The State Institution for Development of Drinking Water Supply and Wastewater Disposal of the Water Resources Service under the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic

DRAFT

Environmental and Social Management Framework

«Water Supply and Sanitation Universal Access Program – Phase 1»

October, 2024

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ABBREVIATIONS

AP	Atmospheric precipitation
BMP	Biodiversity management plan
BP	World Bank Procedure
CAP	Corrective action plans
DMFES	Department for Monitoring and Forecasting Emergency Situations
EHS	World Bank's Environmental, Health, and Safety Guidelines
ES	Environmental and Social
ESIA	Environmental and Social Impact Assessment
ESF	World Bank Environmental and Social Framework
ESCP	Environmental and social commitment plan
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMP Check list	Simplified ESMP for moderate and low risk category
ESS	World Bank Environmental and social standards
GIIP	Good International Industry Practice
GRM	Grievance redress mechanism
HI	Human impact
IPF	Investment Project Financing
ILO	International Labor organization
LMP	Labor management plan
MWRAPI	Ministry of Water Resources, Agriculture and Processing Industry
MLSSM	Ministry of Labor, Social Security and Migration
MNRETS	Ministry of Natural Resources, Ecology and Technical Supervision
MPA	Multiphase program approach
MoES	Ministry of Emergency Situation
NGO	Nongovernmental organization
OSH	Occupational safety and health
PAP	Project Affected People
PEE	Public environmental expertise
PBGs	Performance-based grants
PIU	Project implementation unit
PPE	Personal protective equipment

RAP	Resettlement Action Plans
RPF	Resettlement Policy Framework
SIDDWSWD	State Institution for Development of Drinking Water Supply and Wastewater Disposal
SEE	State Environmental Expertise
SEP	Stakeholder Engagement Plan
SEA/SH	Sexual exploitation and sexual abuse/sexual harassment
SOEs	State-owned enterprises
WASH	Water, sanitation, and hygiene
WB	World Bank
WSS	Water supply and sanitation
WHO	World Health Organization

I. EXECUTIVE SUMMARY

Project Description, goals, objectives and main activities of the project

The Kyrgyz Republic closely cooperates with international financial institutions and development partners on a long-term basis to overcome poverty, promote sustainable development and economic growth in the Kyrgyz Republic.

Ensuring the population's access to safe drinking water and sanitation services is one of the priority areas of state policy of the Kyrgyz Republic.

The Cabinet of Ministers of the Kyrgyz Republic aims to ensure universal access to at least basic water supply and sanitation services by 2030 in accordance with the National Strategy for Sustainable Development of the country for 2018-2040. To achieve this objective, the Cabinet of Ministers of the Kyrgyz Republic is receiving investments from the World Bank under the new Partnership Framework, with the Kyrgyz Republic for fiscal years 2024-2028.

Achieving universal access to water supply and sanitation (hereinafter - WSS) will have transformational effects on the country, given that reliable and affordable access to safe water is an essential precondition for a healthy population and productive economy. These WSS investments will particularly benefit the country's rural population, which relies on unimproved water sources and is exposed to a high risk of contamination and recurrent water, sanitation, and hygiene (hereinafter - WASH) related diseases.

The proposed “Universal Access to Water Supply and Sanitation” Program is aimed at accelerating the achievement of universal access to improved water supply and sanitation services in seven oblasts of the country and is an integral part of the program structure that supports the vision of the Cabinet of Ministers of the Kyrgyz Republic as set out in the “Program for the Development of Drinking Water Supply and Sanitation until 2026” and its planned follow-up program.

The proposed Program is expected to support the Cabinet of Ministers of the Kyrgyz Republic for a period of ten years or more in funding the necessary WSS infrastructure, technical assistance and service delivery models to progressively cover unserved communities with improved WSS services, modernize and expand to efficient, reliable and sustainable WSS services.

Each phase includes targeted interventions to strengthen the policy and institutional capacity of the sector as: (i) clear separation of functions (policy, operation and regulation); (ii) autonomy, accountability and efficiency of service delivery; (iii) principles of cost recovery and financial sustainability; and (iv) environmental and climate resilience.

It is important to note the importance of the Program and that it has a clear focus on poverty reduction, including specific design elements aimed at providing benefits to the poorest and most vulnerable households, and contributes to reducing gender inequality in rural communities by improving access to safe drinking water, enabling women to participate in other economic activities.

SIDDWSWD acts as state executive body that implements the state policy in the sector of water supply and wastewater disposal. The implementation of the Program will be carried out by the Project Implementation Unit under the SIDDWSWD. WRS of the MWRAPI will be supported through the Project Implementation Unit, which will be entrusted with fiduciary functions (disbursement, financial management, procurement, environmental and social standards, monitoring and evaluation).
Existing ES risk management capacity is at a good level. Thus, currently PIU under SIDDWSWD successfully implementing ES safeguard measures in “Climate resilient services project’ financed by the World Bank. In addition, the Program will attract the necessary additional qualified specialists and consultants to the PIU team at the central and regional levels. The implementation mechanism of each stage of this overall Program will be implemented in accordance with the requirements and environmental and social standards of the World Bank, which will be set out in the Financing Agreement.

Goals, objectives and main activities of the project

Phase 1 (hereinafter, Project) will focus on three strategic areas: (i) establish a framework for WSS infrastructure investments and capacity development in the country; (ii) progressively develop climate-resilient WSS infrastructure and WSS access in unserved rural areas of the Kyrgyz Republic, and (iii) test and quick start the implementation of a performance-based grants (hereinafter – PBGs) financing mechanism to promote service delivery efficiency and enable climate adaptation.

The Project presents an opportunity to advance the implementation of the new institutional framework proposed under the ongoing water sector reform. The project is designed to narrow the gap between urban and rural areas and minimize the intraregional disparities in access rates in the Kyrgyz Republic. Further, a results-based financing approach at the center of the Project capacity-building strategy will ensure a greater focus and prioritization of service quality, customer and citizen engagement, investments in approaches to reduce the gender gap, and the pursuit of climate-smart and decarbonized solutions, particularly on sanitation. Further, the Project is expected to promote skills development and jobs by attracting, training, and integrating young people into the WSS service delivery chain.

The proposed Project for Phase 1 of the MPA consists of the following four components. The expected total number of beneficiaries is estimated at around 350 000 people living in 111 villages of Chui, Issyk-Kul, and Osh oblasts. In addition, the Project will indirectly benefit existing customers from utility management activities. Below is a brief description of the activities that will be funded under each component.

Goals and objectives of the Environmental and Social Management Framework

This Environmental and Social Management Framework (ESMF) was prepared to assist the Government of the Kyrgyz Republic develop environmental and social instruments that are consistent with national regulations.

The framework approach was chosen because the project finances small and medium-scale activities, most of which the specific interventions will not be fully defined until implementation begins. Thus, only at the stage of preparing the detailed design of the water supply system scope of intervention and sites for system components such as water intake, reservoirs, water towers, etc. will be determined.

Accordingly, in accordance with ESS1, an ESMF is being prepared which defines the rules and procedures for activities and provides a screening tool to determine the need for an Environmental and Social Impact Assessment (ESIA) of specific sub-component sites, as well as to prepare the corresponding Environmental and Social Management Plans (ESMPs).

Therefore, the purpose of this document is to outline a framework for environmental assessment and management, giving details of potential environmental issues and guidelines on what type of environmental assessment tools to be applied for various sub-project activities

The ESMF ensures that identified projects are properly assessed from an environmental and social perspective to meet the requirements of the ESSs and the World Bank's Environmental, Health and Safety (EHS) Guidelines along with environmental and social laws and regulations of the Kyrgyz Republic to adequately mitigate residual and unavoidable impacts (if any).

The ESMF will guide project implementation through the provision of the following:general guidelines and procedures for preventing, mitigating, or minimizing the adverse environmental and social impacts of potential activities; description of implementation mechanisms, including details on how environmental and social risks will be managed; descriptions of the environmental and social screening processes that will help determine the appropriate site-specific environmental and social instruments; checklists for preparation of ESIA/ESMP for specific sites; environmental and social monitoring and reporting requirements; a section on proposed capacity building activities to help the PIU comply with the World Bank ESF.

The ESMF ensures that the identified sub-projects are adequately assessed from environmental and social point of view to meet the WB's Environmental and Social Framework (ESF) and its applicable Standards, as well as Environmental and Social Laws and Regulations Kyrgyz Republic for adequate mitigation of any residual and/or unavoidable impacts. The ESMF serves as a guiding tool for PIU in identifying and assessing the potential environmental and social impacts of sub-projects, in preparing environmental and social management plans (ESMPs) that will summarize necessary mitigation measures to minimize or prevent identified risks and impacts, and to provide guidance on environmental and social monitoring and reporting.

The project will be co-financed by the Asian Infrastructure Investment Bank (AIIB), the Organization of the Petroleum Exporting Countries (OPEC) Fund for International Development, which will focus on financing activities under Component 1; and the Swiss Agency for Development Cooperation (SDC), which will support Component 3. There is no single approach for this project as AIIB has agreed to follow the Bank's ESF under the Cofinancing Framework Agreement signed on May 15, 2021. It is expected that the Bank's ESF will also apply to Project activities to be financed by the OPEC Fund and SDC. Accordingly, the environmental and social risk management of the Project, including activities under the AIIB, OPEC Fund and SDC financing, will follow the World Bank's Environmental and Social Policy (ESF). Meanwhile, the Asian Development Bank (ADB) and the Islamic Development Bank (IDB) are expected to provide parallel financing, and activities planned under their financing will follow their own environmental and social procedures.

Regulatory and institutional framework for environmental and social assessment

This document describes the background, policy and legal framework, and possible environmental and social impacts related to the project interventions. This includes ESIA procedures and guidelines, institutional arrangements, consultations, and disclosure procedures. The ESMF provides guidance on the development of appropriate measures to mitigate and compensate for adverse impacts caused by project activities.

According to the planned activities within the framework of the Project, out of the ESSs, eight will be related to the activities of the Project. These 8 ESSs set the standards that the PIU as the Executing Agency (EA) and the Project should meet throughout the life cycle of the project, namely:

- ESS 1: Assessment and management of environmental and social risks and impacts;
- ESS 2: Labor and working conditions;

- ESS 3: Resource Efficiency and pollution prevention and management;
- ESS 4: Community health and safety;
- ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement;
- ESS 6: Biodiversity conservation and sustainable management of living natural resources;
- ESS 8: Cultural Heritage;
- ESS 10: Stakeholder engagement and information disclosure.

A summary of the ESSs, their relevance to the project, and a gap analysis in national legislation within the considered World Bank standards are discussed in Table 3.

In general, the main provisions and requirements of the ESF are taken into account by national legislation, and where certain issues are not considered, the ESF instruments will be developed or enhanced (site-specific ESMPs, OHS plans, RAPs, SEPs etc.), and these not considered issues will be included in these documents.

Existing general environmental and social conditions and of the project areas

This section summarizes the areas where the project is planned to be implemented. Socio-economic characteristics and natural characteristics of Panfilov, Sokuluk rayons of Chui oblast; Aravan, Kara-Kuldja, Kara-Suu, Uzgen, Alai rayon of Osh oblast and Ak-Suu of Issyk-Kul oblast is considered. Data on biodiversity and cultural monuments included in the official state register are given.

The Osh oblast occupies the territory of the Alai, the northern slopes of the Trans-Alai, the south-eastern part of the Fergana ridges, which are the eastern frame of the Fergana depression. The Alai Mountain system has an almost latitudinal strike and is characterized by a relatively gentle northern slope, complicated by a series of sharply defined foothill ridges; the southern slope - facing the highly elevated Alai depression, is relatively short and steep.

The climate of the Fergana Valley is characterized by mild winters with little snow and dry hot summers in the lower zone, moderately cold and cold winters in the upper zone. The climate of the Alai Valley is continental. The eastern part has more severe conditions than the western and central ones. On the territory of the region there are such large high-water rivers as the Kara-Darya, formed by the confluence of the Tar and Kara-Kulzha rivers. Below the city of Uzgen in the river. The Kara-Darya River flows into Iasi. These rivers originate from the Fergana and Alai ranges. The rivers Gulcha, Ak-Buura and Kyrgyz-Ata begin from the northern slopes of the Alay Range. The Kyzyl-Suu River, originating on the southern slopes of the Alai and northern slopes of the Trans-Alai ridge, is the main waterway of the Alai depression.

The territory of the Osh region is characterized by the intensive development of dangerous natural processes associated with geological and structural features, relief, climatic and hydrogeological conditions, seismic activity, man-made factors, etc. Many settlements are located along the banks of large and small rivers, in mountainous areas. Depending on the structure of adjacent slopes and the water content of rivers, residents of many villages are threatened by landslides, rockfalls, avalanches, mudflows, flood waters, flooding with surface water, and flooding with groundwater.

The territory of the Issyk-Kul oblast is located at an altitude of 1600 to 7439 m above sea level. The relief of the territory is divided into 2 main parts: the Issyk-Kul depression and the Issyk-Kul syrts. The only natural exit from the basin to the Chu Valley is the Chu River, flowing through the Boom Gorge. The basin has a length from east to west of 240 km, a width of about 100 km. According to climatic zoning, most of the Issyk-Kul region is located in North-Eastern Kyrgyzstan. The climate of North-Eastern Kyrgyzstan is formed under the influence of the large (6200 sq. km) ice-free Lake Issyk-Kul, located at an altitude of 1608 m above sea level, and has marine features: mild winters, relatively warm summers, smoothed annual air temperature.

Bedrock rocks consist of igneous, metamorphic and sedimentary complexes, grouped into rocky and semi-rocky groups. Outcrops of rocky and semi-rocky soils are observed in high- and mid-mountain zones (less often in low-mountain areas), while in rocky soils the development of dangerous exogenous processes is predicted - landslides, rockfalls, screes, karst (on limestone and carbonate rocks), and in semi-rocky soils landslide phenomena are expected. Surface deposits in high-medium, low-mountain and low-mountain areas are combined into formations of mountain slopes, intermountain depressions and mountain glaciation, consisting of loose and cohesive soils and in them the development of landslides, gully erosion, mudflows, solifluction, planar washout, and other exogenous processes occurs and phenomena.

The territory occupied by the Chui oblast includes the low-mountain Chui, as well as the Suusamyr and Chon-Kemin intermountain depressions. The relief is dissected, the absolute height ranges from 550 to 4856 m above sea level. According to climatic zoning, the Chui Valley belongs to Northern and Northwestern Kyrgyzstan. The distribution of precipitation in the Chui Valley is decisively influenced by the altitude of the area above sea level. The amount of precipitation increases from 370 mm in the north of the valley to 425 up the valley in the eastern direction and to 450-500 mm in the southern direction towards the foothills. The hydrographic network of the Chui region belongs to the basins of the Chu and Naryn rivers.

According to the engineering and geological features of the structure, the territory of the region in the section consists of two parts, underlying ancient bedrock rocks with rigid structural connections and younger, less

durable Quaternary surface deposits. Bedrock rocks consist of igneous, metamorphic and ancient sedimentary complexes, combined into rocky and semi-rocky soils. Outcrops of rocky and semi-rocky soils are observed in high- and mid-mountain zones (less often in low-mountain areas), while in rocky soils the development of dangerous exogenous processes is predicted - landslides, rockfalls, screes, karst (in limestone and carbonate rocks), and in semi-rocky soils manifestations are often possible landslide phenomena. Surface deposits in high-, mid-, low-mountain and low-mountain areas are represented by loose and cohesive soils. In surface sediments, the development of landslides, gully erosion, mudflows, solifluction, planar washout, and other exogenous processes and phenomena is predicted.

The negative impacts of climate change in these oblasts led to environmental degradation and increased frequency of climate-related natural disasters; degradation of pastures and land conditions; impacts on water resources availability leading to reduced availability; and will affect the socio-economic well-being of the population, especially in rural areas.

Potential environmental and social impacts and Mitigation Measures

Environmental risk rating is **Substantial**, and the social risk rating is **Moderate** for an **overall ESF risk rating of Substantial**. The main social and environmental risks and mitigation measures will revolve around the activities of Components 1 (Construction of new water supply systems in unserved settlements of priority areas of the country) and 2 (Construction and/or rehabilitation/modernization of decentralized sanitation system, including upgrading of latrines for vulnerable households and selected public social institutions).

The project's environmental risk rating is based on risks potentially arising from infrastructure construction/rehabilitation and possible water and soil pollution. The risks will be mitigated through the preparation, implementation, and monitoring of E&S instruments and capacity-building for project staff and service providers.

In general, the project is expected to have the following environmental and social impacts: depletion of water resources; soil erosion and landslides; increased noise and vibration levels; soil and water pollution; risk of water quality degradation, impacts on drainage, soil and biodiversity (soil erosion, habitat disruption), waste generation and disposal, increased energy usage leading to greenhouse gas emissions; air pollution from vehicle exhaust gases and dust generation; clearing of vegetation; sludge, sewage, spillage, odor, traffic and asbestos containing materials (ACM); work safety issues; possible restriction of road access; land acquisition, temporary restriction of land use, involuntary resettlement (IR)[1]; impact on the health of workers; influx of workers; impacts to vulnerable groups which may be adversely impacted due to increase of tariffs and connection costs; limited access of vulnerable groups to project information; lack of or insufficient financial resources of vulnerable population for connection to WSS; possible social resistance against an increase in the drinking water tariff; conflicts with communities around the intake areas; impacts on public health, safety and welfare; transparency and governance issues; gender issues etc.

The selected subprojects are not located on specially protected natural areas of Kyrgyz Republic. And also similar projects have been successfully implemented in the Kyrgyz Republic before, and based on the experience of previous water projects, it can be concluded that all of these negative impacts are temporary, localized, reversible and can be mitigated by appropriate interventions and best practices, EHS. Table 27 of the ESMP identifiess the types of the negative impacts along with related and mitigation measures , as well as monitoring activities.

The ESMF provides guidance on the screening of the proposed Project interventions to ensure that they do not affect negatively the natural and social environments. It outlines several principles in this respect, including:

- a systematic procedure for participatory screening for project specific sites and activities related to environmental and social considerations.
- a step-by-step procedure for predicting the main potential environmental and social impacts of the planned activities.
- a generic environmental and social management plan for addressing negative externalities during activities implementation (planning, construction, and operation);
- a step-by-step monitoring and evaluation system for implementation of mitigation measures.
- an outline of recommended capacity building measures for environmental and social planning and monitoring of the activities.

The ESMF was prepared in accordance with the requirements of national legislation and the ESF. The ESMF will be used in conjunction with the Labor Management Procedures (LMP). Stakeholder Engagement Plan (SEP) and Resettlement Policy Framework (RPF) prepared separately to assist the borrower in addressing the risks and impacts and concerns of stakeholders that may be affected by or interested in the project.

ESMF Implementation Mechanism

[1] By IR, the PIU understands the application of all necessary actions in accordance with ESS 5 in relation to the affected people.

According to the ESF, the PIU will ensure that the environmental and social assessment takes into account the country's applicable policy framework, national laws, and regulations, and institutional capabilities (including implementation) relating to environment and social issues and applicable requirements under the WB ESSs.

The following tools can be used to conduct environmental and social assessment and mitigate adverse impacts: environmental and social screening check lists, ESIA, site specific ESMPs, ESMP checklist, OHS plan, BMP, RAP (if applicable), E&S provisions in Bid documents, Budget, Training, Monitoring & reporting, Feedback mechanisms.

etc. These tools and plans will be applicable depending on the need for each subproject individually.

The site-specific ESMP is specified to describe the mitigation measures for all the impacts associated with the subproject during its implementation phase. The site specific ESMP includes the monitoring and management measures to minimize such impacts by allocating management responsibility and suggesting skill requirement for implementation of these specific measures during the implementation phase.

The site specific ESMP includes the following:

- mitigations suggested for adverse environmental and social impacts and associated risks;
- institutional arrangement for the implementation of suggested measures;
- monitoring arrangements for effective implementation of suggested mitigations for the project;
- reporting requirement to the regulatory agencies and funding institutions.

An OHS plan is a definite plan of action designed to prevent incidents and occupational diseases. Some form of a program is required under occupational health and safety legislation. A health and safety program must include the elements required by the health and safety legislation. Also, the OHS measures will take into account the general EHSGs and, as appropriate, the tailored industry-specific EHSGs and other GIIP.

Given the planned activities under the Project components, Component 1, “Water Supply Investments”, could have potential impacts on land acquisition, temporary land use restrictions and involuntary resettlement covering livelihood impacts in the area around the community facilities, if Project activities require new structures or additional land for infrastructure improvements.

Component 2 “Sanitation Development” could have potential impacts on land acquisition, temporary land use restrictions and involuntary resettlement in the area around community facilities, temporary access restriction to the sanitary facilities.

After final identification of the target sites, detailed designs will be developed and prepared for rehabilitation/construction works, the development of which will identify which specific sites may have ESS 5 issues. Further, if any of the impacts discussed in ESS 5 are confirmed, Resettlement Action Plans (RAPs) will be prepared for each specifically identified site, following the instructions of the Resettlement Policy Framework document.

Any project activity will be carried out only after the full implementation of the relevant RAP and the preparation of a report on its implementation. Until such documents are developed, disclosed, and approved by the WB, PIU will not start implementing specific sub-projects for which the impact of forced temporary and/or permanent land acquisition has been identified.

The present Project takes into account the importance of open and transparent communication between the PIU SIDDWSWD and stakeholders as an important element of effective cooperation during the project implementation period. It is important to note that effective interaction with stakeholders contributes to increasing the socio-environmental sustainability of the project, their positive perception and making a significant contribution to the successful development and implementation of the project.

A grievance redress mechanism (GRM) will be provided to address any project activities related concerns that may arise during project implementation. The project’s GRM is described in the Stakeholder Engagement Plan (SEP) and grievance forms are provided in Annex 9 to this report.

The project’s key labor risks are determined to be related to the hazardous work environment, associated injury, and labor influx. Based on current sector circumstances, the risk of child or forced labor is estimated to be insignificant. No children will be employed by the project. These risks will be regulated according to the LMP and GRM.

Institutional arrangement for the implementation of the ESMF

The PIU with its regional offices will have overall responsibility for the supervision, management and coordination of the project in conjunction with local governments.

The PIU under the SIDDWSWD will consist of at least a project coordinator, M&E specialists, accounting, financial management (FM), communication, procurement, social and environmental specialists, as well as technical specialists structural divisions.

The PIU has the responsibility to ensure implementation of and compliance with the ESF and the specific instruments prepared and disclosed that are relevant to the Project. The responsibility for implementing the mitigation measures and compliance rests with the PIU/SIDDWSWD.

The Bank will continuously assess performance of the PIU during project implementation in managing project environmental and social (E&S) risks. Project-specific targeted training on environmental and social management aspects will be provided by the PIU ESF team on an ongoing basis including the topics such as the ESMF implementation, monitoring and and reporting, World Bank ESF and EHS Guidelines, among others. Specific PIU capacity building needs are identified and listed in this ESMF.

Monitoring and reporting

Environmental and social monitoring during implementation should provide information about key environmental and social aspects of the sub-projects, particularly its environmental impacts, social consequences of impacts and the effectiveness of taken mitigation measures. Such information enables the PIU to evaluate the success of mitigation measures as part of project supervision and allows corrective action(s) to be implemented in a timely manner, when needed. The status of the compliance with the ESMPs' requirements shall be regularly provided by contractors to the PIU (via the supervision consultant / company) /or by the contract manager, and then to the Bank by the PIU, in a consolidated way, in form of their semi-annual report.

Integration of the ESMPs into project documents

The ESMP provisions will form part of the design documents for the project and will be included in construction contracts in case of civil works for selected subprojects, both into specifications and bills of quantities. Respectively the Contractors will be required to include the cost of ESMP requirements in their financial bids and required to comply with them while implementing the project activities. The bidding documents for selecting the contractors will include specifications that would ensure effective implementation of environmental, health and safety performance criteria by the winning bidder.

Public consultations and information disclosure

As required by World Bank ESS 10, the PIU will disclose the ESMF to the public, including all information on potential environmental and social risks and impacts.

Such information will be posted on the website of PIU in an accessible form and in an accessible language for the public. and stakeholders so that they can fully contribute to project design and mitigation measures.

The ESMF will be presented in a preliminary version; later, after revision, the final (updated) version will be disclosed. The document should adequately analyze the project's main risks and impacts in enough detail to inform the Bank's stakeholder engagement and decision-making processes.

In general, the process of interaction with stakeholders (district authorities, state bodies, representatives of the Bank, etc.) is also carried out at the stage of preparing a ESMF/ project, through meetings, discussions and recommendations, and consideration of potential target sites.

Stakeholder Engagement Plan (SEP) identifies the various stakeholders and provides an approach for engaging with them throughout the project life cycle. The ESMF provides mechanisms for effective community engagement through disclosure of project-related information, consultations, input, and feedback.

Labor Management Procedures (LMP) provides guidelines and procedures for managing labor and employment practices within the project. LMP intended to ensure that the Project complies with all applicable labor laws and regulations and provides fair and safe working conditions for workers. LMP can help to identify potential labor risks and impacts associated with the project and provide guidelines for how to manage them. By adhering to the LMP, the project can ensure that it meets the labor requirements of both national legislation and the ESS of the World Bank.

Resettlement Policy Framework (RPF) - The tool that will be used throughout project implementation. The RPF sets out the resettlement's objectives and principles, organizational arrangements and financing mechanisms for any resettlement that may be required during project implementation. The RPF guides the preparation of resettlement action plans of individual subprojects to address the needs of people who may be affected by the project.

Environmental and Social Management Plan (ESMP) is a tool that details (a) the measures to be taken during project implementation and operation to eliminate or offset adverse environmental and social impacts or to reduce them to an acceptable level; (b) the actions required to implement those measures.

Budget for ESMF implementation

Implementation of ESMF is included in the preliminary budget for the Project with an estimated cost. Costs associated with the coordination of ESMF implementation by the PIU will be fully costed after final design. The preliminary cost of ESMF implementation is US$ 356 100.

Conclusions

During the project implementation period, the PIU will be responsible for preparing relevant environmental and social documents and providing information to the WB, as well as for addressing environmental and social risks within the ESMF and will be responsible for compliance with the requirements of the ESMF.

The proposed physical works of Components 1and 2 require a certain amount of construction and excavation work, such as laying watermains, distribution networks; construction of reservoirs, water towers, captages, drainages and drilling of wells. There will be excavation activities such as excavation, clearing, mass transfer of soil and rocks, and tillage that could potentially damage the vegetation cover and lead to clearing of vegetation.

Therefore, the movement and storage of building materials, disposal of surplus, waste and construction debris can affect the natural environment and biodiversity habitat, if not adequately managed.

Identified impacts can be avoided or minimized with the appropriate mitigation measures.

In the medium and long term, the project is expected to bring significant environmental benefits, such as more efficient and rational use of water; promoting the protection of ground and surface water by promoting the construction and use of environmentally friendly sanitation facilities; sustainable management of modernized infrastructure.

Environmental risks are considered “substantial”, social risks - “moderate” and can be predicted, avoided or mitigated through assessment, adequate management and monitoring.

II. PROJECT DESCRIPTION

2.1. Introduction

The Kyrgyz Republic closely cooperates with international financial institutions on a long-term basis for alleviation of poverty and facilitation of the sustainable development and economic growth in the Kyrgyz Republic.

Ensuring the population's access to safe drinking water and sanitation services is one of the priority areas of state policy of the Kyrgyz Republic.

The Cabinet of Ministers of the Kyrgyz Republic strives to ensure universal access to at least basic water supply and sanitation services by 2030 in accordance with the country's National Sustainable Development Strategy for the years 2018–2040. To achieve this goal, the Cabinet of Ministers of the Kyrgyz Republic receives investments from the World Bank according to the new Partnership Framework Program with the Kyrgyz Republic for fiscal years 2024–2028.

Achieving universal access to water supply and sanitation (hereinafter - WSS) will have transformational effects on the country, given that reliable and affordable access to safe water is an essential precondition for a healthy population and productive economy. These WSS investments will particularly benefit the country's rural population, which relies on unimproved water sources and is exposed to a high risk of contamination and recurrent water, sanitation, and hygiene (hereinafter - WASH) related diseases.

The proposed “Universal Access to Water Supply and Sanitation” Program is aimed at accelerating the achievement of universal access to improved water supply and sanitation services in seven oblasts of the country and is an integral part of the program structure that supports the vision of the Cabinet of Ministers of the Kyrgyz Republic as set out in the “Program for the Development of Drinking Water Supply and Sanitation until 2026” and its planned follow-up program.

The proposed Program is expected to support the Cabinet of Ministers of the Kyrgyz Republic for a period of ten years or more in funding the necessary WSS infrastructure, technical assistance and service delivery models to progressively cover unserved communities with improved WSS services, modernize and expand to efficient, reliable and sustainable WSS services.

