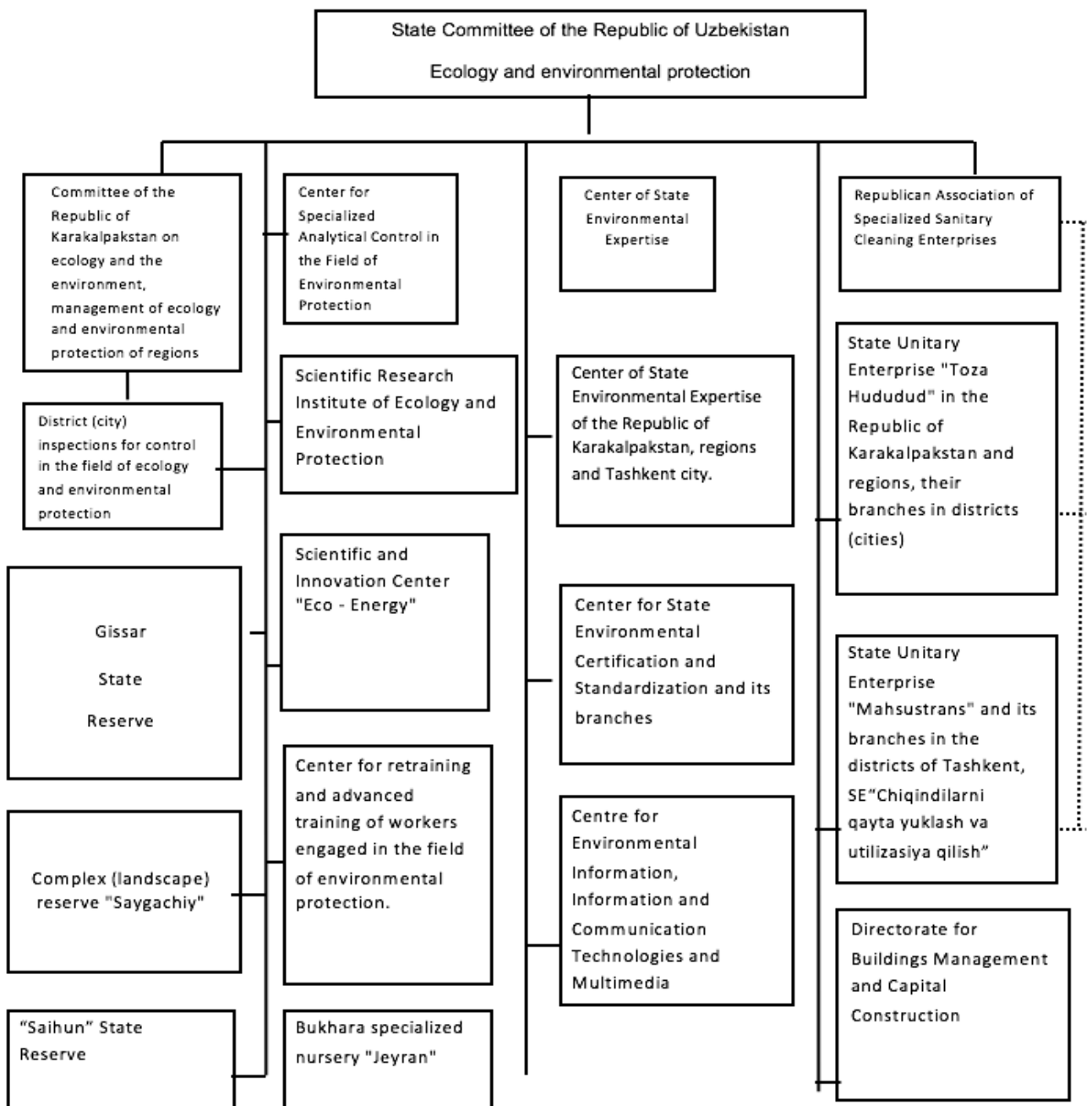
The legal and policy framework of this Project in the sphere of Land Acquisition and Resettlement (LAR) is based on both national laws and legislations related to LAR and WB OP 4.12 on Involuntary Resettlement (2001). Based on the analysis of applicable laws and policies and WB's Policy requirement, project related LAR principles have been adopted.

The detailed information about national regulatory base related to LAR and about WB OP 4.12 as well as the principles of its harmonization within the framework of this Project is provided within the Resettlement Policy Framework (RPF) document (Annex 10).

2.3. GOVERNMENT AGENCIES RESPONSIBLE FOR CONDUCTING ENVIRONMENTAL IMPACT ASSESSMENTS

The State Committee on Ecology and Environmental Protection (SCEEP) is the main regulatory body in the field of ecology, environmental protection, rational use and reproduction of natural resources (Fig. 2.3.1). It reports directly to the Cabinet of Ministers and is responsible for coordinating the activities of other national authorities in the field of environmental protection and natural resources at the central, regional and district levels. The activity of the Committee is regulated by the Resolution No. 949 of 22/11/2018: "On Approval of the Regulation on State Environmental Expertise" of the Cabinet of Ministers».

Figure 2.3.1. Organizational structure of the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection



The SCEEP is responsible for the protection of environmental and natural systems. It oversees the national protected area system, can initiate liability/damage actions, and administers an environmental fund that receives pollution charges and fines and supports mitigation measures. The SCEEP also issues permits for emissions of polluting discharges and may prohibit projects and construction activities that do not comply with (international) legislation.

The State Environmental Expertise (SEE) is regulated by the Law on Ecological Expertise (2000), updated on 14.09.2017 and the Cabinet of Ministers Resolution No. 949 of 22/11/2018: "On Approval of the Regulation on State Ecological Expertise". In accordance with Article 3 of the above-mentioned law, an environmental impact assessment is carried out in order to identify:

- Compliance of planned economic and other activities with environmental requirements at the stages preceding the decision on their implementation;
- The level of environmental hazard from planned or ongoing economic and other activities that may have or have had a negative impact on the environment and public health;
- Adequacy and validity of measures provided for environmental protection and rational use of natural resources.

The structure of the SCEEP has the form of a central body in Tashkent, with regional (oblast) and local (district) branches and institutions for scientific and technical support. Organizations at the regional level have the same structure as those at the national level. The SEE shall be carried out by the following specialized expert units of the State Environmental Committee:

- State Unitary Enterprise "Center of State Ecological Expertise" Goskomekologii, hereinafter referred to as "GUP Center of State Ecological Expertise";
- State Unitary Enterprise "Center of State Ecological Expertise" Republic of Karakalpakstan;
- State Unitary Enterprises "Center of State Ecological Expertise" of regions and Tashkent city.

Other state bodies within the administrative structure of Uzbekistan with relevant environmental responsibilities are:

- The Ministry of Agriculture and Water Resources (MAWR) is the main republican organization responsible for the development of the agricultural sector. In the agriculture and water sector, the MAWR has two main sub-sectors under the auspices of one organization: agriculture and water management. The water sector is organized at the level of basin authorities and at the oblast level.

There are two regional institutions for water allocation: the Water Association (WA) for the Syrdarya River Basin and the Amudarya River Basin

- State Committee on Land Resources, Surveys, Cartography and State Cadastre (or Goskomgeodezkadastr)-main activities of the committee are the development and implementation of a unified state policy on the rational use of land resources, ensuring the conservation and protection of land, increasing soil fertility and maintaining a unified system of state cadastres.
- The State Committee for Geology and Mineral Resources of the Republic of Uzbekistan conducts geological study of subsurface resources in order to strengthen and expand the mineral resource base of the mining and processing industry, and ensures intersectoral coordination of activities related to the geological study of subsurface resources in Uzbekistan.

The Committee exercises state control over the geological study of subsurface resources by all enterprises and organizations regardless of their form of ownership, creates and ensures the functioning of the data bank on the geological structure of subsurface resources and mineral resources of the Republic, and maintains the state balance on mineral resources and other resources in order to determine the conditions for their economic and rational use.

- The Hydrometeorological Service Center (or UzHydromet) carries out systematic observations of air, soil and surface water, as well as oversees the formation and development of catastrophic hydrometeorological phenomena, and provides the information to the state and economic management bodies. It also provides citizens with information on actual and expected hydrometeorological conditions, climate change, the level of environmental pollution, and emergency information on the occurrence of dangerous and natural hydrometeorological phenomena; it carries out fundamental and applied research in the field of hydrometeorology, climate change and environmental pollution.
- The Ministry of Health (or MHUz) develops and approves sanitary rules and hygienic norms, carries out state sanitary supervision over their observance, as well as methodical supervision over the work of sanitary and epidemiological services, regardless of their departmental subordination.
- Sanoatgeokontekhnazorat (State Inspectorate for Supervision of Geological Study of Subsoil, Safe Operation in Industry, Mining and Utilities) works together with the State Committee on Ecology and Environmental Protection of the Republic of Uzbekistan and exercises control in the field of geological study, use and protection of mineral resources.

2.4. MAIN STAGES OF ENVIRONMENTAL ASSESSMENT

Taking into account the requirements of EAs established by national legislation, as well as the WB OP and the General Guidelines for Environment, Health and Safety (EHS), the EIA process for individual subprojects will consist of three or four steps:

- (a) based on the preliminary project description prepare the Draft Statement of the Environmental Impacts (DSEI) which should be presented to the SEE for its review and approval;
- (b) based on the detailed project design prepare the ESMP for the project implementation phase (the description of the ESMP is presented below);

- (c) during projects implementation and before its commissioning – when needed (this is specified in the decision of the SEE on the Statement draft of environmental impacts), - prepare the Statement of the Environmental Impacts;
- (d) before commissioning the project (only for category 1-3 projects (Uzbekistan)) prepare Declaration of Environmental Effects (DEE). Preparation of DEE is not mandatory for the projects belonged to all category IV project in Uzbekistan and for many Category III projects too – this is decided by the SEE at the DSEI stage.

First stage - Draft Statement of Environmental Impacts (DSEI). This document should be prepared by sub-project beneficiary and/or by a consultant hired on its behalf. The RCM № 949 (2018 r.) specifies the content of DSEI. The content of document for project category IV projects is different from content of DSEI developing for category 1-3 projects. As indicated in Figure 2.4.1, 1st category is similar to WB’s Category A. 2nd and 3th categories are equivalent to category B (WB). DSEI’s content for 4th category projects is more simplified than for projects category 1-3. The full DSEI should specify a large spectrum of environmental and social issues, based on the technical and economic substantiation of the sub-project and in particular the following : (a) environmental, social and economic baseline; (b) situational plan showing existing recreational areas, settlements, irrigation, reclamation facilities, farmland, power lines, transport communications, water, gas pipelines and other information about the area; (c) description of project activities and used technologies; (d) expected emissions, discharges, wastes, their negative impact on the environment and ways of neutralization; (e) warehousing, storage and disposal of wastes; (f) analysis of the alternatives of the proposed or existing activity and technological solutions from the perspective of environmental protection, taking into account the achievements of science, technology and best practices; (g) organizational, technical, technological solutions and activities, excluding the negative environmental impacts and mitigating the impact of the expertizing object on the environment; (j) analysis of emergency situations; and (i) forecast environmental changes and environmental impacts as a result of the implementation of the expertizing object.

For the projects belonged to Category 4 (Uzbekistan) which is equivalent to WB category C the following information have to presented in EA report¹: (a) location plan with indication of land usage of area; (b) description of production technology, (c) information on existence of sewage network and requirements for sewage discharge; (d) amount and content of discharges/emissions, (e) amount and storage conditions of wastes, (f) environment protection measures.

The DSEI has to be reviewed and approved by the national level of Glavgosekoexpertisa (for the projects belong to category 1-2 (Uzbek) or Category A or B (WB)) or provincial level of Gosekoexpertisa (for the projects belong to category 3-4 (National) or category B (WB)) under State Committee of Ecology and Environmental protection (national and provincial level accordingly). The State Ecological Expertise confirms the project Category and specifies the main issues on what the project beneficiary has to be focused during the next steps of the EA process and during project implementation (construction or rehabilitation activities).

Second stage – development of ESMP needs to be done in accordance with the requirements of the WB OP 4.01. These requirements for the ESMPs and its structure are provided below and in the current ESMF document.

Third stage – development of SEI. This stage has to be implemented if it is required in Environmental Conclusion issued by DSEI. Usually such documents are developed to fulfill information provided into DSEI or provide investigation on indicated parameters. SEI needs to be developed before construction activities launching.

Fourth stage – development of Declaration on Environmental Effects (DEE) (for subprojects belonged to categories 1-3 (Uzbek) or Category B (WB)) will need to be developed prior the selected sub-projects will

¹ Resolution of the Cabinet of Ministers (RCM) on “Regulation on Environmental Expertise” (2018)

start operation. For the sub-projects which are not included into the list with activities which are object of national EA.

2.5. NATIONAL REQUIREMENTS FOR ENVIRONMENTAL AND SOCIAL ASSESSMENT

The National ESA procedure is regulated by the Law on Environmental Expertise (2000), updated on 14.09.2017 and the Cabinet of Ministers Resolution No. 949 of 22/11/2018: "On Approval of the Regulation on State Environmental Expertise". In accordance with Article 3 of the above-mentioned law, an environmental impact assessment is carried out in order to identify:

- Compliance of planned economic and other activities with environmental requirements at the stages preceding the decision on their implementation;
- The level of environmental hazard from planned or ongoing economic and other activities that may have or have had a negative impact on the environment and public health;
- Adequacy and validity of measures provided for environmental protection and rational use of natural resources.

The special authorized state body in the field of state environmental expertise is the State Committee on Ecology and Environmental Protection (Goskomekologiya). The organizational structure of the State Committee on Ecology and Environmental Protection of the Republic of Uzbekistan is discussed in detail in 3.2 Section.

The main organization responsible for the state environmental expertise is the Glavgosexpertiza SCEEP (Main state expertise) (Figure 2.3.1.).

SUE "Center of State Environmental Expertise" carries out state eco-expertise of EIA of the objects of economic activity belonging to I and II categories of environmental impact (high and medium risk);

The State Unitary Enterprise "Center of State Environmental Expertise" of the Republic of Karakalpakstan and regions carry out environmental impact assessment of economic activity objects belonging to III and IV categories of environmental impact (low risk and local impact).

The Regulation on the Main state expertise describes in detail the procedure for organizing and conducting the SEE and the procedure for conducting the SER.

Environmental impact assessment is a procedure that includes three stages of the EIA:

Step 1: The Draft Environmental Impact Statement (DEIS) should be conducted at the planning stage of the proposed project prior to the allocation of development funds and contain the following sections:

- environmental conditions prior to the beginning of the planned activity, population of the territory, land development, analysis of environmental characteristics;
- a situational plan indicating the existing recreational zones, settlements, irrigation, reclamation facilities, farmlands, power lines, transportation, water supply, gas pipelines and other information about the area;
- proposed (planned) main and auxiliary facilities, used machinery, technology, natural resources, materials, raw materials, fuel, analysis of their environmental impacts, environmental hazards of the products;
- expected emissions, discharges, wastes, their negative impact on the environment and methods of neutralization;
- warehousing, storage and utilization of wastes;
- the analysis of alternatives to planned or ongoing activities and technological solutions from the perspective of nature protection, taking into account the achievements of science, technology and best practices;
- organizational, technical, technological solutions and measures that exclude negative environmental consequences and reduce the environmental impact of the facility;
- analysis of emergency situations (with an assessment of their probability and a scenario to prevent their negative consequences);

- forecast of changes in the environment and environmental consequences as a result of the implementation of the object under the expertise.

Step 2: Preparing the Environmental Impact Statement (EIS) - the need for such step is decided at Stage 1 and Glavgosexpertiza shall indicate that additional researches or analyses are needed. The EIS shall be submitted to the Glavgosexpertiza prior to approval of the Project Feasibility Study, prior construction activities. The application shall contain the following:

- assessment of ecological problems of the selected site based on the results of engineering and geological surveys, model and other necessary studies;
- ecological analysis of the technology in relation to the identified problems of the site;
- results of public hearings (if necessary);
- reasoned studies of environment protection measures that prevent negative consequences of implementation of the object of examination;

Step 3: Preparing the Declaration of Environmental Effects (DEF) is the final step in the SEE process and should be made prior to project implementation. Such documents are necessary only for projects with significant environmental and social impacts. Main sections of the DEF are the following:

- adjustment of design decisions and other measures taken following the review of the draft SCEEP conclusion on the environmental impact, as well as proposals made during the public hearings;
- environmental standards regulating the activities of the object of expertise;
- requirements to the organization of works and implementation of measures for environmental support of the facility operation;
- main conclusions on the possibility of conducting business activities.

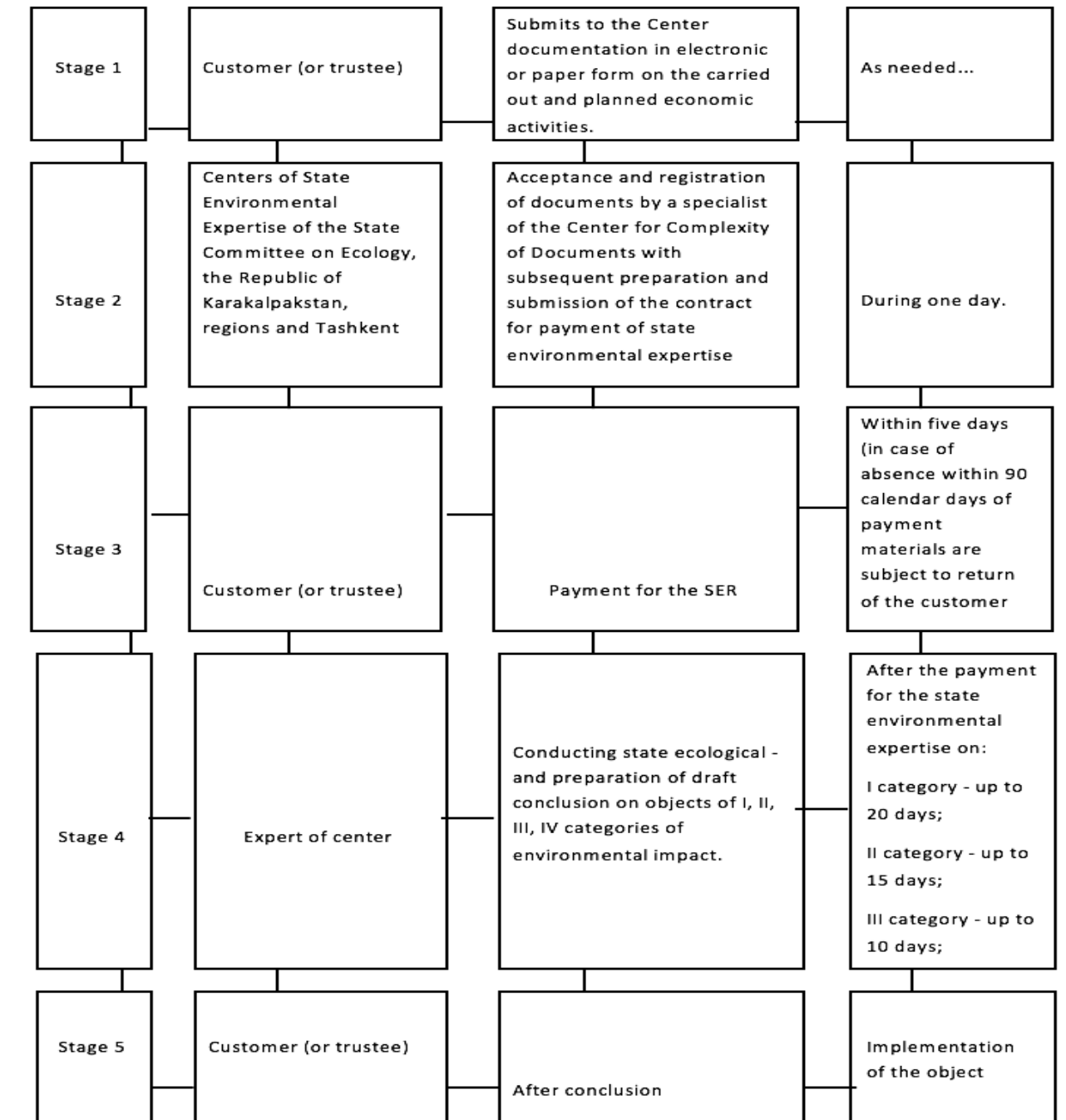
Project Categories. According to the Cabinet of Ministers Decree No. 949 of 22/11/2018: "On approval of the Regulation on State Environmental Expertise". All types of environmental activities are divided into 4 categories with different degrees of impact:

- Category I - high risk of environmental impact (SEE is conducted by the SUE "Center of State Environmental Expertise" within 20 days, all stages of the EIA are required);
- Category II - "Average risk of environmental impact" (SEE is conducted by the State Environmental Expertise Center within 15 days, all stages of the EIA are required);
- Category III - "low risk of impact" (SEE is conducted by the regional branches of the SUE Center of State Environmental Expertise within 10 days, all stages of the EIA are required);
- Category IV - "minor impact, local" (SEE is conducted by regional offices within 5 days, only the first phase is required, the SEI Project).

All other projects that do not fall into different categories are considered as projects that do not have an impact on the environment and do not require state environmental expertise and environmental licenses.

According to point 24 " SEE regulations ", the positive conclusion of SEE is a mandatory document for the opening of financing by banking and other credit institutions and the execution of legal entities and individuals of the implementation of the object of state environmental impact assessment. The SEE conclusion is valid for three years from the date of its issue. SEE conclusion is sent to the relevant district (city) inspectorates for ecological and environmental control. The EIA procedure for this project is described in more detail in Section 4 of this document.

Figure 2.4.1. Procedure for organizing and conducting environmental and social impact assessment



Public participation in ESA process. The Constitution of the Republic of Uzbekistan (arts. 50.55) lays the foundation for the participation of citizens and public associations in environmental management. Law of the Republic of Uzbekistan of 09.12.1992. (updated on 18.04.2018) "On nature protection" in Articles 12-13 regulates the right of citizens to unite in public organizations for nature protection, to request and receive information about the state of the environment and measures taken for its protection, as well as the authority of NGOs established. Legislation in the field of ecology and environmental protection provides for public participation as a) an individual citizen or a group of citizens; b) through citizens' self-governance bodies and c) through non-governmental non-profit organizations.

Direct participation of non-commercial environmental protection organizations is envisaged in the course of EE of documentation for construction of new and reconstruction of existing facilities for management purposes. In particular, Article 27 of the Law of the Republic of Uzbekistan "On Nature Protection", as well as Article 23 of the Law of the Republic of Uzbekistan of 2018. " The SEE law enables NGOs and citizens to carry out public EE in any area of activity that needs to be justified by independent groups of specialists at the initiative of the NGOs themselves and at their own expense or on a voluntary basis. The public expertise

may be carried out independently of the state ecological expertise. It is prohibited to hinder the implementation of public EE. It is established that the conclusion of the public EE is of a recommendatory nature.

In addition, during the SEE of the organization-customers of its implementation are obliged to publish an announcement of the environmental impact assessment and information on its results in the media, in cases where the authorized bodies include the object of construction in the list of important objects.

2.6. THE REQUIREMENTS OF THE WORLD BANK'S SAFEGUARDS POLICIES

2.6.1 Project Categories and Project Selection (Screening)

Per the WB safeguards policies Environmental and Social Assessment (ESA) is a process of the pre-implementation stage which evaluates a project’s potential environmental and social 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. ESA is mandatory for projects, which may potentially have negative impacts. Furthermore, a well-organized public participation is mandatory in all the stages of the process. In the case when the projects activities to be financed are not identified at the design stage, the Bank applies an Environmental and Social Management Framework (ESMF) which should: provide details on procedures, criteria and responsibilities for subproject screening, preparing, implementing and monitoring of subproject specific ESIA’s. The ESMF should also include Environmental Guidelines for proposed subprojects, containing an assessment of potential impacts and generic mitigation measures to be undertaken for identified subprojects in all stages - from identification and selection, through the design and implementation phase, to the monitoring and evaluation of results.

2.6.2. World Bank Safeguards Policies and their requirements

There are 10 key World Bank safeguards policies that aim to identify, minimize and mitigate potentially adverse environmental and social impacts of Bank-financed projects. The requirements of these policies and their implications for the project are presented in Table below.

Table 2.6.2: World Bank safeguards policies and their relevance to the project

SAFEGUARDS POLICIES	TRIGGERED	RELEVANCE
<p><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.</p>	<p>Yes</p>	<p>This OP is triggered as a number of proposed sub-projects may be subject to reconstruction and construction during project implementation, thereby causing a number of different environmental and social impacts. These impacts will mainly occur during the construction and reconstruction period and will relate to noise, dust, air and water pollution, health and safety issues, etc. Soil and groundwater contamination may occur during the construction period. All of these impacts are expected to be typical for construction/rehabilitation and temporary in nature and can be readily mitigated through the application of advanced construction techniques. Environmental and Social Management Framework (ESMF) Document has been prepared to prevent and mitigate adverse impacts. This document aims to identify a number of mitigation, monitoring and</p>

SAFEGUARDS POLICIES	TRIGGERED	RELEVANCE
		institutional responsibility measures that will be taken during project implementation. This framework document presents measures to address potential negative environmental and social impact, mitigation or reduction measures to acceptable levels.
<p><i>Involuntary Resettlement (OP/BP4.12)</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</p>	Yes	This policy is driven by the potential need to acquire small plots of land (temporary or permanent), restrict access and economic relocation in connection with activities under Components 1 and 2 for modernization and investment in infrastructure.
<p><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.</p>	No	The specifics of the project activities do not provide for the implementation of measures that may affect the natural environment, as there will be investments.
<p><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.</p>	No	The project will be implemented in non-afforested rural areas and thus no impacts on the forests status are expected.
<p><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.</p>	No	No pest management issues are expected since the investments will target water supply and sewerage infrastructure and will not involve infrastructure related to agricultural activities
<p><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</p>	Yes	The design works will to extent possible avoid impacts on natural and cultural heritage sites. However, the environmental impact assessment process will verify the availability of physical and cultural resources and, in the event that such sub-projects are funded by the project, a specific SPM management plan will be prepared. In addition, a chance find

SAFEGUARDS POLICIES	TRIGGERED	RELEVANCE
urban areas, sacred sites, graveyards, burial sites, unique natural values; implemented as an element of the Environmental Assessment		procedure will be included in all work contracts.
<p>Indigenous Peoples (OP/BP 4.10) IP – distinct, vulnerable, social and cultural group attached to geographically distinct habitats or historical territories, with 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.</p>	No	There are no IPs in the country.
<p>Safety of Dams (OP/BP4.37) 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</p>	No	The project activities will be implemented inside the rural areas and will not be dependent on the functionality of dams.
<p>Projects on International Waterways (OP/BP7.50) 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</p>	Yes	<p>Parts of the proposed program interventions will be located on Syrdarya and Zarafshan rivers, which are considered international waterways for the purposes of the World Bank’s Operational Policy regarding Projects on International Waterways. In this instance, OP 7.50 requires that Republic of Uzbekistan notifies other riparian countries of the Program. The World Bank has been requested to notify on behalf of the Government of Uzbekistan.</p> <p>Given the nature and location of the proposed program activities, it is considered in view of the World Bank that these proposed investments would not adversely affect the quality or quantity of water flows of the Syrdarya and Zarafshan rivers to other riparian’s or adversely affect other riparians’ possible water use.</p>
<p>Disputed Areas (OP/BP7.60) 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</p>	No	The project will be implemented on the territory of the Republic of Uzbekistan. No disputed territories involved
Disclosure Policy (BP17.50) supports	Yes	The draft will be published and discussed

SAFEGUARDS POLICIES	TRIGGERED	RELEVANCE
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		in the country prior to the final evaluation and published on the WB website.

2.6.3 World Bank Project Categories and Screening

In order to identify the most important potential environmental problems at the stage of project selection for financing, they are classified according to the degree of their environmental and social impact. The purpose of the classification is to decide the nature and extent of the environmental and social assessment to be undertaken in connection with the proposed loan or credit.

The level of detail of the environmental and social assessment depends on the scale and environmental impact of the proposed works. According to the WB Operational Policy (OP 4.01), all projects are classified into categories A, B and C, considering the level of their potential environmental and social impact:

- *Category A.* The proposed project is categorized as Category A if it is likely to have a significant adverse impact on the environment (depending on the type, location, sensitivity and scale of the project and the nature and magnitude of its potential environmental impacts). These consequences are generally irreversible, sensitive, diverse, cumulative, or precedent-setting, and can affect areas outside of project sites or facilities. For example, Category A projects have one or more of the following attributes: large-scale conversion or degradation of natural habitats; extraction, consumption, or conversion of significant quantities of forest, mineral, and other natural resources; direct release of pollutants leading to air, water, or soil degradation; production, storage, use, or disposal of hazardous materials and wastes; measurable changes in the hydrological cycle; and risks associated with proposed pesticide use. Typical examples in the context of this project include: the construction of many new treatment facilities, a new landfill, and the reconstruction of existing landfills with significant environmental impacts.
- *Category B.* The proposed project is categorized as Category B if the potential environmental impacts, usually site specific, are reversible in nature; less damage than in Category A sub-projects, and for which mitigation measures can be developed more easily. Category B projects sometimes differ only in scale from Category A projects of the same type. For example, large irrigation and drainage projects are usually classified as A; however, small-scale projects of the same type can be classified as B. The same can be true for small-scale, relatively clean (with gas or light diesel oil combustion) thermal power plants, micro-hydropower plants and small sanitary landfills. Similarly, projects that finance the rehabilitation or maintenance of existing infrastructure may have adverse effects, but are likely to be less significant than a Category A project, and will be classified as B. Typical examples include: rehabilitation or construction of water supply and/or sewerage facilities, wastewater treatment plants, which do not include expansion or new construction, construction of small-scale wastewater treatment plants, road rehabilitation, etc.
- *Category C.* The project falls into category C if it is likely to have minimal or no adverse environmental impacts. For example, technical assistance projects in institutional development, computerization and training fall under category C.

The Bank reviews the findings and recommendations of the EA to determine whether they provide an adequate project basis for the Bank's financing. If the borrower has completed or partially completed an EA prior to the Bank's participation in the project, then the Bank reviews the results of the EA to ensure consistency with this policy. The Bank may, if necessary, require additional environmental assessment, including public consultation and disclosure.

2.7. COMPARISON OF NATIONAL AND WORLD BANK REQUIREMENTS FOR ENVIRONMENTAL ASSESSMENT

The main provisions of the National ESA rules and procedures are generally similar to the requirements of the World Bank, but there are several important differences. These differences relate to the following issues:

- The project environmental categorization;
- The requirements for and the structure of the Environmental and Social Management Plan of the Project (ESMP);
- Requirements in terms of disclosure of the Environmental and Social Assessment documents and their public consultation.

2.7.1. Differences with regard to project environmental categories

The environmental impact assessment system in the country is based on the SEE requirements, developed more than 20 years ago. The SEE is regulated by the Law (No. 73-II dated 05/25/2000) on Environmental Expertise and the Decree of the Cabinet of Ministers on the Approval of the Provision on the State Environmental Expertise (2018). As specified above, according these documents there are 4 project Categories:

- Category I (high risk),
- Category II (medium risk)
- Category III (low risk) and
- Category IV (local impact)

Taking into account different project categorization it was decided that the higher requirements of the WB shall be applied. This is mainly for deciding on Category C projects - national legislation on EA is not applicable for small-scale subprojects, including construction and reconstruction of various buildings. In such cases, will be applied the criteria of the World Bank:

- Category A (World Bank) - Category I (Uzbekistan)
- Category B (World Bank) - Category II (Uzbekistan)
- Category B (World Bank) - Category III (Uzbekistan)
- Category C (World Bank) - Category III (Uzbekistan)
- Category C (World Bank) - Category IV (Uzbekistan)

2.7.2. Differences in terms of ESMP

According to national legislation, in course of ESIA development for each project, compliance with decreasing/mitigation measures is necessary, but there is no obligation to develop/implement a special Environmental and Social Management Plan (ESMP). According to the WB requirements which will be applied for this project, this plan will include avoidance and mitigation measures, a monitoring plan and reporting, an organizational structure for the ESMP implementation, as well as measures to strengthen the capacity and associated necessary costs.

2.7.3. Differences in terms of EA information disclosure and public consultation activities

According to the national legislation, disclosure of information on EA and public consultations are mandatory only for categories I and II. Furthermore, in accordance with the SEE Law, it is possible to conduct a public environmental expertise at the initiative of an NGO and residents in any area and for all types of project categories. Public environmental expertise can be conducted independently of state environmental expertise. The conclusion of public environmental expertise is advisory. According to the World Bank's safeguard policy on EA, a borrower is responsible for conducting at least one public consultation for all category "B" projects to discuss issues that need to be addressed in an ESMP or to discuss the very draft of the ESMP. These requirements will be followed during implementation of this project.

2.7.4. Applicable environmental standards

Sub-projects requiring an ESIA should include mitigation measures to ensure compliance with the environmental standard of operation. If both Uzbekistan and World Bank standards exist for a specific mitigation measure, then the strictest of the two standards is used. For example, if the environmental problem

is a high noise level and the World Bank noise standard is more stringent than that of Uzbekistan, then the selected mitigation measure should meet a more stringent World Bank standard. The table 2.7.1 provides the Summary of the comparative analysis of WB and National ESA requirements and the ways on harmonization of the national one with the WB OPs.

Table 2.7.1. Comparative table between World Bank safeguards requirements and Uzbek national environmental legislation

ASPECT	WORLD BANK	NATIONAL UZBEK REGULATIONS	HARMONIZED FRAMEWORK
<p>Environmental Policy and Regulations</p>	<p>There are key 10 Environmental and Social World Bank Safeguard Policies and World Bank Group Environmental, Health, and Safety General Guidelines (EHS). The Bank's environmental assessment policy is based on the operational management of OP-4.01. The Bank monitors the environmental aspects of the project based on the findings and recommendations of the EA, including measures specified in legal agreements, certain EMPs and other project documentation.</p>	<p>In Uzbekistan, the following normative documents are used as a basis for environmental impact assessment: Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 949 of 22 November 2018; the Law "On Nature Protection" (as amended in 2018), the Law "On Environmental Impact Assessment". (2018 version).</p>	<p>The project complies with the WB Environmental Assessment Policy (OP-4.01) and Resolution No. 949 of 22 November 2018. However, there are some parameters in which national requirements and standards differ from those of the WB. In such cases, the project will be subject to stricter requirements, which will be established by national or WB legislation.</p>
<p>Screening and Categorization</p>	<p>WB carries out project screening and categorization at the earliest stage of project preparation when sufficient information is available for this purpose. In the case where World Bank and national categorization requirements differ, the more stringent requirement will apply. This refers mostly in the case of deciding about Category C subprojects - the national EA legislation doesn't refer to small scale activities, including construction and rehabilitation of various buildings. In these cases the client will apply the WB criteria. Categorization into Category A, B, C, FI The project categorization depends on location. There are several locations which should be considered while deciding to qualify the project as category "A": in or</p>	<p>The EIA procedure in Uzbekistan is regulated by Law No. 73-II "On Environmental Impact Assessment". (as amended in 2018) and the Cabinet of Ministers of the Republic of Uzbekistan Resolution No. 949 of 22 November 2018;</p> <p>The project category is defined in accordance with Annex 1 to RCM No. 949, which provides for 4 impact categories.</p> <ul style="list-style-type: none"> <input type="checkbox"/> - Category I (High Risk), <input type="checkbox"/> Category II (Middle Risk), <input type="checkbox"/> Category III (Low Risk), <input type="checkbox"/> Category IV (Local Impact). <input type="checkbox"/> If the activity is not included in Annex 1 to the RCM № 949, the 	<p>If the requirements of the World Bank's EA and national classification/requirements differ, higher requirements apply. This is mainly true for decision-making on Category C projects. - national EA legislation does not apply to small-scale activities, including construction and renovation of various buildings. In such cases, the client will be guided by World Bank criteria.</p> <p>Category A (World Bank) - Category I (Uzbekistan)</p> <p>Category B (World Bank) - Category II (Uzbekistan)</p> <p>Category B (World Bank) - Category III (Uzbekistan)</p> <p>Category C (World Bank) - Category III</p>

	near sensitive and valuable ecosystems, archeological heritages, densely populated areas and etc.	EA is not performed. The location of a potential project is not taken into account in categorization.	(Uzbekistan) Category C (World Bank) - Category IV (Uzbekistan)
Environmental Impact Assessment Report	The main principles and content of the EIA report are given in the WB Environmental Assessment Policy (OP-4.01). For the category B project the scope of EA and report should be narrow than for category A projects. The environmental management plan will include proposed mitigation measures, monitoring and reporting requirements, institutional arrangements, schedules and cost estimates. The report should be in English.	RCM No. 949 (2018) defines the content of the Category 1-4 EIA project report. Information on existing laws and regulations is usually provided in the Introduction. For Category IV projects, the EIA report is simplified. The report should be in Russian.	The project will produce an EIA report in English in the format of the World Bank.
ESMP	ESMP should be prepared and should specify, along with the proposed mitigation activities, a monitoring plan and reporting requirements, institutional arrangements for ESMPs implementation. For sub-projects category B with low impact ESMP checklist has to be filled.	National legislation on EA requires to identify possible impacts, but it does not require a preparation of separate EMP or any other environmental documents/plans/checklists. There is no requirements on environmental monitoring with specification of monitoring parameters and location.	A checklist and ESMP will be developed based on the results of subprojects screening.

<p>Requirements on Cultural Heritages</p>	<p>WB OP 4.11 requires development of Cultural Physical Heritage Management Plan as part of EIA, which includes mitigation measures, provisions for chance finds, capacity building program, monitoring and reporting system.</p>	<p>Law of RUZ “On protection and usage of cultural heritage objects” states that a project’s design for rehabilitation of cultural heritage needs to be approved by the Ministry of Culture and Sport. However, there are no special requirements /measures for works which are conducting near cultural heritages.</p>	<p>During this project implementation sub-projects’ beneficiaries of which will be implemented close to cultural heritages will be required to develop Cultural Physical Heritage Management Plan. Design of rehabilitation works/subprojects will have to be approved by the Ministry of Culture and Sport prior commissioning of the sub-project related to rehabilitation of cultural heritages.</p>
<p>Public Consultations and Disclosure</p>	<p>The Category B project requires one-off, constructive consultation with the communities affected by the project.</p>	<p>Public consultation is not required for the development of the draft Environmental Impact Statement.</p>	<p>For all Category B subprojects, public consultations will be held with affected parties, NGOs. Issues and concerns raised during the public hearings will be reflected in the ESMP documents.</p> <p>An environmental summary in the local language will be published prior to the public consultation.</p>

3. BASELINE INFORMATION AND ANALYSIS

The Government of the Republic of Uzbekistan is preparing a Program on Water Supply and Institutional Support Services for the proposed investment loan provided by the World Bank.

The ESMF and RPFs within the framework approach will cover the entire scope of activities within the program - to guide the management of relevant, potential, environmental and social issues and resettlement issues within the program.

Investments in Regional infrastructure will finance regional, important infrastructure sub-projects based on comprehensive feasibility studies. This includes: (1) reconstruction and expansion of sewerage systems:

- (1) in the Republic of Karakalpakstan - Nukus, Takhiatash, Kungrad and Khodjeyli;
- (2) improvement of water supply and sewerage systems in the Syrdarya region;
- (3) Reconstruction of water supply and sewerage systems in the city of Kattakurgan, Samarkand region.

3.1. RELIEF, CLIMATE, HYDROGEOLOGY, SOIL, VEGETATION, FAUNA AND PROTECTED AREAS

3.1.1. Republic of Karakalpakstan - Nukus, Takhiatash, Kungrad and Khodjeyli.

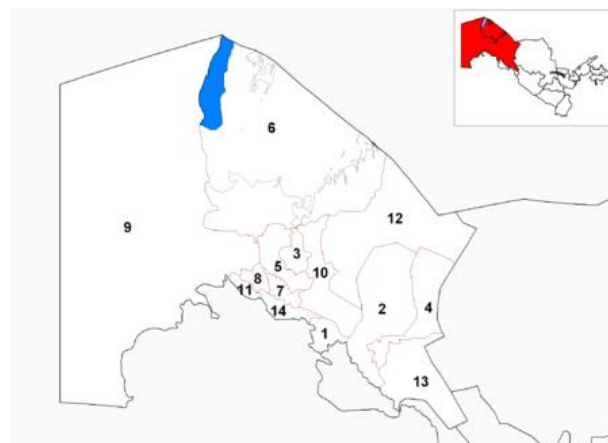
The basic analysis of the environment is based on the geographical location of the objects, their community and the characteristics of each city.

The first region is the Republic of Karakalpakstan. Karakalpakstan is located near the Aral Sea in the lowest part of the Amu Darya basin. More than 80% of territory of the republic consists of deserts. It is surrounded by the Kyzyl Kum desert on the east and the Kara Kum desert on the south. A rocky plateau Ustyurt extends west to the Caspian Sea. Location of this region in a zone of natural disaster created additional social and economic challenges for its development.

Administratively, it consists of 14 districts and the city of Nukus (Figure 3.1.1.). In the Republic of Karakalpakstan the project will be implemented in 4 cities.

Nukus has the status of the capital, is territorially located in Nukus district (in Fig. 3.1.1. corresponds to 7), Khodjeyli is the district center (14), Takhiatash is territorially located east of Khodjeyli district. Kungrad is the administrative center of the largest district of Karakalpakstan (9).