The MPA is structured as a 10-year engagement through three IPF operations/phases to achieve the PrDO. The Project Development Objective (PDO) for each phase and PrDO target the same topics, and the phases are progressive; each phase maintains a similar structure and builds towards the achievement of the overall PrDO. The structure of the MPA is uninterrupted to ensure that the Program's activities continue without a gap in the rollout of the key activities. The total Program's estimated cost is US$400 million, with a proposed IDA financing envelope of US$200 million. This includes

(i) a four-year Phase 1 (2024-2029) of focused investment covering unserved and underserved rural settlements while piloting the aggregated district-level service delivery structure and enhancing the capacity using PBGs, few and simpler sanitation interventions, complemented by extensive analysis and design of more complex sanitation solutions, including paving the way for potential private sector engagement;

(ii) a *three-year Phase 2 (2028-2031)* to scale-up the investments, shifting to water supply infrastructure upgrade and expansion, priority sewerage investments and scale-up the service delivery models, with a focus on operational and financial efficiency, and climate adaptation; and

(iii) a *three-year Phase 3 (2030-2033)* to scale-up sanitation investments, and consolidate the water supply improvements, with a strong emphasis on knowledge exchange and appropriation of the policies, plans, and tools developed under the previous two phases.

Each stage includes targeted activities to strengthen the policy and institutional capacity of the sector such as: (i) a clear division of functions (policy, operation and regulation); (ii) autonomy, accountability and efficiency in service delivery; (iii) principles of cost recovery and financial sustainability; and (iv) environmental and climate change resilience.

It is important to note the importance of the Program and that it has a clear anti-poverty focus, including specific design elements aimed at providing benefits to the poorest and most vulnerable households, and contributes to reducing gender inequality in rural communities by improving access to safe drinking water, which allows women to participate in other economic activities.

In general, this Program includes the activities envisaged in the Program for the Development of Drinking Water Supply and Wastewater Disposal Systems of populated areas of the Kyrgyz Republic until 2026, approved by the Resolution of the Government of the Kyrgyz Republic No. 330 dated June 12, 2020.

There are 1,905 settlements in the republic, of which 32 are cities and 1,873 villages. According to the specified Program for the development of water supply and sanitation systems in populated areas of the Kyrgyz Republic until 2026, 715 villages have been identified where new construction of a water supply system is required and

448 villages in which it is necessary to rehabilitate water pipelines.

The State Institution for Development of Drinking Water Supply and Wastewater Disposal (hereinafter-SIDDWSWD) of the Water Resources Service under the Ministry of Water Resources, Agriculture and Processing Industry of the Cabinet of Ministers of the Kyrgyz Republic is a state executive body that implements the state policy in the sector of water supply and wastewater disposal.

SIDDWSWD under the WRS MWRAPI acts as the executing agency of the project, which has sufficient potential for its implementation. The implementation of the Program will be carried out by the Project Implementation Unit (hereinafter - PIU) under the SIDDWSWD, which employs qualified, experienced specialists and experts. WRS of the MWRAPI will be supported through the Project Implementation Unit, which will be entrusted with fiduciary functions (disbursement, financial management, procurement, environmental and social standards, monitoring and evaluation). Also, during the implementation of the Program, the necessary additional qualified specialists and consultants will be involved to the PIU team at the central and regional levels.

The implementation mechanism for each stage of this overall Program will be carried out in accordance with the requirements and environmental and social standards of the World Bank, which will be set out in the Financing Agreement.

2.2 Project description

1. **Phase 1 (US$200 million, of which US$82.5 million IDA financing)** will cover the first batch of the Program's WSS infrastructure investments in unserved and underserved settlements in the least served regions and districts within those regions without ongoing or planned investments. Phase 1 will finance the construction and upgrade of water supply systems, and priority household and social institutions' sanitation infrastructure (containment). The WSS interventions will build on experience and lessons learned under the ongoing World-Bank financed Sustainable Rural Water Supply and Sanitation Development Project (SRWSSDP, P154778) and Climate Resilient Water Services Project (CRWSP, P173734) by putting a stronger emphasis on incentivizing service improvements in parallel with infrastructure development to ensure the sustainability of these investments. Thus, Phase 1 will include a PBG-structured capacity-building program for four DWSSPs to enable them to independently expand and enhance the quality of services within their district. The PBGs will complement ongoing capacity-building programs that target national-level institutions. The project will also finance improvements to existing fecal sludge management (FSM) services led by both private and municipal operators and the design of sanitation interventions to be implemented in the subsequent phases. Further, Phase 1 envisages the establishment of a learning program to document lessons and inform the program implementation. The preparatory work for this phase is financed under the CRWSP, which includes funding for the design of future investments.

2. **Phase 2 (US$100 million, of which US$50 million IDA financing)** will scale up the PBG capacity building program to other DWSSPs and upgrade and expand the existing water supply systems in both rural and urban settlements. Under this phase, FSM and household sanitation will be scaled up and complemented by priority sewerage investments, using the designs and knowledge developed in Phase 1. Further, private sector engagement for wastewater treatment and re-use will be pursued in partnership with the International Finance Corporation (IFC), targeting the settlements around Issyk-Kul Lake, a vital region for the country's tourism industry currently threatened by untreated wastewater discharges. By the end of this phase, it is expected that all the settlements in the country will have access to (at least) improved water services. The PBGs will be expanded, considering the lessons learned from Phase 1, including adjustments to enhance its implementation efficiency. Phase 2 is planned to begin implementation in 2028, four years after Phase 1 starts; to allow sufficient time to incorporate lessons learned during Phase 1 and attract additional co-financiers.

3. **Phase 3 (US$100 million, of which US$50 million IDA financing)** will prioritize scaling up sanitation improvements across the country and developing a large-scale investment package to promote safely managed sanitation, targeting the full-service chain and potential waste-to-resource opportunities. Under this Phase, the program will support additional last-mile water supply infrastructure with targeted upgrades and expansion. In addition, this Phase will include consolidating the service delivery model, with a greater focus on investment management capacity for the DWSSPs, innovation, further efficiency improvement, and private sector engagement in water supply. Further, under this Phase, priority will be given to knowledge exchange within regional and DWSSPs to ensure widespread appropriation of the policies, plans, and tools developed under the WASUAP. Phase 3 is expected to start implementation in 2030.

The proposed Project for Phase 1 of the MPA consists of the following four components. The expected total number of beneficiaries is estimated at around 350 000 people living in 111 villages of Chui, Issyk-Kul, and Osh oblasts. In addition, the Project will indirectly benefit existing customers from utility management activities. Below is a brief description of the activities that will be funded under each component.

2.3. Project components

Component 1 – Water Supply Investments (US$117 million, of which US$36.5 million IDA credit, US$7.5 million IDA shorter maturity loan, US$50 million co-financing credit from the AIIB, US$ 3.0 million grant parallel financing from AIIB, and US$20 million co-financing credit from OPEC Fund) will finance the construction and upgrade of water supply systems in 109 rural villages and small towns in Chui, Issyk-Kul, and Osh regions, benefitting around 373,000 people. The Project will prioritize the use of gravity systems, energy-efficient pumping equipment, and solar energy, where feasible, to minimize GHG emissions. Water source development will target groundwater exploitation to minimize the impacts of climate change, and network construction will utilize materials resistant to high-temperature variations. All water intakes will include source protection and reforestation interventions to prevent contamination and enable water conservation and aquifer recharge. The system design will follow a participatory approach, with consultations involving disabled people, building on local knowledge and historical data. Additional village water supply system upgrades to ensure universality and service improvements will be covered through ADB financing in Naryn Region (US$ 30 million serving 36,000 people) and IsDB financing in Jalalabad Region.[2] Specifically, the Project will finance:

Subcomponent 1.1 – Water Supply Access to the Unserved (US$23.0 million) will finance the design and construction of climate-resilient water supply systems in 36 currently unserved settlements (around 66,000 beneficiaries). Specifically, the Project will finance resilient water source development and storage, water treatment infrastructure to ensure high drinking water quality, robust transmission and distribution networks capable of withstanding extreme weather conditions, reservoirs to increase water availability and metered household connections to ensure sustainable water use. All water connections will be metered to ensure sustainable water use.

Subcomponent 1.2 – Water Supply Upgrades *(US$94.0 million)* will finance the design, rehabilitation, and upgrade of water supply systems in 73 villages and district centers in Aksu, Alai, Kara-Kulja, Kara Suu, Panfilov, Sokuluk, and Uzgen districts (around 307,000 beneficiaries). The upgrades will prioritize investments with demonstrated impacts on service reliability, financial viability, and climate resilience. Specifically, the Project will finance investments focused on source and storage increase, network hydraulic improvements, and expansion to secure water supply in the face of climate variability, ensure efficient water management, and reduce vulnerability to climate impacts.

Component 2 – Sanitation Development (US$28.0 million, of which US$24.5 million IDA credit, and US$ 3.5 million financing gap) will finance priority sanitation improvements focused on the containment element of the service chain and FSM services, and the technical assistance (TA) to design more complex sewerage improvements.

Sub-component 2.1 – Onsite sanitation improvements (US$ 25.1 million of which US$ 3.5 million financing gap) will finance the (i) construction, rehabilitation/retrofitting of decentralized sanitation systems, including toilet upgrades for vulnerable households and selected public institutions (schools, kindergartens, hospitals, and rural health centers) in all 109 target settlements, thereby enhancing community resilience to climate-related health risks and contributing to climate change mitigation by promoting more efficient water use and reducing energy consumption associated with centralized sanitation systems; (ii) TA, equipment and works for FSM services improvement, including the guidelines for fecal sludge collection, transport, treatment, and re-use, which contributes to climate adaptation by enhancing the resilience of sanitation infrastructure to climate impacts and reducing the risk of contamination during extreme weather events and to climate mitigation by preventing the release of methane from untreated waste; and (iii) the implementation of a sanitation marketing and behavioral change strategy to incentivize the adoption and use of improved WASH and behaviors that are essential for climate resilience and mitigating the pressures on water resources.

Sub-component 2.2 – TA for the design of sewerage improvements (US$2.9 million) will support TA for the engineering design of sewerage systems in priority settlements, aiming to reduce environmental pollution and enhance the resilience of sewerage infrastructure to the impacts of climate change, such as increased flooding, sea-level rise, and extreme weather events. The Project will prioritize the development of solutions for settlements with multi-story buildings, whose sanitation systems are currently a source of environmental pollution, including groundwater contamination. The Project will also finance the technical assessments required to attract private sector engagement in wastewater treatment along the Issyk-Kul Lake and address vulnerabilities in existing sewerage systems exacerbated by climate change. This TA is also expected to leverage innovative and sustainable private sector solutions for wastewater treatment and contribute to climate mitigation through improved wastewater management practices and climate adaptation by reinforcing the resilience of the lake's ecosystem and the livelihoods dependent on it.

[2] Ongoing feasibility study to determine the number of beneficiaries and financing needs, possibly joining in program Phase 2.

Component 3—Performance-based Service Improvement Program (US$15 million, of which US$5.0 million IDA credit and U$S 10.0 million SDC grant) will (i) provide PBGs for DWSSPs to finance WSS service improvements and enhance the sustainability of WSS services, and (ii) finance the professional and vocational development program (PVDP).

Sub-component 3.1 – Service Delivery Improvements (US$10 million) will finance PBGs for four DWSSPs (out of the ten planned for Phase 1) and will cover the start-up activities and operational and structural investments that are critical to enabling the operational and financial efficiency of the DWSSPs, and the resilience of water supply systems against climate variability. Funding for the PBGs will cover activities from the DWSSPs' institutional and service development plans and will focus on increasing service management capacity, innovative solutions for service expansion and climate resilience, asset management and operations, digital solutions for customer services, tariff-setting procedures, financial management, and service monitoring and reporting.

The PBG will be structured in two parts: (i) a fixed part linked to the achievement of institutional prerequisites (the legal establishment of the DWSSPs, development, approval, and adoption of a service improvement plan, a gender improvement plan, and an approved tariff review framework and an auditable financial management system) to encourage the adoption of sustainable and equitable water management practices that support climate adaptation and climate mitigation by promoting energy-efficient operations and reducing water-related emissions. To incentivize efficiency in the establishment process, the fixed grant will only be available during the first 18 months after Project effectiveness. (ii) A variable part linked to service delivery performance, including coverage, hours of supply, customer satisfaction, cost recovery, and NRW reduction, aiming to improve water use efficiency, thus supporting climate mitigation efforts by optimizing resource use and contributing to climate adaptation by ensuring reliable water supply during climate-induced disruptions. The exact set of performance indicators will be defined in the performance agreement between the SIDDWSWD and the DWSSPs.

Sub-Component 3.2 - Professional and Vocational Development Program (US$5 million). The Project will finance the implementation of a certificate-oriented, long-term capacity development program in response to the need to create a pipeline of water sector professionals with the required skills to plan and manage efficient and sustainable water services, including in the design and implementation of adaptive WSS infrastructure and services. By equipping professionals in the water sector with the knowledge and skills to implement energy-efficient technologies and practices that reduce greenhouse gas emissions, the program will also support climate change mitigation. Training institutions will be selected on a competitive basis, taking into account the technical robustness of the proposed training program, demonstrated training methods, and effectiveness of the monitoring and evaluation (M&E) systems that demonstrate the impact of the training.

Component 4 – MPA Program Structuring and Management and institutional development support (US$10 million, of which US$9.0 million IDA credit, and US$1.0 million grant parallel financing from AIIB, and in-kind counterpart financing) will finance technical assistance and institutional capacity building for the establishment of a program management framework and WSS infrastructure development capacity. Specifically, the component will finance (i) TA and training for the development of the program management tools, including standard E&S instruments, implementation manuals and protocols, to enhance coordination and Program implantation efficiency, and a M&E; (ii) TA for the preparation of investment packages, engineering design, and E&S instruments for future interventions planned for the subsequent phases of the MPA; (iii) Incremental operating costs, TA and equipment for program management; (iv) TA, equipment and services to support a knowledge development program and communications strategy for the MPA aiming to build awareness and understanding among stakeholders about the importance of accelerated WSS access, service delivery sustainability and climate resilience; (v) TA for the preparation of service contract agreements between the operator and asset owner and the PBG independent verification; and (vi) TA for targeted policy regulations, particularly focused on the implementation of the new tariff framework.

Component 5. Contingency Emergency Response (CERC- US$0). This component will provide preparedness and rapid response measures to address disaster, emergency and/or catastrophic events in accordance with the applicable CERC Manual. Following an eligible crisis or emergency event, the Borrower may request the World Bank to reallocate project funds to support emergency response. This component would draw from the uncommitted grant resources under the project from other project components to cover emergency response.

The proposed project structure and component costs are shown in Table 1.

Table 1. Component funding

Components	Amount (USD)
Component 1. "Water Supply Investments"	117 000 000
Component 2. "Sanitation Development"	28 000 000
Component 3. "Performance-based Service Improvement Program"	15 000 000

Component 4. “MPA Program Structuring and Management”	10 000 000
Component 5. “Contingency Emergency Response”	
Total	170 000 000

2.4. Geographical scope of the Project

Currently, according to the SIDDWSWD data, there are 346 villages that require investments for capital construction and rehabilitation of water supply systems (which have not yet been included in any project), of which 18 villages are the administrative centers of districts that are not yet covered by projects and are priorities for financing. Based on the allocated funding from the WB for the proposed Project, the SIDDWSWD includes 109 villages in Chui, Issyk-Kul and Osh oblasts according to the following selection criteria:

1. Lack of access to safe drinking water:
   - lack of a water supply system; the population receives water from ditches, springs and canals;
   - the water supply system was built before 1980 and fell into disrepair, rehabilitation has not been carried out in recent years, water is supplied for less than 3 hours;
   - there is a centralized water supply system, but not the entire population receives water; it is supplied less than 24 hours a day or less frequently.
2. Willingness and consent of the population:
   - willingness to connect to a new water supply system and pay for connection;
   - willingness to pay for drinking water supply services according to the established tariff.
3. Economic feasibility (the cost of constructing a water supply system should be about $350 per capita).
4. Availability of potential to ensure further sustainability of the water supply system.

The proposed list of villages, which includes 109 villages in Chui, Issyk-Kul and Osh oblasts, is formed based on the following factors:

- compliance with village selection criteria;
- the possibility of combining several villages for the purpose of bundling during design and construction, as well as creating a single operator of water services or transferring them to regional branches of the state-owned enterprise to ensure their further sustainability.

Below the planned project zones for Phase 1:

- Chui oblast – Panfilov and Sokuluk raions;
- Osh oblast – Alay, Kara-Kuldzha, Kara-Suu, Aravan, Ozgon raions;
- Issyk-Kul oblast – Ak-Suu raion.

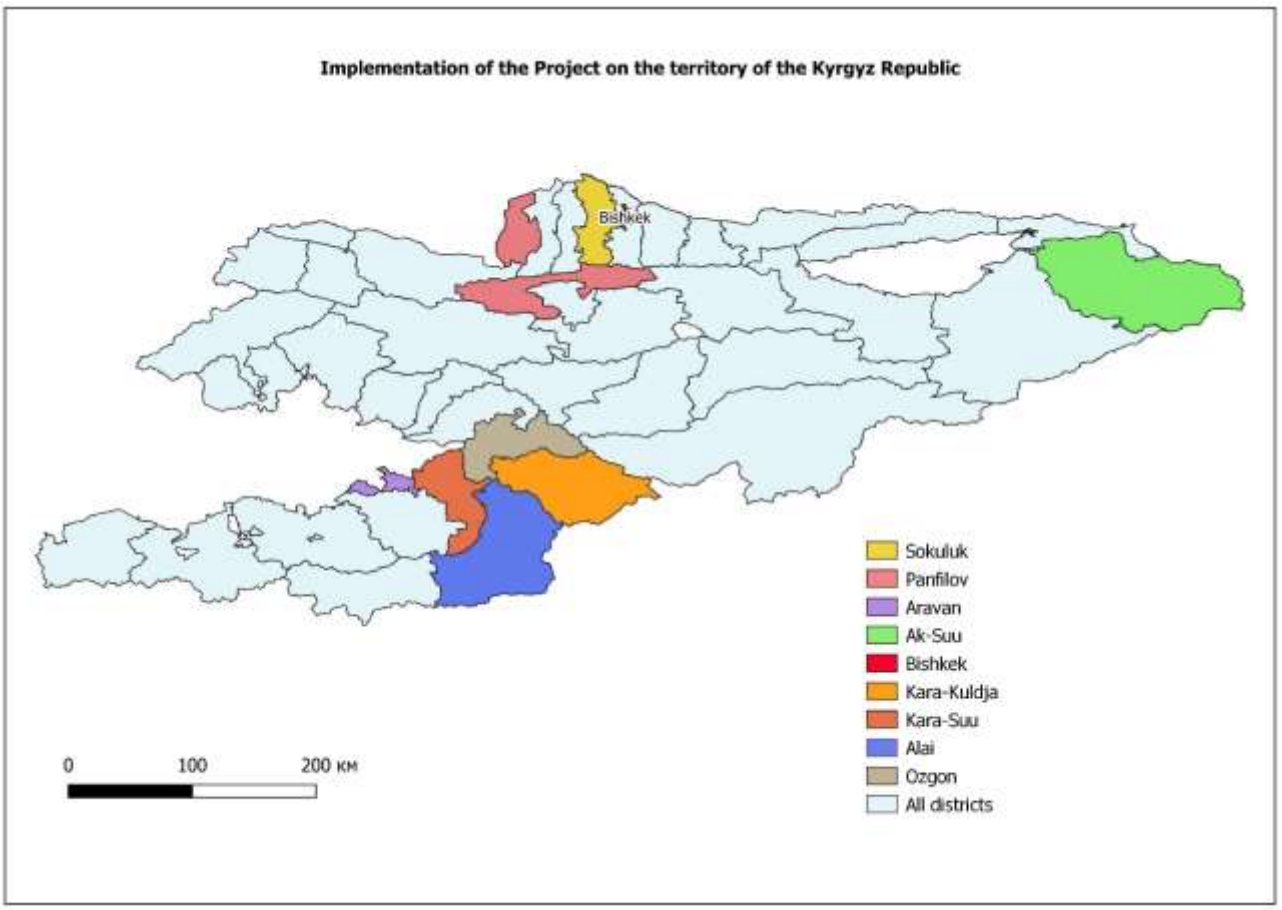

Figure 1. Map of the administrative-territorial division of the Kyrgyz Republic, with planned project zones (highlighted in colors).

Source: SIDDWSWD

2.5. Project beneficiaries

Within the framework of this Project, the necessary activities will be carried out for the construction of new and/or rehabilitation of existing water supply systems in selected villages of the Kyrgyz Republic. Recipients of benefits from the implementation of this Project, according to the level of benefit received, are divided into the following categories, as direct and indirect:

Direct beneficiaries:

- about 373 000 residents living in 109 villages of Chui, Issyk-Kul and Osh oblasts will be provided with access to piped and safe drinking water with connection through water meters;
- around 300 social institutions will be connected to the water supply system;
- around 100 000 people (mostly children) will directly benefit from investments aimed at the construction and modernization of sanitation facilities, as well as related information and educational activities to improve health hygiene and change behavioral skills in educational institutions;
- about 40 local service providers such as village water enterprises (MWE) will strengthen the material and technical base for further sustainable operation of the water supply system. In addition, relevant capacity-building activities will be organized in the field of management and development of WSS services at the local level;
- The Project's investments will focus on improving 6 DWMDs planning and management capabilities and operations, including innovative solutions to improve climate resilience, asset and operational management, customer service, tariff setting procedures, financial management, monitoring and reporting.

It should be noted that direct beneficiaries living in the target areas include low-income households, women, persons with various disabilities and youth. Improved water service delivery is expected to bring a range of benefits to these social groups. These include: realizing the human rights to water and sanitation, reducing waterborne illnesses and public health risks, and improving environmental quality (including reducing odors from unsafely managed toilets and untreated wastewater).

Indirect beneficiaries:

Beneficiaries of the Project will also be government bodies at the republican and local levels, namely:

- The State Institution for Development of Drinking Water Supply and Wastewater Disposal of the Water Resources Service under the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic;
- Local authorities (Aiyl Okmotu) in the participating project areas. Ultimately, consumers in the Project areas will benefit from quality service delivery that will benefit from institutional support and capacity building activities;
- The Department of Disease Prevention and State Sanitary and Epidemiological Surveillance under the Ministry of Health of the Kyrgyz Republic and its district divisions will benefit from the Project in the form of laboratory equipment necessary for conducting laboratory research/analysis and monitoring the quality of drinking water. Also, the Department's database for monitoring water quality and diseases associated with drinking water quality is expected to be updated.

III. GOALS AND OBJECTIVES OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK

This Environmental and Social Management Framework (ESMF) was prepared to assist the Government of the Kyrgyz Republic to develop environmental and social instruments that are consistent with national regulations.

Since the technical assessment (e.g. feasibility study, detailed designs) and specific intervention sites within the project are not fully defined and their specific impact is not known, a framework approach is applied in project assessment. Accordingly, in accordance with ESS1, an ESMF is being prepared which defines the rules and procedures for activities and provides a screening tool to determine the need for an Environmental and Social Impact Assessment (ESIA) of specific sub-component sites, as well as to prepare the corresponding Environmental and Social Management Plans (ESMPs). The main purpose of the ESMF is to identify measures, methods, and mechanisms for preventing, minimizing and/or mitigating potential negative environmental and related social impacts that may arise from the project's implementation. The ESMF ensures that identified projects are properly assessed from an environmental and social perspective to meet the requirements of the ESSs and the World Bank's Environmental, Health and Safety (EHS) Guidelines along with environmental and social laws and regulations of the Kyrgyz Republic to adequately mitigate residual and unavoidable impacts (if any).

This document describes the background, policy, and legal framework, as well as the possible environmental and social impacts of the project interventions. This includes ESIA procedures and guidelines, institutional arrangements, consultation, and disclosure procedures. The ESMF provides guidance on the development of appropriate measures to mitigate and compensate for adverse impacts caused by project activities.

The ESMF will guide project implementation through the provision of the following:

- General guidelines and procedures for preventing, mitigating, or minimizing the adverse environmental and social impacts of potential activities.
- Description of implementation mechanisms, including details on how environmental and social risks will be managed.
- Descriptions of the environmental and social screening processes that will help determine the appropriate site-specific environmental and social instruments.
- Checklists for preparation of ESIA/ESMP for specific sites.
- Environmental and social monitoring and reporting requirements.
- A section on proposed capacity building activities to help the PIU comply with the World Bank ESF.

Project activities may also result in temporary restriction of land use and access to land resources, possibly in some subprojects to temporary land acquisition, resulting in the community or groups within the community being temporarily restricted in access to resource use in areas, areas of biodiversity (water, forest, etc.) to be rehabilitated in connection with the project. To address this risk, the process scheme below provides ways in which local communities, stakeholders can participate in land and natural resource management through informed and meaningful consultation and negotiation to develop and implement action plans. There will be such action plans:

- identify restrictions on access to natural resources in the proposed project areas;
- identify and quantify the impact these restrictions may have on different segments of the local community;
- identify mechanisms for mitigating impacts;
- propose, implement and monitor measures to compensate for possible loss of assets and related income;
- livelihood recovery programs

The Resettlement Policy Framework (RPF) framework document identifies potential impacts, an appropriate entitlement matrix with types of compensation due, a livelihood restoration programme, grievance mechanisms for project-affected people, and implementation, monitoring and evaluation mechanisms.

After final identification of the target sites, detailed designs will be developed and prepared for construction/rehabilitation works, the development of which will identify which specific sites may have ESS 5 issues. Further, if any of the impacts discussed in ESS 5 are confirmed, Resettlement Action Plans (RAPs) will be prepared for each specifically identified site, following the instructions of the RPF document.

A Stakeholder Engagement Plan (SEP) that identifies the various stakeholders and outlines the approach for engaging with them throughout the project life cycle is also being provided.
Furthermore, the ESMF provides mechanisms for effective community engagement through disclosure of project-related information, consultations, input and feedback.

IV. REGULATORY AND INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL ASSESSMENT

4.1. Main provisions of the national environmental legislation

This chapter presents the main legal acts that consider environmental issues relevant to the activities of the Project.

The Constitution of the Kyrgyz Republic establishes the basic principles of nature management, including the right of citizens of the Kyrgyz Republic to have access to primary sources of life, while the main resources (land, water and subsoil) are the common property of the people and the Kyrgyz Republic. Based on these principles, a legal framework was developed to regulate relations between users of natural resources and the state.

The Law of the Kyrgyz Republic "On Environmental Protection" (dated June 16, 1999, No. 53, as amended in 2020) defines the state policy and general legal framework for the use of natural resources and environmental protection, including environmental impact assessment, the establishment of environmental standards and legal regime of protected areas.

The Law of KR on Environmental Expertise (dated 16 June 1999 No.54) ensures that economic and other activities comply with environmental requirements. Applies to projects that may have an impact on the environment, including feasibility studies, as well as projects for construction, reconstruction, development, requipment, other projects, regardless of their estimated cost, affiliation or type of ownership, the implementation of which may have an impact on the environment. The law obliges the project proponent/initiator to submit the necessary documentation on the project and its environmental impacts to the SEE. The review of the submitted documentation is carried out by the MNRETS expert commission. Requires a favorable SEE decision prior to financing or implementation of the project. A negative opinion prohibits implementation of the project.

One of the main opportunities for participation of citizens and their associations in the decision-making process in the field of environmental protection and rational environmental management is public environmental expertise. There are 2 types of environmental expertise in the Kyrgyz Republic: state environmental expertise and public environmental expertise.

Regulation on the Procedure for Environmental Impact Assessment in the Kyrgyz Republic (dated Feb 13, № 60)

The Regulation on the Procedure for Conducting an Environmental impact assessment in the Kyrgyz Republic (hereinafter referred to as the Regulation) establishes the procedure for assessing the impact of planned activities on the environment (hereinafter referred to as the EIA). The purpose of the EIA is to prevent and/or mitigate the impact of the planned activity on the environment and related social, economic and other consequences.

The EIA is carried out in three stages.

The third stage of the EIA is an assessment of the impact of the planned activity on the environment, accompanying the project documentation (project, working draft), containing:

1. an updated comprehensive assessment of the impact of the selected basic implementation option;
2. updated technical solutions and a set of measures to prevent, mitigate and minimize the impact of the planned activity, its functioning and liquidation on the environment and public health;
3. a resource-based program of production control and monitoring of the component-by-component state of the environment during the construction, operation and decommissioning of planned activities;
4. design standards for emissions, discharges of pollutants, formation and disposal of waste;
5. Environmental Impact Statement.

The results of the impact assessment are drawn up in the form of a Section of the project (working draft) named as "Environmental protection section".

The Law of KR on Water (dated 14 January 1994, No. 1422-XII) regulates relations in the sphere of use and protection of water resources, prevention of ecologically harmful impact of economic and other activities on water objects/bodies and water facilities, strengthening of legality in the field of water relations. This law regulates the quantity and quality of water discharged into the environment and prohibits the discharge of industrial, domestic and other wastes and waste into water bodies.

Regulations on water protection zones and strips of water bodies in the Kyrgyz Republic (Government Decree of the Kyrgyz Republic dated July 7, 1995 N 271) The regulation determines the procedure for establishing water protection zones and strips on water bodies of the Kyrgyz Republic, establishes the regime for economic activity and the use of lands that are part of water protection zones and strips, as well as responsibility for keeping them in proper condition.

The Constitution of the Kyrgyz Republic provides for the protection of workers by providing that they are entitled to working conditions that meet the basic requirements of safety and hygiene in the workplace.

The Ministry of Labour, Social Security and Migration of the Kyrgyz Republic has primary responsibility for overseeing occupational health and safety. Key relevant legislation includes the Occupational Safety and Health Law of the Kyrgyz Republic of 2003, the Labor Code of the Kyrgyz Republic of 2004 and certain regulations. The Kyrgyz Republic joined the International Labor Organization on March 31, 1992. An inspection conducted by this organization in 2008 showed that the OSH Law of the Kyrgyz Republic was in line with international norms and standards, although there was also a shortage of trained government inspectors to enforce compliance (ILO, 2008).

In addition to national legislation and regulations on environmental and social issues, the Kyrgyz Republic is also a party to several international treaties on environmental and social issues (see Table 2).

The Law of KR "General Technical Regulations on Ensuring Environmental Safety in the Kyrgyz Republic" (dated 8 May 2009, No. 151) establishes general requirements for ensuring environmental safety in the design and implementation of activities at the objects of economic and other activities for the processes of production, storage, transportation and disposal of products/recycling.

Under this Law, hazard categories will be defined for each subproject to establish mechanisms for EIA implementation.

The Law of KR on Interstate Use of Water Bodies, Water Resources and Water Facilities of the Kyrgyz Republic (dated 23 July 2001, No. 76) defines the principles and main directions of the state policy on interstate use of water bodies, water resources and water facilities of the Kyrgyz Republic.

The Law of KR on the Transfer (Transformation) of Land Plots (dated 15 July 2013 No. 145) determines the legal basis, conditions and procedure for transfer (transformation) of lands from one category to another or from one type to another.

Resolution of the Government of KR on Approval of Acts in the field of drinking water supply dated 31 January 2018 No. 68:

- Sanitary and epidemiological rules and regulations "Sanitary and epidemiological requirements for zones of sanitary protection of water supply sources and water pipelines for domestic use" according to annex 1;
- Sanitary and epidemiological rules and regulations "Sanitary and epidemiological requirements for centralized domestic water supply systems and drinking water pipelines according to annex 1";
- Sanitary and epidemiological rules and regulations "Sanitary and epidemiological requirements for sources of non-centralized drinking water supply to the population according to annex 1;".

SNiP 2.04.02-84* Construction Rules and Regulations "Water Supply, external networks and structures". Sanitary Protection Zone.

Sanitary protection zones should be provided for all designed and reconstructed water pipelines for domestic use in order to ensure its sanitary and epidemiological reliability.

Water supply zones should include the zone of water supply source in the place of water intake (including water intake structures/intake facilities), the zone and sanitary-protection strip of water supply structures (pumping stations, water treatment stations, tanks) and sanitary-protection strip of water pipelines.

The zone of water supply facilities in the place of water intake should comprise three sub-areas: the first - exclusion area; the second and third -constraints area. The waterworks zone should comprise the first sub-area and sub-area (when waterworks are located outside the second sub-area of the water supply source zone).

Table **2**. List of relevant international environmental treaties and conventions ratified by the Kyrgyz Republic

Conventions	Objective
UNECE Aarhus Convention "On Access to Environmental Information and Public Participation in Decision-making and Access to Justice in Environmental Matters", 25 June 1998, (Law of the Kyrgyz Republic on Ratification of 12 January 2001, No. 5).	The Convention's purpose is to support the protection of human rights to a healthy environment for health and well-being, access to information, public participation in decision-making and access to justice in environmental matters.
Stockholm Convention on Persistent Organic Pollutants (POPS), May 22, 2001, (Law of the Kyrgyz Republic on Ratification, July 19, 2006, No. 114).	The Convention aims to protect human health and the environment from persistent organic pollutants.
UN Framework Convention on Climate Change (Law of the Kyrgyz Republic on Accession of 14.01.2000, No. 11).	The Convention aims to combine efforts to prevent dangerous climate change and achieve stabilization of greenhouse gas concentrations in the atmosphere at a relatively safe level.
Paris Agreement on the UN Framework Convention on Climate Change, signed on December 12, 2015, in Paris (Law of the Kyrgyz Republic on Ratification of November 11, 2019, No. 125)	The Agreement aims to strengthen the global response to the threat of climate change in the context of sustainable development, by keeping global average temperature growth well below 2° C above pre-industrial levels; improving the ability to adapt to the adverse impacts of climate change; and aligning financial flows with a trajectory towards low-emission and climate resilience.

Source: Department of Water Resources

4.2 Main provisions of national legislation on social guarantees and citizen engagement

Constitution of the Kyrgyz Republic, adopted by referendum (popular vote) on May 5, 2021.

Article 33, item 3. Everyone has the right to receive information about the activities of state bodies, local government bodies and their officials, legal entities with the participation of state bodies and local government bodies, as well as organizations financed from the republican and local budgets.

Article 33, item 4. Everyone is guaranteed access to information maintained by state bodies, local governments and their officials. The procedure for providing information is determined by law. **Civil Code of the Kyrgyz Republic (May 8, 1996, No. 15, with the latest amendments dated September 15, 2021, No. 120).** Civil legislation determines the legal status of participants in civil transactions, the grounds for the emergence and procedure for the exercise of property rights and other real rights, rights to the results of intellectual activity and equivalent means of individualization (intellectual property), regulates contractual and other obligations, as well as other property and related them personal non-property relations.

Land Code of the Kyrgyz Republic (June 2, 1999, No. 45, with the latest amendments dated August 5, 2022, No. 85) regulates land relations in the Kyrgyz Republic, grounds for occurrence, procedure for implementation and termination rights to land and their registration, and is also aimed at creating land market relations in the conditions of state, municipal and private land ownership and rational use of land and its protection.

Labor Code of the Kyrgyz Republic No. 106 of August 4, 2004 (as amended in 2022) is the main legislative act aimed at regulating all labor issues that arise in the Kyrgyz Republic. This Code regulates labor relations and other relations directly related to and aimed at protecting the rights and freedoms of participants in labor relations and establishes minimum guarantees of rights and freedoms in the sphere of labor. Article 9 of the Code prohibits discrimination and guarantees all citizens equal rights to work; discrimination in employment relations is prohibited. No one may be restricted in their labor rights and freedoms or receive any benefits in exercising them, regardless of gender, race, nationality, language, origin, property and official status, age, place of residence, religion, political beliefs, affiliation or dissent, membership in public associations, as well as other circumstances that are not related to the employee's business qualities and the results of his work.

Any differences, exclusions, preferences, or refusal of employment, regardless of nationality, race, gender, language, religion, political beliefs, social status, education, or property status that led to a violation of equal opportunities in the world of work, are prohibited. Article 10 of the Code prohibits forced and child labor. The Department of Labor Protection and Labor Relations of the Ministry of Labor, Social Protection and Migration supervises and monitors compliance with labor laws, registers complaints related to labor activity.

The Law of the Kyrgyz Republic "On labor protection" dated August 1, 2003, No. 167 (as amended in 2016) provides a framework for the regulation of working conditions, including workplace safety measures, workplace safety rules and workplace hygiene.

The Law of the Kyrgyz Republic "On the procedure for considering citizens 'appeals", No. 67 of May 4, 2007 (as amended in 2016) requires complaints from citizens of the Kyrgyz Republic to be registered, properly considered and dealt with in a fair, timely and accountable manner (Articles 2 and 4). Every citizen has the right to apply personally or through his representative to State authorities, local self-government bodies and their officials, who are obliged to give a reasoned response within the time limit established by law (Article 4). A complaint registered with a State or local self-government body must be considered within 14 working days, although in exceptional cases this period may be extended for no more than 30 days (Article 8).

The Law of the Kyrgyz Republic "On Local Self-Government" No. 101 of July 15, 2011 (as amended in 2019) establishes the principles of organizing local self-government at the level of administrative-territorial units, defines the role of local self-government in the exercise of state power, establishes the organizational and legal basis for their activities, establishes the competence and principles of relations between local self-government bodies and state authorities, state guarantees of local legal communities on self-government issues. Local self-government bodies work in close cooperation with State authorities to create conditions for the implementation of the constitutional rights of citizens of the Kyrgyz Republic to participate in solving issues of state and local significance.

Access to information. According to **Law of the Kyrgyz Republic "On Guarantees and Free Access to Information"** No. 89 of December 5, 1997 (as amended in 2017) and **Law of the Kyrgyz Republic "On Access to Information under the jurisdiction of State and Local Self-Government Bodies of the Kyrgyz Republic"** No. 213 of December 28, 2006 (as amended in 2022), each state institution is required to provide relevant information to citizens and organizations within two weeks.

The Law of the Kyrgyz Republic "On the rights and guarantees of persons with disabilities" No. 38 of April 3, 2008, establishes guarantees of protection and assistance provided to persons with disabilities, as well as measures aimed at protecting public health, preventing disability and creating conditions for integration of persons with disabilities into society.

4.3 Environmental and Social Framework of World Bank

The World Bank Environmental and Social framework (ESF) applies to all Investment Project Financing (IPF) initiated on or after October 1, 2018. This is an important step forward in areas such as employment relations, non-discrimination, climate change mitigation and adaptation, biodiversity, public safety and health, and stakeholder engagement, including enhancing public participation and improving mechanisms for dealing with and resolving grievances. The ESF further enhances the World Bank's sustainability efforts through the implementation of 10 environmental and social standards (ESS) designed to assist Borrowers in managing environmental and social (ES) risks. ESF takes a risk-based approach that increases control and resources for complex projects and enables them to respond more quickly to changing project circumstances through adaptive risk management and stakeholder engagement.

The ESF includes the following items:

- The Concept of sustainable development, reflecting the Bank's aspirations to achieve environmental and social sustainability;
- The World Bank Environmental and Social Framework for Investment Project Financing, which establishes mandatory requirements applicable to the Bank;
- Environmental and Social Standards (ESS), together with their annexes, establishing mandatory requirements for the Borrower and projects.

Borrowers and projects must also comply with the relevant requirements of the World Bank Group's Environmental, Health and Safety (EHS) Guidelines.

According to the planned activities within the framework of the Project, out of the ESSs, eight will be related to the activities of the Project. These 8 ESSs set the standards that the PIU as the Implementation (IA) and the Project should meet throughout the life cycle of the project, namely:

- ESS 1: Assessment and management of environmental and social risks and impacts;
- ESS 2: Labor and working conditions;
- ESS 3: Resource Efficiency and pollution prevention and management;
- ESS 4: Community health and safety;
- ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
- ESS 6: Biodiversity conservation and sustainable management of living natural resources;
- ESS 8: Cultural Heritage;
- ESS 10: Stakeholder engagement and information disclosure.

International Waterways (OP 7.50). OP 7.50 has been triggered because the project will finance rehabilitation, improvement, or minor additions/expansions to drinking water supply systems located within the transboundary basin of the Aravan-Say and Chu Rivers. However, project interventions are not expected to adversely affect water quality or quantity to downstream other riparian states. It is anticipated that the nature of Project activities will not (i) cause appreciable harm to the other riparian states as it will not adversely change the quality or quantity of water flows, and (ii) will not be appreciably harmed by other riparian state's possible water use. Infrastructure rehabilitation, modernization, and water supply management improvements should increase system efficiency, thereby generating water savings and providing users with a reliable water supply. Further, the project aims to improve efficiency of water use and to substantially reduce technical losses and high-water consumption rates. Leakages will be reduced through infrastructure rehabilitation and replacement which will help conserve ground and surface water resources. Water conservation will be promoted through improved demand-management measures, i.e., replacement of continuously running communal standpipes, replacement of communal standpipes with household standpipes, and installation of individual meters.

The ESS requires that the World Bank Group Environment, Health and Safety (EHS) Guidelines apply to the project.

The EHS Guidelines are technical reference documents with generic and industry-specific examples of Good International Industry Practice (GIIP) referenced in the EFS. The EHS Guidelines contain performance levels and measures generally acceptable to the World Bank Group and that are considered to be achievable in new facilities at a reasonable cost using existing technologies. The World Bank Group requires borrowers to apply the appropriate levels or measures of the EHS Guidelines. When host country regulatory requirements differ from the levels and measures presented in the EHS Guidelines, projects will need to be achieved whichever is more stringent.

Applicable EHS guidance for the project, depending on the specific type of work, includes but is not limited to the following:

- General EHS Guidelines of the World Bank Group (2007); https://www.ifc.org/content/dam/ifc/doc/2023/ifc-general-ehs-guidelines.pdf
- EHS Guidelines for Water and Sanitation https://www.ifc.org/content/dam/ifc/doc/2000/2007-water-and-sanitation-ehs-guidelines-en.pdf
- World Bank Group EHS Guidelines for Perennial Crops (2016).

- In the case of the Project, the General EHS Guidelines apply. PIU will pay particular attention to the following General EHS Guidelines[3]:
- EHS 1.0 – Environmental;
- EHS 1.6 - Waste Management https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-waste-management-en.pdf
- EHS 2.0 - Occupational health and safety;
- EHS 3.0 - Community health and safety;
- EHS 4.0 - Construction and decommissioning.

The Contractor shall prepare EHS checklists, Code of conduct and safety trainings prior to commencement of works.

The World Bank has issued Interim Guidance on COVID-19 Construction Reviews to be included in Environmental and Social Management Plans (ESMPs).

The World Health Organization (WHO) maintains a dedicated COVID-19 pandemic website with up-to-date country and technical guidance.

More specific WHO technical advice is available on:

- infection prevention and control,
- individual quarantine,
- rational use of PPE. A list of additional guidance is attached in Annex 10 (SOPs/Safety Measures, Interim Note Considerations for COVID-19 in Construction/Construction Projects).

As the situation remains fluid, it is critical that those managing specific subprojects adhere to WHO recommendations and other international best practices.

4.4 Gap Analysis between the national legislation and the World Bank ESSs

A summary of the ESSs, their relevance to the project, as well as a gap analysis in national legislation within the considered World Bank standards are discussed in Table 3.

[3] EHS in Russian: https://www.ifc.org/wps/wcm/connect/be37221a-fc47-4379-b539-eca3fe72c3e6/General%2BEHS%2B-%2BRussian%2B-%2BFinal_.pdf?MOD=AJPERES&CVID=jqeI79F&ContentCache=NONE&CACHE=NONE

Table 3. Gap analyses in the requirements of national legislation and the requirements of the ESS of the World Bank within the framework of the project. In the event of any dissonance between the KG national laws and those of the Bank, those of the Bank shall prevail.

WB ESS requirements	Environmental and social requirements of national legislation	Gaps	Actions by Project
ESS 1 - Assessment and management of environmental and social risks and impacts - Applicable			
ESS1 identifies, assesses and manages the environmental and social risks and impacts of the project in accordance with the ESS. This standard uses a mitigation hierarchy approach: a) anticipate and avoid risks and impacts; b) if not avoidable, minimize or reduce risks and impacts to acceptable levels; c) once risks and impacts have been minimized or reduced, proceed to mitigate them; and (d) where significant residual impacts remain, offset them if technically and financially feasible. Take differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and that they do not suffer from the sharing of benefits and development opportunities arising from the project. Use national environmental and social institutions, systems, laws, regulations and procedures in the evaluation, development and implementation of projects, where appropriate. Contribute to the improvement of environmental and social performance in a manner that recognizes and enhances the Borrower's capabilities.	• Law “On Ecological Expertise” No. 54 of 1999 (as amended on 04 May 2015). • Law on Environmental Protection No. 53 of 1999 • Law “General technical regulations for ensuring environmental safety”. No. 151 of 2009 • Regulations on the procedure for conducting environmental impact assessment in the Kyrgyz Republic (February 13, 2015, No. 60). • Regulations on the procedure for conducting state environmental expertise in the Kyrgyz Republic (May 7, 2014, No. 248).	The environmental risk classification system under Kyrgyz Republic law is based on the inclusion of a “List” of activities that are either subject to or not subject to EIA. According to the Law "On Environmental Protection No. 53 of 1999", the Law "On General Technical Regulation in the Field of Environmental Safety". No. 151 of 2009, Appendix 1 of the Regulations on the procedure for conducting environmental impact assessment in the Kyrgyz Republic in accordance with Government Decree No. 60 dated February 13, 2015 – Groundwater intakes and water supply systems for settlements, drainage systems are included in the mandatory List of economic activities subject to environmental impact assessment (EIA). The project will be required to undergo the third stage of EIA - assessment of the environmental impact of the proposed activity accompanying the project documentation (Project, Detailed Design). The results of the impact assessment should be formalized as the "Environment" section of the Project (Detailed Design), which includes the Environmental Management Plan. Whereas under the ESF, risk is classified based on due diligence and according to the Bank's classification. However, some provisions of ESS 1 are not fully reflected in national legislation – for example, in relation to social risk assessment, the need to identify vulnerable and disadvantaged groups, and the application of differentiated measures to prevent disproportionate impacts or adverse impacts when sharing development benefits. National legislation also lacks other types of social risk assessment and mitigation, such as public health and safety, although some of these aspects are present in other government regulations, such as air or water pollution, and food safety.	The following tools were prepared for the actions: • ESMF; • SEP; • LMP; • RPF; The ESMF covers the applicable WB ESS and the EHS Guidelines of the World Bank Group. In accordance with the ESF, the more stringent of the national and WB Group regulations will apply. The ESMF includes screening checklists to determine where and when Environmental and Social Impact Assessment (ESIA)/ Environmental and Social Management Plans (ESMPs) are required. Stakeholder Engagement Plan (SEP) outlines strategies and mechanisms for engaging with stakeholders, including affected communities, local authorities, civil society organizations, and other relevant actors. It bridges the gaps between national legislation and the World Bank's ESS by: a. Enhancing Participation: SEP ensures that stakeholders have opportunities to participate in decision-making processes, as required by the World Bank's ESS. It promotes meaningful engagement, thereby providing affected communities a platform to voice their concerns. b. Addressing Communication Gaps: National legislation may not adequately address the communication and information needs of stakeholders. SEP fills this gap by establishing mechanisms for transparent information sharing, disclosure of project-related documents, and effective communication between the project and stakeholders. c. Promoting Social Accountability: SEP strengthens social accountability by establishing grievance redress mechanisms and channels for feedback from stakeholders. This helps address any gaps in national legislation concerning stakeholder grievances and ensures that affected communities have avenues to seek resolution for their concerns. Labor Management Procedures (LMP) provides guidelines and procedures for managing labor and employment practices within the project. LMP

			intended to ensure that the Project complies with all applicable labor laws and regulations and provides fair and safe working conditions for workers. LMP can help to identify potential labor risks and impacts associated with the project and provide guidelines for how to manage them. By adhering to the LMP, the project can ensure that it meets the labor requirements of both national legislation and the ESS of the World Bank. The Resettlement Policy Framework (RPF) provides guidance for developing appropriate mitigation measures and providing compensation, rehabilitation assistance for Project impacts in land acquisition, land use restrictions, and involuntary resettlement whose exact location is unknown.
ESS 2 - Labor and Working Conditions - Applicable			
ESS2 recognizes the importance of job creation and income generation in the pursuit of poverty reduction and inclusive economic growth. The standard applies to project workers, including full-time, part-time, temporary, seasonal and migrant workers. Subject to these requirements, the Borrower shall develop and implement written workforce management procedures applicable to the project. These procedures shall define how project workers are managed in accordance with the requirements of national legislation and this ESS. Procedures should consider how this ESS will apply to different categories of project workers, including direct workers, and how the Borrower will require third parties to manage its workers in accordance with ESS 2. The standard recognizes the promotion of occupational safety and health and fair treatment, non-discrimination and equal opportunity for project workers; prevents the use of all forms of forced and child labor and upholds the principles of freedom of association and collective bargaining with workers, in accordance with national law.	• Labor Code of the Kyrgyz Republic, 2004. • Law of the Kyrgyz Republic on labor protection of 2003 (Article 2). • Law of the Kyrgyz Republic "On Occupational Safety and Health", 2003 • International Labor Organization March 31, 1992	The Kyrgyz Republic has ratified eleven ILO conventions on issues such as forced and child labor, freedom of association, the right to organize and conduct collective bargaining, non-discrimination and labor inspection. The National Labor Law, with the latest amendments in April 2021, establishes state guarantees of labor rights and freedoms of citizens, creates favorable working conditions, and protects the rights and interests of workers and employers. In addition to this Law, the government has approved fourteen other laws and more than twelve regulatory legal acts that directly relate to labor relations. Taken together, the laws adopted in the country cover many of the goals and requirements of ESS 2. Registration of complaints and subsequent procedures are available in the Law on Citizens' Petitions; however, they are common to all project affected persons and do not define a specific grievance redress process for employees as required in ESS 2.	The project will be implemented in accordance with the applicable requirements of ESS 2 by implementing appropriate health and safety measures, including emergency preparedness and response measures; determination of mechanisms for communication with project workers and inclusion of OHS requirements as technical specifications in tender documents and contracts with contractors and supervisory firm. The EA prepared the LMP, including Code of Conduct and GRM for project workers, within the framework of ESS 2. Component activities will employ direct and contracted workers subject to national labor law requirements and the World Bank Group EHS Guidelines in accordance with ESS 2, which will be addressed in the LMP. PIU will develop the GRM for direct and contracted workers before the project starts. Civil works contracts will include EHS-based social and environmental mitigation measures and the ESMF. Each Contractor will prepare its LMP and site specific ESMP (for the construction period) addressing the above labor issues. In accordance with ESS 2 and relevant national legislation, the Project prohibits the use of forced and child labor.
ESS 3 - Resources and Efficiency, Pollution Prevention and Management - Applicable			
ESS3 recognizes that economic activity and urbanization often generate air, water and land pollution and consume limited resources that can threaten people, ecosystem services and the environment at the local, regional and global levels.	• Law on Environmental Protection 1999. • Water Law, 2009 • Law on Production and Consumption Wastes of 2001	The national regulatory framework for pollution prevention prioritizes the protection of public health and is based on the definition of threshold values for permissible concentrations of pollutants to which people may be exposed.	The ESMF covers issues of resource efficiency, pollution prevention and management, it requires that risk definitions and proposed mitigation measures related to the relevant requirements of ESS 3, including raw materials, water use, air

The standard sets out requirements for resource efficiency, pollution prevention and management throughout the life of the project in accordance with Good International Industry Practice (GIIP).		The environmental regulation requires the calculation of expected negative impacts such as emissions, noise, wastewater discharges, waste generation as part of the EIA, to prove the compliance of the proposed project with the established threshold values.	pollution, waste generation, be included in the Contractor's ESMP, if applicable. Design, construction/rehabilitation of water supply systems as well as the main equipment, mechanization and automation means must comply with national legal norms and the requirements of international technical regulations and standards. The Contractors will prepare an ESMPs covering all types of possible waste generated during the implementation process including dirt and debris, household waste, hazardous waste if found.
ESS 4 - Community Health and Safety - Relevance - Applicable			
ESS4 considers the community health and safety risks and impacts affected by the project and the Borrowers' respective responsibilities for preventing or minimizing such risks and impacts, with particular attention to individuals who, due to their circumstances, may be vulnerable.	• Law on Environmental Protection • Labor Code of the Kyrgyz Republic, 2004. • Law of the Kyrgyz Republic on labor protection	The general principles of protecting the health and safety of citizens and communities are enshrined in the Constitution of the Kyrgyz Republic and the Law on Environmental Protection. These laws provide that everyone has the right to live in a natural environment that does not harm his health. To achieve this goal, thresholds are established to limit human exposure to hazardous environments based on several physical, chemical and biological parameters.	The following tools were prepared for the solution: • ESMF; • SEP with Project GRM LMP with Code of Conduct The ESMF covers the applicable ESSs and the EHS Guidelines of the World Bank Group. The PIU will take measures, including requiring contractors to develop a health and safety plan as part of the ESMP (during construction phase) to address the impact of moving construction equipment on local communities; measures and actions designed to assess and manage the specific risks and impacts outlined in the ESMF and subsequent ESMPs. All activities will comply with applicable national regulations and ESS 4.
ESS 5 - Land Acquisition, Land Use Restrictions and Involuntary Resettlement - Applicable -			
ESS5 mitigates the inevitable adverse social and economic impacts of land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement cost, and (b) assist displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real terms, to pre-displacement levels or pre-project levels, as appropriate, which is higher. This standard improves the lives of poor or vulnerable people who are physically displaced by providing adequate housing, access to services and amenities, and security of tenure.	• Civil Code, 1996, 2021. • Land Code, 1999, 2021, (Article 49, paragraph 1, subparagraph 5; Article 66, paragraphs 1, 4; Article 68, paragraphs 1, 3, 4; Article 78, paragraphs 2, 3). • Law on State Registration of Rights to Real Estate and Transactions Therewith, 1998 2021 • Decree of the Government of the Kyrgyz Republic “Standards for the valuation of property, mandatory for use by all subjects of valuation activities in the Kyrgyz Republic”, dated April 3, 2006, No. 217.	The Land Code of the Kyrgyz Republic states that the withdrawal of land is an exceptional measure for the termination of the right to a land plot. The constitution and several laws refer to the need for compensation for land acquisition, although there are no specific requirements for the preparation of action plans for land acquisition or resettlement with a detailed procedure. In accordance with the national legislation of the Kyrgyz Republic, affected persons are those who have formal legal rights to land or property and/or have a right to land or property recognized under national law. The latter mainly concerns land rights allocated by the relevant authorities, but not yet registered in accordance with the law. Users of land or property without proof of such a claim are not entitled to compensation. This is one of the main legal gaps that exist between national legislation and the ESF. The national legislation does not say anything about the rehabilitation and improvement of the living	Component 1 "Water Supply Investments" may have potential impacts on land acquisition and temporary restriction of land use in the area around the utility facilities if new facilities or additional land for infrastructure improvements are required for project activities. Component 2, “Sanitation Development”, may have potential impacts on temporary land use restriction in the area around utility facilities, temporary restriction to sanitation facilities. Due to construction work there may be physical displacement as well as economic displacement of households Construction activities are expected to take place within existing infrastructure or on available state and/or municipally owned land. Department for Development of Drinking Water Supply and Wastewater Disposal PIU will avoid or at least minimize the need for involuntary resettlement, temporary and/or permanent land acquisition.

		conditions of the households affected by the project, or about special attention to vulnerable persons and additional assistance to them.	To prevent negative impacts, within the framework of ESS5, a Resettlement Policy Framework (RPF). Social-environmental screening check-list was prepared. If during the project implementation (target sites are finalized, scopes of work are determined and designs are prepared), any unanticipated impacts or additional impacts are identified a site-specific Resettlement Action Plans (RAPs) will be prepared in accordance with RPF and implemented prior to the commencement of civil works.
ESS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources - Applicable			
ESS6 promotes the sustainable management of living natural resources and supports the livelihoods of local communities and inclusive economic development through the adoption of practices that integrate conservation needs and development priorities. The standard protects and conserves biodiversity and habitats. This standard applies a mitigation hierarchy and a precautionary approach to the design and implementation of projects that may impact on biodiversity.	• Water Code of the Kyrgyz Republic; • Law on Specially Protected Natural Territories; • Law on Biosphere Territories; • Air Protection Law; • Law on the protection of flora; • Fisheries Law; • Law on environmental protection; • Regulations on the protection of surface waters of the Kyrgyz Republic; • List of rare and endangered species of animals and plants listed in the Red Book of Kyrgyzstan.	The Kyrgyz Republic has a strong legal and regulatory framework for the protection, conservation and restoration of biodiversity, but the legal provisions on the sustainable use of natural resources do not provide a regulatory framework to meet the social needs of biodiversity dependent (e.g. forest ecosystems) communities and to derive maximum benefits from their economic use while preserving natural ecosystems, preventing degradation and depletion of their natural resources. National legislation is mainly focused on the protection and conservation of species and to lesser extent on habitat conservation. The Red Book and Red List of Species Law prohibits any activity that damages habitats supporting protected species, meaning that any proposed activity in such habitats must prove that the proposed mitigation measures are sufficient to meet this requirement.	The ESMF includes a screening checklist (Annex 2) to identify potential high risks to biodiversity for specific sites under Component 2. If these risks are identified, so these subprojects will not be funded. In case risks are identified as substantial, a separate Biodiversity Action Plan will need to be prepared. Implementation of Component 2 activities located in natural habitats (including rivers, forest areas, mountain pastures, etc.) will only be eligible for project funding if the requirements of ESS6 are met.
ESS 7 - Indigenous Peoples - Not applicable			
ESS 8 - Cultural Heritage – If applicable			
ESS8 protects cultural heritage from the adverse impacts of project activities and supports its conservation and considers cultural heritage as an integral aspect of sustainable development. The Borrower will apply internationally recognized methods of field study, documentation and protection of cultural heritage in connection with the project, including by contractors and other third parties.	• Law on the protection and use of historical and cultural heritage.	National legislation comprehensively covers many aspects related to historical and cultural heritage. The Law on the Protection and Use of Historical and Cultural Heritage obliges the state to recognize the common cultural values of mankind to support cultural development and international cultural relations, to ensure the availability of cultural values to the public and to preserve the freedom of expression of every citizen his own cultural identity. The state establishes a system for the protection of objects of local, state and international historical or cultural significance.	Since construction works on rehabilitation of water supply systems will be carried out inside settlements and water supply networks will be laid along existing pipes and communications, identification of cultural and national heritage sites is unlikely. Nevertheless, during the design stage, a thorough survey for physical cultural values will be conducted in determining the design solution. In addition, the procedure to be followed in the event of a find of cultural value will be included in all works contracts. ESMF includes a screening checklist (Annex 2) to determine the presence of cultural heritage, in case of work and accidental discovery of cultural heritage, the procedure will be applied "chance finding" to be included in the ESMPs.