Fig.3.1.1. Political and administrative division of the Republic of Karakalpakstan.



Three other cities - Nukus, Khodjeyli and Takhiatash are located compactly, separated from each other within a radius of 14 km. The most distant is the city of Kungrad, the distance from Nukus is more than 88 km. Taking into account the proximity of cities, similarity of natural conditions, the analysis of the environment by components is given for the region as a whole with the identification of features for each city.

Economy

Economy of the Republic of Karakalpakstan is mostly based on industrial and services sectors. Share of agriculture in gross domestic products is the lowest compared to the previous two sectors. Structure of gross domestic product of Karakalpakstan in Jan-Sept, 2016 was as follows: services – 50.78%, industry – 34.14 and agriculture – 15%. Industrial sector of economy is represented by such productions as sodium and carbide producing factories, Urga gas processing factory and “Ustyurt” gas and chemical production factory in Kungrad district, glass producing factory in Khodjeyli district, marble and cable producing factories in Nukus district. The sectors of agriculture are mainly represented by grain (production of wheat and raw rice), cotton growing, livestock and silk production. Services sector includes logistics, public catering, information and communication, trading etc.

Relief

In physical and geographical terms, the studied cities are located in the Lower Amudarya region. The area, in turn, belongs to the Turan plain, at the base of which lies the Turan plate of tectonics. The surface of the Lower Amudarya region is composed of alluvial deposits of the Amudarya River, which are represented by sand, loam and sandy loam. The thickness of river sediments is from 25 to 90 meters. The territory of the region is bounded from the northwest by the Ustyurt plateau, from the east by the Kyzylkum desert, from the southeast by the low mountains of the Sultan-Uvais, and from the south-west by the Zaunguz sands of Karakum. The northern border of the region is a new desert formed on the site of the exposed bottom of the Aral Sea - Aralkum.

All the cities studied are located within the lowlands with absolute altitudes from 59 to 80 m above sea level, e.g. Kungrad - 59-62 m above sea level, Khodjeyli - 71-77 m above sea level, Takhiatash - 76-80 m, Nukus - 75-79 m above sea level. The surface of the region is slightly inclined from the south-east to the north-west. The relief in the vicinity of cities is not absolutely plain, it is characterized by the presence of small depressions, dry land (most of the year, dry lands remain dry, in the spring they flow through melt water, and in autumn – precipitation), ridge heights 4-6 meters high. It should be noted that around these cities, where the land is used as arable land, the relief is levelled due to long-term cultivation of the soil.

A specific feature of the physical and geographical location of the Lower Amudarya region is its proximity to the dry bottom of the Aral Sea; therefore, the environmental problem of salt transfer is very acute for all of these cities, but it is most marked for Kungrad due to its closest location.

Climate

Climatic features of the Lower Amudarya region, where the cities of Kungrad, Nukus, Takhiatash, Khodjeyli are located, are formed under the influence of three main factors: solar radiation, atmospheric circulation and underlying surface. A significant amount of solar energy produced in summer causes the air to heat up very strongly. The vast anhydrous deserts of the Karakum and Kyzylkum surrounding the territory are the source of transformation of air masses freely coming from outside as a result of plain relief. Therefore, in the summer the air here gets very warm, and in the winter cold air masses from the north and north-east of the mainland reach here freely.

The climate characteristics of the cities of Kungrad, Nukus and Takhiatash are given based on the materials of Uzhydromet weather stations according to observations from 1995-2016.

Climatic conditions of the territory are characterized as sharply continental. Winter is cold, with winds, and the average monthly winter temperature ranges from -4.6 to -6.7°C. The coldest months of the winter period are January and February. The absolute minimum winter temperatures range from -26.8°C to -31.4°C. The average annual temperature is 12.3-13.6°C.

Summer is hot and dry. The average monthly temperature in July is from + 28.5 ° C to + 29.4 ° C. The absolute maximum of summer temperatures is from + 45° C -to + 46.1° C.

There's not much precipitations. The average annual amount does not exceed 100 mm. Moreover, precipitation is mainly in winter and spring seasons.

Winds have variable directions, with priority given to the north and northeast directions.

The condition of atmospheric air is determined by the emissions of mobile and stationary sources and the conditions of their dispersion. The cities of Kungrad and Nukus are industrial, on the one hand, and a region where crop and livestock production is developed, on the other hand.

The main sources of air pollution in Nukus are the brick making plant, lime and graphite marble plants (construction materials industry), ABZ, DRSU-1, (motor transport enterprises), canning, cultivating, Removing, Meat Processing, DSC, JV LLC Nukus Electroapparat, JV LLC Nukus Polymer».

According to Uzhydromet, the level of air pollution is low (API = 3.39).

Nukus	1,61	Dust	Ministry of Agriculture and Water Resources, Company
	0,83	Carbon monoxide	"Uzstroyaterialy "
	0,34	Phenol	motor transport
	0,35	Nitrogen dioxide	
API (5) =3,39	0,26	Nitrogen oxide	

The level of air pollution is considered to be very high if the total API with five substances exceeds 14, high - $14 > \text{API} > 7$, increased - $7 > \text{API} > 5$, low - $\text{API} < 5$.

At present, the sources of air pollution on the territory of Khodjeyli are the cotton processing plant; the cotton spinning, cotton weaving and carpeting factories; food industry enterprises.

The condition of the atmospheric air in the city of Kungrad is affected by harmful emissions from the Kungrad Soda Plant, textile and food industry enterprises and motor transport.

On the territory of the city of Takhiatash there is the Takhiatash hydro power station, a railway station, a flour mill, enterprises of the construction industry and logistics.

Sources of anthropogenic impact on the environment are also farmland and livestock farms. Cities are exposed to frequent dust storms on a wide front.

Hydrogeological conditions

The hydrogeological conditions of Nukus, Kungrad, Takhiatash and Khodjeyli are quite similar, except that Nukus is located on the right bank of the Amu Darya River, and the other three cities lie on the left bank.

Quaternary aquifers in the Aral Sea delta of the Amu Darya represent a single groundwater basin, which is generally characterized as inland.

The groundwater level in this area is significantly affected by the desiccation of the Aral Sea, the hydrological regime of the river. Amu Darya and the largest irrigation canals, as well as the Tuyamuyun reservoir.

Formation of the groundwater regime is related to the irrigation regime. The maximum falls on the irrigation period and reaches 0,4 m, the minimum - on autumn-winter months and gradually decreases on the average from 2 to 5 m.

Cretaceous and quaternary sediments take part in the geological structure of Nukus and its adjacent areas. The oldest of the studied sediments are Upper Cretaceous. They lie at a depth of 20.0 to 1.0 m from the surface of the ground and are discovered by the majority of exploration wells.

In the north-east (Lake Ashikul area), east and south-east of the area, chalk deposits reach the seabed surface. The total thickness of upper chalk deposits is 250-300 m, discovered in the area of Nukus city is 170 m.

These deposits are represented by dusty and fine sands, weak sandstones with interlayers of clays, shells, conglomerates and limestones.

Quaternary deposits in the territory are developed everywhere. The thickness of these deposits varies from 1-2 m to 25-30 m. Thickness increases from east to west and southwest.

Ground waters of quaternary deposits are developed everywhere in Nukus. Water-bearing rocks are alluvial sands, quaternary sandy loam and loam and upper part of the Upper Cretaceous sandstones. Waterproofing is provided by clay interlayers and conglomerates in the Upper Cretaceous sandstones. The entire water-bearing strata form a single horizon of quaternary groundwater. The thickness of the horizon is 26.0-30.0 m near the Kyzketken canal, decreasing to the east to 17-18 m

The main sources of groundwater supply are filtration waters of the Amu Darya River, Kyzketken and Feeding canals, as well as infiltration waters from irrigation fields. The depth of groundwater levels in the city varies from 1.2 to 6.3 m. There is a regularity in the submergence of the groundwater table from the feeding system, i.e. in the direction of the Amu Darya River, the Feeding and Kyzketken canals to the north and north-east.

The underground waters of the left-bank floodplain of the Amu Darya, where Takhiatash and Khodjeyli are located, are divided into artesian and ground waters. Artesian waters open up in the Cretaceous and Jurassic deposits, while ground waters open up in the Quaternary alluvial deposits of the Amu Darya.

Ground waters of alluvial deposits have varying degrees of mineralization. A few tens of meters from the Keneges Canal (Takhiatash) there is an increase in mineralization from 2.4 to 12.3 g / dm³.

Groundwater for the most part belongs to the sulfate-sodium-calcium type, sometimes chloride-sulfate-sodium are also found. They have sulfate aggressiveness to concrete on ordinary cements and increased corrosion in relation to metals. The hydrocarbon content ranges from 421573; chlorides - 13364752; sulfates - 24002784; calcium ions 5601080; magnesium - 576612; sodium and potassium 4412296 mg / dm³.

Availability of fresh water resources and their use in the regions of Karakalpakstan are given in the table 3.1.1.

Table 3.1.1. Summary data on fresh water reserves and their use in the Republic of Karakalpakstan as of 01.01.2012

№	Name of administrative district	Number of approved groundwater reserves thousand m3 / day	Groundwater abstraction rate thousand m3 /day	Drinking water demand for 2020 thousand m3 /day
1.	Kungrad	-	-	32.22
2.	Mo'ynoq	-	4.5	8.4
3.	Shimbay	13.7	17.85	29.72
4.	Qorao'zak	2.0	17.85	10.73
5.	Taxtako'pir	-	-	9.31
6.	Kegeyli	-	-	20.52
7.	Shumanay	10.5	37.12	11.23
8.	Qonliko'l	-	0.36	10.41
9.	Nukus	-	0.66	108.44
10.	Khodjeyli	51.5	16.6	43.48
11.	Amudarya	-	-	62.2
12.	Beruni	23.6	2.1	46.3
13.	Ellikqala	27.5	-	34.63
14.	To'rtko'l	22.65	8.5	49.94
15.	Bozatau	-	-	-
	<i>Total for the Republic of Karakalpakstan</i>	158.4	87.69	477.53

Thus, groundwater lies close to the surface. They have high mineralization and sulfate aggressiveness to concrete on conventional cements.

Fresh groundwater reserves are extremely limited, and it is not necessary to fully rely on them to provide water.

Surface water

The main river in the region is the Amu Darya, the largest river in Central Asia. The river is fed mainly by melt snow and glacial waters, so the maximum flow rates are observed in summer and the lowest in January - February.

The main flow of the Amu Darya is formed in Tajikistan (80%). The Amu Darya River is a river with sharply changing water discharge from 100 to 10500 m³ /sec.

Flowing down the plain to Nukus, the Amu Darya loses most of its flow for evaporation, infiltration and irrigation. In terms of turbidity, the Amu Darya takes first place in Central Asia and is one of the first in the world. Suspended sediment content in the water is up to 200 million tonnes per year, with about 80 per cent of this occurring during floods (May-September 2010).

To regulate the flow of the Amu Darya River, the Takhiatash hydroelectric complex has been built, but nevertheless, downstream of the river at low flow rates, it is possible to leach and destroy the coastline.

At present, the river waters do not reach the Aral Sea, as they are taken for irrigation. Water from the Amu Darya is used for irrigation. The largest canals are the Karakum, Karshi, Amu-Bukhara and other canals.

All canals irrigating the cities of Nukus, Takhiatash, Khodjeyli and Kungrad are fed by the waters of the Amu Darya River

Within the city of Nukus, the hydrographic network is represented by the Kyzketken and Feeding canals. Water intake into the canals is carried out from the upper high relief of the Takhitash dam. The main double water divider consists of two regulators: in the channel of Kyzketken (flow rate of 216.0 m³/sec) and in the feeding channel (flow rate of 311 m³/sec.).

Both canals feed on the waters of the Amu Darya River, which runs along the western and southwestern borders of Nukus.

The irrigation network of Takhiatash and Khodjeyli cities is powered by the Kungrad Canal, which feeds smaller canals through their territory when approaching these cities.

The Kungrad irrigation network is also supplied by the Kungrad Canal, and there are such canals as the Raushan Canal, the Voroshilov Canal and others that are located within the city.

Soil and vegetation cover

In the cities of Nukus, Takhiatash, Khodjeyli and Kungrad there is much in common in the composition of the soil cover.

Along the canals and floodplains of the Amu Darya, meadow-oasis soils of the desert zone prevail, saline and washed loamy on alluvium. A distinctive feature is the fact that the eastern and southern parts of Nukus are characterized by desert sandy soils, while Takhiatash, Khodjeyli and Kungrad are more often associated with the meadow-oasis soils.

Meadow-oasis soils are widely spread in places where ground waters are kept at the depth of 1-3 m. The humus content (0.1-1.4% in the arable horizon) is decreasing and at a depth of 0.5 m it is 0.5%. Desert climate and irrigation-low-water conditions determine susceptibility of meadow-oasis soils to salinization. They are systematically washed out. Usually the irrigated lands of oases are saline and motley. Salinization degree of the same area changes quickly: there are spots of weak, medium, strong salinity on the background of non-saline areas. These spots can form continuous areas of varying degrees of salinity, occupying large areas. The formation of spotty salinization is often associated with uneven relief of the irrigated area. Elevated areas during leaching are not free from salts, and during vegetation irrigation are not evenly moistened. Main type of salinization is chloride-sulfate.

The soils are saline and continue to undergo salt deposition from the Aral Sea region. Given the prevalence of northerly winds, salt transfer has the most negative effect on the soil conditions of the city of Kungrad.

Takhiatash is characterized by a negative impact in the form of emissions of acidic pollutants based on nitrogen and sulfur oxides, which are released to the atmosphere into emissions of the Takhiatash State District Power Station and other enterprises of the city.

Vegetation

The studied cities of Nukus, Takhiatash, Khodjeyli and Kungrad are located in the desert zone. But with the development of irrigation and water supply to these areas, there was a change in the species composition of vegetation in cities.

In the vicinity of these cities the flora changes dramatically depending on the substrate: psammophyte vegetation dominates the sands, gypsophyte vegetation dominates the stony substrate, halophyte vegetation dominates the saline, and wormwood, wormwood-salt and ephemeral vegetation dominates the saline soils.

Depending on the conditions of moisture and salinization of soils near the cities, there are communities of tamarixes or Karabaraks in combination with herbs – Aeluropus (azhrek), Karelínia (akbash), sea lavender (kermek), been caper, saltwort, camelthorns.

In the vicinity of cities where irrigation is limited, psammophyte vegetation from wormwoods, saltwort of Astragalians with sparse cover of ephemerals is more often observed. Irrigated meadow soils are occupied by cotton, corn, alfalfa, melons and rare orchards.

Within the city streets, residential buildings, parks, boulevards, local tree plantations and shrubs participate: acacia, willow, Turkmen elm, *Populus pruinosa*, *Populus euphratica* auct., tamarix, honey locust. The species composition is poor.

In the cities of Takhiatash and Khodjeyli, the densest plantings of decorative trees are located in the city center, in the park and along the main streets. Poverty of vegetation is explained by a high degree of salinization of soil and water, high insolation, dust storms, as well as an insufficiently established irrigation system.

Fauna

Due to the fact that the territory of the cities is developed and cultivated, the fauna here is minimal, the fauna is represented mainly by rodents, ornithofauna, pets (cattle and small cattle, birds).

The list of animal species is limited to those species that have been able to adapt to life under anthropogenic conditions. There are no large mammals' characteristic of uninhabited areas. There are often ubiquitous representatives of rodents - vole, grey rat, house mouse, sometimes an eared hedgehog.

Of the birds, typical representatives of the countryside live here. Gray sparrow, myna, turtle dove, swifts and swallows, rooks, jackdaws, hooded crows, starlings, pigeons, etc. are observed in large numbers. Less often you can see a magpie, and closer to autumn, representatives of the Corvidae family (carrion and hooded crow, raven, (crow and raven are two different birds), magpie, jay, jackdaw, rook become frequent guests).

The variety of reptiles is quite limited. Their most striking representatives are the rapid fringe-toed lizard and gray gecko.

Among the insects are those species that live in the grass: crickets, grasshoppers, etc., among shrubs and in the vineyard - mantis, wasps, hornet.

In the vicinity of cities there is a thin-toed ground squirrel, great gerbil; nocturnal animals - midday gerbil; feather-footed jerboa. From the detachment of insectivores, sandy deserts are characterized by an eared hedgehog, which eats poisonous snakes.

Away from the cities of the ungulates, there's a gazelle. Among the birds, there are species typical only of sandy deserts, such as the saxaul jay. There is a small desert flavor here. Crested larks, a desert shrike and a desert crow can be found here.

Sandy deserts are characterized by an abundance of reptiles. The lizards are inhabited by a dessert toad-headed agamas, *Phrynocephalus mystaceus*, which can be seen at the top of a barchana or hillock, where it usually stands on elongated legs with its tail bent upwards; the *Laudakia lehmanni*, which, escaping from the hot sand, often climbed to the top of the bushes. There is a single coarse dessert monitor with a length of up to 1.5 m. Of the snakes, a sand boa, a steppe ribbon snake and a poisonous carpet viper live here. Of the insects in the sandy desert, there are numerous darkling beetles, of arachnids - Solifugae and scorpions.

Specially protected natural areas and cultural heritage objects

The territory of Karakalpakstan belongs to the zone of negative impact of the Aral Sea exposed bottom in the form of salt transport, sand movement, reduction of the vegetation cover species composition and a number of ecological loads.

At present, the Lower Amudarya State Biosphere Reserve has been formed here, to which the Baday-Tugay Reserve has been transferred.

Baday Tugay is located in the Beruni district of the Republic of Karakalpakstan, near the Amu Darya River, occupying the area formed by the main channel and the channel of the Kondaria. In the conditions of the reserve, more valuable types of riparian vegetation have been formed on floodplain-alluvial meadow soils: Asiatic poplar, oleaster, elk, willow, etc. Flora is represented by plants belonging to 120 genera and 35 families.

Bukhara deer (Hangul - Red Book of Uzbekistan), wild boar, fox, jackal, badger, tolai hare, eared hedgehog are prominent representatives of the animal world. Twelve Bukhara deer, a species listed in the IUCN Red Book, were brought to the reserve. At present their number reaches 30 heads. It is planned to create an experimental pheasantarium to study and develop methods of artificial breeding of Khivan pheasant.

In 2019-2022, 5 protected natural areas will be created in the Republic of Karakalpakstan:

- State reserve "South Ustyurt";
- State Protected Areas "Beltov", "Okpetki" and "Mezhdurechye Akdarya-Kazakdarya";
- «The Sudochye System of Lakes» State Protected Area on the basis of the «Sudochye» State Protected Area.

In the Uzbek part of the Ustyurt plateau, the country's largest saiga reserve will be established, the population of which has been declining sharply in recent years. The new site will be symbolically named «Saiga». Declaring a part of the Ustyurt plateau a protected area will give a chance to prevent the disappearance of this rare animal species listed in the Red Book.

In Karakalpakstan, the Kungrad State Forestry Department is located in the Kungrad region of the Republic of Karakalpakstan. The total area of the farm is 2606515 ha, most of which is located on the Ustyurt Plateau, smaller in the floodplain of the Amudarya River. Desert and riparian vegetation prevails here. The main hunting species are saiga, wolf, fox, tolai hare, pheasant of Khiva subspecies and waterfowl.

The farm does not have specially equipped cordons but is able to provide normal conditions for hunting and fishing. The farm is located 150 km away from Nukus.

The project area covering 4 cities of the Republic of Karakalpakstan is located at a considerable distance from existing and newly created nature reserves and protected areas. The project implementation should take into account the peculiarities of the natural environment, already existing environmental problems and apply measures to mitigate the impact on natural components.

Objects of cultural heritage include numerous remains of ancient fortresses, such as Ayazkala. As a rule, they are located in a desert area, there are no residential buildings near the fortresses, and they are located at a considerable distance from the objects of the Project Area.

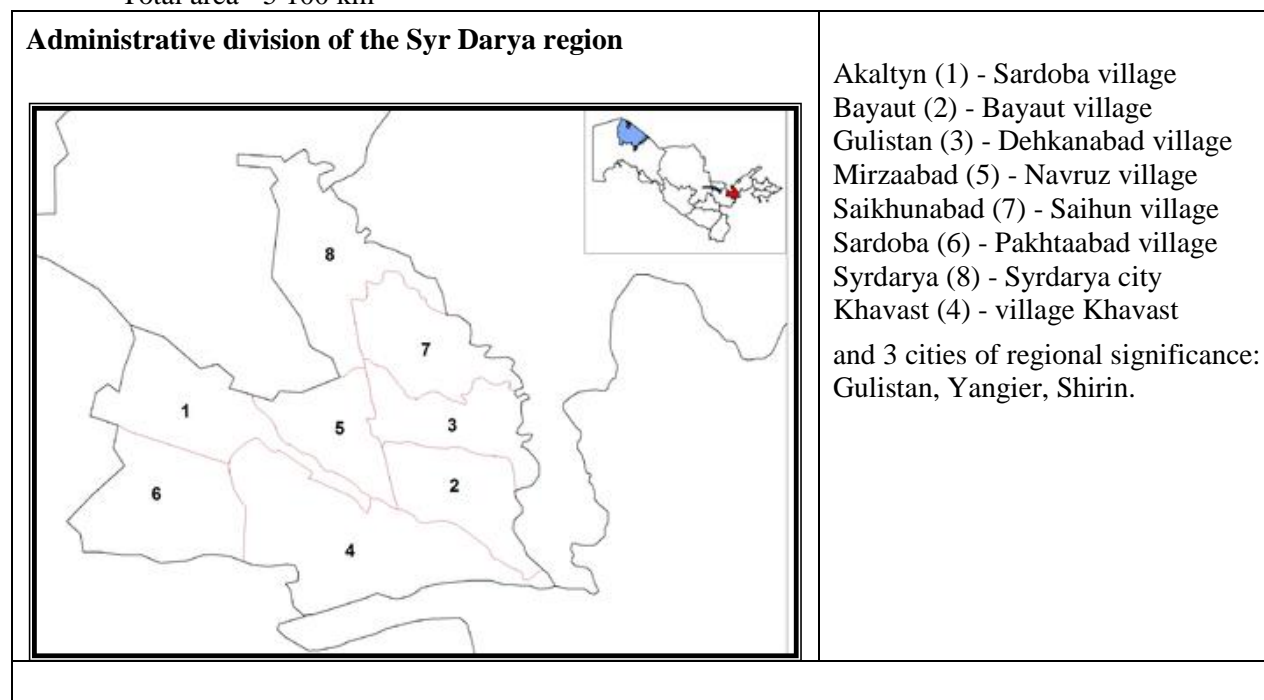
3.1.2. Syrdarya, Gulistan, Saykhunabad, Akaltyn, Sardoba, Mirzaabad, Bayaut, Khavast regions and Yangier city

Relief

Syrdarya region is located in the central part of Uzbekistan, on the left side of the Syrdarya river. In the north it borders with Maktaaral and Saryagash districts of South Kazakhstan region of Kazakhstan, in the south with Istaravshan and Zafarabad districts of Sogd region of Tajikistan, in the west with Jizzakh region, in the east with Tashkent region. Hungry steppe occupies a significant part of the region.

The administrative center is the city of Gulistan.

Total area - 5 100 km²



The Syrdarya region is located in the center of the country on the left bank of the Syrdarya River. Administratively, it is structured into eight districts and three cities of regional importance: Gulistan, Yangier, and Shirin.

Syrdarya province is located on the plain of the Tashkent-Hungry Steppe Depression, which is called the Hungry Steppe on the territory of Syrdarya province. Hungry steppe is the southern part of the depression and is formed by three terraces of the Syrdarya River. The terraces are composed of loess-like loam and loamy loam and sandy loam, and in the southern part of the area - proluvial sediments of temporary streams coming from the mountains. The third highest terrace of the Syrdarya - the Hungry Steppe plateau - gradually rises to the south and merges with the foothills of the Turkestan ridge. In the north-west, the hungry steppe merges with the sands of Kyzylkum; in the east, the steppe is cut off by a 6-20-metre high scarp to the Syrdarya River.

Climate

The most common and characteristic features of the climate in the Syrdarya region is its sharp continental character, aridity, abundance of heat and light during the entire vegetation period.

Low precipitation in the plain area is characterized by its aridity. On average, 261-316 mm of precipitation falls here during the year. The western desert part of the territory is the least humidified by precipitation.

The coldest month is January. The average January temperature in the territory varies from 0.1 ° to -2.9 ° C.

Meteorological	Air temperature, °C			Soil temperature, °C			Precipitation, mm	Fog, hours
	Average	Average Monthly	Absolute	Average	Maximum	Minimum		

station	annual	Max	Min	max	min					
Syrdarya	14,5	36,7	-3,2	42,9	-20,1	18,3	71,0	-15,0	323,4	153
Yangiyer	15,8	37,3	-1,5	43,8	-16,5	18,7	70,0	-15,0	356,6	45,8

The snow cover is unstable, and during the winter it repeatedly forms and stacks. Only in some years can stable snow cover be observed, which is not less than a month in a row. The average number of days with snow cover during the winter is 30-34. The average snow depth is 8-12 cm.

The duration of the warm period with air temperature above 0° on the territory of the Syrdarya region is on average 330 days.

Summer is hot and dry. The warmest month is July. The average monthly temperature in July varies from 25.8 to 30.0 ° C. The absolute maximum can reach 44-47 ° C.

For most of the year, northeast winds prevail in the region. In summer, northern winds prevail.

The wind regime due to the geography of the area is rather complicated. In the average annual course, winds of northern, eastern and western directions prevail. In winter, east and south-east dominate, reaching a force of 5.2 m / s, in summer - north-west winds, accompanied by separate strong gusts (up to 28-30 m / s) and rare dust storms.

The average annual wind speed of 1.3 m / s; most often weak winds are recorded (0-1 m / s), accounting for 62.9% of the total.

Atmospheric air condition

The data of stationary and episodic observations of Glavgidromet of the Republic of Uzbekistan in the cities of Shirin, Havast, Yangiyer are used for the analysis of the current state of the atmospheric air.

According to the data of the expedition observations, the atmospheric air pollution in Shirin is lower than the average for the Republic of Uzbekistan. There is a slight excess of MPC for dust and NO₂ concentrations. The condition of the atmospheric air in Havast and Yangiyer is similar. Episodic observations have shown the excess of NO₂ concentrations, and in recent years there has been an increase in the proportion of this impurity in the atmospheric air.

The analysis of sources of atmospheric air pollution revealed that the main harmful substances emitted by enterprises into the air basin of the region are dust, hydrocarbons, carbon monoxide, volatile organic compounds, nitrogen oxides.

The condition of atmospheric air is influenced by one of the largest power plants of Uzbekistan - Syrdarya Hydroelectric Power Plant, which operates on gas and generates a significant part of electricity in the country.

Thus, the condition of atmospheric air in the study area, although it is characterized by increased dust content and contains NO₂ above the norm, is generally characterized as satisfactory. The level of air pollution in the basin is lower than the national average.

Surface waters

The Syrdarya River is the main and largest water source in the Syrdarya region. It flows along the north-eastern border of the region. The width of the Syrdarya valley in the region is 15 km. The banks of the river are cliffed. There are many abandoned loops in the valley. Some of them turned into lakes, others into swamps. In winter the river can be covered with ice on the territory of the region. Numerous canals that supply water to the Syrdarya region depart from the Syrdarya River.

Except for the Syrdarya, there are no permanently flowing natural waterways in the region.

The flow regime of the Syrdarya river is characterized by the features inherent in the rivers of snow-glacial feeding. The annual distribution of water runoff is as follows: the lowland covers the period from the second half of September to March. At this time, the minimum values of water discharge are observed. The lowest values are observed in October. A significant increase in flow starts in April, with June being the wettest month, during which about 28% of the annual flow takes place. Average duration of floods is about 180 days.

The flow of the Syrdarya River in the section under consideration is strongly distorted by the fact that it is heavily regulated by reservoirs.

After the completion of the construction of the Farkhad HPP (near the town of Shirin on the border of the Syrdarya region of Uzbekistan and the Sogd region of Tajikistan), the Hungry Steppe was supplied by the Farkhad hydroelectric complex. The following irrigation canals run through the territory of the region: 1. The Southern Hungry Steppe Canal named after Sarkisov (south of the region), Central Hungry Steppe Canal with branches (central part of the region), Zhetisay collector (southeastern part of the region), Dustlik canal (eastern and central part of the region).

Also in the south of the region, the Jizzakh Machine Canal runs through the territory of the Khavast district, which has several branches - Machine Canal 1 and Machine Canal №2

Hydrogeological conditions

In lowland areas of Syrdarya province, groundwater occurs at depths of 0.5-1.0 m to 3-4 m. There are territories with groundwater occurrence from the land surface from 8.0 to 10.0 m.

In spring, groundwater is the closest to the surface, sometimes reaching the surface. They have the deepest occurrence in autumn and winter. In some places ground waters are strongly mineralized and coming to the surface cause soil salinization.

The main source of ground water supply in the region is the river. The Syrdarya River and the South Hungry steppe Canal. Their underground inflow is large, precipitation plays an insignificant role, and the time of their participation in groundwater recharge falls in December-January. The Syrdarya River is a natural drainage system.

The entire alluvial valley of the Syrdarya River belongs to the area of impeded groundwater inflow and outflow, with unstable depth and regime, depending on local conditions.

The most difficult groundwater outflow conditions approaching the conditions of a drainless groundwater basin are characterized by the Sardoba Depression and the Shuruzyak depression, where groundwater lies closest to the surface of the earth and is highly saline.

Syrdarya region has approved reserves of fresh groundwater in the amount of 697.3 thousand m³/day. In the eastern part of the region, where the studied areas are located, there are Syrdarya, Central-Gulistan and Khavast fields of fresh groundwater

It should be noted that the most significant reserves belong to the Syrdarya and Central Gulistan deposits, most of which are territorially related to the Syrdarya and Gulistan districts.

The Saykhunabad and Khavast districts have less reserves, and the Saykhunabad district can almost meet its needs from the reserves of its field.

The reserves of the Khavast deposit cannot cover the fresh water requirements of the region, including the city of Yangier.

Table 3.1.2. Summary data on fresh water reserves and their use in the Syrdarya region as of 01.01.2012

№ п/п	Name of administrative district	Number of approved groundwater reserves thousand m ³ /day	Groundwater abstraction thousand m ³ / day	Drinking water demand for 2020 thousand m ³ / day
1.	Syrdarya	238,60	14,00	32,89
2.	Saykhunabad	15,90	8,15	16,38
3.	Akaltyn	76,33	19,35	12,8
4.	Mirzaabad	39,50	8,35	15,25
5.	Gulistan	311,80	72,5	43,37
6.	Sardoba	-	-	13,53
7.	Bayaut	11,52	6,37	33,27
8.	Khavast	3,64	1,55	32
	Total Syrdarya region	697,30	130,2	199,5

Thus, the Syrdarya and Gulistan districts have significant reserves of fresh groundwater, due to which it is possible to improve the water supply of the population of not only these areas. Saykhunabad district uses half of the possible water reserves. The situation for the city of Yangier is unfavorable, because its reserves of fresh groundwater are extremely small.

Soils and subsoils

Types of soils forming the territory of the Syrdarya region change from north to south. The northeastern part of the region, confined to the valley of the Syrdarya River, is composed of meadow-oasis soils of the serozem belt. They have a clearly defined structure. Soil salinization is not widespread. These soils are long used for irrigated agriculture of soil-capillary moistening, developed on river terraces. The humus content in the arable horizon of these soils is 1.5-2.0%.

In the central part of the region there are mainly serozem-oasis saline loams, lying on alluvium and proluvia. However, there is also an area where saline soils are developed.

Serozem-oasis soils include soils that have been significantly altered by irrigated agriculture and have completely lost the structure of the serozem profile from which they were developed. They are characterized by high capacity and monotonous brown-grey coloring. The characteristic properties of this type of soil acquired during the development process are clearly expressed argillization.

In the western and southern parts of the Syrdarya region, meadow soils of the serozem belt (saline clay and loamy on alluvium and proluvia) are mostly developed. This type of soil develops due to capillary moistening from shallow groundwater (most often 1-3 m). The content of humus in the upper horizon is low (in the range from 1.5 to 2.5%).

Vegetation and fauna

Most of the plain areas of the Syrdarya region are occupied by oases, where natural vegetation has long been replaced by cultural vegetation. Natural vegetation has been preserved here only in areas that are unsuitable or less suitable for use. Natural vegetation has also been preserved in the depressions occupied by saline soils (various types of saltwort), in the swampy areas of the Syrdarya river floodplain (reed, sedge, etc.).

The region's wind regime required the creation of windbreaks and forest parks located between villages along roads and canals. Vegetation is represented by artificial plantings of trees (mulberry, plane tree, poplar, elm, acacia). Under the canopy of trees, on voids, along roadsides, on the banks of irrigation ditches, cenoses of weed grass are formed, among which are dominated by arpahans and a hairy crab grass with prickly cousinia and cornflowers.

Forage value is represented by ephemeral-ephemeroid cereals and some saltwort. Among herbaceous vegetation there are widely spread actively vegetating ephemeroids: *Poa crispa* Thuill, dandelion, as well as annual and perennial wormwood, wheatgrass creeping, wild carrot, *Aeluropus* (azhrek).

Thus, the natural flora of the Syrdarya region is represented by ephemeris - *Carex pachystylis*, spotted hemlock, poppies, wild grass (annual wormwood), which grow rapidly and develop in the short spring

period. In May, the heat begins and the plants dry up. Only drought-resistant plants remain - wormwood, feather grass, camel thorn (yantak).

Within the settlements there are artificial wood plantings with mulberry, poplars, plane trees, oaks, chestnut, maple.

In Syrdarya region, agriculture is of great importance. Agricultural lands occupy more than half of all arable lands. More than half of the sown area is irrigated.

In Syrdarya province, about 40% of arable land is rain-fed. Also in the region two thirds of agricultural lands are pastures. In Syrdarya province, sheep breeding is developed in desert areas.

The leading branch of agriculture is cotton growing on irrigated lands. Vegetable growing, melon growing, horticulture, viticulture also plays an important role in the suburban area. In rainfed areas, the main crops are wheat, barley, millet.

Mammals within the area are: house mouse, grey rat, red tailed gerbil, mole vole, common bat, eared hedgehog, lesser white-toothed shrew, Aral yellow-souslik, marbled polecats, jackal, fox. Birds are represented by: tree sparrow, Indian sparrow, turtle dove, European swallow, black swift, myna, desert finch, Iduna rama, little green bee-eater, Egyptian nightjar, crested lark, roller, hoopoe, rufous-backed shrike, little owl.

Reptiles are mainly represented by grey gecko, desert lidless skink, rapid fringe-toed lizard lizard, steppe agama, mountain racer, cliff racer, Pallas' coluber.

In the riparian forests off the Syrdarya River you can find lynx, wild boar, jackal, pheasants, ducks, geese, and muskrat.

Specially protected natural areas and cultural heritage objects

There are no state nature reserves in the Syrdarya region. But the project zone is adjacent to Jizzakh region, which has 2 reserves: Zaamin mountain-juniper reserve and Nurata state mountain-nut reserve. There was also Arnasay reserve, but its status was changed to a wildlife reserve.

Nurata State Reserve

The Nurata State Reserve is located in the central part of the Nuratau Ridge. The main purpose of the reserve is to preserve the walnut and fruit, juniper mountain and forest ecosystems and protect the unique population of *argali* (*Ovis severtzovi*). The area of the reserve is 17752 hectares, 2529 hectares of which are covered with forest. The reserve is crossed by ten large and small streams, which do not dry out in summer. There are about 600 plant species growing in the Nurata reserve. One of the bird migration routes passes through the Nuratau Range. Indian myna, chukar, golden eagles, griffon vultures, black vultures, variable wheatear, grey-necked buntings live there. Mammals are also relatively numerous. Among the species listed in the Red Book of the Republic of Uzbekistan: 3 species of reptiles, 18 birds, 4 mammals: northern wolf snake, Central Asian cobra, gray monitor, bearded vulture, Egyptian vulture, griffon vultures, black vulture, golden eagle, booted eagle, Brandt's hedgehog, desert long-eared bat, argali.

Zaamin mountain and juniper reserve

The reserve is located in Jizzakh region of Uzbekistan and occupies the western part of the Turkestan ridge. The purpose of the reserve is to preserve the unique natural juniper forests with their peculiar flora and fauna. The area of the reserve is 10.5 thousand hectares, of which 4161 hectares are covered with forest. Several hundred plant species grow in the reserve. Mountain and juniper ecosystems at the altitude of 1760-3500 m above sea level, Himalayan brown bear, bearded vulture, black stork are under protection.

Arnasay wildlife reserve

Located in Jizzakh region. Along the northern outskirts of the Nurata Range there is a chain of depressions stretching from the Syr Darya bank along the northern outskirts of the Nurata Range and named after Arnasay Lakes. On one of the sections of the Arnasay depression, 60 km away from Jizzakh, a reserve was established, which later received the status of a wildlife reserve.

The vegetation of the reserve is represented by the ephemeral-calligonum and camelthorn-ephemeral associations characteristic of Kyzylkum. The main representatives of these associations are calligonum,

sedge (*Carex physodes*), awns, astragalus, Russian thirst-quenching and camelthorn. The desert is amazingly beautiful here in early spring, when herbs begin to grow and blossom everywhere, and it is full of all sorts of colors and combinations, among which red stands out. This is a wild tulip blossom, so that the desert sometimes becomes a fire-red.

Spring is also marked by the return of birds to the reserve. There are different types of ducks, swans, geese, cranes, houbara bustard. In the expanses of protected lands there are Dalmatian pelican, Great cormorant, white and grey herons, geese, terns, snipes, pheasant, sandpipers. A spoonbill and heron nest. On the large enough territory included in the Arnasay wildlife reserve, in the coastal reed and bush thickets there are muskrat, wolves, corsaks, wild boars, jackals, *Vulpes vulpes karagan*, badgers, jungle cat, in the water area - carp, sheatfish, barbel, asp, rudd. Among the sandy areas are often found jerboa, Aral yellow souslik, Central Asian tortoise, eared hedgehog, sand snakw, various types of whip snakes, monitor lizards, steppe agama.

The distance of the Project Area from specially protected nature reserves and wildlife reserves ranges from 90 km (Zaamin), 70 km (Arnasay wildlife reserve), 160 km (Nurata). Implementation of the project will not affect the condition of specially protected areas.

Cultural heritage objects in the Syrdarya region include the archeological monument Eski Havos, located between the town of Yangiyer and the district center of Navruz. There are no plans to restore communications in the immediate vicinity of the site.

3.1.3. Kattakurgan city

During the preparation of the program on water supply services and institutional support for the proposed investment loan, the third region has selected the city of Samarkand region – Kattakurgan.

In this region it is planned to reconstruct water supply and sewerage systems in the city of Kattakurgan and measures to restore water supply systems.

The city of Kattakurgan was founded in the last quarter of the XVII century (1683-1684). Kattakurgan is the administrative center of Kattakurgan district, the second in size and population after Samarkand city in Samarkand region, one of the four cities of regional subordination.

Physical-geographical position of Kattakurgan

- lies within the valley of the Zaravshan River;
- is located on the III left-bank terrace of the Zaravshan river (left branch - Karadarya);
- is the nucleus of Central Uzbekistan;
- is major industrial and transport hubs (the roads are radially diverted from them);

Relief

The territory of Kattakurgan occupies the left-bank part of the Zarafshan River valley, which has a common slope from the south-south-east to the north-north-west. The valley has different widths, in the region of Kattakurgan - 23-25 km.

The highest landmarks in Kattakurgan are located in the central and southern and eastern parts of the city (490-510 meters above sea level). Absolute altitudes of the northern and north-western parts of the city range from 472 to 485 meters. Relatively high relief within the city limits is from 18 to 30 m.

The general view of the relief is a hilly plain, dissected by numerous dry lands and erosion trenches of ancient and modern irrigation canals and drainage systems.

Thus, the relief of the city is represented by soft forms of elevation with a general decrease to the north in the direction of the river Zaravshan.

Climatic characteristics and condition of atmospheric air in Kattakurgan city

The climate of Kattakurgan, as well as of all cities in the plains and foothills of Central Asia, has clear signs of aridity. High air temperatures and low humidity combined with a cloudless sky are typical for the summer period. Spring is short and rainy, winter is snowy, with unstable snow cover.

According to long-term observations, the average annual temperature is 14.80 °C, the absolute minimum is 15.0 °C, the absolute maximum + 41.5 °C.

According to long-term observations, the average annual amount of precipitation is 333 mm, of which more than 85% is accounted for by liquid precipitation. The daily maximum precipitation is 45 mm.

The wind regime of the city is influenced by the general circulation of the atmosphere, complicated by the peculiarities of orography.

In Kattakurgan, the winds of the eastern and northeastern directions prevail with a frequency of 58.7 and 13.3% of all directions, respectively.

Average monthly wind speeds in Kattakurgan are relatively low and vary from 1.7 to 2.7 m/sec during the year. Wind speeds of 2-3 m/sec is 32.7% (Kattakurgan). Wind speed of 2-3 m/sec is a purifying factor for dispersion of gaseous impurities from low, unorganized sources.

Light winds (0-1 m / s) prevail in Kattakurgan - 59.5% on average per year. Light winds contribute to the accumulation of impurities from low emission sources, which is the majority in this city.