			In general, the proposed activities will have no direct physical impact on existing cultural heritage sites, indirect impacts from project funded activities will be carefully considered, and mitigation measures provided for in the ESMF will be integrated in the ESMPs if found.
ESS 9 - Financial intermediaries - Not applicable			
ESS 10 - Stakeholder Engagement and Information Disclosure – Applicable			
ESS 10 recognizes the importance of open and transparent communication between the Borrower and project stakeholders as an important element of international best practice. Effective stakeholder engagement can enhance the environmental and social sustainability of projects, increase their acceptability, and make a significant contribution to the successful design and implementation of a project. The Borrower will engage with stakeholders throughout the life cycle of the project, commencing such engagement as early as possible in the project development process and at a time that allows for meaningful stakeholder consultation on project development. The nature, extent and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impacts. In consultation with the Bank, the Borrower will develop and implement a Stakeholder Engagement Plan (SEP) proportionate to the nature and scale of the project and its potential risks and impacts.	• Constitution of the Kyrgyz Republic • Civil Code • Land Code • Labor Code • Law on labor protection • Law on guarantees and freedom of access to information; • Law on Access to Information of State Bodies and Local Self-Government Bodies; • Law on the Procedure for Considering Citizens' Appeals; • Law on local self-government • Law on the rights and guarantees of persons with disabilities	In general, sound legislation exists, but it needs to be applied consistently. Regarding investment projects, national legislation and regulations are focused mainly on stakeholders, interaction at the stage of project preparation. The existing legal framework describes in detail the procedure for dealing with complaints without the division into local, regional/central levels, as in projects funded by IFIs. There are no special rules in national legislation concerning the participation of vulnerable or disadvantaged individuals and groups in public consultations and project activities. Provisions for disclosure of information and meaningful consultation with project-affected persons are not as clear as in the ESF.	The project's priority is to identify the stakeholders that can be positively and negatively impacted by project activities, in particular the impact on people's lives and the sustainability of livelihoods. In this regard, a list of key stakeholder groups was compiled. The information and consultation process shall be started at early stage of Project preparation, including project design, environmental and social assessment, identification of impact mitigation measures, development of the ESF instruments in order to get people's opinions on the project. The project has prepared a SEP outlining all the different types of stakeholders, including vulnerable groups, timing and modalities of communication and consultation. The SEP describes a Grievance Redress Mechanism (GRM) for the Project o address the issue of transparency and feedback.

Source: Department of Water Resources

4.5 National Institutional system for the environmental and social management

In the Kyrgyz Republic, state power is divided into legislative, executive and judicial. Each of them is carried out by special bodies intended for this purpose. The most important is executive power, because through it the implementation of laws, the implementation of laws, the application of laws in real life are carried out.

Table 4. Government agencies involved in social and environmental issues in this project

#	Name	Description
1	**Government institutions involved in the environment and social issues**	**The Ministry of Natural Resources, Ecology and Technical Supervision (MNRETS)**, in accordance with the Regulations on the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic (Resolution of the Cabinet of Ministers of the Kyrgyz Republic dated November 15, 2021 No. 263), exercises protection and control in the field of flora and fauna, protected areas, biodiversity , radiation protection, protection of the ozone layer, industrial ecology, protection of the quality of water, land resources and atmospheric air, forest ecosystems, etc.
		Environmental and Technical Supervision Service under the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic, in terms of implementation of control functions on compliance with the norms and rules of environmental management and protection.
		Kyrgyz Integrated Hydrogeological Expedition under the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic, in terms of data collection on quantity and quality of groundwater, data on groundwater reserves, mineral resources and their use.
		Department of Disease Prevention and State Sanitary and Epidemiologic Surveillance of the Ministry of Health, in terms of bacteriologic and chemical monitoring of drinking water quality (drinking water quality, population disease incidence).
		Agency for Hydrometeorology under the Ministry of Emergency Situations of the Kyrgyz Republic, in terms of monitoring of atmospheric air and surface water.
		Water Resources Service of the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Republic, in terms of planning, organization and implementation of measures of administrative, economic and normative-legal regulation of water use in the operation of water facilities, protection of water fund lands, as well as regulation of interstate water relations on the use of water resources formed on the territory of the Kyrgyz Republic.
		National Academy of Sciences, regarding the implementation of scientific work on the problems of scientific, technical and social progress, contributing to the strengthening of the economic sovereignty of the Republic, national and universal human values, and environmental protection.
		The Ministry of Water Resources, Agriculture and Processing Industry (MWRAPI) is involved in protecting and increasing the country's forest fund, managing and protecting surface water resources.
		Ministry of Labour, Social Security and Migration (MLSSM) The purpose of the Ministry is to implement the state policy in the field of: – labor, including issues of labor protection and promotion of employment of the population; – social protection of the population, including support for socially unprotected categories of citizens, children in difficult life situations, persons with disabilities and the elderly; – social security and gender equality; – protection and protection from domestic violence; migration, including issues of immigrants, ethnic Kyrgyz and refugees, as well as prevention and combating human trafficking.
		Ministry of Health of the Kyrgyz Republic The objectives of the Ministry are: – protection and strengthening of the health of citizens in the Kyrgyz Republic; – medical insurance of citizens in the Kyrgyz Republic.
		State Agency for Civil Service and Local Self-Government under the Cabinet of Ministers of the Kyrgyz Republic The tasks of the Agency are: – improvement of the unified state policy in the field of civil service, municipal service and local self-government; – ensuring the rights and legitimate interests of state and municipal employees (hereinafter referred to as employees); – improvement and optimization of the system of state administration and local self-government; – assistance in strengthening the organizational, legal, financial and economic foundations of local self-government.
		The State Agency for Land Resources, Cadastre, Geodesy and Cartography under the Cabinet of Ministers of the Kyrgyz Republic implements a unified state policy on the land cadastre, land relations, cadastral mapping, land management, registration of rights to real estate and transactions with it, analysis of the land and real estate market.
		The **Ministry of Emergency Situations of the Kyrgyz Republic (MoES**) is an authorized state executive body of the Kyrgyz Republic that implements a unified state policy and management, coordination, control and response in the field of civil protection, fire safety, safety of people at water bodies, hydrometeorology, management of the system of state material reserve. The MoES is also engaged in monitoring and forecasting natural disasters, and creating an early warning system, which are carried out by structural units of the MoES with the participation of the Department for Monitoring and Forecasting Emergency Situations (DMFES), Kyrgyz Hydromet, the Operational Directorate and Directorate for the Protection of the Population and Territories, as well as the Directorate of Selvodzashchita (protection against mudflows).
3	**State, LSG institutions, NGOs related to the implementation of the Project**	**State Institution for Development of Drinking Water Supply and Wastewater Disposal under the Water Resources Service of the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Rebublic.** The purpose of the Department's activity is to create conditions for sustainable development and operation of the centralized system of drinking water supply and sanitation in the settlements of the Kyrgyz Republic. The objectives of the Department are:

		-development of drinking water supply and sanitation in settlements in accordance with the requirements of regulatory legal acts; - strengthening the capacity of entities servicing centralized water supply and sanitation systems, including those providing services in the drinking water supply and sanitation sector; - development of international cooperation of the Kyrgyz Republic in the sphere of drinking water supply and sanitation; - construction, reconstruction, overhaul and operation of facilities of centralized drinking water supply and sanitation systems by establishing a state enterprise for operation and construction; - implementation of the policy on the development of centralized drinking water supply and sanitation in settlements; - coordination of activities on construction and rehabilitation of facilities of centralized drinking water supply and sanitation systems financed from the republican budget and international financial institutions. The Department is also responsible for the investment viability of the Project and for the Project's contribution to the economic development, poverty reduction and overall prosperity of the region.
		Local public administration. The local public administration exercises executive power in the district/rayon, a state executive authority that ensures on the relevant territory the coordinated activity of territorial subdivisions of state executive authorities, their interaction with local self-government bodies and exercises state control over the execution of delegated powers. The head of the local public administration (hereinafter - akim) shall manage the activity of the local public administration on the principles of one-man management.
		Local self-government bodies. Local government is an independent activity of the local community in its own interests and under its own responsibility, aimed at solving issues of local significance. Local self-governance is carried out by local communities through representative and executive bodies, as well as through direct participation of citizens. The executive body of local self-government in aiyl aimak is aiyl okmotu.
		Rural Public Associations of Drinking Water Consumers (RPADWC) and/or Municipal Water Utilities (MWU): - Actively participate in the process of constructing and/or rehabilitating drinking water systems. - Providing the local population with safe drinking water. - Ensure sustainability of water supply systems after construction and/or rehabilitation.
		The **Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic** is an authorized state executive body in the field of environmental protection, environmental safety (including chemical, biological, radiation and nuclear), nature management, hydrometeorology, which exercises state supervision and control over environmental safety issues. The **Department of Environmental Monitoring** conducts monitoring and assessment of the state of the environment to provide state bodies and economic entities with information on actual changes in the state of the environment and the reasons for these changes to prevent and reduce damage.

V. ENVIRONMENTAL AND SOCIAL BASELINE INFORMATION

5.1 Climate change impact

The Kyrgyz Republic is a mountainous country with a sharply arid continental climate. Relief features, geological structure and climatic characteristics determine the vulnerability of the territory to over 20 types of natural disasters. Natural emergencies annually cause certain damage to the economy of the republic and jeopardize the country's food security.

The negative impact of climate change leads to degradation of pastures, environment and land conditions; affects the availability of water resources; leads to an increase in climate-related natural disasters; affect the socio-economic well-being of the population, especially in rural areas.

The temperature regime of the territory of the Kyrgyz Republic is characterized by a significant increase in temperature over the last decades (Fig. 2). Over the entire observation period, the average yearly temperature increased at a rate of 0.0104 °C per year across the country, while the rate more than doubled between 1960 and 2010 (reaching 0.0248 °C per year) and was already 0.0701 °C per year between 1990 and 2010.

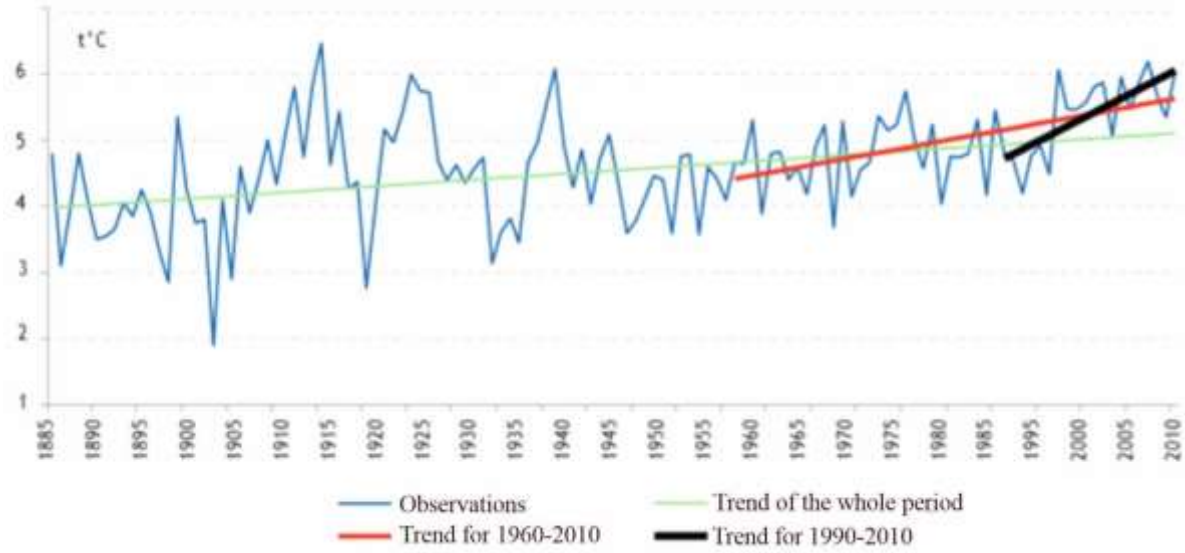

Figure 2. Trend in average yearly temperature in the Kyrgyz Republic.

Source: Ilyasov et al., Climate profile of the Kyrgyz Republic 2013

According to climate scenarios, for 2030-2050, the temperature increase in Central Asia is expected to be about 1-3 °C, while it could reach 3-6 °C at the end of the 21st century. The average yearly temperature increase during the 20th century for the entire country was 1.6°C, significantly higher than the projected global warming of 0.6°C. The highest temperature increase was observed during the winter months (2.6 °C), while the increase was not significant during the summer (1.2 °C). At the same time, significant differences are observed within and between different climatic regions.

It is expected that a 1°C increase in air temperature would increase the evaporation rate by 16 percent. Even if the level of precipitation remains the same, this will result in reduced river flows. However, the intense melting of glaciers will first lead to a dramatic increase in flow. It is estimated that glacier runoff in Central Asia could triple by 2050, leading to significant changes in regional water structure and land use. The rapid melting of glaciers is expected to increase the frequency of glacial lake outbursts, which could lead to destructive landslides in mountainous areas of the Kyrgyz Republic. Another negative manifestation of increased drainage is increased erosion processes.

At the same time, very small (statistically insignificant) changes in annual precipitation occurred over the observation period (Fig. 3). However, in some regions there were quite abrupt changes, both upward and downward (e.g., Suusamyr Valley).

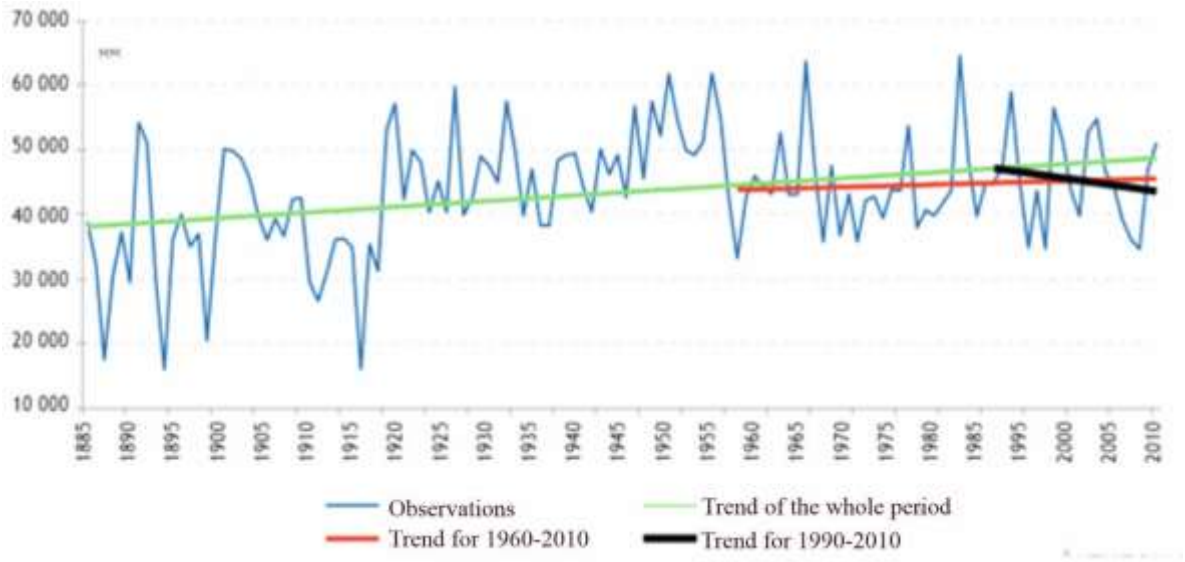

Figure 3. Trend of annual precipitation over the period of instrumental observations (1885-2010).

Source: Ilyasov et al., Climate profile of the Kyrgyz Republic 2013

The negative impact of climate change is expected to adversely affect the quality of land conditions, particularly agricultural land; on pastures increasing the country's food security risks. Will lead to reduced water availability, environmental degradation and increased natural disasters frequency, and will affect rural households particularly low-income groups.

The project is planned to be implemented in four rayons of the Kyrgyz Republic, in Sokuluk and Panfilov rayon of Chuy oblast; Arava, Kara-Suu, Kara-Kuldzha, Uzgen rayons of Osh oblast and Ak-Suu rayon of Issyk-Kul oblast. The full socio-economic, socio-environmental characteristics of the rayons are given below.

5.2 Brief description of implementation areas

5.2.1 Chuy Oblast

Chuy oblast is located in the northern part of the Kyrgyz Republic and occupies the Chuy, Chon-Kemin, high-mountain Suusamyr valley, as well as the slopes of the Kyrgyz, Zailiyskiy (Trans-ili), Kungey Ala-Too, Suusamyr-Too and Dzhumgal mountain ranges.

The oblast area is divided into 8 administrative-territorial districts (Rayons): Alamudun, Zhaiyl, Kemin, Moskovskiy, Panfilov, Sokuluk, Chuy, Yssyk-Ata. The area is 19895 km^2. The average population density is 50.0 people per 1 km^2. Bishkek-Lugovaya railroad, Bishkek-Taraz and Bishkek-Osh highways pass through the area.

Biodiversity

Vegetation The vegetation cover of the Chui Valley is diverse. In the steppe, where the climate is hot with little precipitation, wormwood and wormwood-cereals, such as feather grass and others, grow. Gradually, meadows appear - replete with swamps and reed thickets. You can also see shrubs, thickets of rose hips, sea buckthorn and barberry appear. In the lowlands of the valley and foothills there are also forests and meadows of mixed herbs. In some places there are shrubs and woodlands, in which maple, birch, spruce, rowan and much more grow. Steppe vegetation grows on slopes with plenty of sun. In spring, the meadows are covered with red poppies.

There are few natural places left in the valley. Basically, the entire valley is built up with villages. Residents around the villages planted gardens and vineyards. Wheat and corn are grown in the fields. Large areas are planted with sugar beets and much more.

Wildlife. The fauna of the Chui Valley is part of the West Tenir-Too zoogeographical region. Over 300 species of vertebrates live here, including more than 15 species of fish, about 280 species of birds, and 50 species of mammals. Much of the plain has been plowed and developed, so many birds have lost their habitat and moved to other areas.

In the steppe zone, reptiles include lizards, snakes, vipers, cottonmouths, snakes, etc. The river valleys are home to many species of birds: lark, white-rumped and long-tailed pheasants, reed pika, whiskered tit, minnow, nightingale, blackbirds, pigeons, Indian starling, bats, hoopoe, kekilik, partridge, golden eagle, bearded vulture, etc. Among the mammals found in the Chui Valley are voles, jerboas, shrews, wolves, foxes, badgers, marmots, squirrels, roe deer, bears, mountain sheep, argali, and leopards.

The construction sites are located within the residential sector, which determines the presence of synanthropic animal species.

In the national nature park “Ala-Archa” of Sokuluk rayon among the red-listed animals there are the Turkestan lynx, short-toed eagle, golden eagle, kumai (himalayan griffon), saker falcon, snow leopard and vulture.

Turkestan Lynx

Golden Eagle

Saker Falcon

Snow Leopard

Short-toed Eagle

Vulture

Kumai/Himalayan Griffon

Figure 4. Red-listed animals in the national park “Ala-Archa”. Source: Red Book KR.

State natural parks. *The “Ala-Archa” national nature park is located on the territory of Sokuluk rayon, its area is 19.4 thousand hectares. It is located within the eponymous, very picturesque and unique valley near the city of Bishkek. Its main task is to organize the so-called limited use (mainly for recreation and tourism) with a combination of protection of the natural state of forest, meadow and other ecosystems. The sites of the planned construction will be located away from the “Ala-Archa” national park. Therefore, construction activities for the planned project would not affect park activities.*

Figure 5. The “Ala-Archa” national nature park; location.

Cultural Monuments

Table 5. Cultural monuments officially included in the State List of Historical and Cultural Monuments of the Kyrgyz Republic of Republican Significance - Panfilov rayon

№	Name of the monument	Typological affiliation	Dating of the monument	Address (location of the monument)
1	Suusamyr ancient settlement	Archeology	X-XII centuries.	In the Suusamyr tract on the Iyri-Suu River (left tributary of the Suusamyr River), on the western edge of the Tunuk rural settlement (village)
2	Burial ground	Archeology	I-V centuries.	On the western edge of Tunuk rural settlement (village)
3	A. Osmonov Memorial Complex	Archeology	1990	Kaptal-Aryk rural settlement

Source: Internet resource

Table 6. Cultural monuments officially included in the State List of Historical and Cultural Monuments of the Kyrgyz Republic of Republican Significance - Sokuluk rayon

№	Name of the monument	Typological affiliation	Dating of the monument	Address (location of the monument)
1	Grave of twice Hero of Socialist Labor Z. Kainazarova	History	yy.	Belek rural settlement, at the cemetery

Source: Internet resource

<u>Sokuluk rayon</u>

Socio-economic characteristics. Rayon was founded in 1953. The area is 2550 km^2, 1 city, 19 aiyl aymaks: At-Bashy (4 settlements), Tosh-Bulak (3), Voenno-Antonovka (1), Gavrilovka (4), Dzhany-Dzher (5), Dzhany-Pakhty (5), Kamyshanovka (1), Asylbash (2), Kuntuu (5), named after Krupskaya (4), Kyzyl-Tuu (5), Nizhne-Chuy (6), Novopavlovka (2), Saz (2), Orok (8), Pervomayskiy (3), Sokuluk (1), Frunze (4), named after Kainazarova (3). In total, there are 67 settlements in the rayon (Sokuluk rural settlement belongs to ayil aymaks named after Krupskaya and Sokuluk).

Population. According to the Kyrgyz National Statistics Committee’s data as of January 1, 2022, the resident population is 197.3 thousand people (urban population 10.3 thousand people, rural population 187.0 thousand people). The average population density is 78.0 people per 1 km^2. Shopokov city with a resident population of 10.3 thousand is located on the territory of the rayon.

According to the Kyrgyz National Statistics Committee’s data as of January 1, 2022, the rayon administrative center of Sokuluk rural settlement with the resident population is 15.0 thousand people. The Lugovaya-Bishkek-Balykchy railroad and the Bishkek-Osh highway pass through the district (rayon).

The ethnic composition is represented in the following breakdown: Kyrgyz - 62,6%, Russians - 20,5%, Kazakhs - 2,7%, Dungans - 1,9%, Turks - 1,8%, Azerbaijanis - 1,4%, Ukrainians - 1,2 %, Uyghurs -1,1 %, Dargins - 1,0 %, Lezgins - 0,9 %, Germans - 0,8%, Uzbeks - 0,7%, Tatars - 0,6%, Kurds - 0,5%.

The number of births for 2021 was - 4,144; deaths - 1983; deaths of children under 1 year of age - 26; marriages - 1,251; divorces - 415.

Unemployment, employment, poverty, disease incidence

Due to the close proximity of Sokuluk rayon to the capital, many residents work in Bishkek and therefore the employment level is high compared to other rayon and the average monthly salary is higher.

Table 7. Number of officially registered unemployed; Average monthly salary of employees of enterprises, institutions and organizations by territory

Number of officially registered unemployed					
	2017	**2018**	**2019**	**2020**	**2021**
Chuy	4864	4400	4155	4829	5416
Sokuluk rayon	536	582	558	659	709
Average monthly salary of employees of enterprises, institutions and organizations by territory (soms)					
Chuy	13 391	14 114	14 724	16 051	15 958
Sokuluk rayon	13 724	14 036	14 984	15 206	15 035

Source: National Statistical Committee of the Kyrgyz Republic

Most of the population is employed in agriculture, wholesale and retail trade, construction, and transportation activities. Thus, the turnover of wholesale and retail trade for 2021 in Chuy oblast amounted to 99,735 mln. soms, and in Sokuluk rayon - 15,614.6 mln. soms, which is 15.6% of the entire oblast.

The incidence of certain groups of diseases (cases with first-time diagnosis per 10,000 people) in Chuy oblast for 2021: infectious and parasitic diseases - 142; diseases of blood and blood-forming organs - 33; diseases of the endocrine system - 21; diseases of the circulatory system - 58; diseases of the respiratory system - 1,059; diseases of the digestive system - 62.

Migration. Economic difficulties, problems with work and education force the population to make intra-republican relocations to more favorable places. Bishkek and Chuy Oblast are relatively stable regions. Thus, in 2017, the number of arrivals amounted to 6005 people, and in 2021, 5541 people arrived in the oblast, or 7.7 percent less, the largest part of which are residents of Bishkek (32.5 percent), as well as other oblasts: Jalal-Abad (13,9), Osh (12,2), Naryn (12,0), Issyk-Kul (11,3), Batken (9,2) and Talas (6,9 percent). However, the Chuy people did not become an exception either, moving to other regions of the republic, their departure amounted to 5183 people (7464 people - in 2020).

Along with the growing activity of emigration processes, intra-oblast migration of the population has also increased. The main flow of internal migrants is directed to regions with greater opportunities for labor application: Chuy – 734 people, Sokuluk – 496, Alamudun – 368, Issyk-Ata - 367, Zhaiyl – 316, Moskovskiy – 271, Panfilov – 221, Kemin – 132 people regions and Tokmok – 409 people.

Table 8. External migration of population by territory; internal migration of population by territory

External migration of population by territory (persons)					
	2017	**2018**	**2019**	**2020**	**2021**
Sokuluk rayon	**65**	**162**	**91**	**91**	**248**
Urban population	4	8	7	1	-
Rural population	61	154	84	90	248
Internal (inter-oblast) migration of population by territory					
Sokuluk rayon	**1 122**	**1 663**	**1 813**	**237**	**1 729**
Urban population	121	106	124	21	-
Rural population	1 001	1 557	1 689	216	1 729

Source: National Statistical Committee of the Kyrgyz Republic

In 2021, the greatest losses of external migration are observed in Sokuluk rayon, Issyk-Ata, Alamudun, Zhaiyl, Moskovkiy rayons and Tokmok city. Along with the increase in the activity of emigration processes, interregional migration has gained momentum.

Vulnerable Groups. There are individuals and groups in the area who require special attention during Project implementation due to their disadvantaged or vulnerable situation. This group includes persons with disabilities, pensioners, female-headed households and low-income households (less than subsistence minimum per capita - 5,282 soms/month), elderly single people.

Among the total population, thousands of disabled people live in the oblast (in 2021 - 30 300 people), a small part of them are under the care of the state in special homes and boarding schools for the elderly and disabled (adults) - 1 046 people and for disabled children - 308 children. In 2021, the number of people injured in industrial accidents increased slightly compared to 2017 and amounted to 15 people (22 in 2020 and 11 in 2017). Occupational injuries occur mostly in high-risk industries. More than 86.7 percent of the accidents occurred in the manufacturing industry.

Industry. Chuy oblast is the main industrial production area of the Kyrgyz Republic. Production of rare-earth elements of the yttrium group, cable products, equipment for trade and catering, building materials, lime, window glass, slate, cardboard, carpets, felted shoes, granulated sugar, alcohol, primary processing of wool, cement is concentrated here.

Main industries: light industry, non-ferrous metallurgy, machine building and metalworking, production of industrial building materials. In 2001, the volume of industrial products (works, services) produced in Chuy oblast amounted to 15786.9 million soms or the share of the oblast in the total volume of industrial production of the republic amounted to 32.4%. In the total volume of industrial production, the share of non-ferrous metallurgy accounts for 71.8% of the food industry - 12.7%, machine building and metalworking - 3.2%, flour and fodder industry - 2.8%, fuel industry - 0.2%, light industry - 1.4%, fuel and energy industry - 1.2%.

“Metallobeton” JSC of Panfilov rayon, “Linoleum” SJSC, “Ak-Tash” JSC of Kemin rayon, Emgekchil JSC of Sokuluk rayon, and “Building Products Plant” JSC of Zhayil rayon operate in this sector. This industry is also represented by JSC “Chaldovar garment factory” of Panfilov rayon, “Bobok” factory of Sokuluk rayon.

The largest number of economic entities was registered in Chuy (including Tokmok city) -20186 (16.8 percent), Sokuluk -19856 (16.5 percent), Yssyk-Ata - 17592 (14.7), Alamudun - 16657 (13.9) and Zhaiyl - 14993 (12.5 percent) rayons. The smallest number was registered in Panfilov rayon - 6347 (5.3 percent) economic entities. The largest number of operating enterprises at the beginning of 2016 is in Alamudun rayon (18.1%), Sokuluk (18%), Yssyk-Ata (16.1%) and Zhaiyl (15.3%) rayons. The lowest share of operating enterprises was registered in Panfilov (4.4%), Chuy (5%) and Moskovskiy (6.9%) rayons.

Agricultural Activities. There are 1.3 million hectares of arable land in the republic, which accounts for only 7% of the total area of the country. More than 70% of arable land productivity depends on irrigation. Irrigated lands provide more than 90% of agricultural production and are considered a strategic natural resource of Kyrgyzstan.

Quantitative condition of agricultural arable land in the land fund of Chuy oblast: irrigated - 282 761 ha, bogara (dry farming) - 143 763 ha; Sokuluk rayon: irrigated - 50 573 ha “bogara” (dry farming) – 31 928 ha.

Table 9. Share of arable land in the farmland composition (ha).

	Area of agricultural land (ha)	**Arable land area (ha)**	**Share,%**
by oblast	**1037090**	**426524**	41,1
Sokuluk rayon	138519	82501	59,6
Panfilov rayon	113061	51594	45.6

Source: National Statistical Committee of the Kyrgyz Republic

The share of arable land in the farmland composition in Chuy oblast is 41.1%. The indicators of this value vary by rayons of Chuy oblast. Moskovskiy rayon has the largest share of arable land (70%). In Sokuluk and Yssyk-Ata rayons, this indicator has 59.6% and 55.2%, and in other rayons t is within the range of 16-46%.

On average, there are 0.28 ha of cultivated land for each inhabitant of Chuy oblast.

Table 10. Indicators of land availability with cultivated land

Rayon	**Population, per.**	**Cropped land area, ha**	**Per./ha**
Panfilov rayon	46606	38426	0,82
Sokuluk rayon	187496	59235	0.32
Average for the oblast	876599	247346	0,28
Average for the Republic	6134000	1287600	0.21

Source: National Statistical Committee of the Kyrgyz Republic

The analysis of the indicator of land availability with cultivated land (arable land) showed that the residents of Panfilov, Zhayil and Moskovsky rayons are the most provided. The level of the indicator of land availability with cultivated lands is below the average for the oblast in Alamudun, Chuy, Yssyk-Ata and Kemin rayons. The average indicator of land availability with cultivated lands in Chuy oblast is higher than the republican one by 0.07 percentage points.

As for the production of the main types of agricultural products in Sokuluk rayon, they are grain, sugar beet, potatoes, vegetables, fruits and berries, meat, milk, eggs, wool. Cultivated area of agricultural crops in Sokuluk rayon in 2021 amounted to 80.7 thousand ha, of which wheat -32.7; barley - 21; oats - 0.1; corn for grain - 6.6; grain legumes - 0.1; sugar beet - 2; oil crops -0.6; potatoes -2.2; vegetables -4.9; melons - 0.5% other crops - 0.1; fodder crops - 10.

The number of cattle in the rayon for 2021 amounted to 62.1 thousand heads, including cows - 30.4; pigs - 8.2 sheep and goats - 126.5; horses -10; poultry - 867.1.

Topography and relief.

Sokuluk rayon is located in the central part of the Chuy Valley and is bounded: from the north by the territory of the Republic of Kazakhstan; from the west by the territory of Moskovskiy rayon; from the south by the crest of the Kyrgyz ridge; from the east by the territory of Alamudun rayon.

The area is stretched by slope from south to north, includes northern slopes of the Kyrgyz ridge occupying the southern third of the rayon area, foothill zone with slope up to 2^{o} and flat part with slopes less than 0.5^{o} in the

northern direction.

The mountain part is represented by rocks of Paleozoic age, the valley part by alluvial-proluvial, sandy-clay and coarse clastic rocks of Neogene-Quaternary age. Absolute elevations of the relief increase from the area's northern borders from 580 to 1100 m in the valley part up to 4400 m on the crest of the Kyrgyz Ala-Too Mountain Ridge. 43.2% of the area belongs to the mountainous and 56.8% to the plain type of relief.

Climate. The climate is continental with dry, hot summers and moderately cold winters. The average temperature in July is 25°C. Autumn is dry and warm, followed by a sharp transition to winter. Snow cover is inconsistent. The number of days per year with snow cover is 71, the average snow cover height is 21 cm in the valley part of the area.

On the northern slopes of the Kyrgyz ridge, the number of days per year with snow cover and snow cover height increase depending on absolute elevations. This dependence is reflected in the following figures: 1000 м elevation – 25 cm snow cover height – 68 days per year with snow cover; 1500 m – 26 cm – 91 days; 2000 m – 46 cm – 118 days; 2500 m – 66 cm– 146 days; 3000 m – 84 cm – 183 days; 3500 m – 115 cm – 243 days.

Hydrology. Mountain rivers originating on the northern slopes of the Kyrgyz ridge are mainly mixed glacial-snow and rain feeding, with the highest total discharges/flow rate occurring in July-August. The largest watercourses in the district are the rivers: Konok– 1% flow rate 20,8 m^3/s; Zhylamysh – 29,0 cm^3/s; Sazbulak – 25,1 m^3/s; Burli – 131,0 m^3/s; Chetendi – 39,2 m^3/s; Sarymsakty – 45,4 m^3/s; Kashka-Suu – 89,0 m^3/s; Sokuluk – 61,5 m^3/s. Mountain rivers have strongly deepened channels/riverbed with numerous branches/distributaries wandering in floodplain depressions. When entering the valleys, a significant part of river runoff is diverted for irrigation.

In the valley part, the gully-terrain network with permanent and temporary watercourses of rain and groundwater supply is widespread.

Irrigation networks are developed everywhere in the central and northern part of the area and are represented by numerous canals and artificial reservoirs. In the middle part of the area there are wetlands, and the collector-drainage network is developed.

Emergency danger zones and forecasts of possible activation of natural hazardous processes and phenomena.

The emergency forecast for 2023 shows the location of specific areas of possible activation of dangerous natural processes and phenomena. In terms of prevalence and frequency of occurrence, mudflows and floods, groundwater flooding prevails among exogenous hazardous processes.

Seismic Hazard. On the Map-scheme of probable seismic hazard in the region, one area of expected earthquakes (ERE) is highlighted - Aksuu-Sokuluk (ASS) of the second hazard category with a class of expected earthquakes of 12.6-14.5, intensity 5-7 points.

Table 11. Earthquake information

Name of administrative regions	Name of the area of expected earthquake (area of expected earthquakes)	Index of the area of expected earthquakes on the map	Settlements located within the area of expected earthquakes	Earthquake class	Hazard category (HC)	MSK-64 scale score
Sokuluk	Акsuu- Sokuluk	ASS	no settlements	12,6-14.5	II	5-7

Source: Ministry of Emergency Situations

Landslide Hazard. The mountainous area is subdivided into the following mudflow hazard zones: the second degree (15.4% of the area) is distributed in the upper reaches/riverhead of the Zhylamysh and Sokuluk rivers (as well as in the floodplain and low terraces of the Sokuluk River); the third degree (17.2% of the area) occupies the mid-mountain areas; the fourth degree zone (8% of the area) is distributed in the foothills and low mountains.

In the upper reaches of the Sokuluk and Zhylamysh rivers there are concentrated high-mountain glacial outburst lakes, which increase the risk of mudflows and floods.

Mudflows, floods, bank erosion. Mudflow formation is possible in 38 watercourses of the region. The most dangerous, associated with the outburst of high-mountain lakes are the valleys of the Zhylamysh and Sokuluk rivers (Fig. 6).

All major rivers have floods in July-August months, and this is due to intensive melting of glaciers and snowfields. On smaller rivers and side sai, the flood period coincides with spring snowmelt and overlapping rainfall.

Local heavy rain mudflows can occur in any mountain valley with a catchment area of up to 10 km^2 and their flow rates can reach up to 1-5 m^3/s.

Outburst lakes. In the valleys of Sokuluk and Zhylamysh rivers there are 18 outburst hazardous high-mountain lakes, of which 3 lakes are of the second category, 13 - of the third category and 2 of the fourth category of hazard.

Avalanche Hazard. The mountainous territory of the region by avalanche hazard degree is divided into: a zone with the first avalanche hazard degree, occupying 3% of the area and located in the near-axis part of the Kyrgyz ridge; a zone with the second avalanche hazard degree (with the area of 14.1% of the region territory), spread in

the high-mountainous parts of the region. The zone of the third avalanche hazard degree is 10.2% of the area, and is spread in the mid-mountainous parts of the region. A zone of the fourth avalanche hazard degree, which occupies 4.9% of the area, is spread in the foothills and low mountain areas.

Underflooding. The area with high groundwater table (from 0 to 3 m) includes settlements in the central and northern parts of the region. Shallow groundwater table is caused by natural outcrop, poor drainage of these sections and seepage from the irrigation system.

On Fig. 6 the information on areas of activation of underflooding processes is given. For lowering of the groundwater tableit is necessary to carry out effective irrigation and reclamation measures first of all on cleaning and restoration of collector-drainage networks.

Landslide Hazard. On the map-scheme of typological engineering-geological zoning and landslide hazard forecasting on the territory of the rayon two sites with II category of vulnerability are allocated: with the first degree of risk - located on the slopes of the Chon-Aryk uplift and on the left side of the Sokuluk river; with the second degree of risk - extends to all foothill and lowland areas of the region (15.3% of the area). The rest of the mountainous territory of the rayon belongs to the III category of vulnerability, where the activation of slope processes (landslides, rockslides, rockfalls, mudflows) depends on the steepness and condition of the slope.

Landslides. Landslides hazardous areas have been identified on the territory of the rayon, the activation of which is possible in case of intensive heavy rainfall and strong earthquakes.

Bank erosion is observed along the left bank of the Chu River, where existing dams, agricultural lands and other objects are subjected to erosion (Fig. 6).

Panfilov rayon

Socio-economic characteristics. Panfilov rayon was separated from Zhayil rayon in 1977 and was a rayon of republican subordination until 1990. The area of the rayon is 2606 km2, includes 6 aiyl aimaks, 20 settlements: Voznesenovka (3 settlements), Kurpuldek (3), Ortoev (3), Kurama (4), Frunze (3), Chaldybar (4).

According to the Kyrgyz National Statistics Committee's data as of January 1, 2022, the resident population is 48.6 thousand people (urban population 9.7 thousand people, rural population 38.9 thousand people). The largest population was counted in Kuraman aiyl okmotu - 10956 people. The average population density is 19.0 people per 1 km^2. According to the Kyrgyz National Statistics Committee's data as of January 2022, 1, the rayon administrative center of Kaindy town with the permanent population is 9.5 thousand people. Bishkek-Lugovaya railroad, Bishkek-Taraz and Bishkek-Osh highways pass through the area.

Among the residents are representatives of more than 20 nationalities: Uzbeks — 58,7%, Kyrgyz — 39,6%,Azerbaijani—0,7%,Tajiks—0,5%,Tatars— 0,1%, others —0,5%. The number of births for 2021 was - 3 236; deaths - 657; deaths of children under 1 year of age - 26; marriages - 1084; divorces - 162.

Unemployment, employment, poverty, disease incidence

According to the 2021 sample household survey, in the total population, the poverty rate was 27.0 percent in 2021 (33.3 percent in 2017) and the extreme poverty rate increased to 4.0 percent (1.7 percent in 2017). In 2021, the poverty rate increased by 1.6 percent from last year (25.4 percent in 2020) and the extreme poverty rate increased by 2.7 percent (1.3 percent in 2020).

The level of the minimum consumer budget of the population increased by 16.6 percent compared to 2020 and by 23.3 percent compared to 2017, amounting to 5978.81 soms. In the structure of the subsistence minimum, the share of food products is 65 percent, non-food products - 16, services - 17 and taxes - 2 percent.

Most of the population is engaged in agriculture (farming and cattle breeding), sowing wheat, barley, beets, clover and other crops. Cows, sheep and horses are raised in the household. The population is also engaged in wholesale and retail trade, construction, and transportation activities. So, the volume of retail turnover and public food service in Panfilov rayon for 2021 is 4.6% of the entire oblast.

Migration. The demographic situation in general and the change in the total population is significantly influenced by migration. Among the CIS countries, Russia remains the top priority country for departure. The highest number of departures to Russia was observed in 2021. In 2021, the number of departures to Russia increased 2.2 times compared to 2017, and it increased 2.3 times compared to 2020. At the same time, the largest inflow of population was noted from Russia, Tajikistan and Uzbekistan. The largest migration outflow from the oblast is observed in Russia, Kazakhstan, etc. The most active working-age part of the population participates in the processes of external migration movement. The main share of emigrants in 2021. - people of working age.

Economic difficulties, problems with work and education force the population to make intra-republican relocations to more favorable places. Bishkek and Chuy Oblast are relatively stable regions. Along with the growing activity of emigration processes, intra-oblast migration of the population has also increased. The main flow of internal migrants is directed to regions with greater opportunities for labor application: Panfilov rayon - 221 people.

Table 12. External migration of population by territory; internal migration of population by territory

External migration of population by territory (persons)					
	2017	**2018**	**2019**	**2020**	**2021**
Panfilov rayon	**34**	**13**	**3**	**3**	**85**
Urban population	12	4	1	1	-
Rural population	22	9	2	2	85
Internal (inter-oblast) migration of population by territory					
Panfilov rayon	**1 122**	**1 663**	**1 813**	**237**	**1 729**
Urban population	121	106	124	21	-
Rural population	1 001	1 557	1 689	216	1 729

Source: National Statistical Committee of the Kyrgyz Republic

Industry. The priority of the entities from among the types of economic activity operating in the structure has remained unchanged for five years without any significant changes. The largest share is accounted for by entities of other service activities - 19.4 percent, education - 15.2, wholesale and retail trade; repair of motor vehicles and motorcycles - 10.6, processing industries (manufacturing) - 9.5, agriculture, forestry and fishing - 7.6 percent.

Thus, the volume of industrial production in Chuy oblast amounted to 167981.4 tons, including 4118.6 tons in Panfilov rayon. And the volume of retail turnover and public food service in 2021 (as a percentage of the total volume of Chuy oblast) in Sokuluk rayon is 12.7%, Panfilov rayon - 4.6%.

Panfilov rayon has 6,347 registered economic entities (5.3 percent of the total Chuy oblast). According to statistical data, the smallest share of operating enterprises in Chuy oblast is registered in Panfilov rayon (4.4%). One of the major enterprises of this rayon are “Metallobeton” JSC and “Chaldovar Garment Factory” JSC.

Investments in fixed capital (capital investments): in Panfilov rayon processing industry capacities were introduced - for 194.5 mln. soms.

Agricultural Activities. In the structure of gross regional product for 2020 in the context of industries and types of economic activities, the largest share falls on: agriculture (26.0 percent of the total GRP), wholesale and retail trade; repair of cars and motorcycles (18.5), manufacturing industries (18.2), construction (8.0), education (5.3), public administration and defense; compulsory social security (4.4 percent), etc. At the same time, the share of net taxes on products amounted to 7.2 percent of total GRP.

Cultivated area of agricultural crops in Panfilov rayon in 2021 amounted to 51.2 thousand ha, of which wheat -16; barley - 21,1; oats - 0; corn for grain - 1.6; grain legumes - 0.2; sugar beet - 0,8; oil crops -1.4; potatoes -0.4; vegetables -5; melons - 0.05%; fodder crops - 9.2.

Table 13. Production of main types of agricultural products by territory (tons)

Types of products	**Sokuluk rayon**	**Panfilov rayon**	**Chuy Oblast**
Grain	97,4	34,7	434,5
Sugarbeet	87,8	18,1	352,8
Potato	36,2	6.4	173,7
Vegetables	88,8	8.9	401,6
Fruits and berries	4,2	0.4	16.8
Meat	26 645,1	5 580	96 520,3
Milk	97 981,2	27452,6	433 293,7
Eggs	160 383	6776	336 959
Wool	371,5	177,6	1819,9

Source: National Statistical Committee of the Kyrgyz Republic

Quantitative condition of agricultural arable land in the land fund of Chuy oblast: irrigated - 282,761 ha, bogara (dry farming) - 143,763 ha; Panfilov rayon: irrigated - 26,190 ha, “bogara” (dry farming) - 25,404 ha.

The number of cattle in the rayon for 2021 amounted to 21.2 thousand heads, including cows - 10.5; pigs - 0.8 sheep and goats - 57.4; horses - 5; poultry - 65.4.

Topography and relief. Panfilov rayon is the westernmost rayon of the oblast. Its territory is bounded: from the north and west - by the state border with the Republic of Kazakhstan; from the south - by the territory of Talas oblast; from the east - by the territory of Zhaiyl rayon of Chuy oblast. 81.7% of the area of Panfilov rayon belongs to the mountainous, and 18.3% to the valley type of relief.

Additionally, the Suusamyr valley general use lands without settlements, used as pastures in spring and fall period, belong to the territory of the rayon. The territory of the rayon is stretched along the slope in meridional direction and covers alluvial-proluvial plain in its northern part, foothill area represented by merged cones of removal, and mountainous up to the crest of the Kyrgyz ridge. Absolute altitudes: in the plain 550-750m; in the foothill 750-1200m; in the mountainous part from 1200 to 4380m.

Climate. The climate of Panfilov rayon is characterized by the main climatic indicators for the western part of the Chuy valley. The climate is continental with dry, hot summers and moderately cold winters. The average temperature in July is about 25°C. Autumn is dry and warm with a sharp transition to winter. Snow cover is inconsistent. Number of days per year with snow cover in the valley part 71 with a snow cover height of 21 cm up to altitudes of 800 m above sea level.

On the northern slopes of the Kyrgyz Ala-Too mountain ridge, depending on absolute altitudes, the number of days per year with snow cover and snow cover height increase (1000 m - snow cover height 25 cm, number of days 68; 1500 m - 26 cm - 91 days; 2000 m - 46 cm - 118 days; 2500 m - 66 cm - 146 days; 3000 m - 84 cm - 183 days; 3500 m - 115 cm - 243 days).

Hydrology. The area's hydrographic network belongs to the Chu River basin and is represented by its numerous left tributaries. The largest are Chon-Kaiyndy River- 26.9 m^3/s; Cholok-Kaiyndy River - 5.9 m^3/s; Dzhardy-Kaiyndy River - 31.7 m^3/s; Chorgoly River - 3.0 m^3/s; Taldy-Bulak River - 5.3 m^3/s; Kara-Bulak River - 0.3 m^3/s; Chorgoly ravine - 1.0 m^3/s. The rivers are fed by glacier and snow, partly by rainfall. In the valley part there is a widespread distributed gully and ravine network with permanent and temporary watercourses. The irrigation network in the valley part is developed everywhere and is represented by numerous canals (the largest is the Big Chuy Canal) and artificial reservoirs. An open and closed collector-drainage network is developed to the north of the Big Chuy Canal.

Danger zones and forecasts of possible activation of hazardous processes and phenomena

The emergency forecasting shows the location of specific areas of possible activation of dangerous natural processes and phenomena.

In terms of prevalence and frequency of occurrence, groundwater flooding, mudflows and floods prevail among exogenous natural processes.

Seismic Hazard. Probable seismic hazard on the territory of the rayon - three AEE (areas of expected earthquakes) - Karakol-Kara-Balta (KKK), Oygai (OG), Aksuu-Sokuluk (ASS) of the second category of hazard with the class of expected earthquakes 12.6-14.5, intensity of 5-7 points is allocated.

Table 14. Earthquake information for Panfilov rayon

№	Name of administrative regions	Name of the area of expected earthquake (area of expected earthquakes)	Index of the area of expected earthquakes on the map	Settlements located within the area of expected earthquakes	Earthquake class	Hazard category (HC)	MSK-64 scale score
1	Panfilov rayon	Karakol-Kara-Balta	KKK	no settlements	12,6-14,5	II	5-7
2		Oygain	OG	no settlements	12,6-14,5	II	5-7
3		Aĸsuu- Sokuluk	ASS	no settlements	12,6-14,5	II	5-7

Source: Ministry of Emergency Situations

Landslide Hazard. The mountainous territory of the district is subdivided into the following mudflow hazard zones: the zone with the third degree of mudflow hazard (28.6% of the area) occupies the middle and high mountainous parts of the northern slope of the Kyrgyz ridge, in the Suusamyr valley the basins of the Korumdu, Tokoyluu, Chon-Korumdu, Iyri-Suu Rivers and the right tributaries of the Karakol River (western) in its upper reaches; the zone with the fourth degree of mudflow hazard (area of 48.4%) occupies the remaining mountainous part of the region. Plain areas, except for low terraces and river floodplains are not mudflows hazardous.

Based on hydrological data from the total number of permanent and temporary watercourses on the territory of the region ten watercourses were identified, on which in some periods of the year hazardous mudflow can be formed on the rivers Chon-Kaiyndy, Cholok-Kaiyndy, Dzhardy-Kaiyndy, Chorgoly, Taldy-Bulak and on the ravines Kara-Bulak and Chorgoly.

The above-mentioned rivers can be flooded, among which the Chon-Kaiyndy and Zhardy-Kaiyndy Rivers are the most dangerous. The highest average annual flow rate occurs in July-August and is associated with intensive glacier melting. In the valleys of these rivers' mudflows can be formed in case of high-mountain lakes outbursts, the most probable period is July-August. There are 6 outburst lakes on the territory of the rayon, including 1 of the first and 5 of the third category of hazard (Fig.10)

Table 15. Forecast of possible activation of outburst lakes

№	Lake name and its catalog number	Lake type	Hazard category (HC)	The river basin in whose valley the lake is located	Abs. elevation (m)	Settlements falling within the outburst impact zone
1	Dzhardy-Kaiyndy-1 (Ch-1)	moraine-glacial	I	Dzhardy-Kaiyndy	3578 m, V 80thous.m^3	Orto-Aryk, Panfilov, Kaiyndy, Headworks hydraulic complex
2	Dzhardy-Kaiyndy-2 (Ch-26)	glacial	III	Dzhardy-Kaiyndy	3505	
3	Chon-Kaiyndy-1 (Ch-2)	moraine-glacial	III	Chon-Kaiyndy	3445-3,697	Kara-Bulak, Erkin-Say, Orto-Kaiyrma, Bukara, Voznesenovka, Efironos
4	Chon-Kaiyndy-2 (Ch-14)	moraine-glacial	III	Chon-Kaiyndy	3529	

5	Kurum dy (Ch-83)	moraine-glacial	III	Suusamyr	3630	Highway Bishkek-Osh, bridges, retaining walls
6	Iyri-Suu (Ch-82)	moraine-glacial	III	Suusamyr	3502	

Source: Ministry of Emergency Situations

Avalanche Hazard. The following hazard zones have been identified within the area: the first hazard degree zone covers 11.6% of the area and is located in the near-axial part of the Kyrgyz and Suusamyr ridges.

The second-degree zone with an area of 24,8% of the total area frames the above-described zone and occupies high-mountainous sections of the Kyrgyz and Suusamyr ridges.

The third-degree zone occupies 21.4% of the rayon area, located in the mid-mountain sections of the area. The zone with the fourth degree of avalanche danger, which occupies 4.7% of the area, is spread in the foothills of the Chuy Valley.

The most dangerous areas are avalanches on the Bishkek-Osh highway (132-138, 197-208 km) in the upper reaches of the Suusamyr river basin (about 4% of the area).

Underflooding. Sections with high groundwater table (from 0 to 3 m) are widespread in the northern and central part of the plains of the region (Fig. 10).

Shallow groundwater table is caused by natural outcrops, poor drainage of these sections and seepage from the irrigation network. Underflooding processes are activated during periods of intensive prolonged rains, passage of increased discharges through natural channels and during the growing season in the areas of irrigated massifs.

Lowering of the groundwater table is possible under a set of effective irrigation and reclamation measures first of all on cleaning and restoration of collector-drainage networks.

Table 16. Forecast of possible activation of underflooding processes

№	Aiyl Aimak	Settlement	Possible causes of underflooding	Recommended protective measures
1	Kaindy urban-type settlement		high groundwater table, unsatisfactory condition of collector-drainage networks.	cleaning of collector-drainage networks on Yuzhnaya street, Frunze street - 72 m, Kislykh street – 1500 m, construction CDN (2016 performed the cleaning of CDN on Kislykh street, in 2017 on Yuzhnaya street and Frunze street)
2	sub-station “Kaiyndy”	Gagarin street at the intersection of Kislykh street.	high groundwater table, open CDN overgrown with dense grass, silted up	cleaning of the OCDN about 250m with discharge of unnamed say
3	Vosnesenovskiy	Vosnesenovka rural settlement	high groundwater table, unsatisfactory condition of CDN, inflow seepage from irrigation network	cleaning of CDN
4	Kurpuldekskiy	Kurpuldok rural settlement	-"-	cleaning of CDN, construction of CDN
5	-"-	rural settlement named after Kirov	-"-	Cleaning CDN on Zheek street, Uchitelskaya street -1,5 km
6	-"-	Rovnoe rural settlement	-"-	cleaning of CDN on Kirov street -1000 m (2016 Specific preventive liquidation activities performed cleaning of CDN)
7	Kurama	Dzhaiylma rural settlement	-"-	cleaning of CDN, construction of CDN
8	-"-	Panfilovskoe rural settlement	-"-	-"-
9	-"-	Kaindinskaya street No. 24	-"-	cleaning and deepening of the open-type channel of CDN of about 500 m.
10	Chaldybarskiy	Oyrondu rural settlement	-"-	-"-
11	-"-	Oktybrskoe rural settlement	-"-	-"-
12	-"-	Pervomayskoe rural settlement	-"-	-"-
13	Frunzenskiy	Chaldybar rural settlement	-"-	cleaning of CDN (performed in 2012)

Source: Ministry of Emergency Situations

5.2.2 Osh oblast

Osh Oblast is located in the southern part of the Kyrgyz Republic. The oblast occupies part of the Fergana Valley in the north and the Alay Valley in the south. The oblast area is 29,2 thous. km² and is located at an altitude from 500 to 7000 m.

Osh oblast borders with the Republic of Uzbekistan and Dzhalal-Abad oblast of the Kyrgyz Republic in the north, Batken oblast of the Kyrgyz Republic in the west, the Republic of Tajikistan in the south and the People's Republic of China and Naryn oblast of the Kyrgyz Republic in the east. The oblast consists of 7 rayons, 3 cities, 2 urban-type settlements, 79 ayl okmotu, 469 rural settlements.

Osh oblast was formed in 1939 and occupies an area of 28934 km^2. Administratively, the region is divided into 7 rayons: Alay, Aravan, Kara-Kulzha, Kara-Suu, Nookat, Uzgen, Chon-Alay.

Biodiversity

Wildlife. The fauna of the Fergana Valley is relatively poor. The long-eared hedgehog, Central Asian tortoise, lizards, rodents are quite common, rarely - wolf, fox, wild boar, badger, porcupine. Typical birds are eagles, hawks, pink starlings, hoopoes, larks, nightingales, orioles, doves, bee-eaters, in the floodplain of the Syrdarya - various types of ducks, on the mountain slopes - mountain partridges. The most common fish in rivers are catfish, marinka, barbel, and carp. Arachnids include scorpions, phalanges, tarantulas, and karakurts.

The construction sites are located within the residential sector, which determines the presence of synanthropic animal species.