Dust storms are also relatively rare (average of 4 days per year). The small frequency of dust storms in the Zaravshan valley is explained by the peculiarities of its location and the dominance of mountain winds throughout the year.

Thus, the analysis of climatic conditions of Kattakurgan showed that the frequently repeating increased wind speed favors the dispersion of gaseous impurities from low unorganized sources, and the temperature regime, the dryness of the underlying surface, a small number of days with precipitation contribute to increasing the dust content of atmospheric air at these wind speeds.

Existing sources of environmental impact

Sources of impact on the urban environment of both cities and landscape components are energy, industrial and municipal facilities, land, air and rail transport, locators, transformer substations, natural and climatic conditions (underlying surface).

In Kattakurgan there are "Kattakurgan Oil and Fat Factory" JSC, "Kattakurgan Cotton Purification Plant" JSC, brick, dairy, meat and mill plants. CHPP. Manufacture of art ceramics, Kattakurgan silkworm (grains) breeding plant, tungsten enrichment and processing plant (JV "Ingichki Metals»).

In terms of the degree of exposure, the enterprises of chemical industry, nonferrous metallurgy, mechanical engineering, tobacco products production, cement production, large thermal power plants are included in Category I with high risk.

Taking into account the location of the majority of large industrial facilities on the territory of the city, prevailing wind directions, analysis of UzHydroMet data, it can be assumed that the condition of atmospheric air within the cities is acceptable.

Hydrogeological conditions

The Zaravshan valley is a tectonic depression composed mainly of Paleogene and Neogene sediments. Above them there are alluvial and proluvial deposits brought by the Zaravshan River and its tributaries. These sediments are represented by loess, sands, gravels and conglomerates. The river has deepened the channel, forming a number of terraces.

Engineering and geological conditions of Kattakurgan is determined by the variability of geological factors: geological structure, relief genesis and morphology, hydrogeological situation, composition, condition and properties of aeration zone soils, modern exogenous geological processes that change from south to north. Along with latitudinal variability, there is also a local variability, confined to micro basins of temporary watercourses and sites of human engineering and economic activity in urban conditions.

Geological structure

The most widely developed are the sediments of the Tashkent complex, which compose the III erosion terrace of the Zarafshan River and the foothill sloping plain, formed by a complex of proluvial loess rocks of middle-quaternary age (ρlQ_2). Deposits of loess-like loess loam and sandy loam with lenses and interlayers of coarse-grained, graveled sand and wood are represented.

The deposits of the Tashkent complex have proluvial genesis and are characterized by extreme incompressibility of the section both in vertical and horizontal directions. The thickness of sand and wood interlayers and lenses varies from 20-50 cm to 3-5 meters and more.

On the territory of Kattakurgan as a result of engineering and construction and economic activities of man for many centuries, powerful anthropogenic formations have been formed. Anthropogenic formations are spread in the city territory very unevenly.

Hydrogeological conditions

Hydrogeological conditions are closely related to the geological structure, topography, climate and hydrography. The intermountain depression, within which the city of Kattakurgan are located, is mainly a transit and unloading area and, to a lesser extent, an area of partial accumulation of groundwater.

Depending on the conditions of groundwater formation and distribution, the nature of the water-bearing rocks and age, a number of aquifer complexes are allocated to the area. In terms of their quantitative and qualitative indicators, as well as the degree of their impact on the engineering and geological situation in the area of research, the most important are the aquifer complex in proluvial sediments of middle-quaternary age (ρlQ_2).

The mentioned complex is timed to the interlaying proluvial thickness of loess-like loam, sandy loam, gravel sand, wood of Tashkent age. The complex occupies the largest part of the area by area (Fig.3.3.1).

Groundwater is contained in all lithological differences, but lenses and interlayers with the best filtration qualities (sand, rotted rocks, less often crushed stone) are of practical importance).

Depth of underground water level depending on gypsometric marks varies from 2.0 to 10.4 m. The general waterproofing is clays and siltstones of Neogene and, partially, Paleozoic rocks (Fig.3.3.2.).

The main source of power of the described aquifer complex is an underground inflow from the mountains, to a lesser extent filtration of atmospheric precipitations and surface waters.

Groundwater movement coincides with the general surface gradient and is directed to the north, north-east. Unloading takes place in alluvial sediments of the Zarafshan and Karadarya rivers. Partial unloading also occurs due to ground water seepage through erosion trenches in the form of springs and swampy hollows (mochezina).

The average amplitude of groundwater level fluctuation is 0.5-1.5 m. The highest position of groundwater level is observed in April-May, the lowest - in October-December months (according to the archive data).

The water abundance of rocks is different, which is explained by the diversity of lithological composition. At some horizons, represented by clastic rocks without admixture of clayey particles, the specific flow rate is about 10-15 l/sec. For sandy loam and loam horizons, the specific flow rate varies from 0.01 to 0.2 l/sec.

Surface waters

The largest natural watercourse in the study area is the Zarafshan River, which originates high in the mountains in the gorge between the Turkestan and Zarafshan ridges. Near Samarkand, the river is divided into two branches: northern - Akdarya and southern - Karadarya. Between them, an island of about 100 km long and up to 15 km wide is formed in its middle part. Both branches are connected again near the villages. Khatyrchi. Further, Zarafshan flows in a northwest direction to the Bukhara oasis.

The Zarafshan River has a mixed feeding. In spring, it is fed by rain and snowmelt, and from late June to August by melting glaciers in the mountains. In this regard, the river is characterized by two floods: the spring one in March and the second one in June-August, which is more intense.

The regime of the Zarafshan river within the study area is not constant due to periodic water withdrawal for irrigation. The minimum average monthly flow rate for the river is up to 30 m³ /sec in February, and the maximum in June, which reached 665 m³ /sec. A significant part of the water, 42 km south-east of Samarkand, is disassembled by the Dargom main irrigation canal. The water in the canal, like in the Zarafshan River, is turbid.

For Kattakurgan city the nearest water body of Karadarya (southern channel of Zarafshan river). The length of Karadarya is 121 km. The floodplain of the river is wide, the river wanders along it, forming a lot of branches. Currently, 24 canals withdraw water from Karadarya, the largest of which in Kattakurgan are Narpay, the Supply and Diversion canals. The last two canals of the canal supply water from the Zarafshan river to the Kattakurgan reservoir. The Narpay Canal and the Diverting Canal run through the city.

The main sources of surface water pollution within the city are non-canalized residential development in the water protection zone, industrial wastewaters, discharges of energy facilities and wastewaters of the urban irrigation system.

Soil and vegetation cover

Soils of the III terrace of the Zarafshan river are mainly represented by old-irrigated typical sierozems, in some places eroded, heavy and medium loamy on loess-like sediments. As a result of long-term irrigation, the humus and nitrogen were combined abruptly, carbonate horizons were gradually disappearing, salts were washed away in conditions of good underground water flow, and in conditions of poor flow - groundwater rise and secondary salinization of soils.

Old irrigated areas are characterized by the accumulation of agro-industrial deposits, the thickness of which in the study area reaches 3-4 meters. Agricultural Irrigation deposits or sediments, taking into account their considerable capacity, are characterized by uniform grey coloration, uniform humus content (1-2%), high saturation of active microflora and absence of carbonate, gypsum and saline horizons. On the territory of the city natural soils are almost completely transformed into cultural and urban deposits.

Soils of the lower terraces are mainly meadow soils and only within the limits of local depressions, depending on the depth of groundwater level, are developed marshy meadow and marshy soils.

Meadow soils, due to constant or periodic moistening by ascending capillary points of moisture, are distinguished by an abundance of vegetation. As a result of the enhanced decomposition of plant residues, the soil is enriched with humus substances, the humus content is 2.5-5%, its profile does not decrease lower in the profile, amounting to 1.5-5% at a depth of 50 cm. Soils are characterized by high carbonate content, and about 90% of the total amount of absorbed cations are the zones of calcium and magnesium, which determines the increased structural transparency of meadow soils. High content of nitrogen - fixing organisms - helps to convert mineral and organic compounds into easily digestible substances for plants, determining the high fertility of soils.

In the lowest parts of the I and II terraces of the Zarafshan river, as well as in local areas in the valleys of large aryks (ditches) and discharges (Siab, Obimashat, Narpay, Flume, etc.) with a depth of groundwater up to 50 cm are developed marshy soils. They are characterized by high clay content, high carbon content, humus content is 3-4 %. As a result of constant overwetting, the gley horizon is pronounced. Most of these lands are used for sowing (on the surface of I terrace of the Zarafshan river).

In terms of salinity, easily soluble salts, medium soluble salts, soils are not saline.

Cultivated soils within the urban area are not saline.

The main sources of soil and subsoil pollution are industrial and municipal facilities, motor vehicles, non-canalized residential buildings.

Vegetation

Vegetation in Kattakurgan is mainly represented by cultural species characteristic of oases. The most widely developed are agricultural crops and forest parks.

The characteristic representatives of the local oasis vegetation are elm, willow, mulberry, poplar, Asiatic poplar, oleaster, ash, plane tree, walnut and some others. Forest-park vegetation is interspersed with garden and field crops. Various types and varieties of garden and melon crops, orchards and vineyards are widely developed. They occupy a significant part of the territory in the suburban area.

The main sources of negative impact on vegetation are atmospheric air, soil, ground and surface waters used for irrigation. Areas with a high level of impact on vegetation correlate with areas of high content of contaminants in these components and are associated with industrial and energy facilities, as well as highways.

Taking into account the natural and climatic features of the territory under consideration, it is necessary to note the special role of landscaping in the creation of favorable microclimatic conditions, protection of watercourses, as well as all types of tree plantings perform cleaning functions, reducing the content of gases and dust in the atmosphere. The average concentration of dust in the air under plantations decreases by 33-39%. Mixed plantations retain more dust than clean ones by 9-17 %, with vertical crown closure - by 18-20 % more than with horizontal one.

In both cities, along with old plantations, which are several decades old, young trees of 7-10 years old are planted.

The species composition of trees is diverse. There are plantings of traditional representatives, such as elm, mulberry, poplar, ash, plane tree. In recent years, preferences have been given to coniferous representatives, chestnuts, and other species.

The current state of vegetation should be characterized as diverse in species composition. The degree of landscaping is high. In general, the state of vegetation is satisfactory.

Fauna

Due to the fact that the territory of the cities is developed and cultivated, the fauna here is minimal, the fauna is represented mainly by rodents, ornithofauna, pets (cattle and small cattle, bird).

The list of animal species is limited to those species that have been able to adapt to life under anthropogenic conditions. There are no large mammals characteristic of uninhabited areas. There are often ubiquitous representatives of rodents - vole, grey rat, house mouse, sometimes an eared hedgehog.

Of the birds, typical representatives of the countryside live here. Gray sparrow, myna, turtle dove, swifts and swallows, rooks, jackdaws, hooded crows, starlings, pigeons, etc. are observed in large numbers. Less often you can see a magpie, and closer to autumn, representatives of the Corvidae family (carrion and hooded crow, raven, (crow and raven are two different birds), magpie, jay, jackdaw, rook become frequent guests).

The variety of reptiles is quite limited. Their most striking representatives are the rapid fringe-toed lizard and gray gecko.

Among the insects are those species that live in the grass: crickets, grasshoppers, etc., among shrubs and in the vineyard - mantis, wasps, hornet.

In the vicinity of cities there is a thin-toed ground squarrel, great gerbil; nocturnal animals - midday gerbil; feather-footed jerboa. From the detachment of insectivores, sandy deserts are characterized by an eared hedgehog, which eats poisonous snakes.

The fauna of the study area is typical for the residential area and is represented by synanthropic species and birds.

The presence of woody vegetation, organized and unorganized garbage dumps in the cities attracts different representatives of avifauna and rodents. Pigeons, sparrows, turtle doves, tits, etc. live there.

Specially protected natural areas and cultural heritage objects

In Samarkand region there is the only natural reserve - Zarafshan, located in the intermountain valley of the river Zarafshan and far from Kattakurgan city at a distance of more than 80 km to the south-east. The main waterway of the reserve is the Zaravshan River and its tributaries.

Typical vegetation is represented by riparian communities occupying an area of 868 ha. Tugai plants are characterized by a strongly developed, sometimes multilayer, root system, resistant to flooding and salinization. The flora of the reserve includes more than 300 species of plants. Typical plants are *Hippophae rhamnoides* L, *Elaeagnus ongustifolia*, *Salix babylonica* and *Salix songarica*, *Tamarix* L. Endemics of Central Asia, such as *Colchicum kesselringii*, *Gentiana olivieri* and *Crocus korolkowii*, are rare. Depending on the type of humidification, groups of floodplain, above floodplain and desertified phytocenoses are distinguished.

There are 88 species of insects and 26 species of shellfish in the fauna of the Reserve. Vertebrate animals are represented by 245 species. Amphibians (2 species) and reptiles (10 species) are quite poorly represented. The common species are lake frog, Asian snake-eyed skink, rapid racerunner, steppe turtle, dice snake, steppe ratsnake, Dwarf sand boa and steppe ribbon snake. Well studied in the reserve is the fauna of birds, numbering 207 species.

The Uzbekistan Red Book includes mollusks *Colletopterum cyreum sogdianum* and *Corbicula fluminalis*, fish *Barbus capito conocephalus*, *Sabanejewia aurata aralensis* and 26 bird species, including the endemic Zarafshan pheasant *Phasianus colchicus zerafschanicus*.

Implementation of the project in Kattakurgan city will not have an impact on the flora and fauna of the Reserve due to many reasons, the main reason of which is remoteness.

The location of the city of Kattakurgan in relation to the neighbouring areas and their protected areas is also not a cause for concern for adverse impacts in the event of project implementation.

The Nurata and Zaamin reserves in Jizzakh region are more than 50 km away from Kattakurgan and 170 km away, respectively.

The distance to the Arnasay wildlife reserve is more than 100 km to the north.

Vardanzi wildlife reserve

Protected cultural heritage sites include the Vardanzi Wildlife Refuge. Vardanzi is an ancient and medieval town located 150 km west of Kattakurgan and 40 km north-east of Bukhara.

The purpose of the protected area is to preserve the ruins of the former city of Vardanzi, now buried in sand, and the planting of saxaul. The center of the reserve is a high clay hill - the ruins of a fortified castle, based on the turn of our era, the Persian Prince Shampur, who moved to Bukhara and, having received the land from the ruler of Bukhara, built a castle and a village Vardana. Attractions are Vardanzi settlement, Bibi Zubayda sanctuary, Burki Sarmast sanctuary.

Sarmishsay — Sarmishsay tract in Navoi region of Uzbekistan. Natural-archeological monument known for petroglyphic images and rare species of flora and fauna. In Sarmishsay, located on the southern slope of the Nurata ridge, 70 km northeast of Kattakurgan, more than 200 archaeological sites, including burial grounds, burial mounds, remains of settlements and workshops for processing of flint, but the most interesting are rock images; in the gorge 2.5 km long, which is the central part of the Sarmishsay complex, more than 5000 (according to some data - more than 10 000) petroglyphic images were found.

The analysis of the location of the protected natural and cultural objects has shown that Kattakurgan is far away from them. Therefore, the implementation of the design solution within the urban environment will not have a negative impact on the protected objects.

Project area resumes

The project area under consideration, located in different regions of the country, mainly affects populated areas, i.e. urban environment. Restoration of the water supply system or construction of sewerage networks will take place in the residential area, which has its own peculiarities.

For centuries, people have been recklessly taking everything they wanted from nature when they ploughed up new lands and built cities. Now it turned out that some common once plants and animals, especially useful or very beautiful, began to disappear and now they are rare, or endemic, plants and animals.

For example, in the districts of the Syrdarya region, located near any watercourses, even in settlements close to housing can be seen on the pillars of the white stork nest, which is listed in the Red Book of Uzbekistan. The local population worships this bird as a symbol of well-being and it is not threatened.

Among the red-book species of plants in this region there are such plants as *Allium praemixtum*, *Bryonia melanocarpa*. *Allium praemixtum* have a certain nutritional value, it is even grown on homestead lands. But for these plants the urban environment is not a place of their distribution.

In Karakalpakstan, for example, a number of plants are listed in the Red Book: *Stipa aktauensis*, *Euphorbia sclerocyathium*, *Malocarpus crithmifolius*, *Tulipa buhseana*, *Tulipa sogdiana*. These plants can be found in limited areas in nature, but in urban environment they can be accidentally brought in single specimens.

Among the animals, for example, are *Caracal caracal michaelis*, *Cervus elaphus bactrianus*, *Gazella subgutturosa*, etc., which are common in Karakalpakstan. These species inhabit undeveloped areas of steppes and semi-deserts and, as a rule, do not live near populated areas.

However, when constructing new wastewater treatment plants or laying or reconstructing network utilities outside the urban environment, it is necessary to take measures to conserve flora and fauna.

Once the exact location of the facility and the trajectory of the waterway or collector route have been determined, the area should be examined for the presence of rare and endangered species of plants and animals.

If single specimens of endemic species are identified, it is necessary to ensure that they are replanted or relocated to safe areas with identical habitat conditions.

3.2. SOCIO-ECONOMIC CONDITIONS

Population

The population of project area predominantly is living in rural areas. As of January 1, 2019, total number of population of Karakalpakstan was 1,869.8 thousand people, 51% of them live in rural areas. The majority of population of Samarkand and Syrdarya regions also lives in rural areas with 63% and 57% correspondingly (Table 3.2.1).

Table 3.2.1. Population of regions, thousand, January 1, 2019

No	Region	Total Population	Urban		Rural		Estimated number of households (2018)
			Population	%	Population	%	
1	Republic of Karakalpakstan	1,869.8	917.7	49.1	952.1	50.9	384.4
2	Samarkand	3,798.9	1,414.7	37.2	2,384	62.8	709.2
3	Syrdarya	829.9	354.8	42.8	475.1	57.3	160.9

Source: State Committee for Statistics

In all regions, the density of population is growing and this is the result of ongoing process of population concentration mainly in already developed places. In Karakalpakstan, the density of population changed from 9.8 1/sq.km (2010) to 11.2 1/sq.km (2019) or 114.3%. In Samarkand region, from 158.9 1/sq.km (2010) to 226.5 1/sq.km (2019) or 121.8%. In Syrdarya region, from 166.9 1/sq.km to 193.9 1/sq.km or 116.2%. (Table 3.2.2). The growing population needs additional access to basic services and water/sewerage supply systems.

Table 3.2.2. Population Density, 1/sq.km (as of January 1 of respective year)

No	Region	Population Density, 1/ per square km			
		2000	2010	2019	Change 2019/2010, %
1	Republic of Karakalpakstan	9	9.8	11.2	114.3
2	Samarkand	158.9	186	226.5	121.8
3	Syrdarya	149.3	166.9	193.9	116.2

Source: State Committee for Statistics

Total number of population to be covered by the Project in three regions is more than 1,375,000 people. The annual population growth in project districts and cities vary from 1.2 up to 2.5 percent which creates a significant load on the existing social infrastructure, including potable water and sanitary facilities.

Table 3.2.3. Population of the project districts, thousand, January 1, 2019

	Total population, thousand	Annual population growth, as % to the previous year	Share of women population, %
Republic of Karakalpakstan	1,869.8	1.5	49.8
Nukus city	314.9	1.3	50.7
<i>districts:</i>			
Kungrad	128.3	1.2	48.7
<i>incl. Kungrad city (2018)</i>	80.1	No data	No data
Takhiatash	72.8	1.3	50.4
<i>incl. Takhiatash city (2012)</i>	64.1	No data	No data

Khodjeyli	121.2	1.3	50.0
<i>incl. Khodjeyli city (2009)</i>	106	No data	No data
Samarkand region	3798.9	2.1	49.7
Kattakurgan city	88.0	1.3	50.1
Syrdarya region	829.9	1.7	49.8
Yangiyer city	42.5	2.2	49.9
<i>Districts</i>			
Akaltyn	50.9	1.4	49.7
Bayaut	127.2	1.8	49.4
Saykhunabad	75.9	1.7	50.1
Gulistan	70.6	2.5	50.6
Sardoba	64.7	1.9	49.3
Mirzaabad	71.2	2.2	48.0
Syrdarya	125.7	1.5	50.1
Khavast	93.7	1.8	50.2

Source: State Committee for Statistics

Labor market

Economically active population comprises about 75% of the labor force in the project regions. The unemployment level exceeds 9% and it is a little bit higher than the average for the country (8%). The share of external labor migrants is extremely high, and vary from 17 up to 28 percent of the economically active population.

Table 3.2.4. Labor market indicators in the project districts, averages for January-June 2019

	Labor force, thousand people	Economically active population, thousand	Employed, thousand	Unemployment rate, %	Number of external labor migrants, thousand	Share of external labor migrants as % of economically active population
Republic of Karakalpakstan	1073.1	796.5	722.7	9.3	160.8	20
Nukus city	185.0	146.5	133.6	8.8	24.3	17
<i>districts:</i>						
Kungrad	42.2	32.3	29.3	9.2	6.8	21
Takhiatash	72.5	57.3	51.7	9.8	11.4	20
Khodjeyli	69.4	48.3	43.6	9.7	8.4	17
Samarkand region	2121.2	1615.7	1464.7	9.3	338.1	21
Kattakurgan city	49.7	35.9	32.7	9.0	10.2	28
Syrdarya region	485.2	396.6	359.5	9.4	79.6	20
Yangiyer city	24.9	20.5	18.7	9.1	5.2	25
<i>Districts</i>						
Gulistan	39.6	30.4	27.6	9.2	6.3	21
Saykhunabad	43.4	35.7	32.2	9.7	8.4	24
Syrdarya	69.5	57.3	52.2	8.9	11.1	19

Source: State Committee for Statistics

The input of project regions to national industrial production is not significant varying between 2.2% and 5.7% (Table 3.2.5).

Table 3.2.5. Share of regions in the total volume of industrial production (% of country total)

No	Region	2000	2010	2018
1	Republic of Karakalpakstan	2.3	1.8	4.6
2	Samarkand	5.2	5.3	5.7
3	Syrdarya	3.3	2.5	2.2

Source: State Committee for Statistics

The economic development is oriented to agriculture production and as the result rural lifestyle prevails in major parts of these regions.

Table 3.2.6. Sectoral employment by regions

	Karakalpakstan			Samarkand region			Syrdarya region		
	2017	2018	Jan-June 2019*	2017	2018	Jan-June 2019*	2017	2018	Jan-June 2019*
Number of employed persons, thousands	647.2	705.2	722.7	1523.1	1463.3	1464.7	353.1	354.2	359.5
By branches of economy, %									
Agriculture, forestry and fishery	29.6	27.3	27.3	28.2	27.6	27.6	48.0	44.1	44.1
Industry	9.5	8.6	8.6	12.1	12.4	12.5	9.1	9.3	9.2
Construction	9.3	8.4	8.4	7.2	6.8	6.8	6.7	6.5	6.0
Trade	10.9	10.1	10.1	12.0	11.8	11.9	6.5	6.5	6.2
Transportation and storage	5.2	4.8	4.8	5.6	5.6	5.7	3.2	3.2	2.9
Catering and hotels	2.0	1.8	1.8	3.0	3.0	3.1	1.3	1.3	1.3
Education	11.8	10.8	10.6	8.7	9.0	9.0	7.9	7.9	7.9
Health sector and social services	4.8	4.4	4.4	4.3	4.5	4.5	4.8	4.9	4.8
Other	16.9	23.7	24.0	19.0	19.1	19.0	12.3	16.4	17.6

Source: State Committee for Statistics. *Note: Preliminary estimations

Poverty Level

The poverty line, the subsistence level, and methodology for estimating the indicators have yet to be established by the national legislation in Uzbekistan. According to the assessments that the World Bank made on the basis of the Household Budget Surveys regularly held by the State Statistics Committee, the low-income population of Uzbekistan represented 31.5 % of the total population in 2001, including 33.6 % in rural areas and 27.8 % in urban ones². The poverty line was determined as the monetized average per capita per day food consumption of less than 2,100 kcal. In 2015 (the latest available data on poverty by

² “The Republic of Uzbekistan. Living Standards Assessment Update.” The World Bank, August 27, 2007

regions³), the national average poverty level dropped to 13.7% and constituted 29.7% for the Republic of Karakalpakstan (poorest region of the country), 16.4% for Syrdarya region and 10.9% for Samarkand region⁴.

In June 2019 a new World Bank policy research working paper document was published⁵. Considering the absence of the access to national Household Budget Survey database collected annually by the State Committee for Statistics, the poverty level estimations were done on the level of each district of Uzbekistan based on welfare estimates derived from the baseline World Bank study “Listening to the Citizens of Uzbekistan” (2018). In addition to the international “low income” poverty line (\$1.9 PPP a day per person), the World Bank also uses income class poverty lines which facilitate comparisons between countries at similar stages of development. The income class poverty lines are defined for the lower middle-income and upper middle-income countries and are based on the national poverty lines of the countries in each group. As such, they provide a more appropriate threshold to measure poverty for countries in each income class. The lines are defined at \$3.2 (for lower middle-income countries which is Uzbekistan case) and \$5.5 (for upper middle-income countries, like Kazakhstan). The welfare measures of income or consumption used are the same as those used for the international poverty line.

According to the report in 2018 in Uzbekistan the poverty rate measured at the \$3.2/day line stood at 9.6 % of the population, and 36.6 % at the \$5.5-a day line.

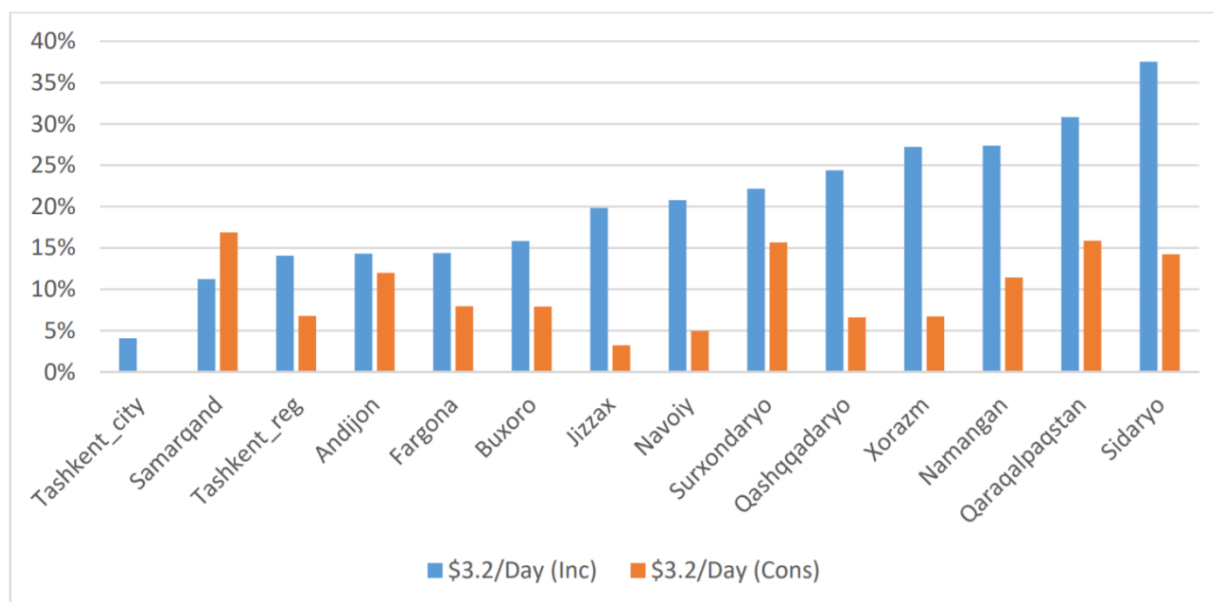
³ The MDG report. Uzbekistan 2015. Tashkent, 2015

⁴ The rise in the living standard in the country made it clear that the methodology, based on food consumption only, underestimates the expenses for the full consumer basket of goods. Thus, this method of the poverty assessment does not reflect the real situation. In the meantime, a methodology for identification of poor families was developed by the Ministry of Labor in 2012 which is still used by local authorities for the award of poverty allowances. This methodology is defined in the Resolution of Cabinet of Ministers №44 , dated February 15, 2013 "On the procedure of appointment and payment of social allowances and material assistance to low-income (poor) families". The minimum threshold of income, which gives the right to an allowance, is defined as 1.5 times the minimum wage per family member per month. Given the lack of other statutory poverty criteria, the above-mentioned methodology is to be utilized for the further detailed Social Assessment for calculation of the poverty level in the different sub-project areas.

⁵ World Bank Poverty and Equity Program for Central Asia, led by William Seitz. “Where They Live District-Level Measures of Poverty, Average Consumption, and the Middle Class in Central Asia”. WB Policy Research Working Paper 8940, 2019

The study shows (Figure 3.2.1), that income poverty \$3.2/day line level in in 2018 in the Samarkand region was in one of the lowest (less than 12% of population), while Karakalpakstan and Syrdarya were the poorest regions of the country (30% and 38% correspondingly).

Figure 3.2.1. Poverty rate by region of Uzbekistan



Source: *The Listening to the Citizens of Uzbekistan baseline survey, Author's calculations*

For the project districts the level the \$3.2 monetary poverty level is much higher than the national average 9.6%.

Table 3.2.7. Poverty level in project districts

	Rate (\$3.2), 00
Republic of Karakalpakstan	
Nukus district	0.185
Kungrad district	0.055
Takhiatash district	No data
Khodjeyli district	0.192
Samarkand region	
Kattakurgan district	0.23
Syrdarya region	
Akaltyn	0.117
Bayaut	0.134
Saykhunabad	0.141
Gulistan	0.124
Sardoba	No data

Mirzaabad	0.087
Syrdarya	0.162
Khavast	0.134

Source: The listening to the Citizens of Uzbekistan baseline survey.

3.3. ANALYSIS OF EXISTING UTILITY NETWORKS

Official data on population access to centralized water supply and sanitary are presented in the Table 3.3.1.

Table 3.3.1. Population access to centralized water supply and sewerage systems in project districts, as % to total number of houses/apartments

as of 01.01.2019

Regions	Access to centralized water supply		Access to sewerage utilities		
	Total	Rural areas	Total	Urban areas	Rural areas
Republic of Karakalpakstan	54.4	25.1	10.7	19.5	1.1
Nukus city	95.4	-	36.3	36.3	
<i>districts:</i>					
Kungrad	60.4	22.6	19.0	27.7	4.6
Takhiatash	87.8	77.0	30.1	40.5	3.5
Khodjeyli	72.6	26.6	7.5	7.3	7.8
Samarkand region	57.3	41.2	25.6	46.1	9.9
Kattakurgan city	81.2	-	38.2	38.2	
Syrdarya region	79.7	84.1	35.8	52.6	23.9
Yangiyer city	90.6	-	42.1	42.1	
<i>districts:</i>					
Akaltyn	77.3	86.3	0.0	0.0	0.0
Bayaut	74.2	78.2	54.2	68.9	51.7
Saykhunabad	96.6	99.2	16.6	67.3	11.2
Gulistan	67.4	69.2	11.4	13.9	10.7
Sardoba	91.3	96.1	57.8	43.6	61.8
Mirzaabad	85.5	86.9	6.8	0.0	7.4
Syrdarya	76.1	78.9	6.9	11.8	2.3
Khavast	60.3	67.6	27.4	51.6	15.6

Source: State Committee for Statistics

Unfortunately, the official data on the number of connections to water supply and sewerage systems are not able to characterize the quality of utilities' operation. In order to assess the current state of utility networks and identify the main environmental problems in the selected cities and regions, a team of project consultants visited the selected areas. On the basis of meetings with the local authorities of the Kommunkhizmat, visits to water intakes, sewage treatment plants, visual inspections, problems and shortcomings were identified.

Nukus city

Nukus city is the administrative center of Karakalpakstan with a current population of about 315,000. Currently about 96 percent of the population in Nukus city are connected to a centralized water supply system. At present, only about 28 percent of the population is connected to the sewerage system, while the remaining share of the population relies on on-site sanitation facilities. Further, there are many apartment buildings under construction, which should be connected to the sewerage network.

Due to the high mineralization, groundwater is not used for water supply in the city. Water withdrawal for domestic and industrial needs, irrigation of streets and greenery is carried out from surface sources.

Water supply of the city of Nukus is provided from 2 sources: from the regional water system Tuyamuyun-Nukus-Shimbay-Takhtakupyr, fed from the Tuyamuyun reservoir and surface water intake on the Kyzketken canal (urban surface facilities - USF).

The Amu Darya River is the main waterway that feeds the Kyzketken and the feeding canals and supplies the city with water.

The chemical composition of the river water is formed to a large extent under the influence of pollution entering the river on the territory of Turkmenistan, under the influence of agricultural runoffs and wastewater from enterprises. Due to the high water volume of the river, average concentrations of harmful substances did not exceed the maximum permissible concentrations (MPC) for both fishery and drinking water, except for a slight excess of mineralization (not more than 1.2 times) and COD values. However, during the period of low water salinity in the Nukus site increases up to 1.7 MPC, the amount of sulphates, chlorides, sodium, oil products, the values of COD and BOD_{complete}.

Water from the regional water supply system enters the city network the Water Distribution Units WDU-1 and WDU -2. The water distribution unit WDU -1 is located in the northern part. Urban waterworks of WDU -2 are located in the southern part of the city. USF capacity - 65 thousand m³ / day.

Water from the Kyzketken canal is supplied to the treatment plant site by the onshore pumping station. Having passed a full complex of clearing, water is delivered in tanks of pure water 2W=10000 m³ . Water from the regional system is also supplied here. Water is chlorinated and supplied to the city network.

The city's waterworks are in poor technical condition. Currently, about 96% of the population of Nukus is connected to the centralized water supply system.

Nukus sewerage system. In the city only 28% of the population is covered by sewerage system, 72% of the population uses cesspools and septic tanks.

Wastewater is supplied by a system of gravity collectors to five pumping stations SP-1-1a, SP-2, SP-4, SP-10-10a, SP-11. In addition to these pumping stations, sewage pumping stations have microdistricts 22, 23, 24, 25, an eye hospital, an infectious diseases hospital, a rice technical school, the Academy of Sciences, and the Sarbinas microdistrict. Sewers from the population, utilities and industrial enterprises enter the sewer.

All effluents from SP-1-1a and SP-10-10a pumping stations are supplied via pressure collectors to the main pumping station located 3 km southeast of Nukus, and then they are delivered to treatment facilities with full biological treatment and additional treatment capacity of 65.0 thousand m³/day. The sewage treatment plant was put into operation in 1984 and consists of bio-ponds with several stages of treatment.

Sewage treatment plant (STP) is located 15 km southeast of the city. The actual average daily wastewater flow rate is 15.0-16.1 thousand m³/day. The length of sewerage collectors and networks is 141 km, including collectors - 60 km, 20 pumping stations and one treatment facility.

All effluents from industrial enterprises and other objects are taken to the city sewerage system without local treatment.

Local treatment facilities have separate industrial enterprises - lime, brick and concrete goods plants. The meat processing plant performs mechanical wastewater treatment with the help of metal lattice in concrete lagoons with height difference, on sludge platforms located on specially allocated maps of the field outside the enterprise.

All other enterprises of the city do not have treatment facilities, and if they do, they have very low efficiency of treatment. Untreated effluents are discharged to the terrain polluting the soil, ground and surface (lake) waters.

Water treatment plants are sources of soil contamination with sludge. Sludge is discharged onto the terrain, which acts as a natural drying ground.

During the meeting with representatives of "Kommunkhizmat" the information on the condition of the city sewerage system was received. At present, the technical condition of the sewerage network is unsatisfactory and cannot ensure the treatment of city wastewater for the following reasons:

- Poor condition of network – 58% coverage;
- equipment NS-1 and NS-10 is severely worn out (rupture of the pressure sewerage pipe);
- unsatisfactory condition of gravity flow collectors (waste water losses can reach 43%);
- ubiquitous unsatisfactory condition of pressure collectors;
- unsatisfactory condition of the STP;
- Poor condition of pumping stations;
- Insufficient technical equipment of «Kommunkhizmat»
- The sewage treatment plant is located at a considerable distance from the city, which leads to high operating and maintenance costs.

Thus, based on the materials of the meeting with representatives of "Kommunkhizmat" and visual surveys of urban communications, their extremely unsatisfactory condition was revealed.

It should be noted, however, that according to the approved Master Plan of Nukus, the following are planned to be implemented by 2035:

- Increase in the length of water conduits and networks by 167.8 km;
- Reconstruction of existing water intake structures;
- Modernization of the existing distribution network in order to increase the guaranteed water supply, as well as water saving measures.

On the sewerage system, it is planned:

- expansion of existing sewage treatment plants;
- an increase in the length of sewer collectors by 144.5 km.

In order to reduce the area of land required for the facilities, it is planned to carry out a comprehensive sludge processing (disinfection from helminthes, use of anaerobic-aerobic method of sludge treatment with subsequent thickening, mechanical dehydration, thermal drying). Application of this method of waste (sludge) treatment prevents soil and subsoil contamination and makes it possible to use it as a fertilizer for any crops.

Takhiatash city

Takhiatash city is the administrative center of Takhiatash district, located about 10 kilometers south of Nukus city, and has a total population of approximately 65,000 people.

The source of water supply for the city of Takhiatash is the Amu Darya River. Water comes from the Takhiatash water treatment plant and from the Takhiatash-Kungrad main water conduit. 86% of the population are connected to the centralized water supply system. Residents receive water no more than 6 hours a day. Reconstruction of the entire system is required.

The City Sewerage Network covers 12% of the population.

The sewerage system is represented by five SPSs, 2 pumping stations, 2 HFPSs (household-fecal pumping stations), 13.5 km of sewerage networks and sewage treatment plants with a design capacity of 7600 m³/day.

The technical condition of the pumping stations is unsatisfactory; their reconstruction is required. The sewage from the sewage treatment plants does not reach sewage treatment plant, due to the emergency state of the networks. The drains are discharged into the drainage collector and enter the terrain.

STP doesn't work very well. Currently, it is planned to build new treatment facilities at the new site, which will be located 13.5 km away from the city.

According to the head of the sewerage system of Takhiatash (from the explanatory note), it is necessary to perform reconstruction of the entire sewerage system with the increase of sewerage networks up to 20 km.

For normal operation of the sewerage network it is necessary to build 7 more sewerage systems.

For the rest of the population, which is not connected to a centralized sewerage system, support is required to create sanitary and hygienic conditions in place (septic tanks and improved cesspools).

Khodjeyli city

Khodjeyli town is the administrative center of Khodjeyli district, located 10 kilometers west of Nukus city, and has a total population of approximately 106,000 people and no industries.

The source of water supply for the city of Khodjeyli is the Amu Darya River. Water flows through the Takhiatash-Kungrad main conduit, fed from the Suenli canal. There are urban water intake facilities on the Suenli Canal. To determine the quality of drinking water in the city there is a laboratory. Currently, reconstruction of the Khodjeyli filling station is being carried out at the expense of the investment program.

Previously, the sewage networks of Khodjeyli were on the balance of the railway. Later, sewer networks switched to the balance of the khokimiyat. Currently, for 10 years they have been on the balance of LLC Sariev Davronbek. In 2019, the reconstruction of SPS-1 and SPS-2 began at the expense of budgetary funds.

There are 7 pumping stations in Khodjeyli, some of them are operational, and some are not.

SPS-3 operates from Mustaqillik to the market, will collect drains from 20 new houses, schools, colleges, new kindergartens, will go to Dustlik Street and connect to the pump to Furkat Street. The gravity sewerage system is not working.

Three pumping stations and 18 km of pressure and gravity flow sewerage network are being built at the expense of the Aral Sea region development.

SPS-4 will collect sewage from buildings along Takhiatash Street, 5 residential houses, 16 apartment houses, service houses, boarding school, a household services center, a restaurant and 30 houses along the A-380 Tashkent highway.

Booster pump station (BPS) - 5 should serve the orphanage, 5 apartment buildings on Takhiatash St.

A working draft is being prepared at BPS-5 and BPS-4, but no sponsors have been found yet. There is no BPS-6 pump station yet. It is planned that it could collect the drains of Shagalakul, there are 7 multi-storey buildings, a textile factory, 5 two-storey houses, 12 new model houses. The drains from SPS-6 must be connected to SPS-1. Gravity sewer networks are out of date. Need to find sponsors.

New construction is planned on Drujba St., to the network of which a hakimiyat, a restaurant, a center of public services, the police department, a district court, a post office, a state security service and other buildings will be connected.

In Khodjeyli, private residences are not connected to the sewerage network. The drains are discharged into cesspools and concreted pits.

At the suggestion of the deputy khokim in some mahallas built two-section concrete containers, served by the "Toza huduk". One section collects garbage, the other - liquid domestic sewage. Toilets are built separately, and the contents are taken out by sanitation machines.

In the city groundwater occurrence is determined as 1-1.5 meters. With such a system of cesspools, there is a possibility of their contamination. Thus, the condition of sewage equipment and networks in Khodjeyli and adjacent settlements is in unsatisfactory condition, which has an extremely negative impact on the environment. To normalize the situation, it is necessary to construct and restore \approx 20 km of sewerage network, to construct and reconstruct 7 SPSs.

Kungrad city

Kungrad is located about 110 kilometers north of Nukus city and has a population of approximately 80,000 people.