In urbanized areas and its environs of southern Kyrgyzstan, synanthropic birds are found: pigeons (Columbiformes (Latham, 1790)), rock pigeon (Columba livia (Gmelin, 1789)), common dove (Streptopelia turtur (Linnaeus, 1758)), cuckoos (Cuculiformes (Wagler, 1830)), owls (Strigiformes (Wagler, 1830)), little owl (Athene noctua (Scopoli, 1769)), swifts (Apodidae (Hartert, 1897)), bee-eaters (Meropidae (Rafinesque, 1815)), hoopoe (Upupa epops (Linnaeus, 1758)), passerines (Passeriformes (Linnaeus, 1758)), swallowtails (Hirundinidae Rafinesque, 1815).

Vegetation. On the slopes of the Fergana and Chatkal ranges there are forests of walnut, apple, cherry plum, and hawthorn. In the oases there are pyramidal poplar, mulberry, jida, plane tree (plane tree), elm (elm), walnut, almond, peach, apricot, plum, apple, pear, quince, fig, pomegranate. Only cultivated vegetation grows on irrigated lands.

Objects of cultural, natural, historical heritage of Osh oblast

All these natural monuments are located far away from the planned construction sites and will not affect these natural monuments.

Table 17. Cultural monuments officially included in the State List of Historical and Cultural Monuments of the Osh oblast.

№	Name of the monument	Typological affiliation	Dating of the monument	Address (location of the monument)
Aravan rayon				
1	Bust of twice Hero of Socialist Labor A. Anarov	Art	1957	Aravan rural settlement
2	Eski-Aravan ancient settlement	Archeology	IV century b.c. - I century.; IX-X centuries.	Right bank of Aravan River
3	Kydyr-Tepe ancient settlement	Archeology	1st century b.c.	Left bank of Aravan River, on the western edge of Tepe-Korgon rural settlement
4	Tepe-Korgon ancient settlement	Archeology	X-XII centuries.	Southwest of Tepe-Korgon rural settlement
5	Rock carvings in Aravan rural settlement	Archeology	Saka-Usun period	Aravan rural settlement
6	Sasyk-Unkur cave site	Archeology	Mousterian (25-20 thous. b.c.)	Aravan group of caves, Aravan rural settlement
7	South-Aravan ancient settlement	Archeology	1 century b.c. - 1 century A.D., IX-XII centuries	Left bank of Aravan River, north of Aravan rural settlement
Kara-Kuldzha rayon				
1	Mass grave of border guards who died in the fight against the Basmachi	History	1927 г.	Sidorov village
Kara-Suu rayon				

1	Kurgashin-Tepe ancient settlement	Archeology	1st century BC. - 1st century AD	To the south on 14 km of the road Osh - Kara-Suu village
2	Mady settlement	Archeology	I-VI-IV centuries	Outskirts of the village of Mady
3	Khozhambag settlement	Archeology	1st century BC. - 1st century AD	South of Khozhambag village
4	Kashgar-Kyshlak ancient settlement	Archeology	1st century BC. - 1st century AD; IX-XII centuries	In the north-west outskirts of Kashgar village - Kazhgar-Kyshlak village
5	Settlement Kyrgyz-Chek	Archeology	Not dated.	Kyrgyz-Chek village
6	Ak-Tepe ancient settlement	Archeology	III century BC. - IV century AD	500 m to north-east. from the village of Kyzyl-Koshchu
7	Booru-Tepe settlement with a platform	Archeology	I century BC. - I in AD	In the north-west outskirts of the village of Agartuu
8	Group of 3 Tepe 1	Archeology	I century BC. - I century AD	To the spare from the Khozhambat settlement
9	Group of 3 Tepe	Archeology	I century BC. - I century AD	Chagyr village
10	Agartuu ancient settlement	Archeology	III century BC. - IV century AD	South-west outskirts of the village of Agartuu
11	Settlement Kyzyl-Sharkskoe (Savai)	Archeology	I century BC. - I century AD	To the east on the outskirts of the village of Kyzyl-Sharq, 29 km to the right of the road Osh - Bishkek
12	Sharihan-Tepe ancient settlement	Archeology	I millennium BC - X-XII centuries.	Kadyrsha village - Kyzyl-Sharq village
13	The house where twice Hero of Socialist Labor Kh. Tashirov lived	History	1958-1963	Kyzyl-Sharq village
14	Mazar Tepe	Archeology	IV century - V century	East outskirts of the village of Savai
15	Mirzalim Tepe 1	Archeology	III century BC. - I century AD	To the left of the Pamir Highway for 1 km.
16	Mazar Tepe	Archeology	I century AD	At 31 km on the right near the Osh-Bishkek road
17	Toloikon burial ground (Ozgor VI)	Archeology	Not dated.	On adyrs, not a lion. ber. Ak-Buura river
18	Rock art of Suret-Tash (Ayirmachtoo)	Archeology	Turk. period	To the north-west from Osh on the slopes of the Korpo-Too ridge
19	Monument to Twice Hero of Socialist Labor Kh. Tashirov	History, art	1957	Kyzyl-Sharq village
20	Savai settlement	Archeology	I century	South outskirts of the village of Savai
21	Tali Tepe	Archeology	1st century BC. - 1st century AD; X-XII centuries	500 m to the north-east. from the village of Kyzyl-Koshchu
22	Shish Tepe	Archeology	1st century BC. - 1st century AD	To the west outskirts of the village of Chagyr
Uzgen rayon				
1	Shurabashat settlement	Archeology	IV-I centuries BC, X-XII centuries.	Shurabashat village, 12 km from Uzgen, on the right bank of the Yassy River
2	Dzhylandy settlement	Archeology	II century BC. - III century AD, XI-XII centuries.	Southwestern from the village of Dzhylandy, right bank of the Yassy River
3	Settlement Kyzyl-Oktyabrskoe	Archeology	V century BC. - V century AD	Left bank of the Yassy River 1.5 km from the village of Kenesh
4	Settlement Kara-Darinskoe	Archeology	IV-I centuries BC.	On the left bank of the River Kara-Daria, 0.5 km north-west. confluence of the Tap-Kara-Kulzha rivers

5	Tepe Myrza-Aki Group	Archeology	I century BC. - I century AD	Left bank of the Yassy river
6	Tepe Zerger Group	Archeology	I century BC. - I century AD	In the Zerger Valley, to the north-east. from Zhylyndy village
7	Caravanserai-Sogolon	Archeology	XIV-XV centuries	In the vicinity of the village of Kara-Shoro
8	North Kurshabskoe settlement	Archeology	XIV-XV centuries	To the north-east from the village of Kurbash
9	North-Uzgen settlement	Archeology	IV-I centuries BC.; XI-XII centuries	Left bank of the Yassy river, north. Uzgen city 10 km
10	Uzgen historical and cultural complex: - Northern Uzgen Mausoleum - Middle Uzgen Mausoleum - South Uzgen Mausoleum - Uzgen minaret	History, architecture, archeology	VIII-XII centuries 1152-1153 Beginning XI century 1187 2nd half XI century.	Uzgen
11	Ancient canal Uzgen aryk	Archeology	III century BC. - V century AD	From the confluence of the Tap-Kara-Kulzha rivers
Alai rayon				
1	Monument and mass grave of border guards who died in the fight against the Basmachi	History	1930.	Nura village
2	Burial ground Zhalpak-Dobo	Archeology	IV-V centuries.	In the Demey tract, 25 km from the village of Sary-Tash, to the east. parts of the Alai Valley
3	Monument to Alymbek Datka, monument to Kurmanzhan Datka	Art	1998	Gulcha village, park

Source: Internet resource

Aravan rayon

Socio-economic characteristics. Aravan rayon is an administrative-territorial unit within Osh oblast of the Kyrgyz Republic. Aravan rayon was formed in 1935, the area occupies 1340 km^2. There are 8 ayl aymaks and 49 settlements in the area: Allya-Anar (5 settlements), S. Yusupov (5), Mangyt (5), Kerme-Too (7), Tepe-Korgon (8), Nurabad (3), Teo-Moyun (8), Chek-Abad (8). The area of Aravan rayon is 1340 km2 to the border with Uzbekistan from Aravan rural settlement 5 km, surrounded by agricultural lands.

According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the resident population is 137.7 thousand people. The average population density is 102,7 people per 1 km^2. There are 19,707 households within the area (acc. to 2009 census). Most of the population are Muslims.

According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the rayon administrative center of Aravan rural settlement with the resident population is 11.1 thousand people. The ethnic composition is represented in the following breakdown: Uzbeks—58,7%, Kyrgyz—39,6%,Azerbaijanis —0,7%,Tajiks— 0,5%,Tatars— 0,1%, others —0,5%.[

The number of births for 2021 was - 3,236; deaths - 657; deaths of children under 1 year of age - 26; marriages - 1 084; divorces - 162.

Unemployment, employment, poverty, disease incidence. The overall economic situation does not allow for the creation of sufficient jobs. It is particularly difficult to find work for people with disabilities, young people and women.

Table 18. Number of officially registered unemployed; Average monthly salary of employees of enterprises, institutions and organizations by territory

Number of officially registered unemployed					
	2017	**2018**	**2019**	**2020**	**2021**
Osh oblast	11 724	15 564	19 479	19 977	19 444
Aravan	1 004	2 560	2 460	2 024	1 440
Average monthly salary of employees of enterprises, institutions and organizations by territory (soms)					
Osh oblast	10 180	10 307	11 368	12 712	12557
Aravan	8 741	8 978	9 687	11 177	11049

Source: National Statistical Committee of the Kyrgyz Republic

The incidence of certain groups of diseases (persons) in Aravan rayon for 2021: infectious and parasitic diseases - 1358; neoplasms - 198; diseases of blood and blood-forming organs - 1243; diseases of the endocrine system - 244; diseases of the circulatory system - 724; diseases of the respiratory system - 9850; diseases of the digestive system - 578.

Migration. Migration has a significant impact on changes in the total population. In 2021, migration changes were characterized by a decrease in intra-regional movements and a decrease in migration outside the country. Labor migrants are for the most part from the poor and poorest segments of the population. People leave for work in other regions of the country, mainly in Chuy oblast, Bishkek and suburbs with their wider employment opportunities, as well as in neighboring countries.

Table 19. External migration of population by territory; internal migration of population by territory

External migration of population by territory (persons)					
	2017	**2018**	**2019**	**2020**	**2021**
Number of arrivals	-	12	6	9	243
Number of departures	8	62	98	80	41
Migration inflow, outflow (-)	8	-50	-92	-72	202
Internal (inter-oblast) migration of population by territory					
Number of arrivals	34	177	137	1 328	202
Number of departures	98	285	288	1 275	192
Migration inflow, outflow (-)	-64	-108	-151	53	4

Source: National Statistical Committee of the Kyrgyz Republic

Vulnerable Groups. There are individuals and groups in the area who require special attention during Project implementation due to their disadvantaged or vulnerable situation. This group includes persons with disabilities, pensioners, female-headed households and low-income households (less than subsistence minimum per capita - 5,282 soms/month), elderly single people.

Industry. The textile industry plays a decisive role in the light industry. Aravan rayon is a leader in cotton production not only in Osh oblast, but also in the republic. Thus, one of the largest enterprises of the area is “Ak-Bula” JSC - the Aravan cotton ginning plant with about 200 employees. The company produces cotton; processed cotton seeds; nonwoven materials. The area also specializes in the food and flour milling industries.

Table 20. Industrial output

Aravan rayon	**2017**	**2018**	**2019**	**2020**	**2021**
Industrial output (mln. KGS)	1263,9	2111,2	3187,2	3834,4	4382,6
Indices of physical volume of industrial products by territory (in percent to the previous year)	112,2	149,8	147,4	103,3	104,1

Source: National Statistical Committee of the Kyrgyz Republic

Wholesale and retail trade for 2021 in Aravan rayon amounted to 1644.1 mln. som; hotel and restaurant activities - 57.0 mln. som; retail trade, including turnover of food enterprises - 1603.7 mln. som; volume of market services - 2187.5 mln. som.

Agricultural Activities. The production of Aravan rayon - grain crops, in 2021 the volume of cropped areas on grain crops amounted to 6863 ha, cotton - 3091 ha, vegetables -2492 ha, melon crops - 1233 ha, potatoes - 1717 ha, tobacco - 60 ha.

Production of main agricultural products (tons) in Aravan rayon in 2021 was as follows: grain - 37067; cotton - 10684; tobacco -168; potatoes - 26991; vegetables - 50816,7; food melons -23640; fruits and berries - 9380; grapes - 503; meat -6319; raw milk -35068; eggs, thousand pcs. -13447; wool -125.

Trade plays a significant role in the economy of the area. Nowadays, the vegetable market of Aravan rayon has become a wholesale market for agricultural products in the south of the country. Aravan entrepreneurs have opened a large service and procurement center for fruits up to 1 000 tons.

The Aravan people provide customers with apples, cherries, apricots, peaches and persimmons.

As before, the prevailing part of consumer goods 76.3 percent is purchased by the population in the markets. The turnover per capita in the whole oblast amounted to 24 937 soms, including 9 294 soms in Aravan.

At present, after various stages of land and agrarian reform, agricultural land in the south of the country is almost entirely in the hands of private owners. Most of the available arable land is used. Land may be in state, municipal, private and other forms of ownership. Under current land legislation, the state retains control over pastures and non-arable land, while land under cultivation and most of the non-land assets of former state and collective farms are distributed among rural residents.

Despite the industrial potential, the main branch of the region's economy is agriculture. In the structure of agricultural production, the weight of livestock and crop production is about equal.

Table 21. Livestock

Number of livestock and poultry (end of the year, heads)					
	2017	**2018**	**2019**	**2020**	**2021**

Cattle	36914	37258	38070	38872	39651
including cows	16444	16623	16897	17192	17524
sheep and goats	75286	69902	70151	62570	63009
horses	1537	1544	1585	1558	1143
poultry	116514	119985	123530	125599	126536

Source: National Statistical Committee of the Kyrgyz Republic

Physical and geographical conditions of the region.

Rayon is located in the western part of Osh oblast, bordered by the Republic of Uzbekistan to the north, Kara-Suu rayon to the east and Nookat rayon to the south. Rayon occupies the south-eastern part of the Fergana depression, bordered by the Chil-Ustun ridge in the north-east and the Keklik-Too Mountain range in the east. Dzhalgyz-Archa and Ulu-Too mountains run along the south area. It is bordered on the west by the Kerkidon reservoir. In orographic terms, the northern part of the area is a flat territory, to the south, rising, passes into the adyr zone. Absolute elevation difference from north to south 500-750 m.

The length of highways is 165 km, of which 100 km are asphalted. There are Osh-Aravan-Markhamat (Republic of Uzbekistan) - Kyzyl-Kiya, Aravan - Nookat roads in the territory.

Topography and relief. In Aravan rayon 54.8% of the area belongs to mountainous and 45.2% to valley type of relief. Rayon is located in the western part of Osh oblast, bordered by the Republic of Uzbekistan to the north, Kara-Suu rayon to the east and Nookat rayon to the south. Rayon occupies the south-eastern part of the Fergana depression, bordered by the Chil-Ustun ridge in the north-east and the Keklik-Too Mountain range in the east. Dzhalgyz-Archa and Ulu-Too mountains run along the south area. It is bordered on the west by the Kerkidon reservoir. In orographic terms, the northern part of the area is a flat territory, to the south, rising, passes into the adyr zone. Absolute elevation difference from north to south 500-750 m.

Climate. The highest amount of precipitation in Osh oblast falls in Uzgen rayon in the Yassy river basin (up to 1000 mm/year), the lowest - in Chon-Alay and Aravan rayons (up to 300 mm/year). In other areas the amount of precipitation is on SW slope of Fergana ridge – 600-1000 mm/year, on NW slope of Alay ridge – 300-700 mm/year.

The climate of the area is arid, determined by the presence of semi-deserts in the north of the area. The summer is hot and long, the warm period averages 236 days, the number of days with snow cover is less than 10. Average annual air temperature in July $+28^0$C, average temperature in January -3^0C. Average annual precipitation is 290-300 mm. The soil in the area is mostly typical gray soilierozem.

Hydrology. The Aravan-Say River flows through the area, which is formed after the confluence of the rivers Khoschan, Kyrgyz-Ata and Chile, which originate on the northern slopes of the Alay ridge. The average annual flow of the river is 9.3 m^3/sec, the average minimum - 37.9 m^3/sec, and the maximum - 52.7 m^3/sec. The waters of the Aravan-Say River are widely used in irrigation. The South Fergana Canal runs along the northern part of the area.

Chili-Say River Left tributary of the Aravan-Say River. The length is 50 km; total area is 425 km^2. It originates from the northern slopes of the Kichik-Alay ridge, where in the upper reaches it is called Gezart, and in the middle reaches it flows through a wooded gorge. It crosses 2 passes - Gezart and Agart. The river is snow-glacial and spring fed. The average annual flow rate is 3-4 m^3/sec, with the highest flow rate in May-June and the lowest in February. Used for irrigation. There are Zhany-Nookat rural settlement and others located on the bank.

Kyrgyz-Ata River. Right tributary of the Aravan-Suu River. The length is 49 km; the catchment area is 318 km^2. The river's source is located at 3240 m altitude the northern slope of the Kichi-Alay ridge. The main supply is snow (22%), glacial (39%), spring (39%). The average annual flow rate is 4,18 m^3/sec, the highest in June-July, the lowest in February-March. It has 6 tributaries, of which the major ones are Kurgan, Shamshaly, Karagoy. Used for irrigation.

The riverbeds are shaped, stepped, usually littered with boulders. A characteristic condition for rivers is the passage in the spring period of mudflow floods (flows) caused by heavy rainfall (April, May, June). The velocity of river flow depends on the slope of the terrain: from 1-5 m/s during low water level and up to 4.5-5.5 m/s during floods. In the foothills, due to the reduction of terrain slope, river flow velocity decreases

Pastures. There has been an increase in the number of cattle, horses, sheep and goats since in recent years there has been an increase in the number of large livestock farmers in remote areas. Distant pastures are inaccessible for small livestock keepers, leading to overloading of rural pastures. According to monitoring observations of the "Kyrgyzgiprozem" State Institution, carrying capacity of the country for the last five years has decreased by 36% due to the reduction of pasture area and increased degradation processes.

Danger zones and forecasts of possible activation of hazardous processes and phenomena

The territory of Osh oblast is characterized by intensive development of dangerous natural processes related to geological and structural features, relief, climatic and hydrogeological conditions, seismic activity, man-made factors, etc. Many settlements are located along the banks of large and small rivers, in mountainous areas.

The territory of Aravan rayon is most prone to underflooding.

The areal extent of dangerous natural processes and phenomena is shown on the maps-schemes of seismic, avalanche, mudflow and underflooding hazards (Fig. 13).

The emergency forecasting map (Fig.14) shows the location of specific areas of possible activation of dangerous natural processes and phenomena in 2022. In terms of prevalence and frequency of occurrence, mudflows and floods prevail among hazardous processes in the area, and significant areas are subject to groundwater flooding.

Seismic Hazard. According to the map-scheme of probable seismic hazard on the territory of the region, the area of expected earthquakes (AEE) Kyzyl-Kiya-Osh (KOSH) - the second category of hazard with the class of expected earthquakes 12-15 with intensity 6-7 points and Taldysuu (TD) of the third category of hazard with the class of earthquakes 12-14 with intensity 6-7 points are allocated.

Table 22. Earthquake information

№	Name of administrative regions	Name of the area of expected earthquake (area of expected earthquakes)	Index of the area of expected earthquakes on the map	Settlements located within the area of expected earthquakes	Earthquake class	Hazard category (HC)	MSK-64 scale score
1	Aravan	Kyzyl-Kiya-Osh	KOSH	Allya-Anarov, Yusupov, Mangyt, Tepe-Korgon, Nurabad, Teo-Moyun, Chek-Abad rural settlements of ayil aymaks	12. - 15	II	6. - 8
2		Taldysuu	TD	Kashka-Suu, Kichik-Alay, Kyundelyuk, Chogom, Min-Teke	12. - 14	III	6. - 7

Source: Ministry of Emergency Situations

Landslide Hazard. Activation of mudflow and flood processes can be expected in case of intensive melting of snow reserves over a large area (March-May); melting of glaciers and snowfields, abnormal temperatures in the high-mountain zone (June-August); heavy rainfall; precipitation during the flood period; outburst of high-mountain lakes and reservoirs.

Mudflows can be caused by the outbursts of high-mountain lakes, heavy rainfall, and active melting of the snow cover in April-June. Mudflows formed in this area can cause river flooding: Kichik-Alay, Gulcha, Tar, Ak-Buura, Kyzyl-Suu, Chile, Kurshab, Kyrgyz-Ata, Yassy, Kara-Kuldzha.

Floodplains and low terraces of the Aravan-Say River (about 4% of the territory) belong to the second degree of mudflow hazard. Floodplains and low terraces of other rivers (about 2% of the territory) belong to the third degree of mudflow hazard. Adyr and mountainous parts of the area belong to the fourth degree of mudflow hazard. Mudflows, floods, bank erosion. Bank erosion processes are developed along the sides of the Aravan Say River, considering the unsatisfactory condition of protective structures in the future it is possible to destroy various objects along the river and flooding of agricultural lands and houses. Bank protection measures are required to protect new washout sites and to maintain existing structures. Mudflows and floods (slope flows) on the territory of the rayon are manifested in the adyr zone during the period of intensive snowmelt and heavy rainfall. Among the priority measures to prevent emergency situations it is necessary to restore and strengthen destroyed dams, canals, washed out sections of banks.

During the fall of intense, area-concentrated atmospheric precipitation, mudflows of torrential nature and areas of storm flooding that are not indicated on the map may occur. Mudflows with the frequency of one or more times per year can occur in sai (mountain river) with a catchment area of up to 10 km^2 with flow rates of 10-15 m^3/sec.

Outburst lakes. For the settlements of Kerme-Too aiyl aymak (Kichik-Alay, Min-Teke, Ak-Talaa) there is a danger of flooding from the outburst of high-mountain lakes located in the basin of the Kichik-Alay River: Kaiyndy (O-9), Kargaly (O-8), Kindik (O-10), Zor-Kumtor (O-11), Kichi-Kumtor (O-12), Sary-Mogol (O-54) - third category of outburst hazard, which are territorially located in Nookat rayon.

Avalanche Hazard. The Kara-Kuldzha, Chon-Alay, Alay, Uzgen, Kara-Suu, Nookat, Aravan rayons are located in decreasing order by the area of exposure to different degrees of avalanche danger.

On the territory the slopes of Keklik-Too and Ulugtak mountains (in the area of Ulugtak peak and Akterek tract) belong to the fourth degree of avalanche danger (about 4% of the territory).

Underflooding. In Osh oblast the processes of underflooding of territories are observed mainly in the north-western part of the oblast and are manifested in 74 settlements (Fig. 14).

Underflooding areas are formed on the bottoms of intermountain depressions with difficult groundwater flow: Uzgen-Kurshab, Osh-Karasu, Aravan, Nookat, Tyoo-Muyun, Takhtek, Karavan-Kokdzhar. underfloodingThe dangerous area of underflooding is Uzgen-Kurshab, where the area of underflooding has increased in recent years. The groundwater level rise is related to backwatering from the Andizhan reservoir. The causes of

underflooding are also: inefficient operation of collector-drainage network (CDN) due to its clogging, irrational irrigation regime of irrigated areas. Activation of the underflooding process takes place during the growing season.

Landslide Hazard

According to the map-scheme of typological engineering-geological zoning of landslide hazard (Fig. 16) the adyr zone along the right bank of the Aravan-Say River belongs to the second category of vulnerability with the second degree of risk.

Landslides. On the territory of Kerme-Too aiyl aymak (Kichik-Alay rural settlement) on the Min-Teke site in 2004 and 2005, activation of old landslides was observed, the site should be monitored. Landslide areas are also present in the territory of Allya-Anarov aiyl aimak (Fig. 15).

In recent years, there has been a significant increase in the number of cases where landslides in southern Kyrgyzstan occur not only in the spring months but also in winter, which was previously considered an anomaly. The fact is that climate change occurring in the foothills of southern Kyrgyzstan, namely the increase in air temperature in the cold period of the year (December-February), frequent and prolonged thaws, increased precipitation in the winter months, undoubtedly cause significant changes in the humidity and heat supply of the near-surface parts of mountain slopes, and thereby cause changes in the mode and nature of landslide processes and mudflow phenomena. Increased frequency of thawing periods in recent years due to climate warming with soil thawing and melting of unstable snow cover on unfrozen slope surfaces contributes to stronger and deeper wetting of the covering deposits on slopes, i.e. reduces the stability of slopes even before the beginning of intensive spring precipitation, causing their sliding in late fall and winter.

Activation of landslide processes can be associated with atmospheric precipitation increased seismic activity. Since recent years have been characterized by numerous landslide activations due to meteorological factors, the slopes are weakened and prone to activation under minor precipitation and seismic movements.

The Central Asian Institute of Applied Geosciences (CAIAG) carried out contractual works on the “Unified database on landslides in Kyrgyzstan” for the territory of Aravan, Kara-Kuldzha, Kara-Suu, Nookat, Chon-Alay rayons of Osh oblast.

Three categories of landslides have been identified based on the results of the studies on the degree of hazard:

- landslides of the first hazard category, requiring year-round monitoring observations and early decision-making on resettlement of residents from the affected area;
- landslides of the second category of hazard, which are in the stage of preparation and secondary displacements, where annual monitoring surveys are required in seasons of landslide-forming factors activity.

When a landslide passes from the second to the first degree of hazard, the issue of resettlement of residents falling within the landslide risk zone should be addressed;

- landslides of the third category of hazard, where the population has been resettled from the zones of possible impact or the landslides are in the stage of possible residual displacements.

Planned monitoring surveys are required at these sites to evaluate landslides that could possibly progress to a second hazard level.

The increased hazard of these landslides may be associated with new unloading of the slope in abnormally wet months and years, in phases of activity of modern tectonic movements, in years of rising groundwater levels and during seismic activity. According to the main prevailing factors of formation and development, landslides are identified, where the decisive role is played by atmospheric precipitation (AP), to a lesser extent human impact (HI). Three stages of landslide development have been identified: 1 - preparation, 2 - movement, 3 - stabilization or secondary displacements.

The degree of risk is defined as a combination of probability and consequences of the occurrence of unfavorable events that may cause damage or loss. Risk: 0 - poses no threat, 1- threatens fields, roads and river damming, and 2 - threatens houses, industrial facilities.

Sites with a second degree of risk require annual surveys. Local self-governments during the period of prolonged precipitation should inform the population about possible activation of landslide processes.

Rockfalls and landslides. Rockfalls are observed from the slopes of Chil-Ustun and Keklik-Too mountains. Periodic slope inspections and section protection measures are needed.

<u>Kara-Kulzha rayon</u>

Socio-economic characteristics.

Kara-Kulzha district was founded in 1937. The district covers an area of 2 km^2. According to the Kyrgyz National Statistics Committee’s data as of January 1, 2021, the resident population is 100.3 thousand people. The average population density is 17.2 people per 1 km^2. The district has 50 settlements of the following 12 aiyl aimaks: Alaykuu (3 settlements), Kapchygay (4), Kenesh (2), Karaguz (6), Kara-Kochkor (4), Kara-Kulzha (4), Kyzyl-Zhar (6), Ylai-Talin (5), Oy-Tal (2), Sary-Bulak (7), Chalma (2), Kashka-Zhol (5). The administrative center

is the village of Kara-Kulzha with a resident population of 15.6 thousand people according to the National Statistical Committee of the Kyrgyz Republic as of 1 January 2021.

Topography and relief. The district area is located at the junction of the Fergana and Alay ranges and coincides with the basins of the Tar and Kara-Kulzha rivers. Most of the area is occupied by mountainous and foothill zones – 97.5% (Uch-Seyit, TasyrakaY, Akademik Adyshev, Alaykuu mountains, etc.), and valley zones – 2.5% (Alaykuu, Kara-Kulzha, Tar, Kulun, Kapchigay, etc.) of the district area. The highest elevation of the district is 4 900 m (Uch-Seyit), the lowest terrain with an absolute elevation of 780 m.

Climate. The climate of the area varies from moderately hot (downstream of the Tar and Kara-Kulzha rivers) to harshly cold (closer to the axial parts of the ridges). Average temperature in January -10-14.8°C (minimum temperature up to -40°C), in July 15, 25°C heat (maximum +30 °C). Annual rainfall is 350-571 mm. The height of the snow cover is: in the valley - up to 20 cm, in the mountain - up to 100 cm.

Hydrology. The main water arteries of the district are the Tar and Kara-Kulzha rivers (with tributaries Buyga, Kyzyl-Suu, Karaguz, Zhalpak-Tash). The maximum river flows are June-July at 492 m^3/s (Tar River) and 245 m^3/s (Kara-Kulzha River). There are 13 729 households within the area (acc. to 2009 census). Kara-Kulzha-Uzgen and Kyzyl-Zhar-Gulcha roads pass through the district.