The source of water supply in the city of Kungrad is the Amu Darya River. The Suenli canal supplies the Takhiatash water treatment plant (WTP) and the Kungrad water intake station (WIS). Further on, water is supplied to the city network through the inter-regional water pipeline. Currently, 75% of the population is connected to the water supply system, but receives water with interruptions.

Kungrad sewerage network requires reconstruction and new construction in connection with new buildings and connection of existing buildings to the sewerage network.

Construction is planned in several directions. The first direction is connected with the central part of the city. Here it is necessary to construct a new domestic gravity flow sewerage system and water wells (Fig. 3.1.7.2.). Connection of new multi-storey houses and 9 existing houses to the central network up to Uzbekistan Street. Replace the pressure sewerage network from the city center to Dongyz lake.

The second direction of construction of the sewerage network is related with connection of:

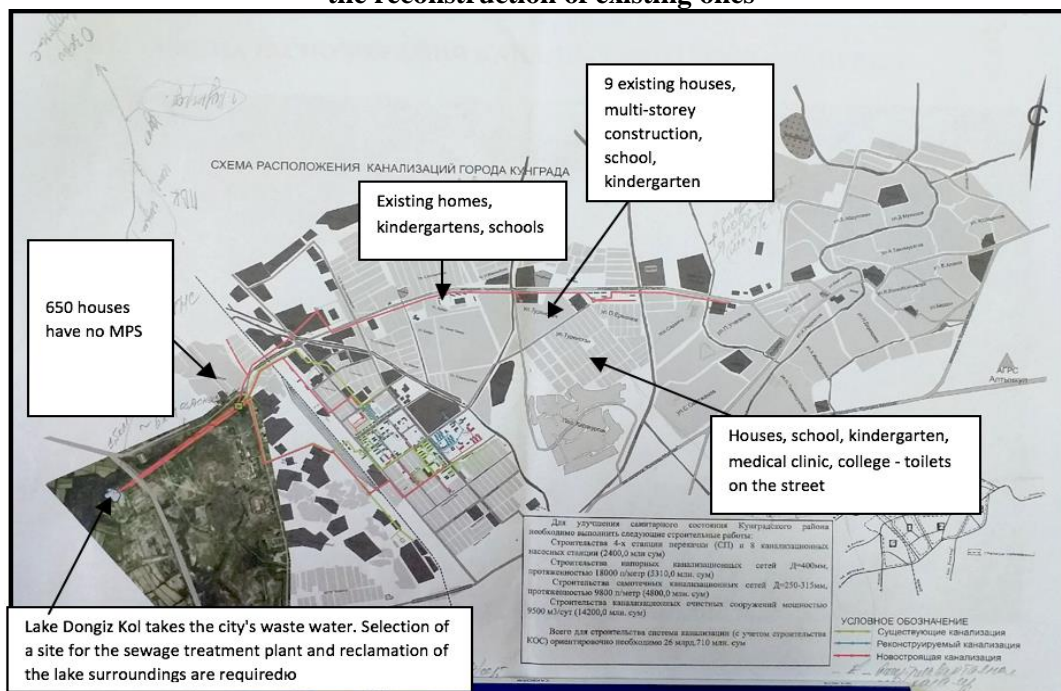
- private sector, school, kindergarten, music school, sports complex (mahalla Gulabat, Boztan, Navoi) to the new projected sewerage network on Karakalpakstan street;
- construction of a new sewerage line to SPS-1 in Timurzhol mahalla, including a swimming pool, a school, a hospital, 2 kindergartens and a Bahormolovlat school;
- in Almozor mahalla, build a sewerage system up to SPS-2 and connect a family dormitory (55 families), a locomotive depot, a railway company and a canteen;

Thus, it is necessary to carry out reconstruction of 7 Pumping stations, construction of the Main pumping station (MPS) and 3 pumping stations. At the same time it is necessary to reconstruct 22 km and build 18 km of new sewerage network.

A new sewage treatment plant (STP) is to be constructed, for which it is necessary to select an environmentally safe area.

- When selecting a site, the depth of groundwater occurrence will be considered to avoid groundwater contamination;
- Sewage treatment plants should not be separated from the city for long distances, as in hot climates, the pipes are rotting with the release of gases, which accelerate the destruction of the pipe. Location of the SPT at a long distance from the city leads to higher network maintenance costs.
- The construction of a closed collector is required from the MPS to the STP, which will reduce the negative impact on the air quality.
- In order to monitor the degree of wastewater treatment, it is necessary to build and equip a laboratory.

Figure 3.3.2. The scheme of territories that need either the construction of new sewerage networks or the reconstruction of existing ones



To improve the sanitary condition of Kungrad, it is necessary to carry out the following construction works:

- construction of 4 pumping stations (PS) and 8 sewage pumping stations;
- construction of pressure sewer networks D400mm, length 18000p / m;
- construction of gravity sewer networks D 250-315mm, length 9800p / m;
- construction of sewage treatment facilities with a capacity of 9500m³ / day.

Syrdarya district

In the Syrdarya region, about 68 percent of 790,000 of the total population currently have access to improved water supply systems and about 9 percent to a central sewerage system. Syrdarya district, with a total population of 87,200 people, is located in the northern part of the Syrdarya region and includes two towns - Baht and Syrdarya - and 43 villages. Currently 96 percent of the population in the district has access to improved water supply systems, but only 40 percent of houses have house connections. Gulistan district, with a total population of 59,200 people, is located in the south of Syrdarya district and consists of 39 villages (Dehkanabad as the district center). Yangiyer town, with a total population of 39,100 people, borders Khavast and Bayaut districts about 33 kilometers south of Gulistan city.

Saykhunabad district, with a total population of 70,000 people, is located in the south-western part of the Syrdarya region and includes 39 villages. Currently 83 percent of the population in the district has access to improved water supply systems.

In Syrdarya, Gulistan and Saykhunabad district as well as in Yangiyer city areas covered by the project about 23,000 people live in 20 MCAs.

The Syrdarya district provides drinking water to 5 water intake facilities with a total capacity of 31,800 m³/day and 111 autonomous wells (25,100 m³/day). They provide drinking water to about 96% of the population. Water intake structures (30%) require repair.

At the same time, only 40% of houses have house connections, 69% are «Suvokava» clients, 19% use other water sources (wells) and 12% are supplied by water suppliers.

The total length of the water supply network is 329 km, of which 89 km in need of repair. More than half of the water towers (87) are out of service.

There is no sewerage system in the area, and the population relies on cesspools that can lead to groundwater pollution.

Analysis of questionnaires conducted with respondents of the Syrdarya region.

In order to assess the current state of communications and identify the main environmental problems of the selected villages in the Syrdarya region, a team of project consultants visited the selected districts and villages. Based on the meetings with the local population through interviews, as well as visits to individual villages and their visual inspection, problems are identified that can be solved through the selection and implementation of various sub-projects of the "Program for institutional support of water supply services».

In the Syrdarya district, surveys of local residents were conducted in the town of Bakht on «Khamza» MFY, in the town of Ziyokor on Kadr Street, on «Adolat» MFY, and on «Ulugbek» MFY on Shafoat Street. The survey revealed that about one third of the respondents live in multi-storey houses, the rest live in one-storey private houses.

On the issue of providing drinking water to households, it was found that 33% of respondents were provided with drinking water. In 17% of the surveyed residents, due to the wear and tear of water pipes, the water does not rise to their apartments, as the increase in pressure in the pipes leads to the rupture of the pipelines. In this regard, water taps are installed in the yards of multi-storey buildings.

Water is supplied to residential houses periodically, mainly 3-9 hours a day (71%). The rest of the respondents answered that water in the tap is 20 hours a day.

About 50% of respondents bring water from afar. It should also be noted that 7-8% of respondents buy drinking water.

Consequently, the first problem is identified - insufficient water supply of settlements with drinking water.

When assessing water quality, the following indicators were identified: turbidity (8%), sedimentation (17%), skinning effect (8%), salinity (25%).

The second problem is the insufficient treatment of drinking water.

For most of the surveyed settlements, the problem of the lack of a centralized sewerage system is indicated. Household and fecal effluents are discharged into non-isolated cesspools, which contribute to the pollution of soils and groundwater.

83% of the households surveyed are not connected to centralized sewers. The depth of cesspools is mainly 3-4 m (80%), and pits with a depth of more than 10 m are also found. After filling the cesspools, the majority of residents call sewage machines for cleaning (80%), the rest bury pits and dig new ones (20%). A small number of people (about 10%) use the contents of these pits as fertilizer.

30% of respondents clean the cesspools in a shorter period (once a week, a month), 60% clean the cesspools once every 0.5-2 years, 10% once every 10 years.

Thus, the main problems of communication in the Syrdarya district are:

- deterioration of the equipment of existing wells (casing of wells is destroyed, old inefficient pumps are destroyed);

- emergency condition of the water supply network (about a third of the water supply network is completely worn out);

As a result, the population is not provided with drinking water in the required quantity and quality.

Proposed activities include:

At the request of DUK "Suvokava" in Syrdarya district it is necessary to form a drinking water supply system:

Deepwater wells (one.)		Water networks (km)		Water towers (one.)	Transformers	Water meters	Electric meters	Construction and equipment of laboratories	Machines and machinery
construction	reconstruction	construction	reconstruction	construction					
23	51	222	91,4	74	31	74	74	1	8

- Restoration of 773 meters of fencing in sanitary protection zones,

Gulistan district

Gulistan district includes 39 villages (Dekhkanabad as a district center), 11 of which are fed by the main water pipeline "Beshbulak - Gulistan city". For 28 villages, the main sources of drinking water are 57 local wells, 15 of which should be reconstructed. The total length of water supply networks is 316 km, 81 km of which are damaged.

The Beshbulak intake structure has a capacity of 75,000 m³/day. It was rehabilitated within the framework of the water supply project in the Syrdarya region and provides water to the city of Gulistan and nearby cities. Currently 82% of the population has access to improved water supply systems.

There is no sewerage system in the area, and the population relies on cesspools that can cause aquifer pollution.

In the Gulistan district, the visual survey and survey of local residents was conducted in three mahallas: Sokhil MFY, Soyibobod MFY, Mustaqillik MFY. In the course of the survey it was found that all respondents live in private one-storey houses.

With regard to the provision of drinking water to households, it was found that 33 % of those surveyed were provided with drinking water in their households. The remaining 67 % of the surveyed residents brought water from afar.

Main problem is the deterioration of water intake buildings and structures. On the territory of Gulistan district water wells are mainly equipped with Rozhnov's water towers. In most cases, the water tower bodies are leaking, and the pipelines and intake equipment are in bad condition.

There is a lack of drinking water supply in the area: the water in the taps is mainly 4 hours a day (44%), 33% of the respondents indicated that water is 1-2 hours a day. The reason for this is the improper condition of artesian wells, which require repair and replacement of pumps.

Inadequate purification of drinking water is also a problem for the region. On the issue of water quality, 44% of respondents complain about the formation of sediment in water, according to 11% of respondents, the water is salty, 6% - there is an unpleasant odor.

For all surveyed settlements, the problem of the lack of a centralized sewerage system is indicated. As mentioned above, all residents live in private homes where there is no centralized sewerage system. Domestic and fecal wastewater from households is discharged into non-concreted cesspools with a depth of 1.5-2.0 m. After filling cesspools, 17% of respondents call sewage machines for cleaning, 67% - dig in pits, 11% - use the contents as fertilizer in the future

The results of the visual survey of the communication system revealed numerous facts of their unsatisfactory condition. Below are the photos with comments.

Proposed activities include:

At the request of «Suvokava» DUK in the Gulistan district, the formation of a drinking water supply system is necessary:

Deepwater wells (one.)		Water networks (km)		Water towers (one.)	Transformers	Water meters	Electric meters	Construction and equipment of laboratories	Machines and machinery
construction	reconstruction	construction	reconstruction	construction					
21	28	80,3	75,6	49	46	49	49	1	8

Saikhunabad district

Saikhunabad district includes 39 villages.

Currently 67% of the population has access to improved water supply systems. A total of 50% are Suvokava clients, 17% use other water sources (wells) and 33% are supplied by water suppliers.

Sources of drinking water are 93 wells, of which 34 must be reconstructed. The total length of the water supply network is 291 km, of which 124 km require repair.

There is no sewerage system in the area, and the population uses cesspools.

The main disadvantages are:

- deterioration of existing wells by one third (casing of wells destroyed, outdated energy-intensive pumps);
- damage to 43% of the water supply network, resulting in large water losses;
- water supply to the population no more than 4 hours a day.

At the request of «Suvokava» DUK in Saikhunabad district, the following types of works are required to form a drinking water supply system

Deepwater wells	Water networks	Water towers	Transformers	Water	Electric	Construction and equipment of	Machines and machinery

(one.)		(km)		(one.)		mete rs	meter s	laboratori es	ery
construct ion	reconstruct ion	construct ion	reconstruct ion	construct ion					
21	31	186,5	42,2	52	21	52	52	1	8

Yangiyer city

Currently, the population of the city receives drinking water from wells. There is no sewerage network in the area, and the population uses cesspools. The main problem of the city is the inability to provide the population with the necessary amount of drinking water.

In the city of Yangiyer, a visual study and a survey of local residents was carried out in two mahallas - MFY Shodlik and MFY Marifat. About 80% of respondents live in high-rise buildings.

On the issue of providing drinking water to households, the residents' answers showed an acute problem. Lack of drinking water supply was confirmed by 89% of respondents. Only 11% of respondents were provided with drinking water in their households.

About 78% of respondents live in multi-storey buildings, where the water does not rise above the first floor, because the pipes are worn out and the supply of water under pressure leads to rupture of pipelines. In this regard, in the yards of each multi-storey building, water taps are organized.

In one-story buildings, 22% of respondents live, half of which bring water from afar. The reason for this is the low percentage of households connecting to the water supply.

Another problem is the insufficient purification of drinking water at water intake facilities. Almost every person surveyed complained about the organoleptic properties of water: more than half of the residents noted water salinity, 33% observed sediment formation, 11% noticed the bad smell of water, and 22% bad opacity.

In the city of Yangiyer, there are cases of accidents along the route of water and sewer pipelines, as a result of which clean water mixes with sewage and residents receive polluted water with an unpleasant odor.

According to local residents, water analyzes were carried out in the regional SES, and it was found that this water is unsuitable for drinking.

For all surveyed settlements, the problem of the lack of sewage or the emergency state of the sewer network is indicated. Of the total number of respondents, 22% live in private homes where there is no centralized sewerage system. Sewage is discharged into 3-4 m deep non-concrete cesspools. After filling the cesspools, sewage machines for cleaning are called up.

Multi-storey houses in Yangiyer are connected to the sewerage system, but in almost every entrance the sewerage is collected in the basements because of the disturbance of the gravity sewerage network (the passages in the pipelines are clogged). Once a week, residents call in an emergency group to clean the pipelines.

Lack of sewerage leads to pollution of soils and groundwater with pollutants, emergency situations with sewerage networks will contribute to the spread of serious diseases among the population

The primary activities should be:

- renewal of pumps at the Northern Pumping Station in Gulistan;
- reconstruction of about 10 km of the main water supply line from the city of Gulistan to the city of Yangiyer;
- reconstruction of 133 km of distribution network;
- purchase and installation of flow meters and water meters.

Analysis of the existing state of the sewerage system in Bayaut, Gulistan, Mirzaabad, Saykhunabad, Sardoba, Syrdarya and Khavast districts of Syrdarya region

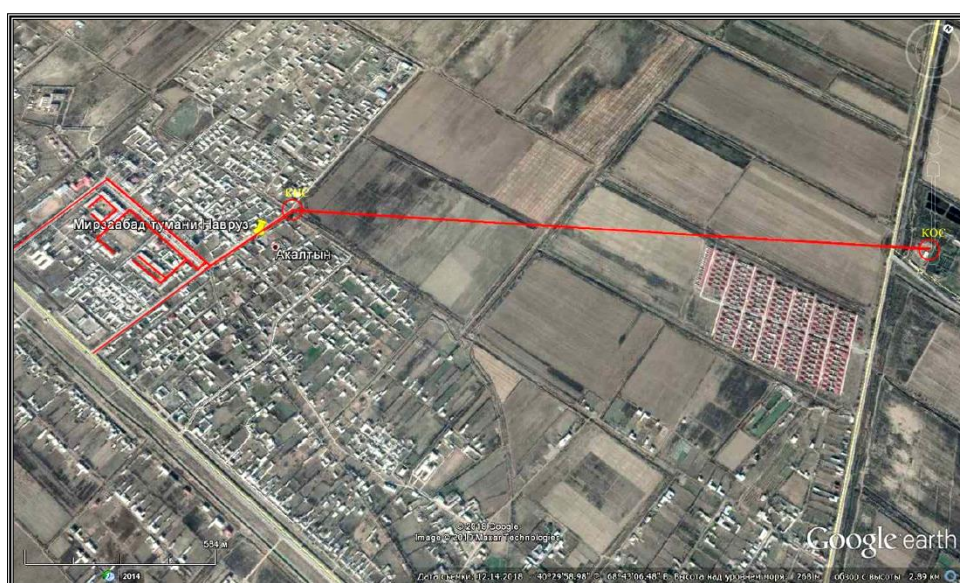
During the visit of the President of the Republic of Uzbekistan of Syrdarya province the problem of sewage disposal and improvement of ecological situation in district centers of the region was raised.

In this regard, the President's Protocol Order No. 4488 dated February 26, 2019 was drawn up.

The aim of the project is to solve the problem of wastewater diversion and improve the environmental situation in the district centers of Bayaut, Gulistan, Mirzaabad, Saykhunabad, Sardoba, Syrdarya, Akaltyn and Khavast districts of Syrdarya region.

Mirzaabad district, Navruz district center

The district center of Mirzoabad district is Navruz village. Its population is 4,683 or 1,048 households. To date, this settlement has not been canalized.



Scheme of the general plan of the Navruz district center in Mirzoabad region

In Navruz village it is necessary to construct 6.7 km of sewerage networks, 3 SPS and a sewage treatment plant with the capacity of 0.4 thousand m³.

At the request of "Suvokava" in the district center "Navruz" of Mirzaabad district of Syrdarya region it is necessary to perform the following types of works:

- Construction of treatment facilities with a capacity of 0.4 thousand m³/day, remote from the village at a distance of 3 km;
- Construction of chemical laboratory with full equipment of 1 unit;
- Construction of sewage pumping stations in the amount of 1 pc;
- Construction of gravity sewerage networks to the pumping station with a diameter of 160 mm to 300 mm and a length of 4.9 km;
- Construction of pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 1.8 km;
- Purchase of machines and mechanisms in quantity - 4 units.

Akaltyn district, Sardoba district center

The population of 3052 households in the district center "Sardoba" is 13730 people, today in this settlement 4002 people are canalized, in the reconstruction and expansion of sewerage networks and collectors, construction of sewage pumping stations and sewage treatment facilities 10025 people will be connected to the sewerage system. All existing 16.5 km of sewerage networks in the settlement need reconstruction.



In the district center "Sardoba" of Akaltyn district of Syrdarya region is provided for:

- Construction of treatment facilities with a capacity of 2.0 thousand m³/day;
- Construction of chemical laboratory with full equipment 1 unit;
- Construction of sewage pumping stations in the amount of 1 pc;
- Construction of gravity sewerage networks to the pumping station with a diameter of 160 mm to 300 mm and a length of 3.4 km;
- Construction of pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 1.2 km;
- Purchase of machines and mechanisms in quantity - 3 units.

Sardoba district, Pakhtaabad district center

In Sardoba district it is planned to create a sewerage system in the district center - Pakhtaabad. About 17157 people live in the district center. There is no sewerage system. There are cesspools in the yards of two-storey houses, which are cleaned by sanitation machines as drains accumulate. The private sector is also not canalized.



Scheme of the district center Pakhtaabad, on the central street of which it is planned to lay sewerage networks.

In the district center "Pakhtaabad" of the Sardoba district of the Syrdarya region, it is planned the construction of:

- Treatment facilities with the capacity of 3.0 thousand m³/day;
- Chemical laboratory with full equipment 1 pc;
- Sewage pumping stations in the amount of 3 pcs;
- Gravity sewerage networks to the pumping station with the diameter from 160 mm to 300 mm and the length of 16.8 km;
- pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 5.7 km;
- Acquisition of machines and mechanisms in quantity - 3 units.

After implementation of the project, 13725 population will be covered by the sewerage system.

Khavast district, Khavast district center (Farkhad)

The population of 602 households in the Farkhad district center is 2444 people. Currently, only a quarter of the population is connected to the sewerage system. At the same time, all existing 1.8 km of sewerage networks in the settlement need to be reconstructed.

The scheme of the district center shows the future sewerage system with a SPS and treatment facilities.



Scheme of Khavast district center sewerage system (Farkhad)

Construction is planned in the district center "Farkhad" of the Khavast district of the Syrdarya region:

- Treatment facilities with a capacity of 0.5 thousand m³/day;
- Chemical laboratory with full equipment 1 pc;
- Sewage pumping stations in the number of 1 pc;
- Gravity sewerage networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 3.2 km;
- Pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 1.5 km;
- Purchase of machines and mechanisms in quantity - 4 units.

After reconstruction and expansion of sewerage networks and collectors, construction of sewerage pumping stations and sewage treatment plant, 1890 people will be connected to the sewerage system.

Bayaut district, Bayaut district center

The number of households in the 4,038 households of the Bayaut district center is 1,8168. Currently, the settlement is not canalized.

The scheme of the Bayaut district center shows the system of future sewerage with a SPS and treatment facilities.



Layout of the district center Bayaut sewerage system

Construction is planned in the Bayaut district center of Bayaut district, Syrdarya region:

- Treatment facilities with a capacity of 0.6 thousand m³/day;
- Chemical laboratory with full equipment 1 pc;
- Sewage pumping stations in the amount of 2 pcs;
- Gravity sewerage networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 12.4 km;
- Pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 3.3 km;
- Purchase of machines and mechanisms in quantity - 3 units.

After the implementation of the project of construction of sewerage networks and collectors, sewage pumping stations and sewage treatment plant, 10334 people or 58% of the population will be covered by the sewerage system.

Gulistan district, Dehkanabad district center

The population of 26777 households in the Dehkanabad district center is 12038 people. The district center does not have a sewerage system.



Scheme of the general plan of Dehkanabad district center

Construction is planned in the district center of Dekhkanabad, Gulistan district, Syrdarya region:

- Treatment facilities with a capacity of 0.6 thousand m³/day;
- Chemical laboratory with full equipment 1 pc;
- Sewage pumping stations in the amount of 2 pcs;
- Gravity sewerage networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 13.6 km;
- Pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 3.4 km;
- Purchase of machines and mechanisms in quantity - 3 units.

In the course of implementation of the project of construction of sewerage networks and collectors, construction of sewerage pumping stations and sewage treatment facilities 70.4% of the population (8478 people) will be connected to the sewerage system.

Saikhunabad district, Saikhun district center

The population of 1,221 households in the Saikhun District Centre is 5480. Currently, the district center does not have a sewerage network.



Scheme of the general plan of Saikhun district center

In the district center "Saykhun" of the Saykhunabad district of the Syrdarya region, it is planned the construction of:

- treatment facilities with a capacity of 1.0 thousand m³ / day;
- chemical laboratories with full equipment of 1 pc .;
- ewer pumping stations in the amount of 3 pcs .;
- gravity sewer networks to the pumping station, with a diameter of 160 mm to 300 mm with a length of 14.8 km;
- pressure sewer networks from pumping stations, with a diameter of 160 mm and a length of 4.1 km;
- purchase of machines and mechanisms in an amount of 3 units.

During the construction of sewer networks and collectors, the construction of sewage pumping stations and treatment facilities, 75% of the population or 4123 people will be connected to the sewer system.

Syrdarya District, Bakht District Center and Syrdarya City

The population of 1,572 households in the district centre of Bakht is 7,071. This settlement is not canalized.

The number of households in 7215 in the city of Syrdarya of Syrdarya district of Syrdarya region is 32434 people, to date, this settlement is not canalized.

In the course of the project of construction of sewerage networks and collectors, construction of sewerage pumping stations and sewage treatment facilities, 55% of the population or 3,892 people of the Bakht district center of Syrdarya district will be connected to the sewerage system

During the construction of sewerage networks and collectors, sewage pumping stations and treatment facilities for the city of Syrdarya, 65% of the population or 21082 people will be connected to the sewerage system.



Scheme of the general plan of the Bakht district center of Syrdarya district, Syrdarya region

1. In the city of "Bakht" of Syrdarya district of Syrdarya region it is provided:

- Construction of treatment facilities with the capacity of 1.0 thousand m³/day;
- Construction of chemical laboratory with full equipment of 1 unit;
- Construction of sewage pumping stations in the amount of 2 pcs;
- Construction of gravity sewerage networks to the pumping station, diameter from 160 mm to 300 mm and length of 9.0 km;
- Construction of pressure sewerage networks from pumping stations with a diameter of 160 mm and a length of 4.2 km;
- Purchase of machines and mechanisms in quantity - 3 units.

2. In the district center "Syrdarya" of Syrdarya district of Syrdarya region it is provided:

- Construction of treatment facilities with the capacity of 6.0 thousand m³/day;
- Construction of chemical laboratory with full equipment of 1 unit;
- Construction of 5 sewage pumping stations;
- Construction of gravity sewerage networks to the pumping station with a diameter of 160 mm to 500 mm and a length of 18.4 km;
- Construction of pressure sewerage networks from pumping stations with a diameter of 200 mm and a length of 6.9 km;
- Purchase of machines and mechanisms in number - 5 units.

Thus, analyzing the state of existing engineering networks of the Syrdarya region, it should be noted the following:

- 6 district centers out of 8 districts of the region currently have no sewerage system (Mirzoabad, Sardoba, Bayaut, Gulistan, Saikhunabad, Syrdarya);
- in two districts (Okoltyn and Khavast) previously there was a sewerage network, but now it is not working.

Double-decker buildings and private sector houses in all district centers use either collective or individual cesspools. There is no wastewater treatment plant in the region to which the wastewater can be exported. Therefore, it is common practice to discharge polluted effluents onto the terrain or, at the request of farmers, to the fields.

In domestic wastewater, mineral substances contain about 42% (of the total amount of pollution), organic - about 58%; precipitated suspended solids account for 20%, suspensions 20%, colloids 10%, soluble substances 50%.

The main sources of biological pollution of terrestrial waters are domestic sewage containing faeces, food waste, waste water from food industry enterprises (slaughterhouses and meat processing plants, dairy and cheese factories, sugar mills, etc.), and in rural areas - sewage from livestock farms. Biological contamination can cause epidemics of cholera, typhoid, paratyphoid and other intestinal infections and various viral infections, such as hepatitis.

Organic substances contained in waste water, accumulating in the soil, quickly decay and deteriorate the sanitary condition of the soil, water bodies and the atmosphere, contributing to the spread of various diseases. Potentially, all domestic wastewater generation facilities pollute soil and groundwater.

The discharge of the household fecal effluents to the terrain as a result has a negative impact on all components of the environment:

- soils and grounds

An important feature of soils is the accumulation of organic matter. The introduction of faeces and polluted effluents not only leads to contamination, but also to the development and spread of pathogens. Biological contamination is created by microorganisms, including pathogens, as well as organic substances capable of fermentation.

-groundwaters

Most of the Syrdarya province is characterized by shallow groundwater table. Existing cesspools in the private sector are mainly not waterproofed. Therefore, domestic fecal runoff seeps into groundwater and can penetrate it.

- air

Discharging the household fecal effluents to the fields leads to air pollution. Stinking odor not only have a negative impact on the population, but also attract a huge number of flies, contribute to their reproduction and spread of various types of infections.

- vegetation and wildlife

Household fecal runoff affects different types of plants in different ways. For some plants (strawberries, tomatoes, cucumbers), they act as fertilizers, stimulating growth and productivity. But the close proximity of fruits to contaminated soil leads to contamination of agricultural products by pathogens.

Some plants (e.g. root vegetables) and animals (e.g. ordinary earthworms) accumulate pesticides in their tissues in much higher concentrations than the soil. As a result, pesticides get into food chains and reach birds, wildlife and pets, humans.

Therefore, the issues of treatment, neutralization and utilization of waste water are an integral part of the problem of nature protection, improvement of the human environment and ensuring sanitary improvement of populated areas.

Kattakurgan City

Kattakurgan city, with a population of 85,600 people, is the second biggest town in the Samarkand region and is located 78 kilometers from Samarkand city, downstream of the Karadarya River in the Zarafshan valley. There are about 210 multi-story buildings with 7,500 households and 22,000 households in individual private houses. Industries in the town decreased drastically in the last decades and now include mainly agro-industry.

In Kattakurgan area covered by the project, 84950 people live in 35 MCAs. The total number of HHs is 22497 and the average size of a family is about 4 people: male 40570 and female 42571. The rate of employment is quite high. Only 810 men and 862 women are unemployed. Total number of vulnerable groups - families with low income is 233 and HHs headed by women - 298.

For the city of Kattakurgan the research program was carried out in accordance with the set task of reconstruction of urban water supply systems.

The water supply system of the city was laid in 1958-1973. The design capacity was 44600 m³ per day. Coverage of the population by the water supply system is 79%. The main source of water supply is underground water, which feeds 5 water intakes. The largest water intakes are the «Murtak» water intakes, located 6 km from the city, and the «Kurpa» water intakes, located 1.5 km from the city. The remaining three small water intakes are located in the city.

On the territory of the "Murtak" water intake 15 wells were drilled, the productivity of which is 22 thousand m³/day. Currently 7 wells are in operation.

Water from the water intake "Murtak" is pumped by the pumping station of the second lift, capacity 1200m³/hour, and is supplied to the main waterway D 630mm, length 6 km. Water is supplied to the "Kurpa" water inlet by conduit, where it is supplied to 2 reservoirs with the capacity of 3000 m³ each.

There are 2 wells at the "Kurpa" water intake, water from them is supplied to the same reservoirs.

Water from two reservoirs is supplied to the city water supply system by means of a pumping station of the third lifting and three water conduits D 400-600 mm. The capacity of the pumping station is 6300 m³/hour.

The total length of the water supply network is 345 km, 66 km of which are water pipes and 279 km are internal distribution networks. In general, the networks are very poor and have exhausted their resources. 41.0 km of networks and 9 km of conduit have become unusable and need to be renewed (reconstructed). With a design capacity of 42.0 thousand m³/day, the actual capacity is 11.0 thousand m³/day.

The sewerage system of the city of Kattakurgan covers 56% of the population. The sewerage system was put into operation in 1971. It includes 10 km of main collectors, 20.6 km of sewerage network and sewage treatment facilities - sewage treatment plants.

Given the long service life, the deterioration of the network is great. The length of networks requiring restoration is 13.0 km.

Sewage drains from the city's network flow by gravity and are discharged into the main 10 km collector. The collector is made partially in steel, partially in reinforced concrete version. The collector is used to transport the effluents to the sewage treatment facilities - sewage treatment plants.

It should be noted that the main collector has damage in several places. Wastewater from damaged areas goes to the fields and is used for irrigation.

Sewage treatment facilities were put into operation in 1988, since 2003 there were problems with the power supply of the facility and they practically do not work. In addition, the STP is removed from the city at a considerable distance, which significantly increases the cost of their maintenance. According to experts, STP cannot be restored.

A visual survey of the area and a survey of local residents was conducted in the city of Kattakurgan. Based on the analysis of the questionnaires of the respondents, it was found that 80% of the respondents live in private single-storey houses, the rest of them live in multi-storey houses. In the course of the survey it was revealed that almost all private one-storey houses were supplied with water pipes.

The situation is the same in multistory buildings as in the previous districts. Apartments have water taps, but due to worn-out pipelines, water is not supplied under pressure. In the yards of apartment buildings there are water taps, from which all residents collect water.

On the issue of providing drinking water to households during the day, the answers of residents are ambiguous. The majority of residents (80 per cent) noted that water in taps is only 4-6 hours a day. Only 20 per cent of households are supplied with water around the clock.

Consequently, the first problem is the lack of drinking water supply to the settlements.

When asked about the quality of drinking water, all respondents answered positively, there are no complaints about the organoleptic properties of water.

In the course of the survey it was revealed that residents understand the importance of water saving, only a small part of the population (20%) buys drinking water

The problem of insufficient coverage of all households with sewerage networks has been identified for the city. Approximately 40% of the interviewed households are connected to the centralized sewerage system. The rest use un-concreted cesspools to discharge domestic and faecal effluents. The depth of cesspools is mainly 10-12 m, and there are also pits 3-4 m deep. As the cesspools are filled up, the collection machines are called to clean them. About a third of the surveyed residents bury cesspools after they are filled. New cesspools are dug in another part of the yard.

The problem of lack of sewerage leads to the penetration of sewage into the ground and its contamination. Especially dangerous are not concreted cesspools with high groundwater levels.

The results of the visual inspection of the communication system of Kattakurgan revealed facts of their unsatisfactory condition.

3.4. SUMMARY FINDINGS OF FGDs IN THE PROJECT AREA

This sub-section includes preliminary analysis of the situation with water supply and sanitary with an emphasis on gender specific issues in the project regions. As it was mentioned above, the findings are based on in-depth interviews and small quantitative survey of different groups of stakeholders (leaders of makhallas, low-income population, women with many children, local businesses, health and educational facilities and other).

On July 5-24, 2019 the field survey was conducted to determine the major social and gender issues related to not sufficient water and sewerage service. Gender sensitive interviews and Focus group discussions (FGDs) were conducted in all the sites to be covered by the project.

In Syrdarya district a total of 61 people (16 men and 45 women) from 20 makhallas participated in the FGDs. In Samarkand city people (all men) from 7 makhallas and Kattakurgan district 15 people (6 men and 8 women) from 9 makhallas were participated. Consultations showed that the main beneficiaries of improvement of water and sewerage supply services are women and girls and inhabitants of semi-urban settlements.

The key findings of the introductory interviews/FGDs

- The majority of the population in the subproject regions has no stable access to piped water supply. The water pipe networks are reported to be the major source of water for drinking and cooking purposes, but the majority of households use a number of water sources for drinking and domestic purposes. Due to the either limited/non-existing access to piped water and irregular water supply, most of the households have to take, at least from time to time, water from open water bodies (rivers, lakes and even drainage canals); many people also have significant time and money expenditures for water delivery, water storage in unsafe and expensive pools, and for buying of water delivered by water vendors. The water sources for poor and non-poor households differ slightly; all households suffer from the lack of water to the same extent.
- Where exist, the condition of existing water and sanitary infrastructure is very poor. For example in Kattakurgan city HHs have water (and consequently) sewerage services) only 2 hours in the morning and 2 hours in the evening. The main reason is outdated pipelines and facilities as well as improper water management of Suvokava.
- The reported average labor input of the households on carrying water is about 1-2 full person days a month. In most of the households the responsibility of carrying water lies with women and children. Women and girls are often primary water carriers, users, as well as water distributors in their HHs. In poor households women and children are even more likely to bear the water-carrying responsibility than those from non-poor households (non-poor households usually use personal vehicles to carry water from more remote but, obviously, safer water sources).
- The quality of water, even from pipeline systems (if exist) is very low and it leads to infectious diseases. In the situation of absence of water supply and sewerage network, many households use water out of boreholes (from handpump taps) located not far from pit latrines from which excrements infiltrate into groundwater. Public facilities (schools and clinics) with no access to the clean and safe water and sewerage systems can not guarantee a safe staying of patients and schoolchildren.
- Although many households are aware of the fact that drinking water standards are not observed, and chlorination stations either dysfunction or non-exist, the majority of the population still believe that the government via district Suvokava establishments supports the minimum drinking water standards: thus, the people think the piped water is quite safe for drinking without any treatment.
- Also, in many rural or low-income households, women do not buy washing machines or rarely use them on account of the irregular supply of water, power supply unsustainability, and the high price of electricity.
- The majority of the households, businesses and public institutions face water supply problems on a regular basis. Water stoppages and low pressure in the pipe systems become a common problem. For residents in multi-apartment buildings, even if they have a flush toilet, the absence of water means the necessity to build pit toilets nearby and to spend additional money for regular pits' cleaning.

- In Nukus, Takhiatash, Kungrad and Khodjeyli cities in the Republic of Karakalpakstan and in the 8 centers of Syrdarya Province the absence of sewerage service is causing several social and environmental challenges: (i) high level of infectious disease; (ii) burden on women related to care of sick members of family; (iii) additional work related to cleaning of pit-latrines; (iv) impact on environment caused by untreated wastewaters from households and businesses.
- People are not satisfied with the quality of Suvokavas services. For example, among participants of FGDs in Syrdarya Province (Syrdarya, Gulistan, Yangiyer and Saykhunabad districts) only 7% are satisfied with the quality of water supply services.
- Despite the frequent water supply interruptions, the population rarely submits complaints to the officials. The major explanation for the situation when people do not want to go to instances is that Suvokava is unable to resolve the water supply problems independently, without external financing.

Thus, the key gender issues relevant to the project include the disproportionate burden on women associated with lack of access to water supply, sewerage services and poor sanitation; insensitivity of WSS operators to the concerns of women consumers; constraints on women's participation in project design implementation activities, including project capacity building; and barriers to women's access to project-related employment. Problems related to water supply and lack of sanitation in homes negatively affect quality of life for all family members, and especially women, and increase labor costs and time required for activities such as washing, cleaning, and bathing. Responsibility for removal of solid and liquid domestic waste typically falls to women, creating special problems for residents of multistory buildings without working sewerage.

According to ADB Country Gender Assessment updated report (2018)⁶ at the institutional level, women are underrepresented in WSS sector staff, both in lower-level positions and at managerial or decision-making levels. Senior and mid-level management staff, and economists, engineers, and operators, are male. Women usually fill junior, and consequently low-paying, technical positions (e.g., controllers, laboratory assistants, cleaners). In 2017, women in the central apparatus of the Ministry of Housing and Communal Services (MHCS) represented only 10% of total staff members. In Kommunnhizmat Agency, only 5% of employees are female⁷. Turnover among women controllers staff is high, mainly because of the low salaries and frequent travel. Transport fees are not included in remuneration schemes.

The positive effects of water and sewerage supply improvement that are expected by women:

- a) Improved 24/7 access to portable water in project areas especially in rural areas;
- b) Better health condition; prevention of different kinds of diseases especially between women and children;
- c) More time for personal, professional development for rural women and girls;
- d) Social stability in community;
- e) Poverty reduction, life quality improvement.

⁶ <https://www.adb.org/sites/default/files/institutional-document/479841/uzbekistan-country-gender-assessment-update.pdf>

⁷ Cabinet of Ministers. 2015. On Measures to Implement the Main Directions of Development of Water Supply Organizations and Sanitation Services (Decree of Cabinet of Ministers 306, 30 October 2015). Tashkent

3.5. STAKEHOLDER ANALYSIS

Identified potential⁸ stakeholders were preliminary identified and divided into categories based on:

- *Whom they represent:* The Government administration and related community structures; the executing agency; government institutions; the private sector; donors and related projects; local media; clients.
- At what administrative level(s) are the stakeholders represented: National, oblast, rayon, local self-government, community.

Table 3.5.1. Major Stakeholder Groups

Stakeholder Category	National level	Region	District	Local self-government	Community level
Government Administration and related community structures	Cabinet of Ministers Ministry of Finance	Regional administration of Khokimiyat	District and city administration District of Khokimiyat City of Khokimiyat	Rural assembly of Citizens (only in rural areas) Makhalla Committees	Makhalla chairpersons Deputy Makhalla chairpersons on womens' issues (Maslakhatchi)
Executing Agency and related structures	Kommunkhizmat Agency	Suvokava	District Suvokava (vodokanal)		
		Single Customer Services for Housing and Communal Services	District department of CSHCS		
	Directorate of Interregional Trunk Mains (under Kommunkhizmat)				
	Project Coordination Unit (PCU) within the Kommunkhizmat				

⁸ The word *potential* is used to emphasize that this analysis will serve as a point of departure for identification of stakeholders for the different activities during and after the project preparation and implementation.