Emergency danger zones and forecasts of possible activation of natural hazardous processes and phenomena.

97.5% of the area of Kara-Kulzha district belongs to the mountainous, and 2.5% to the valley type of relief. Landslides, mudslides and floods dominate the area in terms of prevalence and frequency of hazardous processes and phenomena. Roads are prone to snow avalanches and rockfalls.

Landslide Hazard. About 8% of the district area in the Terek basin is classified as a second degree of mudflow hazard. Areas of a third degree of mudflow hazard, which account for 64% of the the district territory, are spread over small tributaries of major rivers in the interfluves of Yassy-Kara-Kulzha, Kara-Kulzha-Tar and Tar-Gulzha. 25% of the area is classified as a four degree of mudflow hazard.

Mudflows, floods, bank erosion. Floods on the largest rivers are accompanied by increased coastal erosion and flooding. A significant number of hazardous sites exist on the Kara-Kulzha, Tar, Kara-Darya, Kara-Guz, Kyzyl-Suu rivers. Work is needed to build protective structures. There are small watercourses and dry sai in the basins of the above rivers, along which mudflows occur, and their formation is associated with heavy rainfall, intensive melting of snow cover, snow drifts in the bottoms of ravines. Houses, roads, power lines, public buildings, bridges, irrigation networks, water intakes, agricultural land and other facilities are at risk. It is necessary to construct mudflow conduits/check pipe, canal cleaning, and mudflow bank stabilization. During heavy concentrated precipitation (catchment area up to 10 km^2), heavy rainfall events and areas of flash flooding may occur. The stormwater mudflow recurrence may be more than once a year.

Outburst lakes. Possible activation of 3 outburst lakes located on the rivers Kulun and Kaindy-Bulak in the Tar River basin. All lakes are classified as a third category of hazard.

Avalanche Hazard. The southwestern slopes of the Fergana Range in the northeastern part of the district and the northern spurs of the Alay Range (42% of the district area) are considered to be in the first degree of avalanche danger. The second avalanche danger zone area is 34% and is distributed in the upper reaches of the Tar River in the Oy-Tal, Alaykuu and Kyzyl-Zhar depressions. The third-degree avalanche danger zone is located lower the relief and occupies 5% mainly in the mid-mountain zone of the district, the basins of the rivers Kyzyl-Suu, Karaguz, Ak-Kiya and partly upstream of the Tar River. The areas with the fourth degree of avalanche danger occupy 4% of the low-altitude territory of the district. There is no avalanche danger in the remaining 15% of the district area. Avalanche-prone areas are mainly confined to the Tar River basin, especially the right bank where the Kara-Kulzha-Alayku road passes. On the section from 35 to 90 km of the Kara-Kulzha-Kek-Art (Alayku) road, avalanches occur in high-water years, which block the road for 3-5 days. There are settlements and areas of Sary-Bee, Chon-Taldy-Suu, Kara-Tash, Oy-Tal, Kyzyl-Zhar, Tash-Kiya, Budur, Sai, Terek, Ylai-Talaa in the avalanche danger zone.

Landslide Hazard. The first risk degree area occupies 6.8% of the district and is located on the left bank slope of the Kara-Darya River, in the basin of the Zhalpak-Tash, Karaguz, Buiga rivers, the left bank of the Tar River, and partially the left slope of the Ak-Kiya valley. The second risk area - 8.5% of the district is located upstream of the Buiga River. The third risk degree area of 9.1% of the district is located in the interfluves of Zhalpak-Tash-Karaguz, Kyzyl-Suu-Buyga, Ak-Kiya-Kara-Kulzha. The second vulnerability category area is divided into 2 risk areas. The first risk level area (2.2% of the area) is located upstream of the Kyzyl-Suu River valley, on both slopes downstream of the Karaguz and Ak-Kyya rivers. The area of 1.2% is classified as a second risk and is located in the Tar-Kara-Kulzha interfluve and along the right slope of the Kara-Kulzha River downstream of these rivers. The greater area (74.4%) of the district is classified as a third category of vulnerability. This area occupies high and mid-mountain zones with a distribution of mostly rock.

Landslides. The most landslides occurred in the valleys of the rivers Buyga, Kyzyl-Suu, Karaguz, Zhalpak-Tash and the left banks of the rivers Kara-Darya and Tar. There are single landslides along the rivers of Kara-Kulzha

and Ak-Kiya. Landslides destroy houses, power lines, communication lines, bridges, block roads, mountain rivers and others.

In 2004, due to precipitation 1.5-2 times higher than normal in the valleys of the Kyzyl-Suu and Karaguz rivers, the existing large landslides were activated and new ones were formed. New landslides are not excluded in the above areas, as there are still potentially hazardous areas.

The number of landslides in southern Kyrgyzstan has increased significantly in recent years, not only in spring but also in winter, which used to be considered an anomaly. The fact is that climate change occurring in the foothills of southern Kyrgyzstan, namely the increase in air temperature in the cold period of the year (December-February), frequent and prolonged thaws, increased precipitation in the winter months, undoubtedly cause significant changes in the humidity and heat supply of the near-surface parts of mountain slopes, and thereby cause changes in the mode and nature of landslide processes and mudflow phenomena. Increased frequency of thawing periods in recent years due to climate warming with soil thawing and melting of unstable snow cover on unfrozen slope surfaces contributes to stronger and deeper wetting of the covering deposits on slopes, i.e. reduces the stability of slopes even before the beginning of intensive spring precipitation, causing their sliding in late fall and winter.

Activation of landslide processes can be associated with atmospheric precipitation, increased seismic activity. Due to the fact that recent years have been characterized by numerous landslide activations due to meteorological factors, the slopes are weakened and prone to activation under minor precipitation and seismic movements.

The number of landslides in southern Kyrgyzstan has increased significantly in recent years, not only in spring but also in winter, which used to be considered an anomaly. Thawing periods with soil thawing and melting of unstable snow cover on unfrozen slope surfaces contributes to stronger and deeper wetting of the covering deposits on slopes, i.e. reduces the stability of slopes even before the beginning of intensive spring precipitation, causing their sliding in late fall and winter.

Rockfalls and landslides. Measures to protect dangerous sections of roads are recommended. Increased rockfalls and collapses are most likely in heavy rainfall.

Kara-Suu rayon

Socio-economic characteristics. Kara-Suu district was established in 1935 and covers an area of 3,616 km^2. According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the resident population is 448.6 thousand people (urban population 26.6 thousand people, rural population 422.0 thousand people). The average population density is 124.0 people per 1 km^2. The district has 139 settlements of the following 16 aiyl aimaks: Ak-Tash (3 settlements), Zhany-Aryk (7), Zhoosh (13), Katta-Taldyk (9), Kashgar-Kyshtak (8), Kyzyl-Kyshtak (10), Kyzyl-Suu (8), Madyn (11), Nariman (15), Otuz-Adyr (12), Sary-Kolot (6), Papan (9), Savay (9), Saray (6), Teleken (6) and Shark (7). The district center is Kara-Suu town, according to the National Statistical Committee, as of 1 January 2021, with a resident population of 26.6 thousand people.

There are 60 953 households in the district (according to the 2009 census). Bishkek-Osh, Osh-Khorog, Osh-Uzgen, Osh-Nookat, Osh-Aravan and Kara-Suu-Jalal-Abad railways pass through the district. The district has an airport in the city of Osh.

Topography and relief. The district occupies the Osh-Kara-Suu oasis, the northern spurs of the Alay Range, and the partially adyr zone of the Kichik-Alay Range. The oasis elevations vary from 800 to 1200 m. The topography of the district in the northern part is flat (22%), which is replaced in the southern direction by an adyr zone (20%), and above are the mid-altitude and high-altitude zones. Mountain and foothill zones cover 78% of the district area and 22% of the plains.

Climate. The climate of the district depends on the altitude with hot summers on the plain and foothill part of the district, winters are moderately cold. The air temperature in January is -3.3 °C in the plains and -6.9 °C in the mountains. The average annual temperature is 12.1 °C. Precipitation is uneven, ranging from 300-500 mm. The warm season lasts 200-225 days.

Hydrology. The main water arteries are the middle and lower reaches of the Ak-Buura River, the downstream of Kurshab and Taldyk rivers. The territory contains the Papan Reservoir and the southern part of the Andizhan Reservoir.

Emergency danger zones and forecasts of possible activation of natural hazardous processes and phenomena.

78% of the Kara-Suu district area belongs to mountainous and 22% to valley relief type. Areas of expected manifestations of natural hazards and phenomena are concentrated in the central part of the territory in the adyr and low mountain zones between the Kurshab and Ak-Buura rivers.In terms of prevalence and frequency of dangerous natural processes and phenomena in the region are dominated by mudflows and floods, groundwater flooding,landslides are prevalent in the mountainous foothill parts.

Seismic Hazard. Three areas of expected earthquakes (AEE) have been identified within the district. Kyzyl-Kiya-Osh (KOSH) of the second hazard category with expected earthquake class of 12-15, intensity of 6-8 points, Uzgen (UZ) and Taldysuu (TD) of third hazard category with class of 12-14, intensity of 6-7 points.

Landslide Hazard. 13% of the district area is classified as a second degree of mudflow hazard and occupies side tributaries of the Taldyk River from the village of Karatay to the upstream of the river. 33% of the district area is classified as the third degree of mudflow hazard and occupies the southern part of the district and elevated areas of the Taldyk-Ak-Buura interfluve. 27% of the district area is classified as the fourth degree of mudflow hazard and occupies the adyr and low-altitude zones in the Kurshab-Taldyk-Ak-Buura interfluve and the left-bank slopes of the Ak-Buura River. There are no mud processes in the plain part of the Osh-Kara-Suu oasis.

Mudflows, floods, bank erosion. Mudflows are the most widespread in the region. Mudflows most often occur along the tributaries of the Ak-Buura, Taldyk, and Kurshab rivers. In the Papan aiyl aimak territory above the bridge over the Ak-Buura River along the Papan-Nookat road up to the gorge, mudflows of varying intensity related to precipitation are observed annually across all the short constituent mudflows. It is very common to clean the bottom of the sai beds. There is still a risk of residential flooding. Mudflows along the Kurshab River in Kyzyl-Suu aiyl aimak make it difficult for transportation to pass along the Kyzyl-Suu - Karatay road. Mudflows along the Taldyk River (Mashrab Say) cause extensive damage throughout the river. The areas of many villages and agricultural land are in the flood zone. Protective dams are constructed in the most dangerous areas to protect residential buildings, industrial facilities and agricultural lands, which also deteriorate over time due to changes in the channel bottom surface (rise or fall). In river and sai beds with mudflow hazard it is necessary to clean the bed and mudflow check canal after each passage of mudflows.

The flooding of the area often occurs due to overflow of irrigation canals along the slopes by mudflows. Floodwaters are observed on Kurshab and Ak Buura rivers annually during June and July. In high-water years, they erode developed coastal areas. Such areas include the left bank of the Kurshab River, where the area under cultivation is reduced every year due to the accumulation of fragmentary material in front of the Andizhan reservoir. The pioneer camp territory in Zhany-Aryk village on the left bank of the Kurshab river is subject to flooding in recent years and may be destroyed in the future. Through the valley of the Ak-Buur river, the river banks are eroded by floodwaters. Bridges, roads are in the area of potential impact. Bank protection works are required. During the fall of intense, area-concentrated atmospheric precipitation, mudflows of a torrential nature and areas of storm flooding that are not indicated on the map may occur.

Outburst lakes. Within the district area, there are 2 outburst lakes of III hazard category (lakes Sary-Koy and Kashka-Suu upper) in the upstream of the Ak-Buura river, the remaining 6 lakes are territorially located in Nookat district.

Avalanche Hazard. On the northwestern slopes of the Alai Range and in the Ak-Tor Mountains, 5% of the district area is classified as a first degree of avalanche danger. The area with the second avalanche danger degree is 19% and is spread in the upstream of the Ak-Buura, Kyrk-Kechuu, and Taldyk rivers. The third-degree avalanche danger zone is located in the lower slopes of the Ak-Buura, Kyrk-Kechuu and Taldyk river valleys and occupies 17% of the district area. The area with the fourth avalanche danger level occupies 13% of the district area in the adyr zone of the Taldyk-Ak-Buura interfluve and the left-bank slopes of the Ak-Buura River. There is no avalanche danger in the remaining 50% area.

Underflooding. Large areas in the Kara-Suu region are prone to flooding by rising groundwater levels. Flooding of houses is observed on the territory of Savay aiyl aimak on Tashirov site since 1976, when the damage of houses started in the southern part of the village. The area of waterlogging has increased every year since then. Cleaning and rehabilitation of collection and drainage networks, as well as comprehensive studies to to substantiate dewatering projects, are needed to eliminate flooding.

Landslide Hazard. The area of the first risk degree in the district occupies a very small territory along the right bank of the Kyzyl-Suu River. The area of the second risk level occupies 3% of the district and is located along the left bank of the Kurshab River and the right bank of the Kyzyl-Suu River. The area of the third risk degree occupies 5% of the district and is located along the left bank of the Kurshab and Kyzyl-Suu rivers in the vicinity of Kara-Sogot, Algabas and Laglan villages. The second vulnerability category area is divided into 2 risk areas. The first risk level of 12% of the district area occupies low-altitude zones in the Kurshab-Taldyk-Ak-Buura interfluves and the left slopes of the Ak-Buura River. The second risk level of 36% of the district area is located in the Kurshab-Taldyk-Ak-Buura interfluve and along the left bank of the Ak-Buura river.

Landslides. Landslides are mostly observed in the mid-mountain zone in the area of Cretaceous-Paleogene deposits and are found along the left bank of the Kurshab river valley in the area of the villages of Alpordo, Chaygi and others. There are surface landslides along the left bank of the Taldyk river in the area of Lyangar village. There were 2 major landslides along the Kara-Sogot stream valley above the village of the same name in 1988. There are similar slopes adjacent to them from which ground masses can shift. In the Кнrk-Kechuuu river valley (Kamyr-Suu river), large landslides occurred in 2 areas, posing a threat to residents of Laglan and Ak-Terek villages. Several ancient and modern landslides exist along the right bank of the Ak-Buura river above the villages of Kyzyl-Tuu and Alchaluu.

The research found that there is a risk for residents on the southwestern outskirts of the village of Uchkun. In this regard, it is recommended that new construction of residential houses be restricted in this area, and the guiding protective dam be built along the western border of the village, as well as people be relocated to a safe place if construction is not possible.

Rockfalls and landslides. Collapses in the area are noted along the road Zhany-Aryk - Kyzyl-Suu, built along the right bank in the gorge of the Kurshab river valley. In the villages of Kozho-Kelen and Laglan, blocks of rocks rolled down on houses, the residents were evacuated from the hazard zone. To ensure safe transportation along the Kurshab river valley it is needed to periodically remove unstable stones and boulders from the slopes.

Uzgen rayon

Socio-economic characteristics. Uzgen district was founded in 1928. The district area is 3308 km^2. According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the resident population is 283.0 thousand people (urban population 62.8 thousand people, rural population 220.2 thousand people). The average population density is 85.5 people per 1 km^2. The district has 105 settlements of the following 19 aiyl aimaks: Ak-Dzhar (4 settlements), Bash-Dobo (4), Dzhalpak-Tash (7), Dzhylaldy (7), Den-Bulak (10), Zerger (8), Zhazy (4), Iyri-Suu (7), Changet (2), Kara-Tash (5), Karool (5), Keldyuk (2), Kyzyl-Oktyabr (9), Kyzyl-Too (5), Kurshab (4), Myrza-Aka (3), Altyn-Bulak (6), Salam-Alik (7), Tort-Kul (5). The roads Osh - Uzgen - Bishkek, Osh - Uzgen - Kara-Kulzha, Uzgen - Iyri-Suu - Jalal-Abad, Uzgen - Kara-Kulzha - Gulcha pass through the district. The district center is the city of Uzgen, with a permanent population according to the National Statistical Committee as of 1 January 2021 of 62.8 thousand people.

Topography and relief. The district covers the southwestern slopes of the Fergana Range, to the south is bounded by the Uzgen and Academician Adyshev Ranges, to the west by the plain part of the Fergana Depression, coinciding with the Uzgen-Kurshab plain. Most of the territory is occupied by mountain and foothill zones - 88%, and valley zones - 12%.

Climate. The are climate depends on the altitude, summers are hot, winters are moderately cold with significant snow cover. The average temperature in January in the Uzgen-Kurshab depression is -3.2 ^{o}C, in July +23.6 ^{o}C, in the mountains in January -10^{o}C, in July +15^{o}C. The average annual temperature is 11^{o}C. The warm season is 210-235 days. Average annual precipitation is 350-600 mm, on the slopes of the Ferghana Range is 900 mm.

Hydrology. The main waterways are the Kara-Darya, Yassy and Kurshab rivers, which flow into the Andizhan reservoir.

Emergency danger zones and forecasts of possible activation of natural hazardous processes and phenomena.

88% of the Uzgen district is mountainous and 12% is valley type of relief. Areas of expected manifestations of natural hazards and phenomena are concentrated in the western part of the district in the territories of almost all aiyl aimaks. In terms of prevalence and frequency of hazardous natural processes in the region are dominated by mudflows and floods, groundwater flooding.

Seismic Hazard. There are four areas of expected earthquakes (AEE) on the territory – the second hazard category North Fergana-1 (NF 1), Urumbash (USH) with expected earthquake class of 12-15 and intensity of 6-8 points, the third hazard category Uzgen (UZ), Iyrisuu (IS) with expected earthquake class of 12-14 and intensity of 6-7 points.

Landslide Hazard. About 21% of the district area is classified as the second mudflow hazard level and occupies the upper and middle reaches of the Changet River and the left-bank tributaries of the Yassy River. About 20 % of the district area is classified as the fourth mudflow hazard level and occupies the Zerger-Donuz-Too-Tuyuk-Suu, Kara-Darya-Koldyuk interfluves and in the basin of Shorsu river. 46 % of the district area is classified as the third mudflow hazard level and occupies the valleys of Zerger, Donuz-Too, Zindan-Suu rivers with tributaries and the left bank of the Yassy river. There are no mudflows on 26% of the area in the Uzgen-Kurshab plain.

Mudflows, floods, bank erosion. The areas of possible activation of mudflows, floods and bank erosion, which cover the territories of all aiyl aimaks and Uzgen, pose a threat to settlements and the infrastructure connecting them. The most hazardous areas of mudflows, floods and bank erosion are in Zerger and Salam-Alik aiyl aimaks. In the left bank of the Yassy river, mudflows forming coalescing fans, significant in thickness and size, pose a threat to the territory of villages and agricultural land.

Mudflows are also formed along the banks of the Kurshab river in the downstream and along the right bank of the Yassy river. Flood waters of Kara-Darya, Yassy, Kurshab rivers cause large property damage. After the Andizhan reservoir was commissioned, the riverbeds of began to rise due to the accumulation of boulders and pebbles, and the low terraces were lower than the floodplain parts, so there was a risk of destruction of residential houses in many settlements located along the riverbeds.

Avalanche Hazard. On the southwestern slopes of the Fergana Range and on the northeastern slopes of the Academician Adyshev Range, 17% of the area of the district belongs to the first degree of avalanche danger. The area with the second avalanche hazard degree is 15% and is spread above the middle part of the Yassy river

valley with all channels and the upstream of the Koldyuk river. The zone of the third degree of avalanche danger is located in the upper reaches of Zerger, Donuz-Too, Zindan-Suu rivers and occupies 6% of the area. Areas with the fourth degree of avalanche danger occupy 9% of the area in low-altitude and adyr zones, in the lower reaches of the Donguz-Too, Zindan, Koldyuk rivers. There is no avalanche danger on 53% of the territory of the district (Uzgen-Kurshab plain).

Underflooding. There are settlements of 6 aiyl aimaks in the district in the flood zone, including Dzhany-Dzhol, Kyzyl-Oktyabr, Kyimyl, Ana-Kyzyl, and Alga, which are in the impact zone of the Andizhan reservoir.

The eastern part of Kurshab village was exposed to flooding due to rising groundwater levels even before the Andizhan reservoir was put into operation. One of the reasons for waterlogging of the area, besides water loss from the irrigation system and seepage of water from Shorsu stream, is probably the backwater of groundwater by Osh-Uzgen roadbed, during the existence of which there was a gradual subsidence of soils in the zone of excessive wetting. Another important cause of groundwater level rise is the unsatisfactory condition of existing collector-drainage networks. A set of irrigation and reclamation measures must be carried out and the cleaning and rehabilitation of existing collector-drainage networks must be a priority.

Landslide Hazard. The first risk area covers 3% of the district area and occupies the left bank slope of the Kara-Darya River, the Koldyuk river basin, and part of the Zhalpak-Tash River basin.

The second risk area covers 12% of the district area and is in the basins of Changet, Dzhylaldy, Zerger and Shorsu rivers. The third risk area covers 13% of the district area and lies between the rivers Koldyuk-Kandava, Kara-Darya-Shorsu, Kurshab-Shorsu, the upper reaches of the rivers Zerger and Changet, and the right bank of the river Dzhalpak-Tash. The second vulnerability category area is divided into 2 risk areas. The first-degree risk area – 6% of the district, is located in the Dzhylaldy basin river, on the left bank of the Zerger river, between the Koldyuk-Kandava rivers, in the foothill zone south of Kurshab village. An area of 28 % is at second risk degree and lies between the Yassy-Changet, Dzhylaldy-Zerger-Yassy rivers and on the left bank slopes of the Kandava river. The greater area (38%) of the district is categorized as a third category of vulnerability. This area occupies high and mid-mountain zones coinciding with a distribution of mostly rock.

Landslides. Engineering and geological work was carried out to assess the stability of landslide-prone slopes in Toktogul village of Zerger a/a. The study established: safety in the short term, but given the high rainfall, the potential threat of landslides exists. Recommended: measures for surface water drainage, organization of slope monitoring, limitation of slope grazing and agricultural works on these slopes.

According to the assessment of stability of landslide-prone slopes in Kairat village of Zerger a/a, the study established that there is a danger to the outbuildings of the school, for the school building the threat is unlikely. Recommended: monitor the slope and relocate the school's outbuildings to a safe location.

The most landslides occurred in the valley of Changet, Zerger, Nichke, Koldyuk, Shorsu, Kara-Taryk rivers, and continuous landslides development is noted on the left bank of Kara-Darya River. Many settlements on the territory of Dzhalpak-Tash aiyl aymak are located on the surface of large ancient landslides. In the eastern part of Kara-Taryk village in the upper part of the valley of the same name there are landslide cracks, deformations and movements of this part of the territory. Further development of the landslide could lead to deformations of residential houses. The right slope of the Shorsu river valley is complicated by landslide processes. Displacement of one of the blocks may lead to damming of the Shorsu river with formation of a reservoir and its subsequent breach.

Rockfalls and landslides. There are rockfalls in Kors-Etti village of Iyri-Suu aiyl aimak. Landslide-prone areas are located in the vicinity of Uzgen, where vertical walls 10-15 m high were formed after the extraction of loam for brick production. Above the ledges and at the base are residential buildings. Soaking loam at the top of the slope can cause landslides and slope collapse.

Alay District rayon

Socio-economic characteristics. Alay district was founded in 1928. The area of Alay district is 6 821 km^2. According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the resident population is 87.4 thousand people. The average population density is 12.8 people per 1 km^2. Seventy-five rural settlements are located in the district. 14 aiyl aymaks: Alay (7 settlements), Sary-Tash (2), Budalyk (6), Byuleli (4), Gulcha (6), BDzhosholu (12), Konur-Dobo (7), Kabylan-Kol (4), Korul (3), Lenin (7), Taldy-Suu (5), Sary-Mogol (1), Uch-Debe (7), Zhany-Alay (2). According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the district administrative center - Gulcha village with the resident population is 13.8 thousand people. There are 13 489 households in the district (according to the 2009 census). Sary-Tash-Khorog, Osh-Sary-Tash-Irkeshtam, Gulcha-Kara-Kulzha roads pass through the district.

Topography and relief. The Alay district occupies the area coinciding with the middle and upper reaches of the Gulcha river basin, the upper reaches of the Kyzyl-Suu River basin and the Kok-Suu river basin, and is bounded on the south by the eastern part of the Zaalai Range, on the north-east by the Academician Adysheva Range and on the west by the Ak-Ter Range. The relief is medium- to high-mountainous.

Plains are found in the eastern part of the Alay Depression and on separate terraced surfaces along the banks of the Gulcha river and its tributaries, on which settlements are located.

The district center of Gulcha village is located on the surface of the first floodplain terrace about 1 km wide on the right bank of the Gulcha river. The river of Gulcha that originates from the spurs of the Alay Range, cuts through mostly Paleozoic rock formations in its course. In these areas the valley is narrow with steep slopes. On sections cutting through Mesozoic semi-rock formations, the valley takes on gentle slope shapes with wide terraces.

Climate. The area climate depends on the altitude and the significant dismemberment of the topography. Average annual temperature 7.3 °C (Gulcha 1542 m), -3 °C (Sary-Tash 3655 m). The minimum temperature in January reaches -35 °C and the maximum in July is 40°C. The average multi-year annual precipitation is 471 mm (Gulcha) and 368 mm (Sary-Tash).

Hydrology. The main water artery of the district is the Gulcha River, with numerous tributaries (maximum discharge reaches 138 m^3/s). There are 4 irrigation canals in the district, the largest of which are the Savay and Otuz Adyr canals.

Emergency danger zones and forecasts of possible activation of natural hazardous processes and phenomena.

91.7% of the area of Alay district belongs to the mountainous, and 8.3% to the valley type of relief. In terms of prevalence and frequency of hazardous natural processes in the area are dominated by mudflows and floods, groundwater flooding.

Seismic Hazard. On the map of probable seismic hazard in the territory of the district, four AEE (areas of expected earthquakes) are identified – Kyzyl-Agyn (KA), Uluuchat (UCH) of the first hazard category with expected earthquake class of 13-16 with intensity of 7-9 points, Gulcha (GCH), Taldysuu (TD) of the second hazard category with expected earthquake class of 12-15 with intensity of 6-7 points (figure 7.2, table 7.1).

Landslide Hazard. The second-degree mudflow hazard area occupies 19% of the district area and is located on the northern slopes of the Zaalai Range. The third-degree mudflow hazard area occupies 48% of the district area and is located in the Gulcha-Kok-Suu interfluve, in the Murdash and Zhyluu-Suu River basins. The fourth mudflow hazard level occupies 6% of the district area and is located along the Gulcha and Kok-Suu River valleys and along the right bank of the Kyzyl-Suu River. There are no mudflows in 27% of the district area.

Mudflows, floods, bank erosion. Mudflows, bank erosion, flooding of areas by flood and storm flows are widely developed in the district and often occur on the right bank and left bank of Gulcha river (Gulcha, Tooshkan villages, etc.), Dzhosholu, Korul, Kichi- and Chon-Bulelyu, Budalyk, Terek-Suu right bank tributaries, and Zhyluu-Suu left tributary. In order to protect residential houses, public buildings, structures and land, it is necessary to apply a set of bank protection and bank stabilization measures.

Mudflows of storm character most often occur in the beds of small rivers, dry sai with exposed slopes covered with rare vegetation. Mudflows discharge occurs in the beds of larger rivers or directly on the territory occupied by settlements. In some cases, flooding occurs after mudflow masses block irrigation or mudflow check canals.

Outburst lakes. There are areas of potential activation of 7 outburst lakes of all the third hazard category located on the northern slopes of the Zaalay Range (Lake Sary-Mogol is territorially located in Chon-Alay district).

Avalanche Hazard. In the axial parts of the Alay, Zaalay, Academician Adyshev and Min-Teke ranges, 17.5 % of the district is classified as the first-degree avalanche danger. The second-degree hazard zone area is 34.1% and is spread on the slopes of the above-mentioned ranges. The third hazard zone is located on the relief lower and occupies 18.8%, mainly middle-mountain zone of the district, the valleys of the Gulcha, Terek, Dzhosholu rivers, the downstream of the Kok-Suu River, the southern slopes of the Alay Range. The fourth-hazard area occupies 3.3% of the low-lying area of the district. There is no avalanche danger in the remaining 26,3% of the district area.

Very frequent avalanches occur on the 176-185 km of the Osh-Sary-Tash Road. Rare avalanches are observed in other parts of the Gulch River basin and its tributaries.

Underflooding. The largest area of flooding is in the village of Gulcha, where about 200 residential houses are in the hazard zone. To keep residences safe, existing drains need to be cleaned and new ones constructed.