	Regional Project Coordination Units (R-PCUs)	PCU for Karakalpakstan PCU for Samarkand PCU for Syrdarya			
Government institutions	Ministry of Finance	Department of Finance	Department of Finance		
	Ministry of Economy	Deputy Khokims	Deputy Khokims		
	Ministry of Labor	Regional department	District department		
	Ministry of Water Resources	Region Department of Water Resources Agrovodokanal	District Department ... Agrovodokanal		
	Ministry of Health (MOH)	Department of Health (Oblzdrav)	Department of Health (Rayzdrav, District Clinic	Clinics, rural health posts (SVP)	Makhalla health workers
	State Sanitary and Epidemiology Inspectorate (SSEI) (under MOH)	SES (Obloses under Oblozdrav)	SES (Rayses under Rayzdrav)		
	State Committee on Geology and Mineral Resources (SCGRM) (Goskomgeo)	Region committee... Oblkomgeo	District Committee... Raykomgeo		
	Ministry of Public Education	Department of Public Education (OblONO)	Department of Public Education (DistrictONO)	Elementary & secondary schools, kindergartens	
	Ministry of Higher and Secondary Specialized and Professional Education (MHSSE)	Region MHSSE	District MHSSE	Colleges, Lyceums	College

	The State Committee for Architecture and Construction (Goskomarkhitektstroy)	Chief Region Architect (in regional Khokimiyat)	Chief District Architect (in District Khokimiyat)		
	The State Committee for Nature Protection (Goskompriroda)	Region Committee for Nature Protection (Oblkompriroda)	District Committee for Nature Protection		
	Ministry of Energy (UZBEKENERGO)	Region Energy Department (Obluzbekenergo)	Electricity Agency (Elektroset)	Electricity Inspector	
	State Committee on Land Resources, Geodesy and Cartography UzGeoDezCadastr	Region departments	District departments		
NGOs and Private sector	<u>Women's Committee of the Republic of Uzbekistan</u>	Region <u>Women's Committee</u>	District Women's Committee	Maslakhatchi = Adviser (female)	(Kutcha kayvona): Women advisor at the street level, assistants to maslakhatchi
	Contractors	Contractors	Contractors	Local technicians	Local technicians
	National Association of NGOs of Uzbekistan (NANNOUz)	Region departments	District branches		EcoNGOs "Zarafshan", "Jonli Tabiyat" (Samarkand) UDASA (Union for water access for vulnerable groups residing downstream Amudarya river) (Karakalpakstan)

	UN Multi-partner human security trust fund for Aral Sea region	UN Joint Programme 'Building the resilience of communities affected by the Aral Sea disaster through a Multi-Partner Human Security Fund for the Aral Sea'			
	Business Women Association (Tadbirkor ayol)	Region departments	District departments		Community level activists, trainers, entrepreneurs
	ECOSAN foundation	ECOSAN	District branches		Community level activists, trainers, facilitators, doctors
	Federation of Societies for the Protection of Consumers' Rights	Regional branches	District and city level societies		Local support teams, community level activists and lawyers of the societies
	NGO "Suvchi"				Community level trainers for water saving
Related Projects and international organizations	ADB: Djizzak Sanitation System Development Project				Construction of SWTP, reconstruction of sewerage networks
	ADB: Western Uzbekistan Water Supply System Development Project	PIU in Nukus, Karakalpakstan	Six districts of the Karakalpakstan covered including Nukus city		
	ADB: Water and Sanitation Strategy Development and Capacity Building	Nationwide strategy development project			
Local media		Regional public TV, radio and newspapers Telegram messenger bloggers	City or district public TV, radio and newspapers		

Table 3.5.2. Stakeholder Roles and Capacities

Role in project	Stakeholder category	Contribution to planning, implementation and sustainability after completion	Their capacity, commitment and experience in implementing such role
<p>1. Project coordination, implementation, implementation and liaison with WB and government ministries and departments. Operation and maintenance of the networks. Implementation support.</p>	<p>Executing Agency Kommunkhizmat and related structures: Project Coordination Unit (PCU), supported by the a Project Management Consultant (PMC), EE Consultant (EEC), and Detailed Design and Construction Supervision Consultants (DDCSC), Regional PIUs, district/city <i>Suvokavas</i></p>	<p>The EA in coordination with relevant ministries and departments will contribute to strengthening the capacities of the existing PCU. The PCU, with the direct support of the PMC, will strengthen the capacities of the R-PCUs and <i>Suvokavas</i> to effectively and efficiently implement and sustain the infrastructure, to ensure continued supply of clean drinking water and sanitary services, to establish good client-service provider relationships, and to improve awareness of and respond to important role women play in drinking water, sanitation and hygiene.</p>	<p>The EA has considerable experience and expertise with providing drinking water as well as in coordinating with government ministries and donors. It currently cooperates with the different donors on other similar projects.</p>
<p>2. Policy coordination and guidance and instructions for the Project, review of reports and regular consultations at the central level</p>	<p>Inter-ministerial project steering committee (PSC) chaired by the Cabinet of Ministers and comprise representatives from Kommunkhizmat, the Ministry of Finance; Ministry of Economy; Ministry of Water Resources; Ministry of Health; Ministry of Public Education; State Committee for Nature Protection; State Sanitary and Epidemiological</p>	<p>The Steering Committee will ensure that all aspects relevant for achieving the Project objectives and for sustaining the services at the required level are considered and taken care of at the central and region levels, and subsequently at the lower levels thru direct communication within the GOU administration and the respective line ministries and departments.</p>	<p>Discussions and negotiations among the relevant institutions as well as between the WB and relevant institutions have been held since the beginning of the planning process. Both the GOU and the WB are committed to proceed with the planning and implementation of the Project</p>

Role in project	Stakeholder category	Contribution to planning, implementation and sustainability after completion	Their capacity, commitment and experience in implementing such role
	Inspection; State Committee for Geology and Mineral Resources; State Committee for Architecture and Construction; State Inspectorate for Supervision of Safety Implementation of the Works in Industry, Mining and Communal Sectors; UzGeodezCadaster; Regional and district governments, and other agencies concerned		
3. Institutional arrangements and capacity building for planning, implementation and sustainable management of operation and maintenance in the regions	Region and District administration; local self government; Line departments of ministries	<p>In addition to GRM mechanism some Project monitoring groups can be established involving the Deputy Khokims for construction and for Women, R-PCUs the Federation for Protection of Consumer’s rights, the RACs chairperson if applicable, chairperson of the <i>makhalla</i> committee, the <i>maslakhatchi</i> and 1-2 representatives from each: the street/quarter committees, <i>makhalla</i> health workers and local schools/kindergartens staff.</p> <p>These groups may have a leading role in the CP process, will monitor progress and facilitate resolution of issues arising during planning, implementation and after completion.</p>	<p>Capacity building of the Project monitoring groups: The proposed monitoring group members have among them considerable and relevant background and experience and most of them are well experienced with coordination of committees and monitoring of projects and other activities.</p> <p>Capacity building will be required particularly at the lower (<i>makhalla</i>) level in subjects such as: organizational sustainability, leadership, M&E, conflict resolution, legal issues relevant legal issues (particularly for women). Such capacity could be provided with by experienced NGOs who would act as service sub-contractors.</p>

Role in project	Stakeholder category	Contribution to planning, implementation and sustainability after completion	Their capacity, commitment and experience in implementing such role
<p>4. Drafting, discussing and finalizing client-service provider contract</p>	<p>Drafting: EA supported by PMC</p> <p>Consultation process: Project monitoring groups including the R-PCUs, supported by legal specialists from the private sector as required</p> <p>Signatories of the approved contract format: clients and <i>vodokanal</i></p>	<p>The Contract will clearly stipulate the rights and obligations of both the client and the service provider. It will form a legal basis for the client-service provider relationships and will serve as basis for resolving issues that may arise between the two parties.</p>	<p>At least one stakeholder from the private sector was identified as having the capacities to assist with consultations of the draft contract: Federation for Consumers' Rights Protection.</p> <p>The Project monitoring groups/their members will have the competence to facilitate the consultation process to collect comments and suggestions, and to present, with the support of the legal advisor(s) the final draft to the EA.</p>
<p>5. Building client-service provider relationships</p>	<p>PCUs/<i>Suvokavas</i> and clients, supported by the Project monitoring groups at all levels and the private sector for training and local media for information dissemination</p>	<p>Mutual trust and understanding between the clients and the service provider combined with efficiency in dealing with issues such as irregular water delivery or delays in fee payments contribute to sustainability. Main elements of the relationship building process:</p> <ul style="list-style-type: none"> ▪ Transparent and up-to-date information about the project available at the <i>makhalla</i> level ▪ Clients including women fully aware of their rights and obligations arising from signing the contracts ▪ Client relations sections with clear task descriptions in each 	<p>The PCU to provide information on the Project to the Project monitoring groups at the subprojects level. The groups will assist with dissemination down to the household level thru their existing structures and provide feed back to the R-PCUs and PCU thru the same channels. Local media to assist with disseminating information to the public and in obtaining their feed back.</p> <p>Information on contractual rights and obligations available and understood by clients/households. The <i>makhalla</i> Project monitoring groups assist in this process.</p>

Role in project	Stakeholder category	Contribution to planning, implementation and sustainability after completion	Their capacity, commitment and experience in implementing such role
		<i>vodokanal</i> ; staff trained in dealing with clients including women	<p><i>Vodokanal's</i> capacity in dealing with clients can be improved by establishing client relations sections, clearly defining their mandate and links with other departments and training their staff. Support by the PCUs, in consultation with the Project monitoring groups.</p> <p>Gender sensitization of the Suvokavas and other stakeholders by women's NGOs (such as the Women's Committee, the Business Women Association who have the capacity to develop and to implement such awareness raising training.</p>
6. M&E, Impact assessment	<p>Monitoring: Project monitoring groups, supported by local media and the private sector.</p> <p>Impact assessment (baseline, mid-term and ex-post): to be contracted out to the private sector - service contractor</p>	Feedback from monitoring and impact assessment to the planning and implementation process will contribute to the relevance, efficiency and effectiveness of activities and ultimately to improved sustainability of the Project.	<p>The Project monitoring groups supported by the local media will collect feedback on project activities and provide the information to the PIUs.</p> <p>The PCU/Project monitoring groups will not have the competence and the capacity to conduct Impact assessments: TOR to be prepared by the PCU supported by the PMC, and the Project monitoring groups; a suitable local contractor to be selected on a local closed tender basis.</p>
7. IEC (Information, Education, and Communication) & KAP (Knowledge, Attitude and Practices)	Government institutions particularly MOH and line departments at the <i>Region</i> and	Improvement of drinking water supplies and sanitation services should lead to decrease in the	Although the health staff at the local level already has experience with training in water, health and sanitation,

Role in project	Stakeholder category	Contribution to planning, implementation and sustainability after completion	Their capacity, commitment and experience in implementing such role
<p>assessments in handling water, hygiene and sanitation</p>	<p><i>District</i> levels, to train trainers of trainers in sub-projects and to develop materials and system for feedback and monitoring.</p> <p>Operational procedures for implementation and involvement of different stakeholders will be prepared after the start of the Project.</p>	<p>incidence of water and sanitation related diseases.</p> <p>Raising awareness about proper use and handling of water, hygiene and sanitation</p>	<p>they lack proper materials and systematic methodology that would include training information, methodology for dissemination of information and feedback from trained persons to assess impact of the trainings and to re-plan IEC activities.</p>

4. RULES AND PROCEDURES FOR ENVIRONMENTAL AND SOCIAL SCREENING AND ASSESSMENT

4.1 ESA PROCESS: STEP-BY-STEP

Conducting subprojects Environmental and Social Assessment requires the following steps:

Step 1: Screening. The Ministry of Housing and Communal Services PCU and Regional WGs will carry out screening of sub-projects in categories A, B or C. It is expected that all selected sub-projects will be Categories B and C, but in rare potential cases if it is decided that the sub-project has more risks than a regular B project, the project will not be eligible for project financing. In general, a project will be classified as a Category A project if it: creates an impact affecting an ecologically sensitive area (for example, designated wildlife sanctuary, national park, others); or area of international importance or cultural heritage and archaeological sites identified by UNESCO and /or Government of Republic of Uzbekistan; and exists and already passes through any ecologically, culturally and archaeologically sensitive areas.

Sub-projects that do not relate to any of these conditions defined above are classified as B. The PCU Environmental Safeguards Specialist will also verify the suitability of the subproject for the IFC Exclusion List (Annex 2) before deciding to include the subproject in the program. The project category must be determined in accordance with both RCM No. 949 (2018) and of the World Bank OP 4.01 as explained above. For the project category, it is determined which documents should be prepared in accordance with the environmental requirements of the sub-project. If a subproject is classified as Category A (Category A (IS) equivalent to Category I (Uzbekistan), it must be excluded from the Project. A detailed definition of WB categorization, the main stages of environmental assessment, subproject screening are outlined in Chapter 3. Only projects with categories II-IV (Uzbekistan) or categories B and C (WB) can be included in the project. Once the environmental assessment process confirms that a subproject proposal can be included in the Program, the PCU Environmental Safeguards Specialist will identify the necessary tools to conduct the ESA. The Category B projects (moderate to low impact) that may have some environmental and social impacts, can be financed under the project, subject to have in place a sites specific ESMP and/or an ESMP Checklist.

Step 2: Subprojects Environmental and Social Impact Assessment. For subprojects that are identified under Category II-III (or Category B according WB classification), a national EIS and/or SEI environmental assessment document will be prepared and is likely to contain information on mitigation measures, but no details on their costs and the institutions designated to implement them or a detailed monitoring plan. For such projects, in order to comply with WB Safeguards Policies the subproject beneficiary or on its behalf an Environmental Consultant will conduct, if needed, an ESIA and/or will prepare the site specific ESMP. As a rule, project designers, subcontract a specialized firm licensed to conduct ESIA in accordance with the legislation of the Republic of Uzbekistan, and, as a rule, the final reports are passed through the Glavgoosekoekspertiza. As specified above, the ESIA process should involve not only proposed subprojects under the Component I but also under Component II, see below relevant requirements and procedures in this regard.

Requirements and procedures for environmental and social assessment to review and approve water supply and sanitation development plans.

As described above, the second component of the project will help the committees to develop water supply and sanitation development plans that will identify sub-projects to be funded under the project. While such activities do not involve any direct physical environmental and social risks, they may indirectly cause some environmental and social impacts (air and water pollution, waste generation, labour and health risks, etc.) that may arise during the implementation and operation phases. Taking these issues into account, the PCU and PCU Environmental Safeguards Specialist for providing assistance in this area that would be prepared for selecting a Facilitating partner that will get such assignment, stipulating environmental requirements while designing those development plans (in terms of location of proposed activities that would avoid environmentally and socially sensitive areas (protected areas, parks or green areas; important habitats for rare and endangered species; wetlands; areas of cultural physical resources, etc.). Environmental requirements will also be considered in terms of identifying reasonable environmental and/or social positive alternatives for the proposed subprojects and their implementation (e.g. energy efficiency and conservation, waste treatment and reduction, new alternative technologies for adaptation to climate change, application of best

construction practices, etc.). Additionally, the designed development plans should specify along with the identified subprojects main requirements for their further Environmental and Social Impact Assessment. All these requirements should be specifying in both – main objectives for the assignment as well as in the criteria for selection of relevant companies for this assignment. In addition, draft plans for the development of water supply and sanitation should be subject to a preliminary review and environmental assessment, which should be carried out by the PCU, and only after that these documents should be disclosed and publicly discussed.

Step 3: Public Consultation. Once the ESIA is conducted and an ESMP is prepared these documents are subject to public consultation. During the public consultation process, ESIA and/or ESMP documents will be distributed to all interested parties and local population, by posting them on the web sites and by submitting them to the local councils. Minutes of public meetings will be kept and will be included in the final ESMP/ or ESMP checklists. During the consultation session, the ESA team in cooperation with the PCU ESS and R-PCUs will present the ESIA/ESMP (project, its location and implementation schedule, overview of the ESA process, and any conclusions on impacts, proposed mitigation measures and benefits). These data should be defined as preliminary or intermediate, indicating that input from participants can still be applied to project planning. Participants will be invited directly (not by order) to submit comments and corrections to what is presented. Adequate and convenient contact information will be provided for use by participants.

The public consultation on the ESMP of a particular sub-project will include an announcement of PCU meetings on the website at least two weeks before the session, with a brief description of the project, location and specific contact details (including telephone numbers). In addition, the ESA team, in collaboration with the PCU, will make an announcement in the local, regional Hokimiyats about holding a public consultation by means of a written short booklet together with an invitation to participate in the meeting. Documentation for the consultation should be submitted to the MEI as part of the sub-project file by the PCU ESS. Versions in Uzbek and/or the local ESMP language and records of the public consultation should be posted in a public place close to the construction site, as well as on the Sub-Borrower's website. Specific ESMP sub-projects will also be available to affected groups and local NGOs in an easily accessible location and on the website of the Ministry of Economy and Industry.

Step 4: WB acceptance. The ESIA/ESMPs documents for first three subprojects from each participating oblasts will be prior reviewed by the WB. After that such prior review will be requested only for full B subprojects which would require ESIA and ESMP.

Step 5: ESA Information Disclosure. For all approved sub-projects, the PCU will ensure that printed copies of the final ESIA/ESMP/checklists in the local language are available in a public place. The PCU will post the final documents on the website of the Ministry of Industry Economy. Before the final approval of the sub-project, the MEI will also submit to the WB the English versions of the ESMP final documents for its own records.

Step 6: Integration of ESIA requirements into project documents. All sub-project bidding documents shall include a requirement for implementation of the ESMP/checklist, and the documents shall be attached to the bidding documents and then to the construction contracts.

Step 7: ESA Monitoring. PCU will carry out regular monitoring of sub-projects during construction and operation to ensure that ESMP/checklists are properly implemented. If PCU/R-PCUs notices any problems in implementation, it will inform the relevant contractor and agree with him on corrective action to be taken. The PCU will present its findings to the WB in the project progress report twice a year or more frequently, and bring issues to the attention of the WB as necessary. The WB project team will also visit the sub-project sites as part of the project supervision, as appropriate and appropriate.

4.2. CRITERIA FOR SUBPROJECTS ENVIRONMENTAL SCREENING

Screening of sub-project activities and identification of EA instruments. Prior making decision on including a sub-project in the program, PCU safeguards expert will check on eligibility of the sub-project against IFC's Exclusion List (Annex 2). Proposed sub-projects do not fall under this List. After that an environmental category of the project has to be defined in accordance with DCM on SEE and World Bank categorization. If the sub-project belongs to category A (WB) equivalent to category I (Uzbekistan), it has to be excluded from the Project. It is expected the supported sub projects will be not related to specified above circumstances and respectively will not have significant environmental and social impacts.

The potential project impact depends not only from type of activities but also depends on the subproject location. Thus, as specified above in section 3 there are several locations which should be considered while deciding to qualify the project as category “A”:

- in or near sensitive and valuable ecosystems — wetlands, wild lands, and habitat of endangered species
- in or near areas with archaeological and/or historical sites or existing cultural and social institutions;
- in densely populated areas, where resettlement may be required or potential pollution impact and other disturbances may significantly affect communities;
- in regions subject to heavy development activities or where there are conflicts in natural resource allocation; along watercourses, in aquifer recharge areas or in reservoir catchments used for potable water supply; and on lands or waters containing valuable resources (such as fisheries, minerals, medicinal plants, prime agricultural soils).

These conditions are not considered by the Uzbekistan regulation while projects categorization. Therefore, each sub-project needs to be checked on its location as well as WB requires. Respectively, the project will not support any sub-projects located in the proximity of mentioned areas and with specified potential impacts.

Once screening process confirmed that proposing sub-project is eligible for inclusion in the Program, PCU will identify required instruments for EA. As it was mentioned above, only sub-projects category B (with moderate and low impact) which may generate some environmental and social impacts which can be addressed by applying certain mitigation measures. For the projects categorized as B (with moderate impact) a development of a site-specific ESIA and/or a simple ESMP will be required. In the case of project that involve some impacts which are not significant and which can be mitigated by well-known mitigation or avoidance measures or by applying best housekeeping and/or construction practices (low impact), it is recommended to apply an ESMP Checklist, - for small scale construction and reconstruction activities. Table 4.2. provides detail information on categorization of potential project activities and proposed EA instruments.

When development of ESIA (WB requirements) and DEIS (national requirements) are required at the same time for the certain sub-project, it is recommended that national DEIS needs to be developed in format of ESIA. It will to allow avoid double work on preparation of EA documents. As shown in the table, ESIA will be needed for several types of activities – sewage, water supply and waste treatment facilities. As part of capacity building program under this program, special training could be conducted for beneficiaries on development EA documents per WB OP 4.01 requirements.

As it was described in Chapter 3 there is some differences in the project categorization and required actions between WB OPs and national environmental legislation. In accordance with national legislation, EA and further actions are not required for existing objects if: planning rehabilitation/repairing of some of the object’s facilities be conducted without extension of the territory of facilities where construction of rehabilitation will be implemented, and during operation phase consumption of natural resources and generation of wastes, discharges and emissions will not increase. The legislation does not require a preparation of separate ESMP or any other environmental documents/plans/checklists.

However, WP OP 4.01 requires development of separate ESMP checklist for the activities which have low environmental impacts. Taking in account, that more strictly requirements need to be applied for this project, for thus sub-projects/activities which are not included in the list of mandatory SEE (Annex 6), but which is under activities with low impact (Category B), the development of ESMP checklist is required.

In the case of subprojects which do not or require only minor civil works or which generally would not have any environmental and social impacts (such as purchasing vehicles or other equipment) the subproject will be qualified as Category C for which is not needed any further ESA activities. The Table 4.2. provides proposed project activities and suggests their environmental Category along with the ESA instrument which could be applied.

Table 4.2: Screening of categories for proposed types of sub-projects and suggested EA instrument

№	Types of potential sub-projects	Proposed Category		Proposed EA instrument (WB)	Requirements of national legislation
		WB	National		
1	"Reconstruction of sewerage systems"				
	1. Rehabilitation of sewerage network;	B (minor risk) ¹	Category 3 (par. 7)	ESMP Checklist	For the category - 3 Draft Statement on Environmental Impacts (DSEI) and a statement on environmental impacts
	2. Expansion of the sewerage network to connect additional residents;	B (moderate risk)	Category 3 (par. 7)	ESMP	For the category - 3 Draft Statement on Environmental Impacts (DSEI) and a statement on environmental impacts
	3. Rehabilitation of pumping stations and construction of new pumping stations;	B (minor risk) ¹	Category 3 (par. 7)	ESMP Checklist	For the category - 3 Draft Statement on Environmental Impacts (DSEI) and a statement on environmental impacts
	4. Partial reconstruction of the pressure sewerage pipeline from the main sewage pumping station to the sewage treatment plant.	B (moderate risk)	Category 3 (par. 7)	ESMP	For the category - 3 Draft Statement on Environmental Impacts (DSEI) and a statement on environmental impacts
	5. Reconstruction of an existing STP or construction of a new STP located closer to the city border.	B (moderate risk)	Category 3 (par. 14)	ESIA and ESMP	For the category - 3 Draft Statement on Environmental Impacts (DSEI) and a statement on environmental impacts

	6. Construction of a new sewage treatment plant with a capacity of about 7 thousand m ³ /day (at a new location).	B (moderate risk)	Category 3 (par.14)	ESIA	For the category - 3 DSEI and a statement on environmental impacts
	7. Maintenance of sanitary conditions on site (septic tanks and improved cesspools) for the rest of the population, which are not connected to the centralized sewerage system.	C	Category 4 (par.7)	After the completion of the Environmental Screening Checklist, no further action is required	For Category 4 - Draft Statement on Environmental Impacts (DSEI)
	8. Purchase of equipment for operation and maintenance, as well as laboratory equipment.	C	Category 4 (par.7)	After the completion of the Environmental Screening Checklist, no further action is required	For Category 4 - Draft Statement on Environmental Impacts (DSEI)
2	<i>"Improvement of water supply"</i>				
	1. Reconstruction of wells;	B (minor risk) ¹	Category 3 (par.14)	ESMP Checklist	For the category - 3 DSEI and a statement on environmental impacts
	2. Rehabilitation of distribution network and main water supply lines;	B (moderate risk)	Category 3 (par.14)	ESMP	For the category - 3 DSEI and a statement on environmental impacts
	3. Restoration of fencing in sanitary protection zones;	C	Category 4 (par.7)	After the completion of the Environmental Screening Checklist, no further action is required	Draft Statement on Environmental Impacts
	4. Installation of large and consumer	-	-	After the completion of the Environmental Screening	-

	water meters.			Checklist, no further action is required	
	5.Renewal of pumps at the Pumping Station	-	-	After the completion of the Environmental Screening Checklist, no further action is required	-
3	" Energy efficiency component"				
	1.Installation of photovoltaic panels	B (minor risk) ¹	Category 3 (par.14)	ESMP Checklist	For the category - 3 DSEI and a statement on environmental impacts
	2.Implementation of bio digesting equipment at WTP	B (minor risk) ¹	Category 3 (par.14)	ESMP Checklist	For the category - 3 DSEI and a statement on environmental impacts

1 Category B facilities with little impact - construction works are carried out at these sites with a low level of impact, reversible effects, which can be mitigated by known mitigation or prevention measures. Subprojects are not in the immediate vicinity of the facilities providing a certain potential impact. For this type of facility, it is sufficient to carry out an ESMP checklist and follow best practices.

2 In accordance with Resolution of the Cabinet of Ministers No. 949 "Regulation on Environmental Expertise" dated November 22, 2018.

4.3. TYPES OF ESA INSTRUMENTS

Once the project category is defined, it is necessary to determine which documents need to be prepared in accordance with national legislation and the WB OP 4.01. For Category C sub-projects beyond screening, no further EA action is required. Category B (moderate impact) projects will require the development of an environmental and social impact assessment (ESIA) and an ESMP (see Annex 3 with the generic TORs for an ESIA and Annex 5 with a template and requirements for a generic ESMP).

For sub-projects that are associated with certain impacts that are not significant and that can be mitigated by well-known mitigation or avoidance measures, or by applying best household and/or construction practices - Category B (low impact) - it is recommended that a small-scale construction and rehabilitation checklist be applied. Table 4.2 above provides details on the classification of potential projects and the proposed environmental assessment tools.

As described in Chapter 2 there are some differences in the categorization of the project and the actions required between the WB OP and national environmental legislation. In accordance with national legislation, an environmental assessment and further action is not required for existing facilities if: (i) The planned rehabilitation/repair of some of the facilities will be carried out without expanding the area of the facilities to be constructed, and (ii) natural resource consumption and waste generation, discharges and emissions will not increase during the operational phase. The legislation does not require the preparation of a separate ESMP or any other environmental documents/plans/checklists. However, WB OP 4.01 requires the development of a separate checklist of WB OP for activities that have a low environmental impact. Taking into account that for this project it is necessary to apply more stringent requirements, as subprojects/activities that are not included in the list of mandatory state environmental impact assessment, but that are under the activities with low impact (category B), the development of a checklist of ESMP (see Annex 6). In the case of rehabilitating access roads without expanding it out of Right of Way (ROW) it is recommended to apply an ESMP Checklist for such type of subprojects (Annex 6).

4.4. THE ROLE OF DIFFERENT INVOLVED PARTIES IN THE ENVIRONMENTAL SCREENING, ESA PROCESS AND MONITORING OF THE ESMP IMPLEMENTATION

This section provides description of the responsibilities of all involved in the ESA process parties as well as of the documents that needs to be prepared and by whom. The local khokimiyats and/or on their behalf Subcontractors (Suvokava): complete the form (Annex 6; Form 1) to identify possible environmental and social impacts of proposed activities. In completing these forms, the subproject applicants' will use the info presented in the Statement of the draft Environmental Impacts to be presented to the SEE and approved by this body. They are also responsible for obtaining appropriate permits and approvals that may be required for the activity to be financed, and, are issued by the local authorities responsible for environmental issues. This document along with the detailed subproject proposal is presented to the R-PCUs. It is expected that the majority of sub-projects will fall into category B.

Regional PCU (R-PCU) SS conduct screening of applications on subprojects including for project eligibility, environmental and social impacts, ensuring required permits and approvals have been obtained and filling part 2 of the screening forms (Annex 6/Form 2). Per the results of environmental screening and in the case the subproject is qualified as category B, ensures an ESIA is conducted and/or an ESMP is prepared which include a monitoring plan. The R-PCU SS, when needed, will carry out field site visits for on-site environmental site visits (specifically, for sub-projects classified as category B), verifying the environmental and social data provided by applicants, assisting in identification of mitigation measures, and confirming that the environmental category is appropriate and that the ESMP is adequate and filling a special form (Annex 6/Form 3). When the RSSs visit reveals environmental and social risks, the subproject applicant will hire a consultant to prepare a site specific ESIA and/or an ESMP. The cost of the ESIA can be included in the subproject amount retroactively, if it has already been approved. During the subprojects implementation the R-PCUs SS will ensure compliance with the ESMP requirements;

The PCU - review the quality of environmental screening of applications on the subproject activities, done by the RSSs, including the quality of the environmental and social impact assessment study, verifying necessary permissions and approvals and filling screening checklist (Annex 6/Form 4). Before starting

subproject implementation, the PCU will conduct the final assessment of the ESA activities, filling the screening form (Annex 6/Form 5).

Project activities with ESMP requirements; provide advice to R-PCUs SS on specific issues that may arise including ESMP preparation and assistance to category B projects through site visits; monitor for cumulative impacts; provide training on environmental and social due diligence to PFIs; provide training on ESA rules and procedures within the third project component.

In the case of non-compliance, PCU and R-PCUs SS will investigate the nature and reason(s) for non-compliance, and a decision is taken about what is needed to bring a sub-project into compliance, or whether financing should be suspended.

5. ENVIRONMENTAL AND SOCIAL IMPACT ANALYSIS

The initial environmental and social assessment of the types of subprojects that might be supported under the project showed their relevance from an environmental and social perspective. The project will generate positive social and economic benefits through the creation and maintenance of the necessary infrastructure, subject to the prevention of negative environmental impacts, mainly during the construction phase of the planned facilities. Their adverse impacts can be related to waste generation, noise and air pollution, as well as surface and ground water, which is associated with health risks for people, both those living in nearby residential buildings and construction personnel.

A summary of potential environmental and social risks and impacts during the implementation of the sub-projects that will potentially be financed under the project, along with the recommended mitigation measures, is presented in Table 5.1 below.

5.1. POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

Reconstruction and construction of water supply and sewerage systems are actually environmental measures, but cause minor environmental impacts during their implementation, leading to both positive and negative effects.

The nature of environmental impacts during and after construction will change.

Environmental damage should be controlled, mainly in relation to:

- soil, surface and ground water pollution through spills of fuel, oil and lubricants;
- the health of workers and the local population, associated with the construction and operation of machinery;
- the collection of waste generated on site;
- ecological disturbance of biocoenoses and habitats of birds and other animals;
- air pollution through emissions of harmful substances;
- the preservation of architectural monuments;

The project will create a number of environmental effects and risks

Waste generation will take place during the restoration and construction phase of operation:

- Waste from mechanical cleaning of sewage collectors from sediments consisting of waste, mineral salts and organic matter, which will be stored on the construction right-of-way and leveled by a bulldozer;
- Soil waste from the preparation of water supply network construction sites, collectors, treatment facilities and various buildings that will be used for backfilling trenches and pits;
- Wastes of materials after repair of damaged reinforced concrete and cast iron pipelines are to be delivered to Vtorchermet or to the metallurgical plant for processing.

Maintenance of equipment will be carried out exclusively at gas stations, used oils and other liquid pollutants will be stored in specially equipped places for them and taken out for regeneration at the nearest oil depot.

Storage of such waste in areas close to populated areas and untimely or inappropriate disposal can affect air quality, dust generation and affect neighboring communities. In addition to this waste, used welding rods, packaging materials and wood will also be generated. Organic waste (sludge) will be generated during the operation of the project facilities and its effective utilization may bring additional profit to the enterprises in the form of biofuel, fertilizer or fodder to other animals. Generally, most of the waste that will be generated at this stage relates to recycled waste and its timely and correct disposal will ensure minimal environmental impact. Construction waste as well as other waste (paper, glass, plastic, etc.) should be classified into separate containers. Waste disposal sites should be carefully selected at the construction site, and waste classification and recycling rules should be prepared in environmental management plans.

Air pollution is mainly expected to be caused by dust and construction equipment emissions. Dust generation will occur during the majority of construction/rehabilitation activities related to excavation, traffic, renovation of buildings, etc. In particular, the risk of dust pollution will increase in windy weather. The magnitude of the impact will increase when construction/rehabilitation works are carried out in the

vicinity of a populated area. Given the nature of most of the works, this impact is expected to be short-term, low-risk and can be mitigated by implementing the measures recommended in Table 5.1. However, additional measures (most often watering, installation of a dust screen) may be required for subprojects involving the dismantling of existing buildings. Particular care should be taken when coming into contact with toxic asbestos dust, which may occur when removing thermal insulation or roofs containing asbestos gaskets. Personnel should wear protective masks. Rules of work with asbestos materials and precautions are given in Appendix 5. Adverse impacts can be prevented by applying best construction practices and appropriate mitigation measures.

Noise pollution can occur mainly during the operation of the equipment and the movement of trucks. Noise levels are not expected to exceed the established limits during project activities. Noise pollution can be mitigated by using recommended measures. Given the specific nature of the project, vibration is not expected to affect human health and structural integrity as there will be no significant vibration generation activities.

Sanitary Regulations and Norms No. 0267-09 are used in Uzbekistan to ensure acceptable noise levels for residential areas. These rules and regulations establish permissible noise parameters for residential and public buildings and residential development of inhabited areas created by external and internal sources and the noise level should not exceed 55 dB(A) during the day and 45 dB(A) at night.

In order to reduce the negative impact of noise at the workplace, employees should use personal protective equipment - anti-audio devices that meet the requirements of GOST 15762-70, if it does not contradict the requirements of safe work execution.

Given the great technical difficulties in reducing noise levels during production processes, it is necessary to address the problems associated not with noise levels that cause irritation and fatigue, but with acceptable levels that exclude the possibility of disease in workers.

The project must also comply with the sanitary regulations and rules 0120-01 to ensure an acceptable level of noise in the workplace.

Surface water pollution. Earthworks, oil storage, storage of hazardous materials will be sources of pollution of river water if the watercourse is nearby. Leakage of oil, improper storage of hazardous materials, construction waste and household waste can lead to chemical contamination. All fuel and chemical storage facilities (if any) should be located on a sealed basis inside the bund and protected by a fence. The storage area should be located away from any watercourse or wetland. The base and bund walls must be impermeable and have sufficient capacity to hold 110% of the tank volume. Disposal of lubricating oil and other potentially hazardous liquids into the ground or into water bodies is prohibited.

In the event of an accidental spill, immediate cleaning will be carried out. All cleaning materials should be stored in a safe place at the site where hazardous waste disposal is permitted. The surface water treatment plan should be carefully planned during the feasibility study to meet the discharge water quality standard. A sedimentation basin, neutralisation tank, and reserve pond should be prepared for flooding. The plan is included in site-specific environmental management plans.

Pollution of land resources. The main impact on land resources is soil contamination with construction wastes and lubricants, waste of cesspools, as well as flooding of adjacent lands with possible damage to structures. Relevant sites shall be prepared for collection and storage of construction wastes and sediments in order to reduce the negative impact on the environment.

The impact on the ground should be minimized. The contractor shall take all practicable measures to prevent the degradation and erosion of soil, streets, roads, gardens and fields. The use of heavy machinery should be as limited as possible to avoid disturbance and compaction of land. In some areas of the project there are hillsides and the construction of the pipelines on the hillsides may lead to erosion of the ravine, which will spread, and water runoff may transport land along the pipeline trenches to settlements. Soil erosion and slope

instability should be addressed by backfilling trenches, terracing hillsides, planting trees and constructing sediment holding dams.

Banned areas for workers and machines should be clearly defined and designated. These include areas with large trees, arable land or fruit trees, wetlands, physical cultural resources (e.g. graves, monuments), and sensitive environmental or social objects identified by the project.

A possible source of soil contamination should not be located near a natural source. The surface runoff from the construction site should be removed. All surface tanks with fuel and lubricants will be equipped above the ground and the integrity of their walls will be monitored at all times. Registration, treatment and storage of hazardous materials, soil contamination prevention plan and fire safety plan shall be prepared in environmental management plans.

During the construction of new sewers and water supply networks, the organic topsoil suitable for further use shall be removed and temporarily stored separately from the remaining ground materials.

Pollution with asbestos dust - asbestos dust generating during demolishing of old roofs from rehabilitated/re-innovating buildings may cause a serious risk for health of people living in houses next or close to construction sites.

For such cases prior conduction construction works, contractor will have to develop a special Asbestos Management Plan in template provided in Annex 1. The Asbestos-Containing Materials Management Plan (ACMMP) describes and evaluates the risk of contractors (and others) encountering asbestos-containing material (ACM) at the Project construction sites during the implementation stage of the project; and it provides a procedure for dealing quickly and safely with any ACM that may be found. The WB OP 4.01 Environmental Assessment requires that WB-funded projects apply pollution prevention and control technologies and health and safety measures that are consistent with international good practice, as reflected in international standards such as the IFC/World Bank *Environmental, Health and Safety General Guidelines* (2007). If national legislation differs from these standards, the borrower is required to achieve whichever is more stringent. There is national procedure Sanitarian Norms and Rules (SNR) of RUz # 0300-11 dated from 2011 “Organization of collection, inventory, classification, disposal, storage and recycling of industrial waste in the conditions of Uzbekistan” covering disposal of ACM⁹ in Uzbekistan. However, the procedure does provide clear description of handling ACM, therefore, the ACMMP follows the World Bank Guidelines.

The main principles of the ACMMP is (i) prompt and effective action to contain and deal appropriately with the ACM (including safe management and disposal); and (ii) maintaining the safety of site personnel and the general public at all times. The ACMMP is designed for use by Contractor, RPCU and the Project Implementation Unit (PCU) to manage the ACM risk over the project as a whole, and by contractors to deal efficiently with any ACM they or their workers encounter. The procedural element of the ACMMP is therefore designed to provide straightforward instructions that can be easily and quickly understood without the need for specialist knowledge and without referring to other sources.

Health and safety of workers and community:

For workers - Safety and health non-compliance may create a risk for construction workers. The Contractors will have to follow Occupation Safety and Health rules, which include among others strictly implementation established norms and procedure H&S which depends on type on conducting works, usage of PPE, training activities and monitoring. In addition, all workers need to be introduced to working procedure with hazardous materials (such as asbestos materials, PCBs etc.). Contractors have to provide workers with appropriate living conditions: safe water supply, washing conditions, rooms for rest and etc.

⁹ Uzbek Sanitary Norms SanPin 0233-07 “National standards “Sanitarian Norms and Rules on Work Hygiene and Environment Protection during production and usage of ACM” was one of a number of pieces of legislation deregulated in the 1980’s. Notwithstanding their lack of legal status, as the most recently-available local standard, the regulations were referred to in preparing the ACMMP and the protocol for handling and disposal of ACM (see Section 3) incorporates soil covering requirements from the SanPin.

For community – Trenching the pipelines without disrupting normal livelihoods may be difficult in communities. The design of the project facilities should take into account environmental and social conditions, including the location of settlements and sensitive and protected areas. The Contractor shall ensure that all buildings, structures, works, services or facilities are adequately protected against damage, breach or deterioration during the term of the contract.

Inadequate lighting and fencing of construction sites inside of settlement areas can be dangerous for pedestrians and vehicles especially during the night time. Increasing of traffic due to trucks and vehicles movements to construction sites, temporary closing of roads during pipe laying inside of settlements may cause inconvenience for local population as well. In addition, pipe laying will cause temporary blockage of household access. Untimely and inefficient disposal of solid waste and improper sanitary conditions generated by the construction workers at construction sites and labor camps may cause pollution of the surrounding environment and affect the health of local people. Moreover, a movement of heavy tracks may destroy or deteriorate conditions of roads inside settlements.

Impact on flora and fauna

During the construction of new water supply and sewerage networks, sewage treatment plants, vegetation and gardens may be affected locally by the clearing of the area for the construction of infrastructure. Trees should be protected from logging, vehicle and machine damage.

Rehabilitation/construction work on sewers usually means that some of the vegetation will be removed and stored along the work site. These can be mitigated by appropriate measures, such as revegetation of disturbed vegetation.

Habitats of various animals, mainly rodents, lizards, amphibians and fish living in the river, and birds nesting in aquatic vegetation, as well as trees and shrubs due to -growing water supply and sewerage networks will be temporarily disturbed.

After the completion of construction works, the area will attract nightlife animals, birds and reptiles. Thus, the impact on animals will be weak in strength and reversible.

Chance finds (historical monuments or cultural finds)

On the project sites it is possible during excavation works, especially when excavating trenches as part of the subprojects of construction / rehabilitation of water and sewer networks, historical monuments or cultural objects can be discovered. There is a permanent control over the execution of works on the project sites by a representative of the regional or city inspectorate for the protection of cultural heritage sites. In the event of archaeological finds, the Plan requires the publication of special notices, the termination of the work and the observance of the procedure for their removal.

Some historical monuments and sacred burial sites may not yet be known or are known only to local residents and are not included in official lists. The use of land with material cultural resources ("archaeological, palaeontological, historical, architectural, religious, aesthetic or other cultural significance") should not be allowed for this project in order to avoid conflicts between individuals and communities. The Contractor is responsible for protecting any valuable landscapes and sites, including archaeological and paleontological remains. If such remains are found during the works, the "Chance finds" procedure developed within the framework of the ESMP will be applied. An announcement should be made to the relevant authorities and permission should be obtained to continue working after the inventory or inspection of the remains. Construction work may not be carried out at a distance of less than 100 m from archaeological remains without prior authorization. Therefore, at the detailed design and ESIA/ESMP stage, a more complete inventory of material cultural resources at the project sites is required, including the possibility of establishing local facilities with relevant local stakeholders.

If material cultural resources, such as archaeological and paleontological remains, are found during the course of the work, the Contractor will follow the "Chance finds" procedure, which will be developed within the framework of the ESMP and included in the Contractor's contract.

The procedure for finding the chances should be in line with the legal requirements of Uzbekistan and the policies of the World Bank. The procedure shall include the following steps (to be developed and included in the ESMP and the Contractor's contract):

- Stop work immediately and report the findings to the authorities.
- The contractor will take the necessary measures to protect the data received and ensure site security and access control. A restricted area will be identified and marked with a warning tape/fence.
- Inform the PCU
- Inform the Ministry of Culture of the Republic of Uzbekistan and relevant local authorities about this.
- The facility will be inspected by a qualified institution/expert to be appointed by the Academy of Sciences.
- Permission to continue work must be obtained from the relevant authorities after an inventory or inspection of the remains.
- No elements of cultural heritage may be removed without the permission of the relevant authorities.

All chance finds and subsequent investigation results will be documented (photos, location, notes, results, etc.).

It is recommended that initial training on chance finding procedures be provided to the PCU, the construction contractor and other relevant parties.

Impact on the population and working personnel

Methods of work at rehabilitated and under construction facilities may create hazardous situations for employees and the population of nearby communities. It is necessary to create healthy working conditions in compliance with occupational safety rules. Fencing of working objects and bridges over trenches should be provided. Traffic management, alarms and lighting should be carried out in accordance with local regulations. If necessary, safe bypass roads and pedestrian crossings should be installed.

For subprojects related to the modernization of existing facilities, such as the purchase of new equipment or the expansion of production through increased capacity, the main environmental impact is expected during the operational phase of the facilities, in particular through increased waste and wastewater generation. In these cases, no construction/rehabilitation work is foreseen. However, in the case of modernization of production by replacing existing old equipment, it is likely that emissions and waste generation will be reduced through the use of modern equipment.

Traffic and Safety on construction sites.

The contractor should plan how to avoid safety problems associated with the movement of traffic and the operation of the excavator at work sites and during the transport of materials. Traffic planning is necessary to minimize the negative impact of project transport on all communities affected by construction. This includes measures to minimize the disturbance of existing road infrastructure, adjacent communities and natural resources, as well as measures to prevent damage to household and community property.

The planning of roads, as well as safe workplaces, parking lots and maintenance areas for trucks and excavators, must be carried out prior to the start of work. Planning includes access routes and entry points to the construction site without affecting households and associated structures, cultivated land, fruit trees or any other potential source of income. Access to commercial and residential real estate should be preserved.

The Contractor shall provide, install and maintain such road signs, road markings, lanterns, barriers and traffic lights and such other measures as may be necessary to ensure road safety around the Project construction sites. Some existing public or private roads or footpaths may need to be closed or diverted for either long or temporary construction periods in order to carry out restoration work. Residents of communities affected by road traffic are advised to provide sufficient information on the impact of traffic

characteristic of the project. Where roads that children use to reach schools are used to ensure road safety, road safety education should be provided in schools.

During the construction phase of the Project, air pollution in the form of dust may occur as a result of the movement of trucks. This problem can be solved by limiting the speed of 30 km/h on untreated roads in dry conditions.

Injuries or accidents resulting from road traffic accidents should be prevented by planning the terrain, warning signs, fences and driver training. Environmental and safety training for drivers should also include emergency response.

5.1.1. Assessment of Emergency Situations and Accidents

An Emergency Preparedness Plan (EPP) should be developed at the detailed design stage.

In EPP, at a minimum, the following risks should be considered:

- Fire
- Earthquakes
- Hurricanes (high wind speeds),
- Risks associated with the operation of the equipment.

Generally, EPP defines various procedures for actions, evacuation and protection of personnel from identified risks. Whenever there is an emergency situation on the site, an alarm sounds with a predefined code. This code allows workers to know which emergency has occurred so that they can follow the procedure described in EPP. Evacuation zones and routes, meeting points, should also be defined to ensure that all personnel have been evacuated.

The emergency management policy and related risk assessment procedures describe potential environmental and social emergencies and accidents. They will contribute to improved preparedness for prevention and management by providing standard procedures for each type of emergency. Risk assessments describe potential dangerous or hazardous incidents that may occur in the course of an organization's activities.

The emergency response documentation shall contain emergency response contact information for each site, which shall be posted in a visible location and shall be available to all personnel. Emergency contact information should include phone numbers and a way to notify local authorities and services about actions in case of fire, road traffic accidents, medical emergencies, accidental release of hazardous materials, etc.

An accident can occur in a water company, construction site, wastewater treatment plant, aquifer, pipeline network, street wells, or in an industrial building near a water source. The objective is to ensure emergency response preparedness in accordance with pollution prevention rules and obligations (including national laws and permits).

The operation of water supply and sanitation systems and associated pipeline networks has no potential for major pollution hazards from accidental chemical releases. The volume and toxicity of the chemicals used are low and the potential for accidents is low. Potential accidents that damage the river ecosystem include breakdowns of sludge tanks and the destruction of large sewerage pipelines, particularly on riverbanks.

The Contractor shall take all reasonable and precautionary measures to ensure that fires do not occur as a result of project activities on the site. Work on open flames on construction sites is prohibited. The Contractor shall ensure that the main firefighting equipment is available on site.

The Ministry of Emergency Situations and Civil Defence is the national authority responsible for the management and coordination of all disaster-related activities. The design and construction of any infrastructure should take into account natural disasters.

In cities and towns, possible emergency situations may be associated with the violation of the integrity of water supply networks, collector-drainage system and sewerage facilities crossing the route of canals.

Accidents can be caused by various reasons: poor quality of construction works, aging of pipelines, corrosion of pipes by overloading of structures; external influence on pipelines; fires, earthquakes, floods, violation of rules of technical operation of structures and safety precautions by service personnel. As a result of such accidents at pipe bursting, it is possible that pollutants will get into the subsoil, groundwater, soil, collector of reclamation system and further into surface watercourses. At the same time, there will be waterlogging at the pipe bursting sites. This will not only affect the vegetation, but may also cause an outbreak of infectious diseases, both in animals and nearby populations. For this reason, pipes made of appropriate corrosion protection material must be laid to ensure reliable operation of irrigation, sewerage and drainage systems. In the case of such accidents, the public should be informed and provided with imported water.

Exclusion of emergency situations at sewerage and water supply facilities is possible provided that their normal operation, preventive inspections of networks and timely maintenance are ensured.

In order to prevent emergency situations at project facilities, it is planned to provide:

- free access and access roads to the structures;
- Sewerage collectors are made of high-strength non-metallic pipes, which are not subject to corrosion and have a long service life;
- Process pipelines on the site of treatment facilities are made of polyethylene pipes, ensuring high tightness and water tightness;
- In order to prevent spills of large amounts of untreated effluents, the structures on the site are carried out in the bunding, also between the structures are arranged bypasses and trays designed for maximum discharge with a coefficient of $K = 1.4$, on the networks to provide for the construction of sewage wells;

The project provides an operation service for process control from the central control room, which is equipped with automatic control and communication facilities. Systems for automatic control and regulation of wastewater treatment and sludge treatment processes, pumps operation, crusher grids, blowers, fans, and measurements of treated effluents before discharge are provided.

The most dangerous emergencies in urban areas, where groundwater and surface water are vulnerable to contamination, may be toxic or lubricating oil spills from vehicles. This can be dangerous, especially in the immediate vicinity of resting places or children's institutions, near unique natural or historical monuments or on overpasses.

Vehicle explosions are the most dangerous in the vicinity of health improvement and children's institutions, as well as health care institutions. In case of emergency - explosion of cars with the volume of fuel tanks up to 10 m³ on the road, the zone of influence of gases and soot along the road will be about one kilometer in both directions, with weak winds of 0-2 m/s, the impact of nitrogen dioxide with a concentration of 0.1 MPC will be stretched along the wind rose to 1000-1200 m. The impact on soot will be more noticeable. The hazardous area with a concentration above 1 MPC will spread to 600-800 m from the accident site. If the wind speed exceeds 3 m/s, the exposure zone will increase 1.5-2 times, but the exposure time will be reduced. The data are based on analogue calculations.

The most negative consequences of a fuel spill are expected to affect the soil cover, which will be subject to oil pollution. In this case, after the accident, the contaminated soil horizon should be removed and treated in biological ponds.

After the accident, mechanical and biological recultivation should be carried out on the entire area disturbed by the fire or explosion to avoid activation of erosion and blowing processes.

5.1.2. Alternative Option of Project Solutions (with and without project scenarios)

The Environmental and Social Management Framework Document (ESMF) provides for the development of the existing sewerage system infrastructure by constructing new and reconstructing existing sewerage networks, sewage treatment plants, pumping stations and water supply infrastructure (water supply networks).

In general, the water supply and sewerage system is not at an adequate level in all project areas under consideration, due to obsolete equipment or insufficient infrastructure.

"Zero option." Refusal from the planned activities on the implementation of the Environmental and Social Management Framework Document, while maintaining the current state of the water supply network and sewerage system will lead to a shortage of water, frequent occurrence of accidents due to wear and tear of water supply and sewerage networks, poor quality treatment or lack of it at sewage treatment plants. These problems, in turn, will lead to pollution of surface and ground waters, soils, subsoils, increase in the level of groundwater, soil subsidence. Ground subsidence can cause subsidence of the road base, which will cause disturbance of the roadbed and the upper structure of the road surface. Frequent accidents due to the deterioration of water supply and sewerage facilities worsen the living conditions of the population, especially of socially vulnerable groups: senior citizens, people with disabilities and children, lead to conflict situations. Pumping tap water at outdated pumping stations and wastewater at sewage pumping stations, and treating wastewater at outdated sewage treatment plants increase energy costs. In this way, the overall environmental situation in the project areas will deteriorate and the social and economic damage will increase.

Therefore, as a result of comprehensive consideration of the issue of water supply and sewerage in the regions of the project zone, the choice of technological solution was made: (1) reconstruction and expansion of sewerage systems in Nukus, Takhiatash, Kungrad and Khodjeyli of the Republic of Karakalpakstan; (2) improvement of water supply in Syrdarya, Gulistan and Saikhunabad districts and Yangiyer city of Syrdarya region; and (3) reconstruction of water supply and sewerage systems in the city of Kattakurgan and measures for rehabilitation of water supply systems and adaptive measures in Samarkand city of Samarkand region.

Implementation of the project solutions planned in this project will allow to ensure uninterrupted supply of quality water and the necessary amount of population, improve the sanitary and environmental situation in the regions.

As a result of rehabilitation/construction of the sewerage network and facilities, the coverage of the population connected to the sewerage network will increase, and losses of sewage will be reduced due to guaranteed and timely collection of sewage and its effective treatment, which helps to reduce the discharge of polluted wastewater into surface and groundwater. The qualitative condition of watercourses will change for the better, as they will receive water after effective treatment.

The increased capacity of the rehabilitated network will increase the outflow of waste water and reduce the risk of soil contamination.

Construction and repair of the existing network, pumping stations and treatment facilities will allow for timely collection and treatment of waste water to meet the standards for waste water quality.

Restoration of structures, reconstruction and construction of STP, improvement of management and operation of water canal services will change the water regime of the territory, which will have a positive impact on the entire complex of natural conditions and public health.

The implementation of this project solution will improve the health of the city's residents through favorable changes in social and living conditions.

Creating comfortable and favorable social and living conditions for the general public will improve the level of urban amenities and sanitary conditions. Providing a reliable centralized water supply and sanitation system for social infrastructure (schools, professional colleges, medical institutions and other social and cultural institutions) and private enterprises in the service and catering sectors will reduce the risk of epidemics and redistribute part of the local budget to other urgent problems of local development.

5.1.3. Impact During the Operational Phase

Implementation of the project activities will significantly improve the environmental situation in the project area of Karakalpakstan, Syrdarya and Samarkand regions.

Installation of new modern pumps on the water supply network and the majority of sewage treatment plants, new blowers, aerators in aeration tanks for biological treatment of SPS will allow to reduce electricity consumption, which will lead to saving of electricity, reduction of water losses, reduction of waste water loss due to guaranteed timely collection of waste water and its treatment, which helps to reduce discharges of polluted waste water into surface and ground waters.

The operation of water supply and sewerage networks, pumping stations after reconstruction and construction of new ones is expected to improve wastewater disposal, eliminate leakages, which will have a positive impact on the environment and public health, as it will eliminate the infiltration of untreated wastewater from sewage pipes into the ground / groundwater, reduce losses of tap water. It is also important that by preventing the dilution of untreated wastewater in the sewerage pipes with groundwater that penetrates into the sewerage network as a result of infiltration, the result of wastewater treatment can be improved. Expansion of the sewerage system will increase the number of connections of the population to the sewerage network, which will reduce the unorganized discharge of effluents into the environment and reduce the negative impact on soils, subsoils and groundwater. Restoration of the water supply and sewerage network provides additional benefits, for example, it reduces the problems associated with traffic stoppages, has a shorter construction period, reduces the costs associated with asphalt roads in urban areas, etc.

Initially, the benefits will be derived from the treatment, rehabilitation and diversion of the sewerage network to the wastewater treatment plant. Currently, the capacity of the collectors is significantly reduced due to sediment, clogging and leakages. The construction of new collectors, flushing and repair of the existing network, pumping stations and treatment facilities will allow for timely collection and treatment of waste water to meet effluent quality standards.

The sources of water supply systems in the Karakalpakstan project area are canals fed from the Amu Darya River. Water intake is carried out according to the document "Permit for special water use" approved by the State Committee for Nature Protection of the Republic of Uzbekistan. The volumes of available water resources are not disturbed and are expected to be within the framework of international procedures and agreements on the use of the Amu Darya River between the Republics of Uzbekistan and Turkmenistan.

The operation of water supply and sewerage systems will pose some problems that can be solved by implementing certain measures and precautions.

Renewal of old sewerage networks will cause interruptions in the reception of sewage from users, possibly damaging other communications (telephone, electrical networks). It is necessary to take the necessary measures during the design of rehabilitation works and mandatory coordination with the relevant services and enterprise.

Noise and vibration from operating pumps, agitators and mixers have a continuous effect on the personnel staying in the premises of pumping stations for the time required for maintenance or repair, but the surrounding space is not affected by noise and vibration from this equipment, as all the equipment generating noise and vibration is installed in the buildings;

Increased use of groundwater/surface water sources can lead to irreversible damage to groundwater sources or ecosystems. To avoid this problem, it is necessary to:

- conduct a detailed hydrogeological or hydrological survey;
- follow the operation procedure recommended in the studies, especially to prevent overloading of hydrogeological facilities:
- Regular monitoring of water runoff (surface water source)
- updating the results of hydrogeological / hydrological studies based on regular monitoring.

Based on these surveys, the flow rate of wells or river flow rates (for a surface source) and the flow rate for all uses, it is possible to assess whether the water sources will be damaged. In addition, for water consumption and wastewater discharge from sewage treatment plants, all water leaks could be eliminated at each stage. The data of the project coordination team were not provided for all subprojects studied. This problem will need to be solved at the next design stage.

During the operation of sewage treatment plants, atmospheric air may be contaminated with chlorine. To ensure air protection measures in chlorination buildings, a scrubber, a tank for neutralizing solution, pumps for pumping a neutralizing solution, a metering gas discharge pipe, gas analyzers that monitor the composition of the air in the warehouse and (separately) chlorination, purge piping systems are provided.

To ensure the safety of wastewater chlorination, air and residual chlorine levels in water are monitored. The process of chlorination used in the decontamination of wastewater will be carried out with the established measures of protection and regulation of its supply.

Newly constructed or reconstructed sewage treatment plants will be able to perform enhanced removal of 2 main mineral substances in the waste water, i.e. nitrogen and phosphorus. The disposal of both nutrients will be carried out exclusively by mechanical-biological means without the use of any chemicals. Wastewater treatment wastes from sand traps and sludge from its disposal can be a source of soil and water pollution (surface and ground). Sand from the sand traps is removed by a hydrotreater to the sandy sites. Sludge can be used as fertilizer on cotton fields (this should be defined in the Environmental Management Plan (EMP)).

Any wastewater treatment system used will produce sludge from sediment ponds or biological ponds. This sludge is composted or stored in lagoons. The sludge lagoons must be operated to prevent environmental pollution. Sludge is usually dirt rich in organic matter, nitrogen, ammonia and phosphorus and may contain some agricultural or industrial chemicals. The lagoon does not pose a significant threat to the environment, provided that it is properly constructed and prevents leakage. Large-scale excavation work may be required to reclaim some of the sludge lagoons. In the future, it is recommended to introduce a process of co-generation of heat and electricity using biogas from fermentation decomposition.

Thus, the implementation of this project, which consists in the restoration of structures, reconstruction and construction of sewerage collectors, improvement of management and operation of water canal services, will lead to changes in the water regime of the area, which will have a positive impact on the entire complex of natural conditions, cultural heritage and public health.

A summary of potential environmental and social risks and impacts with mitigation measures during the implementation of the sub-projects that are potentially included in the Programme is presented in Table 5.1 below.

To produce biogas, biological installations are used in which organic compounds are bacteriologically broken down under anaerobic conditions. During decomposition, methane is used as a fuel for heat and electricity generation. It is a cheap and efficient energy that can be produced from sludge from sewage treatment plants, animal manure, slurry, and biodegradable waste sorted in landfills.

Reducing methane emissions is a cost-effective way to combat greenhouse gases, increase energy security, promote economic growth, purify the air and enhance safety in production. Methane (CH₄), which is the second most important technogenic greenhouse gas (GHG) after carbon dioxide (CO₂), is associated with more than a third of anthropogenic climate-generating factors. It is also the second most abundant greenhouse gas and accounts for 14 per cent of global greenhouse gas emissions. Although methane is released into the atmosphere in smaller quantities than CO₂ and persists for a shorter period of time, its potential "contribution to global warming" (i.e. the ability of gas to retain heat in the atmosphere) is 21 times higher than that of CO₂. Regulation of methane emissions provides a unique opportunity not only to mitigate climate change, but also to obtain an additional source of energy.

Thus, the implementation of this project, which consists in the restoration of structures, reconstruction and construction of sewerage collectors, improvement of management and operation of water canal services, will lead to changes in the water regime of the area, which will have a positive impact on the entire complex of natural conditions, cultural heritage and public health.

A summary of potential environmental and social risks and impacts with mitigation measures during the implementation of the sub-projects that are potentially included in the Programme is presented in Table 5.1 below.

Table 5.1. Potential environmental and social risks and impacts of the project

<i>№</i>	<i>Expected types of subprojects</i>	<i>Expected environmental and social risks and impacts</i>	<i>Scale of impact (local/regional, temporary/permanent)</i>	<i>Prevention/mitigation measures</i>
<i>1</i>	<i>"Reconstruction, expansion of sewerage systems and construction of new sewage treatment plants"</i>			
	1. Rehabilitation of the sewerage network;	Waste generation: (elements of deteriorated old sewerage structures, soil, construction waste);	Local - temporary	Collection and sorting of waste with further disposal (landfill or recycling facilities) (SanPin RUz № 0329-161, RCM № 266 of 21.09.2011.1); Sorting of hazardous waste/waste; Recycling of used building materials; Use of waste containers; Proper waste disposal at local landfills/processing facilities and rehabilitation of disturbed areas;
	2. Expansion of the sewerage network to connect additional residents;	Land and vegetation disturbance;	Local - temporary	Revegetation of disturbed land cover (ShNK 2.05.02 – 07; KMK 2.05.03-97 2);
	3. Reconstruction of existing pumping stations and construction of new pumping stations;	Air pollutant emissions (dust, construction equipment emissions, welding aerosol); Noise during operations; Fuel and oil leakage.	Local - temporary	Dust suppression - watering construction sites, equipping construction equipment with gas cleaning equipment; The noise level in the surrounding residential areas should not exceed 55 dB during the day and 45 dB at night. For workers, the noise level at the workplace should not exceed 70 dB (SanPiN RUz № 0267-093; SanPiN № 0120-014); Place noise and vibration sources as far away from homes as possible; Equipment with silencer; Noise suppression devices; Internal combustion engines with

				<p>silencers; Pneumatic tools with silencer; Fuel and lubricants tanks must be filled according to the established standards; waste oil must not be drained onto the terrain, refueling and transportation rules must be observed.</p>
	4. Partial reconstruction of the pressure sewerage pipeline;	<p>Breaking of sewage pipes and flooding of surrounding land. Restrictions on access to public places.</p>	Local - temporary	<p>Immediate work on pipeline rehabilitation and land reclamation. Limiting the time of work to a daylight period; (SanPin RUz № 0267-09 3; SanPin RUz № 0120-01 4). Providing the builders with safety instructions (SHNK 3) 06.03 - 08; KMK 3.06.04-97) 5; Fence the work area for public safety reasons; Inform the population of the time constraints related to repair and construction works.</p>
	5. Reconstruction of the existing CCS or construction of a new CCS located closer to the city border.	<p>Soil removal, disturbance of soil and vegetation cover; Breaking of sewage pipes and flooding of surrounding land.</p>	Local - temporary	<p>Preparatory environmental protection measures aimed at preserving the soil and vegetation layer and wood and shrub vegetation (ShNK 2.05.02 – 07; KMK 2.05.03-97 2);</p>
	6. Construction of a new STP (at a new location).	<p>Water pollution from construction sites; Breaking of sewage pipes and flooding of surrounding land.</p>	Local - temporary	<p>Provision of drainage and surface runoff removal from the working sites; their timely cleaning from construction wastes, as well as rehabilitation works at the disturbed sites; Immediate work on pipeline rehabilitation</p>

				and land reclamation.
	7. Maintenance of sanitary and hygienic conditions on site (septic tanks and improved cesspools) for the rest of the population, which are not connected to the centralized sewerage system.	Impact on soil and vegetation cover; Land acquisition for new construction; Restrictions on access to public places.	Local - temporary	Preparatory environmental protection measures aimed at preserving the soil and vegetation layer and wood and shrub vegetation (ShNK 2.05.02 – 07; KMK 2.05.03-97 2); Reference to RPF Annex 10 Limiting the time of work to a daylight period; (SanPin RUz № 0267-09 3; SanPin RUz № 0120-01 4). Providing the builders with safety instructions (SHNK 3) 06.03 - 08; KMK 3.06.04-97) 5; Fence the work area for public safety reasons; Inform the population of the time constraints related to repair and construction works.
	8. Construction of one new sewage pumping station;	Impact on groundwater;	Local - temporary	Provision of drainage and surface runoff removal from the working sites; their timely cleaning from construction wastes, as well as rehabilitation works at the disturbed sites; Ensure reliable waterproofing of cesspools (SanPiN RUz №0146-04)6;
2	<i>"Improvement of water supply"</i>			
	1. Reconstruction of wells;	Impact on groundwater;	Local - temporary	Implementation of preparatory measures for waterproofing during well reconstruction. (KMK 2.04.02-97)7;
	2. Restoration of the distribution network and main water supply lines;	Impact on soil and vegetation cover; Waste generation: (elements of deteriorated old sewerage structures, soil, construction waste)	Local - temporary	Preparatory environmental protection measures aimed at preserving the soil and vegetation layer and wood and shrub vegetation (ShNK 2.05.02 – 07; KMK

				2.05.03-97 2); Collection and sorting of waste with further disposal (landfill or on-site disposal) (SanPin RUz № 0329-161, RCM № 266 of 21.09.2011.1).
	3. Restoration of fencing in sanitary protection zones;	Air emissions (emissions from construction equipment)); Noise during the work period; Water pollution from construction sites; Breaking of sewage pipes and flooding of surrounding land. Fuel and oil leakage.	Local - temporary	Dust suppression - watering construction sites, equipping construction equipment with gas cleaning equipment; The noise level in the surrounding residential areas should not exceed 55 dB during the day and 45 dB at night. For workers, the noise level at the workplace should not exceed 70 dB (SanPiN RUz № 0267-093; SanPiN № 0120-014); Place noise and vibration sources as far away from homes as possible; Equipment with silencer; Noise suppression devices; Internal combustion engines with silencers; Pneumatic tools with silencer; Provision of drainage and surface runoff removal from the working sites; their timely cleaning from construction wastes, as well as rehabilitation works at the disturbed sites; Immediate work on pipeline rehabilitation and land reclamation; Fuel and lubricants tanks must be filled according to the established standards; Waste oil must not be drained onto the terrain, refueling and transportation rules must be observed.
	4. Purchase and installation of large and consumer water meters	No risks.		

	5. Renewal of pumps at the pumping station	No risks.		
	6. Reconstruction of the magistral water supply line	<p>Waste generation: (elements of deteriorated old sewerage structures, soil, construction waste) Air emissions (emissions from construction equipment));</p> <p>Noise during the work period;</p> <p>Water pollution from construction sites; Breaking of sewage pipes and flooding of surrounding land. Fuel and oil leakage.</p>	Local - temporary	<p>Collection and sorting of waste with further disposal (landfill or on-site disposal) (SanPin RUz № 0329-161, RCM № 266 of 21.09.2011.1).</p> <p>Dust suppression - watering construction sites, equipping construction equipment with gas cleaning equipment;</p> <p>The noise level in the surrounding residential areas should not exceed 55 dB during the day and 45 dB at night. For workers, the noise level at the workplace should not exceed 70 dB (SanPiN RUz № 0267-093; SanPiN № 0120-014);</p> <p>Place noise and vibration sources as far away from homes as possible;</p> <p>Equipment with silencer;</p> <p>Noise suppression devices;</p> <p>Internal combustion engines with silencers;</p> <p>Pneumatic tools with silencer;</p> <p>Provision of drainage and surface runoff removal from the working sites; their timely cleaning from construction wastes, as well as rehabilitation works at the disturbed sites;</p> <p>Immediate work on pipeline rehabilitation and land reclamation;</p> <p>Fuel and lubricants tanks must be filled according to the established standards;</p> <p>Waste oil must not be drained onto the terrain, refueling and transportation rules must be observed.</p>
3	<i>"Purchase of equipment."</i>			

	1. Purchase and installation of large and consumer water meters.	No risks.		
	2. Purchase of equipment for operation and maintenance, as well as laboratory equipment.	No risks.		
	3.Replacement of pumping equipment	No risks.		
4	" Construction phase"			
	1. During construction work related to the movement of vehicles	Traffic violations and traffic accidents	Local - temporary	Traffic Control Choosing an access route Driving training Maintenance of roads and vehicles
5	"Operation and Maintenance Phase"			
	1. Wastewater Treatment Plant	Soil and water pollution by sludge	Periodically, insignificantly	Strictly regulated collection and disposal of precipitation in designated places, their disposal.
	2. Leakage during transport.	Flooding, pollution of water and soil.	Periodically, insignificantly	Timely network fault detection, liquidation of leaks in a short time, monitoring compliance with wastewater discharges.
	3. Chlorine release during wastewater disinfection.	Chlorine air pollution	Periodically, insignificantly with reversible consequences	A scrubber is installed to capture chlorine, neutralizing solution tank, pump for transferring a neutralizing solution, gas analyzer that controls the composition of air.
6	" Energy efficiency component"			
	1.Operation of photovoltaic panels	Pollution of grounds, surface and ground waters, soils	Temporarily with reversible consequences	Eliminating oil contamination at the transformer site by diverting oil from the oil receivers to an oil reservoir with a capacity for the total oil volume and 80%

		Protection of flora and fauna	<p>of the transformer's water consumption for firefighting; Use of demineralized water for washing panels without chemicals; Elimination of cadmium use in photovoltaic modules; Damaged photovoltaic panels will be assembled by the supplier of photovoltaic modules for recycling and reuse as solar modules or other products. Observance of temporary storage of waste in special containers or containers at specially designated sites, compliance with their rules and regulations, timely disposal; Develop a schedule for waste disposal and storage Tanks with used oil must be equipped with metal pallets. The tray must be capable of holding oil in the event of an overflow of at least 5% of the volume. The platforms and sheds where the containers of used oil products are stored shall be protected. Check the chemical composition of the water after washing the panels and direct the water to watering the vegetation Control the location of photovoltaic panels at a height of 2.0-2.5 m;</p> <p>To protect the animals and equipment of the solar power plant, the project provides for a 2.5 m high fence made of dense netting and an upper additional fence made of galvanized steel To prevent bird deaths and reduce pollution of solar photovoltaic batteries</p>
--	--	-------------------------------	---

		Safety of operating personnel		<p>by bird droppings, special devices such as spikes or wire-coated pipes are to be installed on top of the solar photovoltaic battery.</p> <p>A favorable factor for deterring birds is the installation of darkened panels.</p> <p>To limit exposure to terrestrial animals, solar photovoltaic batteries should be installed at an appropriate height above the ground (typically between 1.5 and 2.5 m).</p> <p>Use low-reflectivity, low-heat panels to reduce the impact on avifauna.</p> <p>To avoid electric shock to personnel, it is necessary to:</p> <p>Before cleaning the modules, carefully inspect them for cracks, damage and loose connections;</p> <p>Personnel must wear appropriate personal protective equipment (PPE) during cleaning.</p> <p>Cleaning time: Recommended time for cleaning the panels - in low light conditions, when the panels generate the least amount of energy.</p>
2.Increasing energy efficiency by installing bio gas at WTP	<p>Pollution of sludge by heavy metals and pathogens.</p> <p>Storage of large volumes of sludge at sludge disposal sites with large volumes of land</p>	<p>Temporarily with reversible consequences</p> <p>Temporarily with reversible consequences</p> <p>Temporarily with</p>	<p>Biological disposition of metals in the sediment in the form of insoluble or slightly soluble amino acid complexes in water, which do not have a toxic effect on humans, animals and natural microflora.</p> <p>Reducing the amount of sludge and the area allocated to it through aerobic treatment of waste water and formation of biogas.</p>	

		Insufficient energy saving during aerobic processes	reversible consequences	Energy saving can be increased by: reducing the time of stay of wastewater in the aeration tank (bioreactor) and, accordingly, lower oxygen consumption (air supply); - obtaining more clarified water through the reconstruction of primary sedimentation tanks; - improvement and creation of better aerators that exclude oxygen overuse; As a result of anaerobic digestion of sediments with significant energy potential, biogas is released, which can provide 25 - 50% of the energy consumption of sewage treatment plants.
--	--	---	-------------------------	--

1 – Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On Approval of the Procedure for Collection and Disposal of Used Mercury Lamps" of 21.09.2011, No. 266.

2 – ShNK 2.05.02 – 07; KMK 2.05.03-97 *Construction Regulations and Provisions for the Environmental Protection of Roads*: Specifies the general need to minimize the negative environmental impact of the road design and provides guidance on the removal and reuse of topsoil; the need to provide a buffer between the road and settlements, and to implement noise reduction measures to ensure compliance with relevant sanitary standards; and the disposal of excess materials.

3 – SanPin of the Republic of Uzbekistan No. 0267-09. Permissible noise level in the residential area, both inside and outside the building.

4 – SanPin of the Republic of Uzbekistan № 0120-01. Sanitary standards for permissible noise levels on construction sites.

5 – ShNK 3.06.03-08; KMK 3.06.04-97 «Regulations "Safety standards in construction"».

6 – SanPin of the Republic of Uzbekistan №0146-04 of 3.08.2004. «Design of residential houses in climatic conditions of Uzbekistan».

7 – KMK 2.04.02-97 «Water supply. External network and facilities».

5.1.4. Occupational Health and Safety Issues

Occupational health and safety issues at the stage of operation of water supply and sewerage systems are primarily related to the following:

- Accidents and injuries;
- Chemical exposure;
- Exposure to pathogens and disease vectors;
- Noise.

Accidents and injuries

Work on water supply and sewerage facilities may involve confined space operations, including hatches, collectors, pipelines, storage tanks, water intakes, enzymatic decomposition reactors and pumping stations. Methane from anaerobic biodegradation of sewage can lead to fires and explosions. Measures to reduce accidents and injuries are discussed in the General EHS manual.

The following measures are recommended to prevent, minimize and control accidents and injuries in the water and wastewater industry:

- Install handrails around all process vessels and wells. When inside the fence, the use of safety ropes and individual floating devices, as well as buoys and lifebuoys, is mandatory;
- Introducing rules for entry into restricted spaces that are consistent with current national requirements and accepted international standards.

The closures on the process tanks should be closed to avoid accidental flooding during maintenance:

- Use of fall protection devices in high-rise work;
- Maintaining cleanliness and order at work sites,
- Use of appropriate techniques for laying trenches and securing the walls of trenches;
- Taking measures to prevent fire and explosion hazards in accordance with accepted international standards;
- When laying or repairing highways near roads, follow the procedure below and regulate traffic:
 - The establishment of working areas to maximize the protection of workers from traffic and equipment.;
 - Reducing the permitted speed of vehicles in the work area;
 - Use of bright protective clothing by workers in the vicinity of traffic areas;
 - When working at night, ensure that the work area is sufficiently illuminated so that lighting does not dazzle workers and passing drivers;
- Determining the location of all underground engineering networks prior to excavation.

Chemicals impact

Water treatment and wastewater treatment involves the use of potentially hazardous chemicals, including strong acids and bases, chlorine, sodium and calcium hypochlorite and ammonia. Water may contain radioactive substances and heavy metals, which usually accumulate in the water treatment sludge. Exposure to radionuclides may be caused by pumps and pipelines with mineral scale deposits; settling tanks and tanks for flocculation and deposition where residual sludge accumulates; filters, pumping stations and storage

tanks where scale and sludge accumulate; devices where filter backwashing water, brines and other contaminated waters accumulate; closed structures (radon accumulates); and treatment or overloading areas.

Wastewater may contain potentially hazardous chemicals depending on the quality of the incoming water, methods of purification of drinking water and types of industrial discharges into the sewerage system, which may contain chlorinated organic solvents and pesticides, polychlorinated biphenyls, polycyclic aromatic compounds, petroleum hydrocarbons, flame retardants, nitrosamines, heavy metals, asbestos, dioxins and radioactive substances. In addition, workers may be exposed to hydrogen sulfide, methane, carbon monoxide, chloroform and other chemicals from wastewater treatment. Micro-organisms may displace or consume oxygen, thereby creating an oxygen-poor atmosphere at waste water treatment sites or waste water treatment sites. Safe handling and storage of hazardous chemicals, as described in the General EHS manual and above in Section 1.1, will help to minimize potential risks to workers.

The following measures are recommended to prevent, minimize and control exposure to chemicals in water supply and sewerage facilities:

- For operators working with chlorine and ammonia, it is recommended that a programme of professional training on the safe handling of these substances and on accident procedures be introduced;
- Providing workers with the necessary personal protective equipment (including, for example, self-contained breathing apparatus) and training in its proper use and maintenance;
- Prepare an evacuation plan for areas where chlorine and ammonia emissions may occur;
- Installation of hygienic showers and eye wash fountains near equipment that uses chlorine and ammonia, as well as in other areas where harmful chemicals are stored or used;
- Ensuring that only wastes that can be effectively treated at the wastewater treatment plant are discharged into the sewerage system and reducing the amount of harmful compounds entering the system from the aerator by controlling industrial discharges (e.g. by introducing a discharge permit system and similar system).
- Analysis of incoming raw water to determine the harmful ingredients contained in it;
- Ventilation of closed process areas and ventilation of equipment, e.g. pumping stations, prior to maintenance;
- Use of individual gas detection devices at wastewater treatment plants;
- Continuous monitoring of the air quality in the work area to detect dangerous situations (e.g. explosive atmosphere, lack of oxygen);
- Technical measures to limit the impact on workers, such as the collection and treatment of exhaust gases from the aerator;
- Allow meals, smoking and drinking only in designated areas;
- Rotation of personnel in various cleaning operations to minimize the inhalation of chemicals from the aerator, aerosols and other harmful compounds.

Workers and employees in waste water treatment and sludge treatment plants and in areas where treated waste water and sludge are introduced into the ground, as well as sludge collector operators can be exposed to a variety of pathogens living in the sewerage system. Biological aerosols may form during the treatment of sewage, which are suspended particles in the air, fully or partially consisting of microorganisms, including bacteria, viruses, mold and other fungi. These microorganisms may remain suspended in the air for long periods of time, maintaining their viability and virulence. Workers may also be exposed to endotoxins, which are formed in the microorganisms and excreted during cell destruction and which can be carried by airborne dust particles. Insects (e.g. flies), rodents (e.g. rats) and birds are carriers of pathogens from sewage.

Recommended measures to prevent, minimize and control exposure to pathogens and vectors include

- Practical recommendations for safe handling and personal hygiene should be included in the worker safety programme to minimize exposure to pathogens and disease vectors;
- The use of vacuum-operated trucks or trolleys instead of manual labour for the disposal of waste sludge;
- Providing and requiring the use of suitable personal protective equipment and devices to avoid contact with waste water (e.g. rubber gloves, aprons, boots, etc.). In particular, medical attention should be provided immediately and any skin damage (cuts, abrasions) should be bandaged to prevent contamination, and personal protective equipment and goggles should be used to prevent the ingress of waterborne dust and splashes;
- Providing working space for showers and clothes after work and ensuring that work clothes are washed. This practice also reduces exposure to chemicals and radionuclides;
- Encourage workers in wastewater treatment plants to wash their hands frequently;
- Vaccinating workers (e.g. against hepatitis B and tetanus) and monitoring their health, including regular medical examinations;
- Reducing the formation and spread of aerosols, for example by the following means 1. planting trees around the aeration pond to shield the area from the wind and to capture particles and droplets; 2. using diffused aeration with small bubbles rather than mechanical aeration; 3. reducing the rate of aeration where possible; 4. using mobile covers to cover the sludge mixture of the aeration pond; 5. disinfecting airborne particles (e.g. with UV radiation); 6. Use of submersible drain collectors (e.g. diaphragm pipes) instead of spillways; 7. Avoidance of manual handling of grids to avoid injury due to injections; 8. Avoidance of persons with asthma, diabetes or reduced immunity to work in wastewater treatment plants, especially composting plants, due to increased risk of contamination.
- Consider the possibility of drip irrigation of treated wastewater, which minimizes the impact on workers and requires a minimum amount of water. If possible, spray of treated wastewater should be avoided;
- Providing workers on site with personal protective equipment, including rubber gloves and waterproof shoes;
- Ensuring access to safe drinking water and sanitation facilities (including hand washers);
- Ensure health monitoring of workers, including regular medical examinations;
- Control of vectors and intermediate carriers of disease.

5.1.5. Impact of Climate Change On Water Resources

The impact of global climate change on water resources is one of the most discussed fundamental issues in the field of climatology and water resources. The 24th Conference of the Parties of the United Nations Framework Convention on Climate Change of 12 December 2018 called for action to protect the environment at all levels, focused on the needs of the world's peoples.

Climate change worsens air quality, reduces food security and poses risks to water supply and sanitation.

Groundwater, an area of active water exchange as part of the land hydrological cycle, is undoubtedly also affected by observed and expected climate change. The international community of hydrogeologists has already been quite actively involved in analyzing the problem of the scale of the impact of climate change on the groundwater regime and balance.

Groundwater is a product of the climate because it is formed mainly by precipitation. Therefore, climate change cannot but affect groundwater, its resources and quality, and the interconnected environment. The environmental consequences of the onset of global climate change are of interest and even worrying concern.

Predicted changes in climatic conditions will entail changes in the full range of hydrogeological conditions, i.e. in the water, thermal and salt balance of groundwater, as well as in the environment interconnected with groundwater. Taking into account the greatest practical significance of hydrodynamic forecasts, it is advisable to consider possible changes in the future, primarily groundwater resources.

Infiltration feeding (IF) of groundwater by means of precipitation in the mean annual cross-section determines the value of their natural resources, which is continuously renewed in the process of the water cycle and, in practical terms, characterizes the upper limit of the possible use of fresh groundwater of the intensive water exchange zone without their depletion. Significant interest in the problem of climate impact on groundwater and surface water resources, which has increased in recent years, is caused by the need to assess the prospects for their use and adaptation of water consumption strategies to the current and projected climate change. The determining role of meteorological factors, primarily such as precipitation, air temperature and humidity, solar radiation, in the process of formation of infiltration feeding of groundwater is obvious. At the same time, climatic changes in these characteristics and their seasonal distribution, depending on landscape and hydrogeological conditions, may have different impacts on water-balance processes on the land surface and in the aeration zone (AZ) that form IF.

An increase in winter air temperature causes a decrease in snow cover: glaciers continue to decline at a rate of 0.2%-1% per year. By 2030, no significant changes in water resources are expected in the Amudarya and Syrdarya basins. By 2050, it is possible to reduce water resources in the Amudarya River Basin by 10-15%, and in the Syrdarya River Basin by 2-5%. In Uzbekistan, precipitation is expected to increase by 5-15% of the norm by 2030, 2050 and by 10-25% by 2080. Taking into account the high-altitude zoning in the process of sediment formation, this may lead to the preservation of modern river runoff or even to its increase in the basins of individual rivers.

It is expected that the current flow rates will be practically maintained until 2030. With a further increase in air temperature, the flow of rivers decreases. Rivers in the Amudarya basin and small watercourses are more sensitive to climate change. Flow variability is expected to increase in all basins. None of the climate scenarios considered, which reflect "climate warming", implies an increase in available water resources. The expected increase in evaporation under warming conditions will increase water losses in irrigation zones, which will require additional water consumption. Under the current situation in irrigated agriculture, climate change will inevitably lead to increased water deficit.

The evaporation rate in irrigated areas increases significantly less than in desert areas. With climate change, the region's natural dryness remains high. Possible increase in precipitation under certain scenarios is fully compensated by the increase in evaporation in the plain and foothill areas.

Warming of climate will lead to increase of the main flow rate of water balance - evaporation and, as a consequence, will cause increase of number and norms of vegetation, water charging and washing irrigations. Under conditions of water resources deficit, it is necessary to estimate additional irrigation water costs and irrigation regime for new climatic conditions in the future.

6. PRINCIPLES AND INSTRUMENTS OF SOCIAL IMPACT ANALYSIS, MANAGEMENT AND MITIGATION

6.1. SUMMARY OF POTENTIAL PROJECT SOCIAL RISKS, IMPACTS AND MITIGATION INSTRUMENTS

Conducted Social Assessment concluded that the Project will generate mostly positive socio-economic benefits due to the improvement water supply and sanitation which will make living in the project areas more comfortable. As a result of rehabilitation and new construction works, the number of households connected to drinking water supply, sewerage system will be increased which will overall have significant effects on living conditions of population in general. At the same time the proposed project activities might generate a series of various adverse social impacts. Here are a few potential social impacts associated with this Project:

- Land acquisition and resettlements;
- Loss of public trees;
- Temporary limitation of access to public spaces, schools, medical organizations due to construction works;
- Temporary termination of water and sewerage services;
- Possible influx of temporary workers;
- Damage to cultural/historical sites;
- Missing the interest of vulnerable groups during the construction of public infrastructures;
- Risk of child labor;
- Risk of occupational accidents and injuries to workers;
- Low capacity of the implementing agencies to conduct social safeguards studies;
- Encroachers possessing or widening their boundary to safety zones of public utilities.

The permanent land acquisition may be needed only for construction of new facilities which likely will be taken from agricultural lands or the state reserve land. Also, the Project unlikely will need any permanent physical displacement of households but may involve temporary land acquisition due to construction/reconstruction of sewerage and water supply pipelines.

The listed social impacts are expected to be typical for small scale construction/rehabilitation works, temporary by nature and site specific, and can be easily mitigated by applying best construction practices and relevant mitigation measures. The summary of potential social risks and impacts along with the generic mitigation measures are presented in the Table 6.1.1 below. The proposed measures could be used for development of ESMPs for selected sub-projects. However, the ESMPs could be fulfilled with other measures as per beneficiaries' decision. The table of possible risks and impacts does not include the full set of risks and mitigating measures related to the land acquisition/resettlement. The full set resettlement related risks are provided in the RPF document (Annex 10). This preliminary list of the project associated risks is to be comprehensively revised and reacted during the project design stage via the Social Assessment (See Chapter 6.3).

Table 6.1.1: Summary Potential Project Social Risks, Impacts and Mitigation instruments

No	PROPOSED TYPES OF ACTIVITIES	POTENTIAL SOCIAL RISKS AND IMPACTS	Likelihood of Occurrence* / Severity of Consequence	MANAGEMENT PLANS AND MEASURES TO PREVENT/MITIGATE NEGATIVE IMPACTS
1	Construction and reconstruction of water supply and waste water treatment facilities	Resettlement related risks		
		Pre - Construction stage <ul style="list-style-type: none"> • Land loss • Loss of trees and vegetation • Loss of employment and income • Adverse impact on vulnerable groups 	Medium / Medium	✓ Regulated by RPF and further by specific RAPs (if any)
		Construction stage		
		<ul style="list-style-type: none"> • temporarily limited access to private and community assets (land, business facilities, roads, markets etc.) during construction activities; 	Medium / Medium	✓ Regulated by RPF and further by specific RAPs (if any)
		<ul style="list-style-type: none"> • Gender-based violence; 	Low / High	✓ Regulated by ESMF/ ESMP
		<ul style="list-style-type: none"> • Forced and child labor; 	Low / Medium	✓ Regulated by ESMF/ ESMP
		Community Livelihood / Population wellbeing		

No	PROPOSED TYPES OF ACTIVITIES	POTENTIAL SOCIAL RISKS AND IMPACTS	Likelihood of Occurrence* / Severity of Consequence	MANAGEMENT PLANS AND MEASURES TO PREVENT/MITIGATE NEGATIVE IMPACTS
		<p>Construction stage</p> <ul style="list-style-type: none"> • temporarily limited or interrupted access to potable water sources during the construction of water delivery facilities and connection activities • temporarily limited access to private and community assets (land, business facilities, schools, roads, markets etc.) during construction activities • Temporarily blocking of traffic for private vehicles and public transport 	Medium/Low	<ul style="list-style-type: none"> ✓ Water supply operators (Suvokavas) have to ensure uninterrupted access to water for population and public facilities (clinics etc.) Safe water is to be provided from alternative sources including water vendors. ✓ Early engagement of communities into the planning of facilities location ✓ Contractor has to provide temporary passes/bridges to community infrastructure and private houses which were blocked ✓ Inform population in advance about planning works ✓ Set up construction works in the way which will minimize time of blockage ✓ Negotiate possible alternative routes for public transport with local authorities and transportation companies

No	PROPOSED TYPES OF ACTIVITIES	POTENTIAL SOCIAL RISKS AND IMPACTS	Likelihood of Occurrence* / Severity of Consequence	MANAGEMENT PLANS AND MEASURES TO PREVENT/MITIGATE NEGATIVE IMPACTS
		<p>Operation stage</p> <ul style="list-style-type: none"> Increased expenditures of people and business for improved water supply and sanitation: a) possible increased tariffs and b) high prices for water meters regular obligatory checking procedures, especially in semi-rural areas (including need to spend much time and money for several trips to bring a water meter to checking facility) c) high prices for in-house connection of potable water supply and d) very high prices for the connection of houses to sewerage system. In addition, the necessity to construct a new toilet and to buy flushed toilets 	Medium/Medium	<ul style="list-style-type: none"> ✓ Reasonable ratification of services ✓ Willingness-to-pay surveys ✓ Trainings on water saving issues ✓ Properly organized water meters checking procedures by Suvokavas / UzStandard ✓ In-house connection support program (micro crediting, organized supply of plastic pipes and fitting to rural areas etc.) ✓ Community/makhalla engagement to help vulnerable households with in-house connection
Changes to Social and Cultural Practices				
		<p>Operation stage</p> <ul style="list-style-type: none"> Limited access to clean piped water due to absence of in-house connection program (when the pipe is installed, but people have no money to connect household to the system) Limited access to constructed 	Medium/Medium	<ul style="list-style-type: none"> ✓ In-house connection support program (micro crediting, organized supply of plastic pipes and fitting to rural areas etc.) ✓ Willingness-to-pay surveys ✓ Community/makhalla engagement to help with in-house connection of vulnerable households ✓ Self-connection trainings ✓ Support with trainings to local

No	PROPOSED TYPES OF ACTIVITIES	POTENTIAL SOCIAL RISKS AND IMPACTS	Likelihood of Occurrence* / Severity of Consequence	MANAGEMENT PLANS AND MEASURES TO PREVENT/MITIGATE NEGATIVE IMPACTS
		sewerage system due to absence of in-house connection program (when the sewerage pipe is installed on the street, but people have no money to connect household to the system). Also, the absence of in-house toilet rooms in rural areas may prevent people to quit using pit latrines in the yard instead of flushed toilets	High/Medium	<p>businesses/firms that will provide the services of in-house connections</p> <ul style="list-style-type: none"> ✓ Program of conservation of pit latrine toilets supported with human waste removal and proper utilization services ✓ Indicative Gender Action Plan (GAP) – see Annex 11
		Project physical infrastructure sustainability issues / Increased expenditures of Suvokavas for the provision of services		
		<p>Operation stage</p> <ul style="list-style-type: none"> • Damage to pipelines / Water stealing / unregistered connections • Water meters installment in rural areas with no access to proper infrastructure for meters repairing and obligatory checking procedures • bad practices of utilities use by some groups of population (for example watering of gardens and yards from potable water pipelines and improper use of waste water pipelines for solid waste 	<p>Low/ Low</p> <p>Medium/Medium</p> <p>Medium/Medium</p>	<ul style="list-style-type: none"> ✓ Establishment of proper system of control for Suvokavas ✓ Community/makhalla engagement to prevent damages to infrastructure ✓ Properly organized water meters checking procedures by Suvokavas / UzStandard ✓ Trainings for population (preferably for women), posters dissemination, lectures for schoolchildren

No	PROPOSED TYPES OF ACTIVITIES	POTENTIAL SOCIAL RISKS AND IMPACTS	Likelihood of Occurrence* / Severity of Consequence	MANAGEMENT PLANS AND MEASURES TO PREVENT/MITIGATE NEGATIVE IMPACTS
		<p>washing / disposing of inappropriate waste etc.)</p> <ul style="list-style-type: none"> • instable work of potable water supply system due to bad electricity supply infrastructure • instable work of sewerage system due to problems with absence of adequate/enough amount and pressure in water supply system to ensure self-cleaning of the sewerage system 	Medium/Medium	<ul style="list-style-type: none"> ✓ Ensure uninterrupted (and preferably multi-source) connection of water supply facilities to electricity grid. ✓ Complex approach to the construction of sewerage systems (first stable water supply, then sewerage construction)
2	<p><i>Professionalization of Participating Water Utilities</i> (three Suvokavas under Component 3)</p>	<p>Risks for the stability of project outcomes</p> <p>Operation stage</p> <ul style="list-style-type: none"> • High level of staff turnover may lead to reduction of trainings' outcomes efficiency • Low level of presence of women in engineering staff of Suvokavas may prevent women workers in capacity building procedures • Risks of weak community engagement into the planning of and operation of water supply and 	Medium/Medium	<ul style="list-style-type: none"> ✓ Proper procedures for the selection of staff for the participation in training programs ✓ Organization of regular re-trainings ✓ Development of proper wage policy for the laborers of participating Suvokavas ✓ Ensure capacity building activities for the different level staff, including accounting departments, call-centers operators etc. to ensure active women's engagement into the project planning and operation ✓ Creation of special stimulus for

No	PROPOSED TYPES OF ACTIVITIES	POTENTIAL SOCIAL RISKS AND IMPACTS	Likelihood of Occurrence* / Severity of Consequence	MANAGEMENT PLANS AND MEASURES TO PREVENT/MITIGATE NEGATIVE IMPACTS
		sewerage systems		makhallas for better engagement (trainings for makhalla staff, special advantages/reduced prices for water supply etc.)

* Likelihood of Occurrence Definitions:	
High:	Event is expected to, or has already occurred under some conditions
Medium:	Event may occur under some conditions
Low:	Event is not expected to occur, but may under exceptional circumstances

6.2. LAND ACQUISITION AND INVOLUNTARY RESETTLEMENT

Screening process

According to the World Bank OP4.12 the screening is a mandatory procedure for the identification of possible involuntary resettlement. The purpose of screening by World Bank of each proposed subproject for which it will provide funding is to determine the appropriate extent and type of the involuntary resettlement to be conducted. Each subproject shall be screened for social impacts based on the given designs for the proposed improvements envisaged. Residential and agricultural lands will be identified during screening requiring different treatment and accordingly suitable modifications to the design/alignment cross section/detours should be proposed to minimize social impacts. Further the screening exercise should identify all aspects that could lead to adverse environmental and social impacts and involuntary resettlement, regardless of the source of financing; from all activities that are necessary to achieve project objectives as set forth in the project documents; and are carried out, or planned to be carried out, contemporaneously with the project.

The social screening serves to ensure that the process for screening remains simple and concise. A version of the social screening format is attached in Annex 7. Specific questions based on each activity of the program might be added as seen relevant by external consultants and the PCU Social safeguard specialist. The list of project activities that have potential resettlement issues will then be subjected to a comprehensive sensitization and consultation process with the potentially impacted communities and the outcome of this process would be documented for each subproject. The list and the outcome of the consultative process for each site/project activity on the list would then be sent to the respective implementing agencies in the jurisdiction mandated to confirm, approve, disapprove, refer for further consultation and/or take a final decision on each proposed site/ project activities. Carrying out the screening process in this way is designed to give it the integrity and transparency it needs to allow all stakeholders to have confidence in the process.

For project activities that do not have any resettlement issues and do not trigger World Bank OP 4.12, the provisions of the RPF /involuntary resettlement provisions of the ESMF does not apply.

The screening and categorization of impact on involuntary resettlement in subprojects will be initiated by PCU either with its own social safeguard specialist. The resettlement impacts are categorized as follows:

- **Category 1 – Significant:** If as a result of the subproject, about 200 or more people may experience major impacts, that is, being physically displaced from housing, or losing 10% or more of their productive (income-generating) assets. Full Resettlement Action Plan (RAP) is required to be prepared.
- **Category 2 – Not significant:** If as a result of the subproject, fewer than 200 people will be physically displaced from housing or lose less than 10% of their productive (income- generating) assets. Abbreviated RAP is prepared;
- **Category 3 – No resettlement effect:** If the subproject does not require temporary or permanent land acquisition, and there are no impacts involving the loss of land, structures, crops and trees, businesses or income. No resettlement plan is required. This category also includes temporary but not significant impacts which will have to be mitigated as a part of construction management in consultation with the Project affected Persons (PAPs) by the Contractor. Due Diligence Report is required.

The social screening report will be prepared by the Consultant or PCU Social safeguard specialist and reviewed by an authorized person of the Uzkommunkhizmat agency and PCU director for clearance. The Social safeguard specialist and director at PCU will finally endorse the social screening and safeguard categorization of the proposed subproject.

Subproject screening is used to identify the types and nature of potential impacts related to the activities proposed under the Project and to provide adequate measures to address the impacts. Screening for resettlement issues shall be part of the environmental and social screening, as is detailed in the ESMF. Measures to address resettlement shall ensure that PAPs are:

- Informed about their options and rights pertaining to resettlement;
- Included in the consultation process and given the opportunity to participate in the selection of technically and economically feasible alternatives;

- Provided prompt and effective compensation at full replacement cost for; and
- Losses of assets and access attributable to the subproject(s).

Resettlement planning includes early selection, identification of the scope of key issues, selection of resettlement tool(s) and information required to prepare the resettlement component or subcomponent. The scope and level of detail of resettlement tools vary according to the scale and complexity of the resettlement. The PCU informs potential displaced persons (including vulnerable groups such low-income families, women, the elderly, persons with disabilities and other often forgotten groups) at an early stage about the resettlement aspects of the project and incorporates their views into project design, ensuring that appropriate consultation methods are used to provide equal access to all stakeholders and PAPs.

Resettlement policy framework (RPF) provides a framework to appropriately identify, address and mitigate adverse socioeconomic impacts that may occur due to the implementation of subprojects that involve the involuntary acquisition of land and the subsequent resettlement of affected people. RPF also serves the following specific purposes:

- Review the existing legal framework, compare with Bank OP 4.12 for gaps, if any, and indicate gap filling measures;
- Describe the approach to taking of private land, assets and other common property resources;
- Valuation process of impacted assets;
- the process of preparation of Social Impact Assessment and RAPs and their review by PCU;
- Defining of the cutoff date for Title and Non-Title holders;
- Consultation mechanisms/approaches to be adopted including disclosure of safeguards instruments; and
- Monitoring and Evaluation arrangements including Grievance Redressal Mechanisms role/responsibilities of different stakeholders.

RPF sets out principles for safeguards management, procedures to screen and survey social impacts and prepare Resettlement Action Plans to mitigate the same, lays down, cut off dates, entitlements with eligibility criteria for providing compensation and resettlement benefits, livelihood restoration, implementation arrangements necessary to implement the action plans to mitigate impacts in the course of implementing subprojects of WASIS.

In frame of WASIS's design stage an alternative design will be taken to avoid or minimize adverse impacts on private landowners and those non-title holders who have been using state lands with or without authorization. To minimize adverse impacts, the following principles shall be adopted:

- Avoid or minimize acquisition of private lands unless absolutely required through analysis of alternatives;
- Avoid or minimize involuntary resettlement and loss of land, structures, other assets and incomes by exploring all viable options;
- Use as much state lands as possible which are free of encroachment and other encumbrances
- Alternative designs will be considered in order that the project may not affect objects and sites like places of worship, cemeteries and structures that are considered socially and religiously important.; and
- Incorporating the gender considerations in social management, resettlement planning and implementation process.

In case of the project has thus triggered OP 4.12. The scale of impact on access, assets, livelihoods or land acquisition will have to be confirmed by the Uzkommunkhizmat agency through PCU once the detailed design has been completed.

To avert any negative social or economic impacts on persons losing access to land, assets and income as a result of the project, a full RPF has been prepared based on the World Bank's Operational Policy 4.12 on "Involuntary Resettlement". For any project component requiring land acquisition, specific RAPs consistent with the principles in this RPF will be submitted to the Bank for approval when detailed investment planning information and the detailed scope of the civil works becomes available, and the extent of the land acquisition needed for the investment is known.

Conditions to be followed in the resettlement procedure

Where displacement of people is unavoidable, the following conditions shall be followed:

- a. The entitlement cut-off date shall be determined and agreed upon in consultation with all stakeholders;
- b. An estimation of the time likely to be needed to restore their living standards, income earning capacity and production levels shall be prepared;
- c. The estimate shall ensure that the condition of the project affected persons shall be maintained to at least the Project Affected Person's pre-project levels condition;
- d. The project affected persons shall be provided with development assistance, in addition to compensation measures described in above. This shall include assistance for land preparation, credit facilities, training, or job opportunities, residential housing, or housing sites; or, as required, agricultural sites for which a combination of productive potential, location advantages, and other factors shall be at least equivalent to those of the old site. Assistance to displaced persons during relocation shall also be provided;
- e. Project affected persons who encroach on the project area after the cutoff date shall not be entitled to compensation, or any resettlement assistance or any other form of rehabilitation assistance.

Pillars of the project RPF

The project is expected to have several subprojects which will become known only during the implementation phase. While the broad category of activities/ impacts is foreseen, exact magnitudes can become known only after detailed design of the subprojects. Social Impact Assessments (SIA) should be undertaken in respect of each subproject, so as to determine the magnitude of displacement and prospective losses, identify vulnerable groups for targeting, ascertain the costs of resettlement, and prepare (if needed) a RAP for implementation.

The RPF confirms that civil works under the "Component 3: Investments in Regional Infrastructure" associated with construction of new facilities and extension of water/sewerage pipelines might have an impact on residents of the settlements within the Right of Way (RoW), as well as on farmers who may lose some part of their agricultural land to be used for the construction of new WWTPs. The RPF document confirms that the project will be implemented in accordance with the mentioned above principles and all the possible losses related to the program implementation will be fully covered. The RPF also provides a comprehensive analysis of the project risks and advantages related to the component of physical construction/reconstruction of water delivery and waste water treatment facilities (See RPF document).

PAPs will be provided with compensation for the land they lose, and other assistance ensuring that they are:

- i. Informed about their options and rights pertaining to resettlement.
- ii. Consulted on, or offered choices among, and provided with technically and economically feasible resettlement.
- iii. Provided prompt and effective compensation at full replacement cost for losses of assets attributable directly to the project.

Eligibility Criteria

The unit of entitlement is any individual eligible to receive compensation or rehabilitation benefits.

The eligibility criteria will be determined by:

- i. Loss of property (full/partial/permanent/temporarily)
- ii. Loss of incomes and livelihood (full/partial/permanent/temporarily loss)
- iii. Cut-off date.

The Entitlements Matrix identifies the assets – permanent loss of agricultural land, temporary impact on agricultural land, field crops, socioeconomic impact on vulnerable groups, people without formal title or rights to property, and severely affected households/persons – and what entitlements are able to be received using the legal framework and negotiations between the WB and the Uzkommunkhizmat agency.

Special attention will be paid to PAPs categorized as vulnerable and with disabled. The RPF or RAP will be fully implemented prior to the commencement of any civil works. Compensations and other assistance will

be scheduled and paid to APs prior to their physical or economic displacement and commencement of civil work.

Determination of unit of entitlement is in lieu with developing and identifying the census and inventory of all assets impacted by the Project to allow full compensation in line with the Entitlement Matrix. All PAPs identified prior to the cut-off date shall be entitled to compensation, according to the compensation principles of the law, the RPF and OP 4.12 whereas the more stringent in requirements shall prevail.

Project affected persons are defined to include the following categories:

- Project affected persons, with formal title, who lose all or part of their land;
- Project affected persons, with formal title, who have immovable property with or without building
- Project affected persons with formal title over businesses that are affected by the loss of all or part of the land on which businesses are located;
- Project affected persons with formal title over animal husbandries and agricultural processors that are affected by the loss of all or part of the land on which they are based;
- Project affected persons with formal title of tenancy on private or public land;
- Project affected persons with formal title over land that will be needed during construction on a temporary basis;
- Project affected persons without formal title on affected land or businesses, but their livelihoods are directly dependent on the affected land or businesses (e.g., those working on affected agricultural land or working in the affected businesses);
- Project affected persons without formal title of ownership or use but who have established usage of public or private land by investing in immovable objects, crops, woods, trees, fruit bearing trees, vineyards, the age of crops, and the time needed to reproduce them; and Any affected community facilities will also be reconstructed or necessary support will be provided for their relation to the community losing access to such common facilities.

Cut-off Date

The date of beginning of the Census serves as the Cut-off date. All PAPs irrespective of their status or whether they have formal titles, legal rights or not, squatters or otherwise encroaching illegally on land, are eligible for some assistance if they occupied the land before the entitlement cut-off date.

Persons who encroach on the area after the cut-off date are not entitled to compensation or any other form of resettlement assistance. Similarly, fixed assets (such as built structures, crops, fruit trees, and woodlots) constructed after the cut-off date will not be compensated. The PAPs, however, will be given sufficient advance notice before construction.

A Moratorium notice informing the general public of the declaration shall be made to serve as the cut-off date for eligibility to entitlements. In addition, at the beginning of the Census, every individual surveyed shall be informed about the moratorium date and the respective consequences of commencing activities after the date of Census.

The cut-off date will be published and communicated to PAPs by the Uzkommunkhizmat agency before the start of final census survey. Consultations will be carried out at each affected settlement with prior notice so that affected people can participate in the consultation to know about the land acquisition and resettlement process and procedure including the broad eligibility and entitlement.

The project's final design and alignment will be shared with the people, and the tentative date of carrying out final assets inventory and PAPs' census surveys will be communicated where the cut-off-date will be declared as the end of PAP census surveys.

6.3. SOCIAL IMPACT ASSESSMENT

Any subproject causing significant resettlement impacts (Category 1) will require a full-scale Social Impact Assessment (SIA), census survey as part of the full RAP. Abbreviated RAPs will be prepared for Category 2 sub-projects affecting less than 200 persons. If a sub-project has no adverse impact (Category 3) then due diligence report (DDR) will be submitted. DDR also will be prepared to determine if there was any IR in

relation with associated facilities. Social DDRs abbreviated and full RAPs will be shared with the WB for review and clearance prior to the award of civil works contracts.

PCU can do SIA this with their own staff or through consultants depending on size of the assignment. For large scale works an external consultant can be hired. The SIA will provide information on loss and damage suffered by individuals/households, and communities, impact on vulnerable groups.

Following the finalization of the design, the detail measurement survey (DMS) of the affected land and/or non-land assets and census survey of the affected households will be carried out to record the actual impacts and preparing the inventory. As a part of the land acquisition, replacement cost assessment (or asset valuation) will be carried out, which will form the basis for determining the compensation for the affected land and assets. This information will be used for fixing up compensation amounts for the land and assets to be acquired. This valuation can also be used to negotiate the value with the plot owner for acquiring the plot as per the land acquisition act, or when land is to be directly purchased.

The information will also include a profile of the affected households including demographic and socio-economic details including landownership, usage, productivity and income, impacts on vulnerable communities. Additional information can be gathered through stakeholder consultations (i.e. focus group discussions) with the project affected people, and vulnerable community groups, their leaders, registered civil societies (NGOs) and Community Based Organizations (CBOs) such as makhallas. These discussions should focus on the positive/negative impacts; measures to enhance positive impacts and reduce/mitigate negative impacts. The proposed content of the SIA shall include following elements:

- Conduct Census, Socio Economic Surveys through questionnaires.
- Collect Demographic Data and prepare a Register of affected persons at all levels including vulnerable persons such as women headed household, low income household, household headed by elderly with no support and household headed physically challenged people, etc.;
- Prepare an inventory of physical impacts;
- Labor (labor influx, forced and child labor);
- Citizen Engagement mechanism;
- Gender Action Plan;
- Consultation and participation of affected persons in the planning process from the very beginning of the planning exercises; and
- Socioeconomic baseline (replicating largely the SA but zooming in on the communities immediately in the project scheme area).

6.4. LABOR ISSUES (LABOR INFLUX, FORCED AND CHILD LABOR)

According to Labor Code of the Republic Uzbekistan all citizens have equal opportunities in the possession and use of labor rights. Establishment of any restrictions or granting of advantages in the field of labor relations depending on sex, age, race, nationality, language, social origin, property and official position, attitude to religion, beliefs, membership in public associations, and other circumstances not connected with the business qualities of workers and the results of their work, is unacceptable and is discrimination

Labor influx¹⁰. In the frame of WASIS, the proposed Contractors for civil works are asked to involve local labor. When there is a shortage of technical skills among local workers, then the Contractor may involve workers from outside the project area. The labor influx under certain conditions can affect project areas negatively in terms of public infrastructure, utilities, housing, sustainable resource management, and social dynamics. The impacts may include increased demand and competition for local social and health services, as well as for goods and services, which may lead to price hikes and crowding out of local consumers, increased volume of traffic and higher risk of accidents, increased demands on the ecosystem and natural resources, social conflicts within and between communities, increased risk of spread of communicable diseases, and increased rates of illicit behavior and crime. During the project design stage, the project will

¹⁰ The rapid migration to and settlement of workers and followers in the project area is called labor influx.

develop the set of measures to reduce the possible further labor influx and to avoid any negative consequences of thereof.

Child labor. According to the Labor Code of Uzbekistan and Minimum Age Convention (No.138 from 1973) minimum age is defined for children under the age of 18. In Uzbekistan, in accordance with Administrative Responsibility Code (article 49), employment of persons younger than 18 years by a legal entity is subject for a fine of 5 to 10 times the minimum wage. Because of the nature of the project (the WASIS program is not linked to agriculture sector where some cases of unorganized family-helping child labor can still exist), it is not expected that the contractors or their workers will involve children under 18 to civil work. However, the situation in the construction area should be carefully monitored throughout the entire project cycle. Work which that is classified as child labour:

- Work that is mentally, physically, socially or morally dangerous and harmful to children.
- Interferes with their schooling.
- Depriving them of the opportunity to attend school.
- Obliging them to leave school permanently.
- Requiring them to attempt to combine school attendance with excessively long and heavy work.

Forced labor. Forced labor is prohibited in Uzbekistan. According to the article 7 of the Labor Code, a forced labor, that is, compulsion to perform work under the threat of the use of any punishment (including as a means of maintaining labor discipline) is prohibited. The project will not support the initiatives of local authorities (if any) to use the practice of unpaid involuntary *khashars*¹¹. The resolution of the Cabinet of Ministers No. 349 (2018)¹² set that the organization and conduct of *khashars* by government bodies and other organizations are carried out exclusively on a voluntary basis, only in the presence of a relevant act of the President of the Republic of Uzbekistan or a decision of the Cabinet of Ministers of the Republic of Uzbekistan on holding a nationwide *khashar* (usually twice a year). In August 2019, a special Presidential Decree¹³ was adopted to prevent any practices related to forced labor. In accordance with the Decree, a) the forced involvement of entrepreneurs in activities not related to their core business, including involuntary/forced sponsorship, charitable support, landscaping, and other forced works and expenditures; and b) attracting entrepreneurs to seasonal work in agriculture (sowing and harvesting) and other activities it is strictly prohibited for the *khokimiyats* of the regions, districts and cities.

Mitigation measures: The potential impacts related to labor influx including their number and origin may be identified in a project's Environmental and Social Impact Assessment (ESIA), which may only become fully known at the implementation stage of the contracts. The most effective mitigation measure against labor influx is to avoid or reduce it. Depending on the size and the skill level of the local workforce, a share of the workers required for the project may be recruited locally. This is generally easier for unskilled workers, while more specialized staff (typically required in smaller numbers) frequently will be hired from elsewhere. Depending on the requirements of the project and their skill level, it may be possible to train local workers within a reasonable timeframe to meet project requirements. During the bidding process for civil works the proposed contractors shall be accountable for their responsibility to act on mitigation measures for the following actions:

- Promote the fair treatment, non-discrimination, and equal opportunity of workers;
- Protect workers, including vulnerable categories of workers such as women and migrant workers;
- Promote safe, healthy working conditions & the health of workers;
- Provide a grievance mechanism for workers to freely raise workplace concerns;
- Avoid the use of forced labor;

¹¹ *Khashar* is a neighbors / communities tradition of voluntary jointly organizing and conducting activities aimed at improving the social infrastructure and landscaping.

¹² The resolution of the Cabinet of Ministers of Republic of Uzbekistan No. 349, May 10, 2018 "On additional measures to eliminate forced labor in the Republic of Uzbekistan.

¹³ Presidential Decree No. 5780, August 13, 2019 "On additional measures to strengthen the protection of private property and guarantees of property rights, radically improve the organization of work to support entrepreneurial initiatives, as well as expand the access of business entities to financial resources and production infrastructure"

- Avoid use of child labor (below 18 years age);
- Initiate training and skills development programs prior to the commencement of construction to ensure members of local workforce are up-skilled and can be employed on the project;
- Ensure construction jobs are targeted to the local people.
- Hire as many local workers as possible to avoid labor influx;
- Encourage contractor to pay equal wages to men and women;
- Ensure social insurances of the workers;

The general mitigation measures shall be described in ESMP that will be developed during the project preparation as part of the tender package and construction contract. During preparation, the project ESIA and the ESMP should identify the risks of labor influx, avoiding forced and child labor. The ESMP should be included in the bid documents.

6.5. GENDER AND DEVELOPMENT

Gender dimension in social safeguards. Gender is a key issue in social risk management in view of the differential vulnerabilities of affected men and women. In view of their higher vulnerability levels, specific measures are proposed to enable the affected women-especially that are poor and vulnerable, to cope with the Resettlement and Rehabilitation (R&R) process. The process of gender inclusive social risk management and resettlement planning include the gender analysis, project specific gender considerations and a gender strategy and action plan.

Women will be given equal access to resources and services and provided with opportunities that would empower them to participate in the development process. Gender equity principles will be enshrined in the RPF and relevant E&S management plans. For instance, ensure that land titles and compensation entitlements are equally available for women, and project employment opportunities are equally targeted at men and women. Therefore, during the project implementation a gender assessment study need to conduct and if necessary the following mitigation measures have to be undertaken:

- Gender responsive consultation strategy and gender disaggregated data during census and socio-economic survey
- During resettlement planning, include following gender consideration:
 - Special attention to women headed households in the relocation and post resettlement process with targeted livelihood assistance;
 - Encouraging women participation in management of resettlement planning etc.

The social risk management and resettlement instruments prepared for the subprojects shall include a strong section on gender and social inclusion statement. Some of the gender considerations that need to be addressed in the RAP include: (a) provision of title of the alternative house in the joint name of spouses if both are willing and in the name of the mother and the children, in case of the husband is dead; (b) special attention to women headed households in the relocation and post resettlement process with targeted livelihood assistance; and (c) encouraging women participation in management of resettlement buildings. The objective of this gender strategy is to ensure equity in the resettlement process enabling the economically and socially women and their families to sustainably re-establish their shelter and livelihoods.

Gender dimension in WSS. Women represent more than half of the population of project beneficiaries. Women are generally responsible for household activities including water collection and treatment, meal preparation, washing dishes, laundry, child care and sanitation. The 2015 World Bank study¹⁴ estimated that 1.5 times as many women as men participate in collecting water who, among other things, report lower back pain from repetitive lifting and moving heavy containers. Furthermore, time spent for this activity is significant, due to long distances to the nearest water sources (for example, standpipe or canals). Women (and children) spend on average 22 person-hours per month collecting water as well as additional time

¹⁴ Social Impact Analysis of Water Supply and Sanitation Services in Central Asia: The Case of Uzbekistan. World Bank, 2015.

boiling water for drinking, heating water for laundry and bathing.¹⁵ Hand laundry takes almost the same amount of time. Women are usually responsible for hygiene and sanitation in the households including disposal of solid and liquid domestic waste. Inadequate and poor-quality services negatively impact women's economic opportunities. Time saved from fetching water and hand laundry can be utilized for income-generating activities, self-education or social activities.

Under Component 3, the activities will provide better conditions for women reducing their time spent on fetching water through improving existing and new connections to piped potable water supply systems within in their homes or yards. The project will directly benefit around 93,500 women saving around 66 working days per woman per year, which can be effectively used to generate additional income. Time savings for women that will benefit from new connections will be monitored at baseline, midterm and completion. Moreover, women across the sub-project areas will receive access to centralized sewerage systems that will improve the hygiene and sanitation practices. At the same time, women's participation in the decision-making process, especially at the local level, is limited. Traditional decision-making mechanisms tend to involve largely men and exclude women and youth from the process. The project will support active participation of women and seek to address specific gender-related needs, including gender-informed activities to support inclusion and equality. Under component 1 and 4, the design and implementation of awareness campaigns will include a central role for women's groups. This approach acknowledges that women are often powerful agents of change at the household level; provide an important gender perspective to the issues; and give voice to women in the community. In Uzbekistan, the number of women's groups is relatively low, and yet they are active and focus on specific needs of women in the country.

Gender and employment opportunities in WSS sector. Women are underrepresented in WSS sector staff at all levels. When employed, women in Suvokovas are typically assigned to domains traditionally considered for females such as accounting, finance, customer relations, and laboratories. The ADB study (2018)¹⁶ reported that only 10% of employees in the central apparatus of MHCS and 5% of employees in Kommunkhizmat Agency are represented by women. A similar disparity exists in regional Suvokovas: 7% (Samarkand), 11% (Syrdarya) and 15% (Karakalpakstan) with very low level at managerial positions and in operation and maintenance (manual labor); while the share of engineering and technical staff is higher: 20%, 23% and 19%¹⁷ respectively.

The project will take steps to integrate gender approaches in corporate governance and increase gender diversity. HR policies, guidelines and procedures of MHCS, Kommunkhizmat Agency and target Suvokovas will be reviewed on gender responsive recruitment, job descriptions, job advertisements, professional development and promotion, flexible work arrangements. Based on the assessment, the project will develop sex-disaggregated HR databases in MHCS and two Suvokovas (except for Karakalpakstan)¹⁸ and Gender Enhancement Plans. Such plans should include assessment of gender inclusion, potential for enhancement, HR policies, incentives to recruit women or increase their capacity and other interventions and pre-requisites to improve gender balance in the Suvokova staffing, especially in managerial, operational and technical positions. The project will also make sure that capacity-building activities will be equally accessible to women and men and will offer gender-awareness trainings and targeted leadership and communication trainings for women.

The project will focus on closing two gender gaps: (i) eliminate disproportional burden on women in project areas and (ii) advance opportunities for employment. The project will address these gaps by (i) financing

¹⁵ Asian Development Bank. 2018. Uzbekistan Country Gender Assessment. Update.

¹⁶ Asian Development Bank. 2018. Uzbekistan Country Gender Assessment. Update.

¹⁷ Suvokova data as of October 2019.

¹⁸ In Karakalpakstan, ADB's Western Uzbekistan Water Supply System Development Project (2019-2025) is implementing a gender action plan with the objectives to ensure women participation in project implementation and monitoring, customer outreach and public awareness on sanitation and hygiene, strengthened management with focus on women needs, including gender analysis of HR policies, gender capacity building and gender responsive recruitment.

investments that improve access to quality and reliable drinking water to households and other high priority social institutions (including pre-schools, schools and health centers) and (ii) developing Gender Enhancement Plans for the respective sector institutions. The project includes results indicators to monitor these actions. Service satisfaction surveys will provide data on the time savings and level of women's satisfaction with the quality of services. The project will also seek to ensure that project committees conduct outreach with women's groups and involve women in consultations, project committees and any other community-based social accountability roles, i.e., monitoring and oversight.

Gender-based violence. The project is anticipating insignificant labor influxes, most workers are expected to be mobilized locally or other regions of Uzbekistan. However, many subprojects will be implemented in remoter areas (including small district towns and rural villages), where awareness and GBV-related support services may be limited. The capacity of PCU staff and contractors to adequately address GBV issues will be assessed and capacity building measures will be planned under each specific ESMP. The project will undertake awareness-raising measures to sensitize all direct and contracted workers and members of beneficiary communities on GBV-related risks. A code of conduct with clear enforcement measures will be prepared for the project, which all project staff and contractor employees will sign. The code of conduct will be widely publicized in beneficiary communities and around specific civil works sites. Project and Contractor's ESMP will include provisions to minimize GBV-related risks, including separate, safe, and easily accessible facilities for women and men, and visible display of signs around the project sites that indicate intolerance for any behaviors that could be associated with GBV. The project will ensure that safe and confidential channels for reporting GBV-related concerns will be made available to project workers and communities.

6.6. CITIZEN ENGAGEMENT

Citizen engagement is defined as the two-way interaction between citizens and governments within the scope of WBG interventions – investment projects, programs, advisory services and analytics – that gives citizens a stake in decision-making with the objective of improving the intermediate and final development outcomes of the intervention. The spectrum of citizen engagement includes consultation; collaboration and participation; and empowerment. Access to information is a necessary enabling condition, but it typically implies a one-way interaction only. Information-sharing and awareness-raising activities alone, therefore, do not meet the definition of citizen engagement. Closing the feedback loop (i.e., a two-way interaction providing a tangible response to citizen feedback) is required to meet citizens' expectations for change created by their engagement, use their input to facilitate improved development outcomes, and justify the cost of engaging with them.

In frame of WASIS, design and implementation of subprojects will draw upon and be guided by results from consultations, citizen satisfaction surveys and grievance-redress mechanism to ensure that citizens are engaged throughout the project cycle. Communities within the project areas will be engaged to ensure that the needs of vulnerable households are considered. Community committees will be established with representation of women, disabled, disadvantaged and other vulnerable groups and hold regular meetings to discuss project implementation, quality of services provided by Suvokovas, and provide proposals/suggestions. A beneficiary satisfaction survey will be conducted at the project start, at midterm and upon completion. The project will also establish a grievance redress mechanism to record and address consumers' complaints related to project implementation. During subprojects preparation, the ESMP should be developed which will describe methods and mechanisms of citizen engagement and will include detailed action plan.

Definitions

According to the Strategic Framework for Mainstreaming Citizen Engagement in World Bank Group Operations following definitions are used in Citizen Engagement:

- **Citizens** are understood as the ultimate client of government, development institutions', and private sector interventions in a country. Citizens can act as individuals or organize themselves in associations and groups such as community-based groups, women's groups, or indigenous peoples' groups. Makhalla can represent citizens and can include organizations outside the public or for-profit sector, such as nongovernmental organizations (NGOs), charitable organizations, faith-based

organizations, foundations, academia, associations, policy development and research institutes, trade unions, and social movements.

- **Beneficiaries** are defined as a subset of citizens directly targeted by and expected to benefit from the World Bank project and CE mechanisms will help to establish two-way interaction with them.
- **Citizen engagement** is defined as the two-way interaction between citizens and governments or the private sector within the scope of WBG interventions—policy dialogue, programs, projects, and advisory services and analytics—that gives citizens a stake in decision-making with the objective of improving the intermediate and final development outcomes of the intervention.

Proposed citizen engagement mechanisms

Citizen engagement will be regulated by PCU. Apart from consultations and meeting at local levels, ICT platforms will be actively used to collect opinions, feedbacks and recommendations given by citizens and stakeholders. This will be done through application of multiple uptake channels such as mail, e-mail, telephone, project website. In order to establish systemized CE, PCU will establish close contact with representatives of Makhallas. In frame of WASIS following citizen engagement mechanisms are proposed:

- **Consultations.** Public consultations will be organized during the feasibility study period of each subproject. The objectives of consultations are to share proposed activities of the project and get the comments, ideas, and recommendations from citizens at respective project areas towards improvement of policies and programs within the project.
- **Focus Group Discussions.** Focus groups are composed of a small number of stakeholders to discuss project impacts and concerns and consult in an informal setting. They are designed to gauge the response to the project's proposed actions and to gain a detailed understanding of stakeholders' perspectives, values, and concerns.
- **Grievance Redress** is a system by which queries or clarifications about the project given by citizens at each subproject areas are responded to, problems with implementation are resolved, and complaints and grievances are addressed efficiently and effectively.
- **Participatory planning** convenes a broad base of key stakeholders and citizens, on an iterative basis, in order to generate a diagnosis of the existing situation and develop appropriate strategies to solve jointly identified problems.
- **Citizen Satisfaction surveys** provide a quantitative assessment of each subproject performance and service delivery based on citizens' experience. The surveys collect data on water supply, sewerage and other physical works set in each subproject.
- **Participatory Monitoring and Evaluation** is a process through citizens and stakeholders at various levels engage in taking or identifying corrective actions in monitoring or evaluation process through their feedbacks, recommendations and opinions.

6.7. ETHNIC MINORITIES

The experience of other projects in Uzbekistan shows that all the ethnic groups living in the country have equal access to all social and other services, including health, education, and water and sanitation. None of the groups are socially excluded either in terms of legislation or in terms of the actual situation. Further, none of the ethnic groups maintain cultural or social identities and characteristics separate from the mainstream Uzbekistan society that would classify them as ethnic minorities. Anyhow, during the FS stage further SA surveys have to ensure that this tendency is correct.

7. INSTITUTIONAL MECHANISMS AND CAPACITY FOR IMPLEMENTATION

The Ministry of Finance (MoF) of the Republic of Uzbekistan is the main borrower of the Water Services and Institutional Support Program while the “Kommunkhizmat” agency under the Ministry of Housing and Communal Services is the Implementing agency. The “Kommunkhizmat” agency (Communal Services Agency or CSA) has considerable experience and expertise with providing drinking water and wastewater management services as well as in coordinating with government ministries and donors. The Agency has its branches (Suvokavas) in all the regions of the Uzbekistan, including district and city level departments. To prepare and coordinate the WSISP, the CSA has established the Project Coordination Unit (PCU) at the national level to coordinate and implement the project in the Republic of Karakalpakstan, Syrdarya and Samarkand regions. For the Component #2 goals the PCU will work also with all 14 regional Suvokavas. At the regional level, the program will be implemented through regional Suvokavas and regional PCUs (R-PCUs), which will work in close cooperation with the relevant regional khokimiyats.

The PCU established under the Kommunkhizmat Agency and is led by a Project Director with relevant staff, will support the MHCS to ensure that the program is delivered in accordance with its objectives and design in a timely and efficient manner. The PCU will report to the Kommunkhizmat Agency.

The PCU will be responsible for project preparation, day-to-day project management and coordination, including the development of the ESMF, safeguards issues, procurement, financial management, submission of withdrawal applications, monitoring and evaluation, safeguards management and interaction with the Bank, Suvokavas, and other stakeholders. The PCU shall be staffed with enough qualified specialists to ensure effective implementation of the program. At the moment of ESMF disclosure, PCU’s existing capacity include Project Director (Coordinator), Monitoring&Evaluation Specialist, Engineer, Procurement Specialist, Financial Management Specialist. PCU shall recruit qualified Environmental and Social Safeguards Specialist at the soonest. At local level, three regional PCU offices will be established in each region at Suvokava offices. PCU regional coordinators will be supported by engineers, safeguards specialists, M&E specialists, and translators as needed.

The PCU will be supported by a Project Management Consultant (PMC), EE Consultant (EEC), and Detailed Design and Construction Supervision Consultants (DDCSC). These consultants will be contracted by the PCU and will have specific responsibilities, to support respective areas of implementation, to be specified in their terms of references. The PMC will be an international firm, staffed with a team of International Specialists who will work side-by-side with the PCU on daily basis to support overall management of the program. The PMC will also be tasked with training and professional development activities to ensure strengthening of the Kommunkhizmat Agency’s institutional capacity for investment planning, design and implementation.

The EEC will facilitate implementation of Component 2 and provide specialized support to the PCU. The EEC will be responsible for energy auditing, identification of EE measures, supervision of the Component 2 investments, measurements and verification of energy and cost savings.

The detailed design and construction supervision consultants will provide support to the PCU / Kommunkhizmat Agency for preparation of detailed engineering designs, tender documentation, bid evaluation support (as needed), construction supervision and contract administration (acting as the Engineer on behalf of the Employer on construction contracts).

The PCU will also be responsible for interaction with environmental authorities, ensuring effective implementation of safeguards documents and will carry out spot checks, environmental supervision and monitoring, assessment of compliance with environmental standards at workplaces, and advising regional PCU (R-PCUs) of Karakalpakstan, Syrdarya and Samarkand regions on environmental and social protection issues. The R-PCU will also include one environmental specialist who will be responsible for ensuring that project activities are carried out in accordance with the WB's Safeguards Operational Policy and national EA rules and procedures. The PCU will be, also, responsible for identifying ESA training needs of all parties involved in ESMPs and RAPs implementation. Among main duties of Environmental SS are the following:

- Undertake a thorough review of the sub-projects' environmental classification in accordance with the WB requirements;
- Providing EA consultants with guidance on the preparation of Category B and C EA documents in accordance with WB requirements;
- Providing EA consultants with guidance on consulting and disclosure requirements for Category B projects;
- Providing EA consultants with guidance on identifying subprojects that would have impacts on cultural heritage sites, natural habitats, forests and international waterways, - subprojects which are to be excluded from the project financing;
- Review of EA documentation, submission of written comments to R-PCUs, EA consultants, ultimately ensuring formal approval of documentation and procedures as required by WB safeguards;
- Ensuring that the subprojects documentation included ESA implementation agreements and any other environmental or social safeguards requirements;
- Oversee jointly with the R-PCUs SS the implementation of the ESMP by the construction contractor and the implementation of documents, recommendations and any further actions required as part of the overall reporting of the WB project supervision;
- Be open to comments from affected groups and local environmental authorities regarding the environmental aspects of subproject implementation. Meet with these groups during site visits, as appropriate;
- Coordination and liaison with the WB Supervision Mission with regard to environmental safeguards aspects of the subproject.

The Land Resources and State Cadaster Departments (LRSCD) for each District in the Project is responsible for identifying and verifying property boundaries and ownership. They also will clarify land allotment certificates for agricultural land that has been formally registered and transferred to the Immovable Property Registration Offices.

Regional “Suvokavas”, district and city khokimiyats and local communities (mahallas) are the final beneficiaries of the project implementation; it is required continuous assistance and presence during all the progress of the project. They will be responsible for the coordination of the implementing procedures and execution of the compensation together with MCS/PCU.

The PCU established under the Kommunkhizmat Agency and is led by a Project Director with relevant staff, will support the MHCS to ensure that the program is delivered in accordance with its objectives and design in a timely and efficient manner. The PCU will report to the Kommunkhizmat Agency.

The PCU will be responsible for project preparation, day-to-day project management and coordination, including the development of the ESMF, safeguards issues, procurement, financial management, submission of withdrawal applications, monitoring and evaluation, safeguards management and interaction with the Bank, Suvokavas, and other stakeholders. The PCU shall be staffed with enough qualified specialists to ensure effective implementation of the program. At the moment of ESMF disclosure, PCU's existing capacity include Project Director and Monitoring&Evaluation Specialist. PCU shall recruit qualified Environmental and Social Safeguards Specialist at the soonest. At local level, three regional PCU offices will be established in each region at Suvokova offices. A PCU regional coordinator will be supported by engineers, safeguards specialists, M&E specialist, and translator.

8. MONITORING AND REPORTING ACTIVITIES

8.1. KEY SOCIAL MONITORING AND REPORTING REQUIREMENTS

The social effectiveness and sustainability of Project implementation can be monitored in a number of ways, including through regular reporting of target Suvokavas supplemented with independent socio-economic surveys. The evaluation of the condition of water supply and water sewerage infrastructure, as well as the assessment of the services' quality can be conducted in a participatory manner so that different stakeholder groups can voice their opinions and suggest mechanisms to improve Project implementation and further sustainability.

To assess the effectiveness of the Project several types of indicators of socio-economic development can be used:

- Indicators of infrastructure conditions including quality of water, Indicators of facilities production (including water delivery schedule, water pressure in pipes), and effectiveness and enhanced capacities of vendors;
- Indicators of living standards of the population linked to potable water and sanitary, including employment/self-employment growth, share of income spent for water delivery and improvements, population health indicators, number of households, schools and clinics with improved water supply and sanitation etc.
- Indicators of participation, awareness and willingness to participate in project activities and to pay for improved water supply and sewerage systems, and
- Indicators of RAP implementation, grievances and conflicts resolution, GAP and capacity building programs implementation, training programs for specialists and population results etc.

Each indicator has to be collected using a unified procedure to ensure compatibility with the indicators of the previous period and/or with normative (standard) indicators (for example, water quality related indicators). Selected monitoring indicators can be used for assessing the social effectiveness and poverty impact of the Project.

The WB policy provides for the relevance of cross-cutting gender expertise for projects/subprojects. These requirements should ensure equal participation of women in the decision-making process and the equal sharing of benefits/resources resulting from the projects, i.e. the interests of women and girls should be taken into account in the social assessment at all stages of the implementation of the program "Water services and Institutional support program" and, therefore subprojects. The implementation stages can be roughly divided into four processes: planning, implementation/execution, monitoring/evaluation and management.

Planning: At this stage, the gender dimension of the assessment is that women understand the socio-environmental risks of the planned projects, i.e., what risks the projects pose to their social and environmental environment in general, how the projects will impact on the community's way of life, and whether these impacts will always be beneficial. Women's participation in the selection and planning process of subprojects will minimize risks, taking into account the needs and interests of women.

Implementation: At this stage, the gender dimension of the social assessment will be reflected in two components: the first, the procedure for involving women and girls in the implementation of the sub-project, and the second, their functional responsibilities. The procedure for involving women and girls in the implementation of subprojects should be as free as possible from traditional gender stereotypes, which contribute to silencing women's voices and limiting access to activities. Representation of women in working groups, advisory councils, and access to paid employment should be specified in project documents and implemented in accordance with them. Functional responsibilities that allow women to participate at this stage should be related to their physiological and reproductive characteristics (work should not be physically demanding) and should not affect their reproductive functions).

Monitoring/evaluation of project results: women and girls, as a large group of beneficiaries of subprojects, will need to be able to make recommendations on the quality of their work. This approach will help to identify hidden social and environmental risks that were not analyzed in the course of subproject planning. Their participation at the stage of monitoring and evaluation of subprojects will influence the formation of public opinion regarding equal/fair consumption of project results.

Results management: Projects/subprojects with public benefit can often stop having a positive impact in two cases: firstly, when the project/subproject has a certain attractiveness for a small group of people with a certain power; secondly, when projects require constant financial support for the results. "Women's voice in this context is important to ensure fair and equitable use of results, as well as continued resource mobilization to sustain project results. It is also important to take into account the fact that the main beneficiaries of subprojects are women and girls.

8.2. ENVIRONMENTAL MONITORING

Sub-projects will be monitored on a regular basis through the monitoring of ESMP implementation by contractors throughout the construction phase.

Environmental and social issues included in the mitigation framework are monitored and monitored by designated specialists through the PCU. Although the environmental and social impacts are expected to be quite low, the potential negative impacts on the environment are planned to be prevented or mitigated during the construction and operation phases. Monitoring is based on impact / mitigation / monitoring issues as defined in the ESMP and/or ESMP checklists of subprojects. Observation monitoring will be carried out through weekly audits of the environmental performance by contractors throughout the construction period. The PCU has the right to suspend work or payments if the Contractor is in breach of any of its obligations to implement an ESMP.

Instrumental monitoring of environmental quality, such as air and water quality. Given the types of activities that will be carried out within the framework of this project, instrumental monitoring may not be carried out. However, in the event of complaints of environmental disturbance/convenience from local communities, the Contractor shall conduct analytical measurements of air or water quality through a certified laboratory. In addition, World Bank experts will also conduct field visits to verify compliance. As mentioned above, in the case of non-compliance with the PCU, the nature and cause of the non-compliance will be investigated and a decision will have to be made on what is necessary to bring the subproject into compliance or funding will have to be suspended.

The environmental management plan is presented in table 8.2.

Table 8.2: Environmental Management Plan

Stage	Problem	Mitigation measures	Responsible organizations	Conducting monitoring	Responsible organizations for monitoring the implementation of works (in the order of participation)
A. Restoration and construction works	Environment				
Construction and reconstruction of water supply and sewerage systems	1. Water resources				
	1.1. Pollution of water (surface or ground) by construction waste	Compliance with repair and construction standards and regulations; - Waste storage only in designated places	Contractor	Current technical control and supervision of construction works	Regional Suvokova, PCU, local construction supervision agency, local nature protection authorities
	1.2. Water pollution from construction sites	- Provision of surface and drainage water diversion from work sites; - Timely removal of construction waste; - Conducting rehabilitation works at the disturbed areas	Contractor	Periodically, during construction work	Regional Suvokova, PCU, local construction supervision agency
	2. Land resources				
	2.1. Soil contamination with construction waste	-Organization of timely collection of construction wastes, their transportation and storage in the designated places	Contractor	Periodically, during construction work	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities of SES (Sanitary Epidemiological

	2.2. Fuel and oil leakages	- Lubricant containers must be filled according to the regulations; - Do not allow used oil products to be drained onto the terrain; - Comply with refuelling and transportation	Contractor, working technicians	Routine monitoring during construction works	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities of SES and nature protection
	2.3. Breakthrough of water and sewer pipes and flooding of adjacent lands	Urgent work on pipeline rehabilitation and land restoration	Contractor	Periodically, during construction work	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities of SES and nature protection
	3. Atmospheric air				
	3.1. Dust from excavation	Irrigation of roads, construction sites and adequate transport coverage for waste transportation	Contractor, drivers of the corresponding cars	Periodically, during construction work	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities of SES and nature protection
	Emissions from operating units and vehicles	Supervision of the physical condition of cars. Compliance with filling regulations	Contractor, drivers of the corresponding cars	Periodically, during construction work	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities of SES and nature protection
	3.3. Noise, vibration from working machines	Compliance with operational requirements	Contractor	Periodically, during construction work	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities of SES and nature protection
	4. Flora				

	Damage of trees and vegetation cover	All the destroyed vegetation is subject to restoration. Decorative trees that have been damaged during the repair and rehabilitation works will be replaced	Contractor	After the work is done	Regional Suvokova, PCU, local agency for supervision of construction work, local authorities on nature protection
	5. Physical cultural heritage				
	Chance finds of cultural value	Termination of work, notification of interested organizations, extraction of finds according to the established rules	Contractor	Constantly, as the extraction of finds	Regional Suvokova, PCU, Regional Inspectorate for Cultural Heritage Protection
	Flooding and negative impacts on cultural heritage sites	Elimination of leakage and accidents at sewerage collectors	Contractor	Periodically, during construction work	Regional Suvokova, PCU, Regional Inspectorate for Cultural Heritage Protection, Hydrogeological
	6. Socio-economic aspects				
	Safe and healthy working conditions, elimination of accidents and incidents	Ensuring occupational safety and health regulations through the correct selection and technically sound size of workplaces and their	Contractor	Constantly	Regional Suvokova, PCU, local agency for supervision of construction work
B. Operation and maintenance	Environment				

Wastewater treatment facilities	Pollution of soil and water by sediment.	Strictly regulated collection and disposal of sediments at designated locations and their disposal	Wastewater treatment plant workers, Regional Suvokova	Regularly, according to a set schedule	Local staff Regional Suvokova, nature protection authorities, SES
Sewage leaks during transportation .	Flooding, water and soil pollution	Timely detection of faults on the network, elimination of leakages in a short time, control over compliance with the discharge of	Local staff Regional Suvokova	Periodic monitoring	Local staff Regional Suvokova, nature protection authorities, SES
Chlorine emissions from wastewater treatment	Atmospheric air pollution with chlorine	Installation of a scrubber for chlorine capture, a tank with a neutralizing solution, a pump for pumping the neutralizing solution gas analyzer, which neutralizes the	Local staff Regional Suvokova	Periodic monitoring	Local staff Regional Suvokova, nature protection authorities, SES

<p>Operation of wastewater treatment plants and sewer networks</p>	<p>Pollution of water resources, soils, deterioration of ecological situation and public health</p>	<ul style="list-style-type: none"> • Timely develop environmental and other criteria regulating the maximum permissible environmental impact ; • Comply with the regime of discharges of treated wastewater and the established standards of their quality, protection of water bodies from pollution, contamination ; • Carry out technological, forest reclamation, hydrotechnical, sanitary and technical measures in coordination with the state control authorities; • Discharge municipal, drainage and other waste water with the permission of nature protection authorities in accordance with the established procedure ; • Comply with the sanitary protection zone at the sewage treatment plant ; • Introduce non-waste and low-waste 	<p>Local staff Regional Suvokova</p>	<p>Annual monitoring of discharges of treated wastewater. Periodic control by nature protection authorities over compliance with the conditions of waste water discharge</p>	<p>Local staff Regional Suvokova, nature protection authorities, SES</p>
	<p>Socio-economic aspects</p>				

Operation of wastewater treatment plants and sewer networks	Occupational Health and Safety .	Develop a comprehensive program to improve occupational health and safety for maintenance personnel	Local staff Regional Suvokova	Periodic monitoring	Local staff, Regional Suvokova, SES.
Disinfection of treated wastewater	Threats to the health of workers	Operation of decontamination equipment in compliance with the established standards	Local staff Regional Suvokova	10-day control	Local staff, Regional Suvokova, SES.
C. Additional measures	Environment				
Equipping the hydrochemical laboratory Regional Suvokova	Insufficient monitoring of specific ingredients in wastewater	Equipping laboratories with instruments and techniques to identify specific ingredients	Kommunk hizmat, PCU, Regional Suvokova	On a regular basis	PCU, Regional Suvokova, nature protection authorities
C. Energy efficiency component	Environment				
Operation of photovoltaic panels	Pollution of grounds, surface and ground waters, soils	Eliminating oil contamination at the transformer site by diverting oil from the oil receivers to an oil reservoir; Use of demineralized water for washing panels without chemicals; Elimination of cadmium use in	Local Staff, Regional Suvokova	On a regular basis	Local staff, Regional Suvokova.

Increasing energy efficiency by installing bio gas at WTP	Pollution of sludge by heavy metals and pathogens.	Biological disposition of metals in the sediment in the form of insoluble or slightly soluble amino acid complexes in water, which do not have a toxic effect on humans, animals and natural microflora.	Local Staff, Regional Suvokova	On a regular basis	Local staff, Regional Suvokova.
---	--	--	--------------------------------	--------------------	---------------------------------

8.3. ENVIRONMENTAL AND SOCIAL MONITORING

Component 3 will support Monitoring and Evaluation (M&E) activities to track, document and communicate the project management, monitoring and evaluation, and capacity building. This component supports the PCU development and implementation of a geo-referenced management information system on the Internet, and monitoring of baselines, milestones and outcomes. PCU is responsible for overall compilation of progress and results. It is suggested that semi-annual reports and quarterly unaudited IFRs will be submitted to WB. These reports should include the scorecards of communities on project implementation and success along with financial records, project implementation records, social audit meetings, and feedback and grievances received. Results measurements are outcomes defined in the results framework and set of output indicators defined in POM. The PCU will be responsible for producing a completion report. All environmental and social issues are monitored and supervised by PCU or R-PCUs SS. In spite of insignificant social impact the potential negative impacts must be prevented or mitigated during construction and operation stages.

Environmental and social monitoring system starts from the preparation phase of the subproject through the operation phase in order to prevent negative impacts of the project and observe the effectiveness of mitigation measures. This system helps the WB and the Client to evaluate the success of mitigation as part of project supervision and allows taking an action when needed. The monitoring system provides technical assistance and supervision when needed, early detection of conditions related to mitigation measures, follows up on mitigation results, and provides information of the project progress. Monitoring Plan identifies monitoring objectives and specifies the type of monitoring, and their link to impacts and mitigation measures. Specifically, the monitoring section of the ESMP 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.

In a case the M&E CC to be hired this undertakes monitoring and verification of processes and activities in RAP implementation and would submit quarterly reports. The CC would also undertake an end-term evaluation post RAP implementation to ascertain if the RAP objectives have been achieved. It is the responsibility of the CC to identify gaps based on desk reviews and field visits and provide timely inputs for course-correction to MHCS to improve implementation and outcomes, to recommend measures necessary to build capacity and provide requisite training to implementation staff and other stakeholders such as civil works contractor. Some of the key activities would include monitoring and verification of:

- a) timely payment of compensation and assistance and prior to the commencement of civil works;
- b) processes followed in the dissemination of information on the project and eligible entitlements as well as the quality of consultations;
- c) processes followed in the relocation of PAPs as per relocation plan, if displaced;
- d) provision of replacement cost (towards the cost of structures, shifting and replacement house);

- e) relocation of all common properties such as toilets, temples, etc.
- f) the provision on livelihood support measures, training towards rehabilitation;
- g) provision of work opportunities to PAPs and other community members during civil works;
- h) grievances received and redressed.

Impact evaluation of the project must be taken up twice – during the project’s midterm and again as an end term at the end of WASIS. End term impact evaluation exercise to be carried out within two months of completion of RAP (if any) implementation. This includes evaluation the ARAP implementation – activities, processes, and outcomes; assertion if there are any pending issues and making recommendations towards the improvement of outcomes, if any. The key socio-economic indicators developed during SIA and as presented in the RAP must be used for impact evaluation. It is recommended prior to commencing the evaluation exercise, these indicators will be further refined and improved upon by the agency in consultation with MHCS/PCU.

9. EA CAPACITY BUILDING ACTIVITIES

The implementation of the ESMF requires specific knowledge for beneficiaries and operators engaged in the different phases of the project implementation. The project will support relevant trainings on knowledge and information on topics such as the ESMF implementation, ESMF/ESMP reporting, World Bank EHS Guidelines, management of hazardous materials and etc. For this purpose, before the civil works will start, the PCU will hire a Consultant with knowledge on the environmental and social management requirements for Republic of Uzbekistan, along with substantial knowledge on World Bank safeguards policies and requirements which will provide ESA training. The training will include the basic requirements of the WB and National safeguards rules and procedures, as well as case studies in this regard. The training activities will continue also during the project implementation when the consultant will provide on the job training regarding environmental and social monitoring and supervision. The proposing the Project's capacity building on environmental and social aspects will cover three main directions:

- i) ***PCU's and R-PCUs' capacity*** on ESMF implementation during sub-projects selection process and sub-project construction stages – the hired Consultant will provide respective training for PCU and R-PCUs's staff and SSs on WB OPs safeguards requirements, ESMF, ESMP, RPF and RAP preparation and further assistance in monitoring of the RAPs and ESMP.
- ii) ***Beneficiaries' Capacity/oblast/districk hokimiyats***, - on development of ESIA, ESMP and RAPs. Since the program will be implemented during several years, the Consultant will provide training for local authorities involved in preparation of ESA reports and conduction per national EA environmental and social assessments. The training will be dedicated to harmonization of process of WB's EISA and national ESA. The target will be to educate EA developers and specialist from local environmental agencies to prepare the documents which meet WB safeguards standards as well.

A separate training on handling, collection and disposal of hazardous materials (especially on asbestos materials) for PCU's, PRCUs' SS and contractors will be provided by the Consultant before starting civil works. As per national requirements the contractors will have to conduct OH&S training for workers with indication in special logbook which will be kept on each construction site.

For the project sustainability it is important along with physical interventions, institutional improvements and financial enhancing, to increase people awareness on the project related topics, particularly waste management, water supply and sanitation aspects. It is proposed, that hired Consultant in collaboration with national NGOs and relevant agencies will develop awareness program which will cover three mentioned above topics and delivered to the target groups through seminars. The tentative plan of capacity building and training plan is presented below.

Table 9.1: Tentative plan for capacity building and training program

	Name of training	Time and tentative duration of the training	Recipients	Organizer	Tentative cost
1	Overview on WB OPs on environmental and social safeguards and their implementation during the project cycle. National Environmental requirements for project preparation and implementation	During first year of Project implementation Duration – 1 day	MEI; PCU R-PCUs	Consultant	6,000 USD
2	Preparation and Implementation of ESMF, ESMP, RPF and ARAP/RAP	Before sub-projects selection and approval Duration - 2 days	PCU's and R-PCUs' SS	Consultant	6,000 USD
4	Implementation of Gender Action Plan	Before project implementation on the ground 2 days	PCU; R-PCUs; Local authorities	Consultant	4,000 USD for each region Total 12,000
5	OH&S, Handling and disposal of hazardous materials	Before starting respective works 1 day	PCU; R-PCUs SS; Contractors	Consultant	4,000 USD for each region Total 12,000
6	Awareness program,	Continuously during the program implementation	General Public, Main stakeholders	Consultant, PCU and RPCUs	30,000 USD
7	Citizen Engagement Component	Continuously during the program implementation	PCU and R-PCUs SS	Consultant	4,000 USD for each region Total 12,000
	Total				78,000 USD

10. GRIEVANCE REDRESS MECHANISM

10.1 GENERAL CONCEPTS OF GRM

Realization of infrastructural projects is often a complex process which can be accompanied by complaints of affected persons, businesses and other stakeholders. To enable people to voice their questions and concern throughout the project, the grievance procedure described below was developed. This mechanism provides for the appeal of any actions and decisions violating the rights and freedoms of citizen affected by the project and it complies with the law of the Republic of Uzbekistan No. ZRU-378 dated 3 December 2014 “About appeals of physical and legal persons” which guarantees rights of citizens and regulates responsible parties to handle appeals from citizens. This law also clearly determines types of queries, deadlines of submitting applications, proposals and complaints. A special appeal mechanism will be managed by heads of organizations or responsible persons especially appointed for grievances arise from affected households.

The WB requires the Executing Agency to establish a project related grievance redress mechanism with suitable grievance redress procedure to receive and facilitate resolution of concerns, complaints and grievances of affected persons. A grievance mechanism will be established to allow affected persons to appeal any disagreeable decision, practice or project activity. The Executing Agency will ensure that grievances and complaints are addressed in a timely and satisfactory manner. All the potentially affected persons will be fully informed of their rights and procedures for addressing complaints whether verbally or in writing, including, if necessary, resort to the courts through the Government’s grievance mechanism. All possible instruments will be made available to affected persons to resolve their grievances at the project level. In case if after completion of detailed design any impact is determined, the information on the project grievance mechanism will be disseminated to affected households on local language through khokimiyats, mahallas or village assemblies of citizens or farmers’ councils.

The grievance mechanism shall not impede access to the country’s judicial or administrative remedies. Affected persons can approach a court of law at any time and independent from the project level grievance redress process. The Executing Agency will establish appeal mechanism based on the legislation of the Republic of Uzbekistan and WB requirements.

10.2 NATIONAL LEGISLATION

National legislation on citizens' appeals provides for two legal regulators that strengthen the complaints mechanism in order to best protect citizens and the public from the impact of the project. The first regulator, the Law of the Republic of Uzbekistan "On the appeal of individuals and legal entities", which provides a mechanism for appeal to public authorities and citizens' self-governance bodies. The second regulator is the Decree of the President of the Republic of Uzbekistan "On the establishment of the people's reception desks of the President of the Republic of Uzbekistan", which deal with the problems of the population at the district, region and republican levels. Another alternative mechanism for considering complaints and protecting the interests of citizens/population is the judiciary, and within the framework of this project, the administrative courts are responsible for examining complaints and protecting the interests of citizens/population.

According to Resolution of President of the Republic of Uzbekistan “On the Approval of the Provisions Associated with the Activities of The People’s Reception of the President of the Republic of Uzbekistan” No 4197 (February 19, 2019) among the main tasks of the People’s Reception are to review and agree on the list of settlements in which construction and improvement works will be carried out within the framework of the programs “WASIS”. These offices of the President of the Republic of Uzbekistan interact with state and economic authorities, request and receive documents and information from them. If necessary, they go to the site to study the execution of decisions taken on the results of consideration of appeals. These options are for people who might have any complains to be used until project-level GRM will take into effect.

10.3 ORGANIZATION OF A GRIEVANCE REDRESSES MECHANISM

The Project Coordination Unit of the Communal Services Agency will establish a simple and accessible grievance redress mechanism which shall ensure number of instruments and levels for grievance resolution and appeals process. PCU will have a Project Coordinator on the site who will be responsible for the project implementation and therefore implementation of GRM.

The Project Grievance Redress Mechanism shall not prevent any PAP to approach the national/government GRM system to resolve their complaints at any stage of the grievance redress process. The national GRM system which is regulated with the law of the Republic of Uzbekistan No. ZRU-378 dated 3 December 2014 “About Appeals of Physical and Legal Persons” which guarantees rights of citizens and regulates responsible parties to handle appeals from citizens. This law clearly determines types of queries, deadlines of submitting applications, proposals and complaints. Particularly, the Article 4 says that grievances can be applied orally or in written, both in hard copy or by e-mail. Article 6 says that a grievance can be applied in official language or in any other language convenient for an applicant. Article 19 fixes the dates for review and solving grievances received. Particularly, a government body must solve a grievance in 15 days. If additional documents are required, then this timeframe can be extended to 1 month. According, to the Article 21 an aggrieved person has a right to obtain information on the process of review of the grievance, provide additional information which can help to solve the grievance efficiently etc.

The main objective of the project specific grievance mechanism is to ensure timely and user-friendly solution of complaints received from affected persons. However, the Project Grievance Redress Mechanism shall not prevent any affected person, if any, to approach the national legal system to resolve their complaints at any stage of the grievance redress process. The affected persons can address their complaints to local courts at any time and not only after using the grievance redress mechanism of the project.

The below table describes the grievance redressing process of the project.

Table 10.3: Grievance redresses mechanism of the project and its levels

Level	Process
Level-1: Regional SUE “Suvokava” (or water utilities)	The aggrieved person applies to relevant district branch of SUE “Suvokava”. After registration of received complaints the relevant branch of SUE “Suvokava” will review nature/specificity of the complaint and will forward it to relevant party for resolving. In parallel, the branch of SUE “Suvokava” shall inform the PCU coordinator about the received complaint. Depending on the nature of complaint it may go to project contractor, land cadaster department, Makhalla or other local entity. During implementation of the GRM the branch of SUE “Suvokava” will be assisted by the Project Management Consultant and social safeguards specialist of PCU (in case the complaint is related to land acquisition issues). At this level, the complaint should be resolved during 2 weeks. The local branch of SUE “Suvokava” will inform the aggrieved person and PCU coordinator about undertaken measures and the outcome of the submitted question or complaint. PAPs also may submit their appeals to SUE “Suvokava” through the following e-government web site www.my.gov.uz .
Level – 2. Grievance Redress Committee	In case if the grievance was not redressed on the first stage or an applicant is not satisfied with the decision made/solution, PAP can submit the

	<p>grievance directly to Grievance Redress Committee (GRC) which will consist of officials of Hokimiyat, coordinator of PCU, officers of IA and PMC. The committee will review the complaint and made decision on its redress. Complaints shall be resolved in 15 days, and in case additional details are required, a maximum of 30 days will be used to resolve and close the complaint. In case this additional time is necessary, the complainant will be informed of the additional delay in writing. In case the grievance is not related directly to the project, the further instance will be recommended to the applicant where she/he should apply for the decision making. The EA through its PCU coordinator on a regular basis will check whether any complaint is received by district branches. At this stage APs also may submit their appeals to EA through the following e-government web site www.my.gov.uz.</p>
<p>Economic Court</p> <p>The Economic Court is not the level of the GRM. Affected Persons can approach the Court of Law at time during the Grievance redress process or independent of GRM and the grievance mechanism should not impede access to the country’s judicial or administrative remedies.</p>	<p>If the issue was not solved or the applicant is dissatisfied with the decision/resolution, or if applicant do not trust that the EA can resolve an issue/don’t want to rely on GRM then an aggrieved person at any stage of the GRM process may submit the grievance to Economic Court (Court of Law) where a decision will be made in accordance with relevant national legislation.</p>

10.4 DEADLINES FOR HANDLING COMPLAINTS

Depending on the severity of the nature of complaint, complaints/appeals to the PCU may be dealt with at different times. Complaints/appeals that do not require expert opinion can be considered within 15 days, with mandatory notification to the complainant. In other cases, where the complaint/appeal requires a thorough investigation with the involvement of specialists, the time limit for consideration of the complaint may be at least 30 days with mandatory notification to the complainant.

10.5 GRM RECORDS AND DOCUMENTATION

The Communal Services Agency and its Project Coordination Unit will keep record of complaints received for its use as well as for review by WB during regular missions. The grievance mechanism applies equally to all PAPs. The PCU will be responsible for monitoring the complaint, the step taken to address grievance, minutes of the meetings and preparation of a report for each complaint. The complaint handling process will be reported to WB through project progress reports.

10.6 GRM DISCLOSURE AND RAISING PUBLIC AWARENESS

The PCU should provide information on the scope of GRM, eligibility criteria for filing a complaint, the complaint procedure (where, when and how), the investigation process, the timeframe for receiving a response to complaints, and the principle of confidentiality and the right to file anonymous complaints. Information on the grievance processing system should be disseminated to all beneficiaries and persons affected by the project through regular information channels used by the project, including through

meetings at the beginning of the project, public hearings (on resettlement, ecology and social issues), public meetings during project implementation, brochures in local languages, posting on notice boards and on the Internet, and information as part of training activities carried out by the project.

Periodic public information campaigns should encourage the use of GRM and publish information on complaints received and resolved. Campaigns will use local media (e.g. television, newspapers, radio). In organizing and conducting these campaigns, special efforts should be made to communicate information to socially vulnerable groups.

11. ESMF DISCLOSURE AND PUBLIC CONSULTATION

11.1. ESMF DISCLOSURE

The environmental and social assessment process will be available to the public, thus all the involved parts will be consulted on project safeguard documents at least once (for category B projects) during the process. The Public Consultation is required to take place for the documents related to the overall project as specific ESMFs or ESIA's will be prepared for each activity.

Even national environmental legislation does not require conduction of public consultations, they will be organized under WB OP 4.01. It should be noted also that the regulation in the sphere of land acquisition and resettlement that will be adopted soon¹⁹ requires an "open public discussion" as an obligatory step of land acquisition process.

Prior conduction of public consultations the relevant project materials (Environmental Executive Summary) was disclosed in local languages (Russian and Uzbek) on website of Implementation Agency. All comments and recommendation provided during the public consultations need to be reflected into the final version of ESMF for further submission to WB.

Once the Kommunkhizmat Agency through PCU officially submits ESMF to WB, the document will be disclosed on WB external website. Under this Project as part of information disclosure process number of meetings were conducted with involved parties, particularly, officials from district khokimiyats, specialists of provincial and district level Suvokavas, regional committees of the Republic Uzbekistan on ecology and environment protection, land cadaster, architectural department, the Ministry of Culture and Sport and others. During the meeting the project team discussed with expert planning activities under the project and introduced WB OP procedures.

Project public consultation meetings in Tashkent

Over the past two years, MHCS and PCU held a number of meetings and workshops in Tashkent dedicated to project component design and implementation. The following groups of stakeholders were invited and present during these discussions and workshops:

- Ministry of Housing and Communal Services, including the PCU
- State Investment Committee
- Ministry of Water Resources
- Ministry of Economy and Finance
- National Energy Saving companies
- Representatives of regional Suvokovas
- Environmental specialists from the State Committee for Ecology and Environmental Protection (SCEEP)
- Development partners (UNDP, ADB, EU, AFD, Swiss development agency, others)
- Commercial banks
- Consulting companies and NGOs

¹⁹ See the Draft Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On additional measures to ensure guarantees of property rights of individuals and legal entities and to improve the procedure for the seizure of land and the provision of compensation in connection with the seizure" ID-8226. <https://regulation.gov.uz/uz/document/8226>. Accessed on October 1, 2019. Available in Russian only.

During these meetings, project components were discussed in detail and feedback sought on enhancing project design. Thanks to these consultations, new technical solutions were introduced into project components, for example Component 2 on Energy Efficiency. Scoping of environmental issues that may occur during project implementation and operation was discussed with SCEEP specialists.

Additionally, in the context of project preparation and collaboration with the national Development Strategy Center, a workshop was held in 2018 on “National Citizen Engagement Framework” introducing general concepts and objectives of citizen engagement, tools for improved service delivery such as customer service feedback and community monitoring and discussed current practices and ways how to improve citizen engagement by utilities. MHCS and regional Suvokovas participated in this workshop.

During the project implementation for category B sub-projects Environmental Executive Summaries of prepared EISAs will need to be disclosed on local khokimiyats’ websites as well and main findings of Environmental Assessments will need to be presented during public consultation with affected groups of people.

11.2. ESMF PUBLIC CONSULTATIONS

The public consultations of the ESMF and RPF are the important part of the project implementation. PCU/MHCS is responsible for organizing and conducting public consultations with different target groups (title and non-title holders, HH with low income, women headed HH etc) affected by each subproject prior to the move and involvement of PAPs in planning prior to completion of the site-specific actions. The purpose of the public consultation is to inform affected community groups about the subprojects. It is important for success of the project and its sustainability to offer PAPs the opportunity to express their opinion of any adverse environmental and social issues they feel may develop during subproject implementation. Any legitimate issue raised through the public consultation should be taken into account.

The best practice of previous WB projects demonstrates the efficiency of “a *two-way flow of information*” approach at the meetings in the subproject sites when PCU describe their activities to local communities, and local communities ask questions or raise their concerns in return. The requirement is documenting public consultations results and including them into the project planning documents.

To achieve the main project goals, to obtain cooperation, participation, and feedback and make process transparent, the PAPs must be systematically informed and consulted about their options and rights, their ability to choose from a number of acceptable alternatives. Particular attention must be given to vulnerable groups to ensure that they are represented adequately in such arrangements.

RPF consultations

The objectives of these public consultations were: to inform the public and stakeholders about the objectives and project developments and the expected of environmental and social impacts; to collect information and data from the public and/or the communities that will be affected by the project; and to ensure participation of the public and local communities in a process and support for the project.

After completing the technical design public consultation meetings with all stakeholders will be carried out to disseminate information regarding the rehabilitation process and entitlement framework for making the RAP preparation and implementation process transparent. Several documents of RPF, RAP and the R&R policy in Uzbek and Russian languages must be introduced to public. The documents available in the public domain will include Entitlement Matrix and RAP (summary in local language) and the list of eligible PAPs for various R&R benefits. All documents will be kept in PCU of MHCS. As per Access to Information Policy of the WB, all safeguard documents will also be available at the World Bank Portal. The MHCS/PCU will be responsible for disclosure and information dissemination on community level including a community display, meetings, and consultation.

Public Hearings in three project regions 11-13 November 2019

On 11-13 November 2019, the Public Hearings on Information Disclosure of the Resettlement Policy Framework (RPF) and the Environmental and Social Management Framework (ESMF) were held.

The public hearings were held on 11 November in the conference hall of the Nukus Youth Centre, on 12 November in the conference hall of Kattakurgan and on 13 November in the "Suvokava" DUK (Management Company) meeting hall in Gulistan. Information on the public hearings was published newspaper "Vestnik Karakalpakstana" №89, in the newspaper "Zarafshan" №140 and in the "Samarkandsky vestnik" №88 in Samarkand region. In the Syrdarya region, in the newspapers "Sirdaryokhakikati" No. 86 and "Syrdaryinskaya Pravda" No. 43 are available in Uzbek and Russian.

Representatives of governmental and non-governmental organizations and Takhiatash, Khojely, Kungrad and Nukus districts, as well as representatives of international organizations were invited to the public hearings, a total of 43 participants. In particular, S. Aitjanova, Head of the "UNDP" JV on social issues and ecologist, R. Kalyanov, representative of the Ministry of Construction of the city of Nukus, deputy khakim of Nukus A. Kasymbetov and M. Ernazarov, Head of the State Committee on Ecology of the Republic of Karakalpakstan M. Ametov, Deputy Director of SUE "Tuyamuyun Nukus" B. Matmuratov, as well as managers and representatives of other organizations and stakeholders.

The public hearings held in the city of Kattakurgan were attended by the Deputy Khakim of Kattakurgan D. Rakhmonov, Director of the Kattakurgan City Branch of "Suvokava" DUK A. Mamedov, Chief Accountant of the Kattakurgan City Branch of "Suvokava" DUK F. Nurilayev, Chairman of the Akaltyn District A. Bakhriev, Chairman of Siplonsky MFY B. Khaiitov and other MFY Chairmen, heads and representatives of relevant organizations, as well as residents of the project area.

In the public hearings held on November 13 in the city of Gulistan, Syrdarya region, in the assembly hall of SUE "Suvokava" took part Khokim of Mirzaabad district I. Makhmanazarov, engineer of the regional department of ecology and environmental protection Khaidarov, chief inspector of the Syrdarya regional branch Davsuvloyikha A. Abduvokhidov, Deputy Director of SUE "Suvokava" Sh. Akramov, Chief Engineer of "Suvokava" of Syrdarya region O. Sharifullayev and directors of district branches, heads of other relevant organizations, as well as residents of the project area of only 25 people.

The objectives of these public consultations were: to inform the public and stakeholders about the objectives and project developments and the expected of environmental and social impacts; to collect information and data from the public and/or the communities that will be affected by the project; and to ensure participation of the public and local communities in a process and support for the project ; and to ensure the participation of the public and local communities in the project process and support. The meetings focused on explaining the rights framework and matrix, GRM and types of PAPs in case any social impacts are expected.

In the presentation prepared for discussion, and two key documents were considered, these are: "Resettlement Policy Framework (RPF) and Environmental and Social Management Framework Document (ESMF), requirements, legislation, scope and content of project documentation, components and mechanisms of implementation, social and environmental risks and impacts, structure of PIUs and other key implementing agencies, gender action plans, monitoring and evaluation, learning outcomes and grievance mechanisms.

Following the disclosure, questions from participants were heard. Questions pertaining to potential environmental impacts or technical design of projects were answered in detail by the PCU.

For example, in Nukus, participants had the following questions: UN J.P., S. Aitjanova, Head of the Social Issues Group, asked when the project is planned to be implemented and whether it is planned to reuse the treated water of the sewage treatment plant. M. Khudaibergenov: Whether similar projects have been implemented in other parts of Uzbekistan by the World Bank and what the results are?

The questions of the participants in Gulistan were as follows: The Chairmen of the district MFY were asked about the timeframe of the project implementation and why it is planned to build/reconstruct sewerage systems only in the district centers. When will the sewerage and water supply systems be built and/or reconstructed in Sardoba district under the "Obod Makhalla" program?

Questions of the participants in Kattakurgan: Will the water supply and sewerage system built under this program contradict the system currently being built under the Obod Makhalla program? Will there be double consumption? At present, the existing waste water is poisoning the population, what will happen

to the population before the beginning of construction? Couldn't local treatment facilities be organized in each makhalla?

Detailed record of questions and answers, minutes of the consultation meetings and photos, as well as a list of participants, are provided in Annex 8.