Landslide Hazard. The second-degree area occupies 2.7% of the district and is located in the Budalyk, Zhyluu-Suu, Murdash, Kabylan-Kol river basins, left slopes of the Gulcha and Dzhosholu rivers. The third risk level area (3.1% of the district area) is located in the upstream of Budalyk river, in the right bank of the Dzhosholu river, in the Gulcha-Dzhosholu interfluve, south of the Kabylan-Kol section. The second vulnerability category area is divided into 2 risk areas. The first-risk area of 1.8% of the district lies along the right bank of the lower reaches Dzhosholu river and in the Zhyluu-Suu-Kabylan-Kol interfluve.

An area of 2.2 % of the district is considered to be at second risk and is on the northern slopes of the Zaalay Range. A large area of the district (73.7%) is classified as third category of vulnerability. This territory occupies high and mid-altitude zones, coinciding with the area of Paleozoic rocks. 18.7% of the district area is glaciers and plain areas of the Alay Valley.

Landslides. Overall, landslide zones cover about 20 % of the Alay district. The area is confined to the zone, where 4 seismic generating zones East-Fergana (the largest number of landslide-prone areas), South-Fergana, Gissar-

Kokshaal and Darvaz-Karakul are distinguished. According to geomorphologic conditions, landslide-prone areas are confined to hilly relief of rockfall deposits and steep slopes of river valleys. In terms of lithologic composition, most landslides are developed in loess loams. In the Gulcha river basin landslide-prone areas are developed on the left-bank slope starting from the mouth of the Zhyluu-Suu River, where current landslides are on ancient landslide slopes pose a threat to residential houses and infrastructure of villages of Konur-Debe a/a, Savay canal.

Rockfalls and landslides. Most often rockfalls and landslides occur on slopes adjacent to Oktyabr village of Budalyk aiyl aimak. Blocks and boulders were rolled down and houses were destroyed. Periodic slope clearing with the involvement of specialists is required on this section. Landslides are observed along the road Osh-Gulcha - Sary-Tash-Irkeshtam.

5.2.3 Issyk-Kul oblast

The oblast has an area of 43,735 km2 (including the water area of Lake Issyk-Kul of 6,283 km2) and is located at an altitude of 1,600 to 7,439 m above sea level. Issyk-Kul oblast borders with Kazakhstan in the north, PRC in the east, Naryn oblast in the south and Chuy oblast in the west. The oblast area is divided into 5 administrative-territorial districts/rayons: Ak-Suu, Dzheti-Oguz, Issyk-Kul, Ton, Tyup.

Biodiversity

Vegetation. The vegetation of the area is mainly represented by trees planted along the route/road, ornamental grasses and flowers.

Wildlife. The fauna is mainly represented by birds: pigeons, thrushes, crows and a small list of mammals: bats, rodents (house mouse, gray hamster, rats). Construction sites are located within the residential sector, which leads to the presence of synanthropic animal species.

The Khan-Teniri State Natural Park is located in the Ak-Suu district of Issyk-Kul oblast in the Sary-Dzhaz River basin. The park's area is 275.8 thousand hectares, which is more than all the combined state reserves in Kyrgyzstan. The Natural Park was created to protect rare and endangered species of flora and fauna, primarily to preserve the snow leopard population.

Figure 6. The Khan-Teniri State Natural Park

A fairly large number of species from the Red Data Book, such as brown bear, stone marten, manula, etc. were also recorded in this area.

Snow Leopard

Stone marten

Brown bear

Manul

Figure 7. Fauna species of Red Book

The territory of the Khan-Teniri Nature Park has so far been little affected by human activity, and the main landscapes have remained almost in their natural state.

Currently, 457 species of vascular plants are known from the Sary-Dzhaz River basin, although their total number may reach 700 species, which is a significant part of the total flora of Kyrgyzstan. Of these, five species are listed in the Red Book of Kyrgyzstan, eight are endemic, that is, they are not found anywhere else, and eleven are known in the Sary-Dzhaz area.

Saussurea wrapped

Edelweiss

Berberis kaschgarica

Daisy pyrethroid

Ranunculus and primula

Allium/onion named after Semenov

Figure 8. Flora species of Red Book

Table 23. Cultural monuments officially included in the State List of Historical and Cultural Monuments of the Kyrgyz Republic of Republican Significance-Ak-Suu rayon

№	Name of monument	Typological affiliation	Dating of the monument	Address (location of monument)
1	Burial ground	Archeology	VII century BC - III century AD, VI-X centuries	The southern and western outskirts of the village Chelpek
2	Mausoleum Kydyr-Ake	Archeology	1993	the village Kerege-Tash
3	The cave Ak-Chunkur	Archeology	Neolithic. (VI-V centuries BC)	The high-mountain syrts (elevated watershed) Sary-Zhaz, the River Sary-Zhaz, in 7 km to the east of the village Echkiluu-Tash
4	Orthodox Church	Archeology	1910	the village Teploklyuchenka

Source: Internet resource

Ak-Suu rayon

Socio-economic characteristics. Ak-Suu rayon was founded in 1973. It is located in the eastern part of the Issyk-Kul Basin. It has an area of 9,917 km2, borders with Tyup rayon in the north, Kazakhstan in the north-east, PRC in the south-east and Zhety-Oguz rayon in the west. The district area includes 14 aiyl aymaks: Ak-Bulun (3 settlements), Zhyrgalan (1), Beryu-Bash (2), Kara-Dzhal (4), Karakol (2), Kerege-Tash (5), Novovoznesenovka (3), Oktyabr (4), Otradnensk (3), Ak-Chiy (3), Tepke (3), Teploklyuchinsk (2), Chelpek (3), and Enilchek (1). There are 40 rural settlements in the district.

Population. According to the Kyrgyz National Statistics Committee's data as of January 1, 2021, the resident population is 69.4 thousand people. The average population density in the district is 7.0 people per 1 km2. There are 13,456 households in the district (according to the 2009 census). The Bishkek-Balykchy-Karakol and Karakol-Enilchek highways pass through the district. The Pristan Przhevalsk (Pier) and Karakol Airport are in the district.

There is a city of oblast (regional) subordination Karakol with an area of 44 km2 with a resident population of 84.3 thousand people (the city of Karakol - 81.5 thousand people, the urban type settlement of Pristan Przhevalsk - 2.8 thousand people) located on the territory of the district.

The administrative center of the rayon is the village of Teploklyuchenka. Teploklyuchenka with a resident population of 14.1 thousand people according to the National Statistical Committee of the Kyrgyz Republic as of 1 January 2021. The relief of the area is dominated by mountain structures of the Teskey Ala-Too and Kokshaal-Too ranges with extensive syrts. The lowland part consists of the terraced valley of the Zhyrgalan River, foothill plumes, and lakeside terraces of Lake Issyk-Kul.

Unemployment, employment, poverty, disease incidence. The nominal average salary per employee in the region (excluding small businesses) in January-June 2023 amounted to 39402.9 KGS (excluding Kumtor enterprises 24535 KGS) and increased by 28.4 percent compared to the corresponding period last year.

The average monthly salary for January-June this year in Karakol was 25253.9 KGS, Balykchy - 27006.8 KGS in Issyk-Kul rayon - 22509.9, including Cholpon-Ata - 26089.9 KGS, Zhety-Oguz rayon - 9,3015.0 soms (without Kumtor 22601.5 KGS), in Tyup - 23627.4, Ton — 26,793.5 and Ak-Suu rayon — 25498.8 KGS.The most significant increase in nominal wages was noted for construction workers by 1.5 per cent, and in processing industries (manufacturing) by 24.1 per cent.

Table 24. Number of officially registered unemployed; Average monthly salary of employees of enterprises, institutions and organizations by territory

Number of officially registered unemployed					
	2017	**2018**	**2019**	**2020**	**2021**
Issyl-Kul oblast	4197	4202	4320	4491	4241
Ak-Suu rayon	382	390	450	572	514
Average monthly salary of employees of enterprises, institutions and organizations by territory (KGS)					
Issyl-Kul oblast	21543	21397	22208	26860	30172
Ak-Suu rayon	10771	11111	11726	13493	13141

Source: National Statistical Committee of the Kyrgyz Republic

The incident of certain groups of diseases (cases with first-time diagnosis per 10 000 people) in Ak-Suu rayon for 2021: infectious and parasitic diseases - 59.3; diseases of blood and blood-forming organs - 66.5; diseases of the endocrine system - 17.7; diseases of the circulatory system system - 96.2; diseases of the respiratory system - 548.3; diseases of the digestive system - 294.6.

Migration

Table 25. External migration of population by territory; internal migration of population by territory

External migration of population by territory (persons)					
	2017	2018	2019	2020	2021
Ak-Suu rayon	2	1	-	-	43
Urban population	-	-	-	-	-
Rural population	2	1	-	-	43
Internal (inter-oblast) migration of population by territory					
Ak-Suu rayon	114	127	96	69	89
Urban population	-	-	-	-	-
Rural population	114	127	96	69	89

Source: National Statistical Committee of the Kyrgyz Republic

Industry. In January-July 2023, industrial enterprises in the Issyk-Kul oblast produced products worth 39 867.6 million KGS; the volume index by January-July 2022 was 76.1 percent. Excluding enterprises developing the Kumtor field, over the past period, industrial products worth 3,785.4 million KGS, or 114.3 percent compared to January-July last year, were produced. Since 2017, the volume of industrial production in Ak-Suu rayon has increased from 96.7 million KGS to 162.7 million KGS in 2021.

Table 26.Industrial output (goods and services) by territory (January-July)

	Produced — in total, million KGS		Physical volume index,%	
	2022	2023	2022	2023
Total by oblast	51954,1	39867,6	139,1	76,1
Ak-Suu rayon	109,4	109.0	102,4	114,2
Zhety-Oguz rayon	49597,3	37359,8	137,1	75,4
Issyk-Kul rayon	112,6	177.5	105.8	128,9
Ton rayon	76,4	106.8	107,0	104,3
Tyup rayon	287,9	335,2	108,7	110,4
City of Karakol	1614,4	1566,1	121,6	94,5
City of Balykchy	156,1	213,2	98,5	126,9

Source: National Statistical Committee of the Kyrgyz Republic

In the total volume of industrial production in the oblast, the share of mining was 0.1 percent, the manufacturing industry was 94.6 percent, and the share of electricity, gas and steam was 5.0 percent, for water supply, purification, processing and production of secondary raw materials - 0.3 percent.

Agricultural Activities. The main types of agricultural products in Ak-Suu rayon are grain, potatoes, vegetables, meat, raw milk, eggs, and wool. As of August 1, 2023, the region's farms of all categories produced 33551 tons of cattle and poultry for slaughter (in live weight), which is 101.6 percent compared to the corresponding period last year, 154468 tons of milk (104.9 percent), the region received 20372 thousand eggs (92.1 percent), 1949 tons of wool, which compared to the corresponding period last year was 89.5 percent. The average milk yield per cow in the region was 1112.6 kg, which is 5.6 percent less than last year. Tyup rayon produced 1197.7 kg of milk per cow, 1141.7 kg in Zhety-Oguz rayon, 1165.8 kg in Issyk-Kul rayon and 1172.3 kg in Ak-Suu rayon.

In the region, an average of 42 eggs were obtained from one laying hen, which is 6 eggs less than the corresponding period last year. The wool was cut from one head to 2.2 kg, which corresponds to the corresponding period in 2022.

The number of cattle in the Ak-Suu rayon for 2021 amounted to 54.5 thousand heads, including cows — 26.2; pigs -0.1; sheep and goats - 172; horses -18.9; poultry — 120.8.

Hydrology. The hydrography of the area is represented by the rivers Karakol, Zhyrgalan (maximum flow rate 70 m3/sec) and Sary-Dzhaz (258 m3/sec) and numerous mountain rivers and sai, and the Merzbacher high-mountain lake with a catchment area of 318 km2, with a mirror area of 4.5 km2, and a volume of 129 million m3.

Climate. The climatic conditions of the district are characterized by the following data: the average air temperature in January is -8° C in the valley and -26° C in the mountainous part. In July, the average monthly temperature varies from +14° C in the valley to +9° C in the mountains. The minimum air temperature is -40° C. The average values from maximum air temperatures vary from +30° C in the valley to +15° C in the mountains. The amount of precipitation is 300-400 mm in the valley, 500-600 mm in the mountains, up to 150 mm in the valley during the warm period and 250 mm in the mountains during the cold season. The height of the snow cover in the valley reaches 40 cm. The highest possible wind speed is 34 m/sec every 20 years.

Danger zones and forecasts of possible activation of hazardous processes and phenomena. In Ak-Suu rayon, about 93% are mountainous, and the remaining 7% are valley-shaped. The areal extent of dangerous natural processes and phenomena is shown on the maps-schemes of seismic, avalanche, mudflow and flooding hazards.

Seismic Hazard. On the map-scheme of probable seismic hazard on the territory of the rayon, six AEE (areas of expected earthquakes) - of the second category of hazard with the class of expected earthquakes 12.6-14.5, intensity of 5-7 points is allocated.

Landslide Hazard. About 23% of the district's area, which mainly covers high-mountain mid-mountain tiers, is characterized by a second degree of danger. About 48% of the area of the district, which occupies mid-mountain zones, has a third degree of mudflow hazard. About 21% of the district's territory, represented by low-mountain terrain and some foothill parts of the valleys, is characterized by a fourth degree of mudflow hazard. Mudflows and floods. Residential buildings, water dams, communications, roads and other facilities are at risk.

During the fall of intense, area-concentrated atmospheric precipitation, mudflows of a torrential nature and areas of storm flooding that are not indicated on the map may occur.

Outburst lakes. Activation of 28 outburst lakes located in the high-mountain glacial zone on the northern sides of the eastern part of the Teskey Ala-Too Mountain range in the upper reaches of the Karakol, Arasan, Ak-Suu, Yrdyk, Boz-Uchuk, Dzhergez, and Turgen-Ak-Suu River basins. Mountain lakes are located in the absolute range from 3092 to 4200 m and have: 1 lake is the first, 1 lake is the second, 17 is the third, and the 9 is the fourth hazard category.

Avalanche Hazard. 17% of the study area in the high-mountainous part of the Teskey Ala-Too, Ak-Shiyrak, Khan-Tengri, Sary-Dzhaz, Kokshaal-Too, Enylchek-Too and Adyr-Ter ranges belong to the territory with the first degree of hazard. Up to 38% of the area, which is located below the relief, mainly covers mid-mountain tiers, is classified as the second degree of avalanche hazard. About 14% of the area of the district, which covers the lower parts of the middle mountains and the high foothills, is an area with a third degree of avalanche hazard. The area with the fourth degree of avalanche hazard occupies up to 5.5% of the district's area and is confined to low-mountain tiers of the terrain.

In the Turgen-Aksuu River basin, a 45-50 km section of the road is classified as moderate avalanche hazard, with possible avalanches ranging from 5 to 25 000 m3 and blocking the highway for 220 m. Here, 72-82 km on the north side of the Chon-Ashuu Pass, there is an area where avalanches from 5 to 120 thousand m3 can occur and the road is blocked for 1200 m. In the Ottuk River basin, on a section of the 82-88 km highway on the southern side of the Tee-Ashuu Pass, an area with a moderate degree of avalanche risk has been identified, where avalanches can occur with volumes ranging from 5 000 to 130 000 m3 and a total road closure length of 350 m. The activation of avalanches in the winter-spring period will be determined by weather conditions.

Underflooding. Areas with high groundwater levels are located in the northwestern part of the district in the form of a narrow strip along the Zhyrgalan River bed and the lower part of the Karakol River. In flood zones, earthquakes increase the likelihood of destruction of buildings and structures. Residential buildings in flood zones are also deformed due to violations of building codes and regulations and poor construction quality.

Landslide Hazard. On the map of typological engineering and geological zoning of landslide hazards, about 1.3% of the territory located in the northern part falls into category I of vulnerability, which has a third degree of risk of landslide hazard. About 2% of the area of the district, located on two sites in the central and northern parts, is identified as the second category of vulnerability with the first degree of risk. Up to 4% of the area located in 4 sites (the first in the central part, the remaining 3% in the northern and north-western ends of the study area) fall into the second category of vulnerability, which has a second degree of risk from landslides and phenomena. About 86% of the territories occupied by high- and mid-mountain tiers of relief fall into the third category of vulnerability, which, due to the expected level of anxiety, has the first degree of risk.

Rockfalls and landslides. The areas of possible increase in rockfalls and landslides that pose a risk to the Karakol—Enilchek and Karakol-Echkili-Tash highways.
Surging glaciers. Surging glaciers are located in the upper reaches of the Sary-Dzhaz River basin, at the Khan-Tengri Mountain knot: Mushketov in the upper reaches of a tributary of the Adyr-Ter River; Unnamed on a separated tributary of the Mushketov Glacier; Kaiyndy in the upper tributary of the Kaiynda River. The following

surging glaciers are located on the Ak-Shiyrak mountain range: Unnamed in the upper reaches of a tributary of the Sary-Chat River; Chomoy in the upper reaches of the tributary of the Chomoy River. These surging glaciers may have an impact on the territory of the Enilchek aiyl aymak.
The district has a tailing dump, which is owned by the Manas Kyrgyz-Russian enterprise, located between the Enilchek-Kaiyndy rivers. The main pollutants are arsenic, copper, zinc, bismuth.

5.3 Description of potential project sites

At the project preparation stage, the SIDDWSWD selected Aravan, Sokuluk, Panfilov and Ak-Suu rayons as priority for inclusion in the project based on the following selection criteria: current condition of the existing water supply system (e.g. age, level of deterioration, coverage, etc.); public health problems (cases of waterborne diseases); and readiness of local authorities and public organizations to participate in the project and introduction of modern water supply operation systems (including installation of meters and introduction of cost-reflective tariffs - based on consumption).

Rehabilitation and construction works will improve access and quality of water and sanitation services in targeted rural communities and strengthen the capacity of agencies and bodies in the water and sanitation sector.

At the moment it is determined that in 111 settlements of Sokuluk, Panfilov, Aravan, Kara-Kuldja, Kara-Suu, Uzgen, Alai and Ak-Suu rayons, rehabilitation works of water supply systems, as well as works on improvement of sanitary conditions in social institutions will be carried out. However, it is only during the design stage that sites for water supply and wastewater infrastructure (water intakes, reservoirs/water towers, networks, sanitary facilities) will be identified when defining the design technical solution. During the design stage, a socio-environmental screening will be conducted to determine whether construction/rehabilitation of water and wastewater systems will take place on existing sites or whether land acquisition for new construction will be conducted.

General scheme of potentially target sites presented in Figure 9.

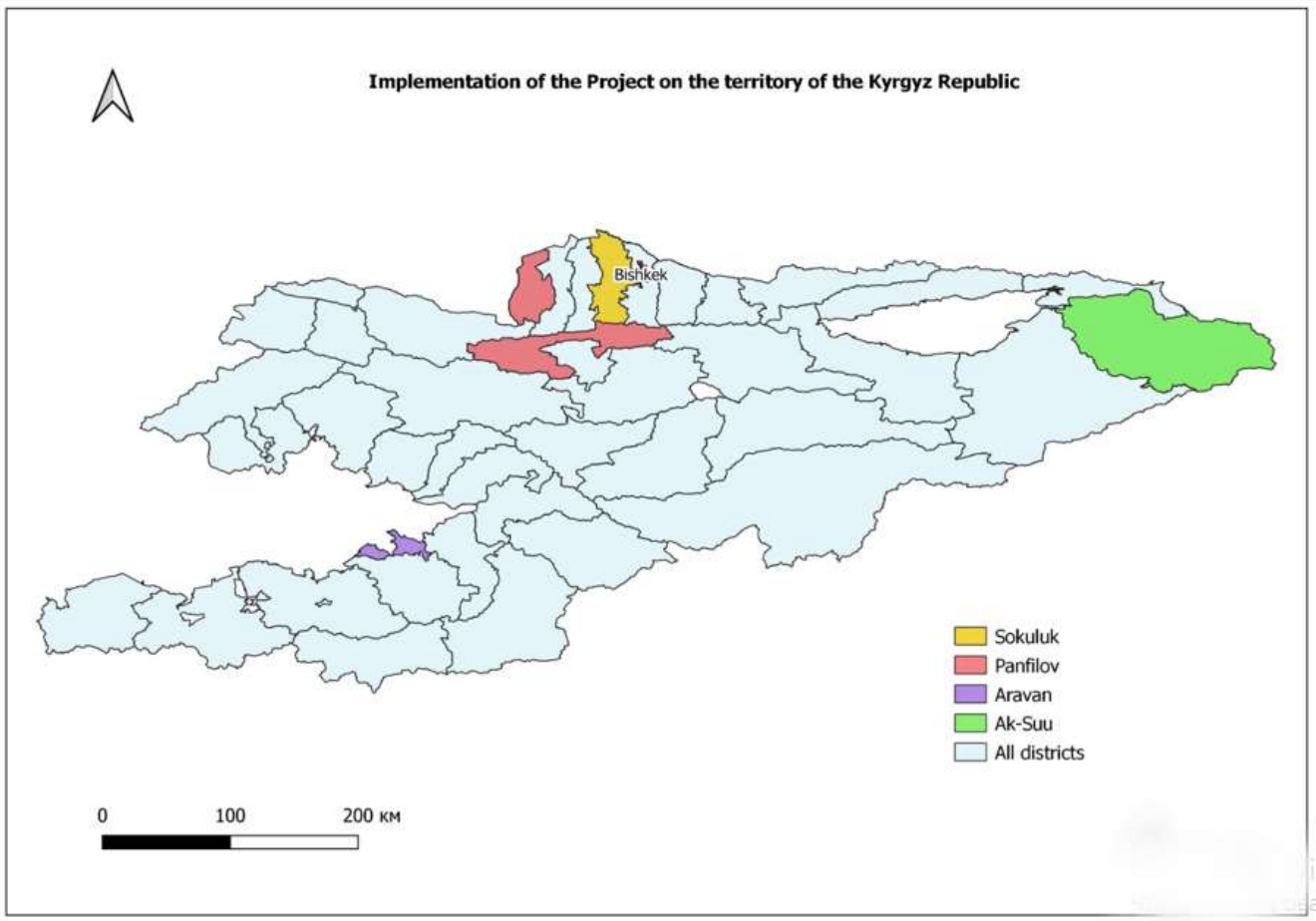

Figure 9. Potentially target sites. Source: SIDDWSWD

VI. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS AND MITIGATION MEASURES

At the stage of project preparation, the exact location of project sites and areas is not clearly defined, so this framework document contains the basic requirements and recommendations for environmental and social management, and to all future subprojects.

6.1. Brief description of the project's planned activities

The main physical impacts are expected within Component 1 **–** Water Supply Investments. The objective of the sub-component is improving access and quality of water supply and sanitation services in targeted communities. Under this component, there will be construction works of new water supply systems in unserved rural villages in priority country areas. This component will focus on priority investments in Chui, Osh and Issyk-Kul regions and finance water source development, treatment, transmission and distribution networks, and household connections in the selected priority areas. Wherever feasible, the project will maximize gravity systems use, install energy-efficient pumping equipment and explore the use of renewable energy solutions such as solar energy to operate them in order to minimize GHG emissions. The scheme design will follow a participatory approach, with consultations involving disabled people, building on local knowledge and historical data. Complementary institutional support activities are defined under Component 4. These activities, together with the infrastructure investments, will support water system operations to enable sustainable service delivery. Component 2 also includes an allocation for contingencies to address potential unanticipated technical challenges that would hinder the achievement of water supply objectives in the project areas.

Component 1 provides for the following types of major works: Earthworks, construction/rehabilitation of water intakes (captation structure/groundwater intake structure, drilling or rehabilitation of boreholes, water intake from an open source), reservoirs, distribution networks, buildings and structures, fences***.***

Earthworks. These include planned foundation pit excavation for reservoirs and water towers, trench excavation for laying penstocks, water supply system distribution networks.

Earthworks will be carried out in compliance with the requirements of current construction norms and rules (SNiP 3.02.01-87 "Earthworks, bases and foundations', SNiP KR12-01-2002 "Safety in construction", SNiP KR12-02:2004 "Organization of construction production"). A strip for trench excavation works is to be performed in consideration of the possibility of natural bending of the pipeline in the vertical plane, the required design depth of the trench, excavated by excavators for a minimum amount of leveling work.

Figure 10: Example works on the subproject sites - Trench cross-section, depth of excavations, is regulated by the project

Construction/rehabilitation of water intakes ***(groundwater intake structure, boreholes drilling or rehabilitation, open source).*** Borehole water intakes and springs are planned to be used as water supply sources, water intakes from open watercourses (rivers, canals) will be considered only in exceptional cases, in the presence of positive preliminary technical proposals. If there are existing facilities (boreholes, captation structures), measures will be taken as a priority to rehabilitate them and improve their efficiency by applying borehole pumps with higher efficiency, cleaning of boreholes, repair works and cleaning of captation structures. The borehole drilling works will be carried out according to the design solutions.


Figure 11. Example works on the subproject sites – opensource and groundwater intakes

Tanks. Tanks of different materials (reinforced concrete, steel) will be used as water storage tanks depending on the design solutions. Manufacturing, installation and testing of steel tanks are done in accordance with the design solutions. The tanks' walls, coating and bottom are manufactured in the form of sheets, which are transported to the place of installation, in rolls. Quality control during the manufacture of structures is done by the manufacturer's inspection department, and during installation - by line engineering staff.



Figure 12. Example works on the subproject sites – Water tanks

Concrete works during the construction of reinforced concrete tanks will be performed in strict accordance with the design documentation, the work program (WP) and applicable building codes and regulations.

The selection and acceptance of cements for the preparation of concrete mixtures shall be made in accordance with GOST 30515-97 "Cements. General conditions". The composition of the concrete mix, preparation, acceptance and control methods shall comply with GOST 7473-2010 "Concrete mixes. Technical conditions" The concrete design is carried out by the manufacturer's laboratory according to the approved process task in accordance with GOST 27006-86 "Concrete. Rules for mix design".


Figure 13. Example works on the subproject sites – concrete works – water tanks

Distribution networks. It is planned to perform works on construction of water conduits, distribution water supply networks made of polyethylene pipes. Shut-off and control valves will be installed in the projected water supply manhole to shut off and regulate water supply in case of repair works.

To connect households in the projected water supply wells combs provided combs designed for several households, depending on the density of construction of the settlement with the installation of stop valves on them.

Figure 14. Example works on the subproject sites – Distribution networks

Buildings and Structures. It is planned to construct buildings where disinfection equipment (chlorination equipment, bactericidal units), pumping equipment, and guardhouses will be located. The buildings are planned to be made of metal containers with subsequent exterior and interior finishing, with connection of communications (electricity, water supply and sewerage) and exhaust ventilation.

Outdoor pit toilets, which are a sealed container made of monolithic reinforced concrete, will be constructed on the territory of the tank sites.

Figure 15. Example works on the subproject sites – Buildings and Structures

Fence. The perimeter of the water intake and tank sites will be fenced with galvanized mesh fencing on metal posts, with barbed wire installed on top of the fence. Energy-saving lamps mounted on reinforced concrete or metal poles are provided for site lighting.

Figure 16. Example works on the subproject sites – Fences

In addition, physical impacts are expected within Component 2 – Sanitation Development. This component will finance the construction and/or rehabilitation/retrofitting of a decentralized sanitation system, including toilet upgrades for vulnerable households and selected social institutions, conveyance, and wastewater treatment and reuse where technically, financially, and environmentally feasible.

It will also finance TA, training, and equipment for developing fecal sludge management services, including collection, transport, and treatment. Further, the Project will finance the development and implementation of a sanitation marketing and behavioral change strategy to incentivize the adoption and use of improved WASH at the household level and public institutions. Component 2 also provides purchase of laboratory equipment, chemicals for water quality testing.

The Department of Disease Prevention and State Sanitary and Epidemiological Surveillance under the Ministry of Health of the Kyrgyz Republic and its district divisions will benefit from the Project in the form of laboratory equipment necessary for conducting laboratory research/analysis and monitoring the quality of drinking water. Also, the Department's database for monitoring water quality and diseases associated with drinking water quality is expected to be updated.

Disassembling works. At this stage, old doors and windows, tiled floors and walls will be removed. Existing sewer and water pipes and sanitary/plumbing fixtures. Depending on the project, it is possible to dismantle partitions, punch holes for pipes. Depending on the technical condition of individual structures, reinforcement works will be carried out.

Earthworks. Work is planned to excavate pits for septic tanks and manholes, trenching for laying of sewer and water supply pipes. Earthworks will be carried out in compliance with the requirements of applicable building regulations. The depth of excavations, trench cross-section, is regulated by the project.

Figure 17. Example works on the subproject sites – Disassembling works

Installation of pipeline and manholes. It is planned to lay sewer and water pipelines in trenches with preliminary soft soil bedding. Reinforced concrete manholes are installed according to the designed project. Outdoor pipes are used as sewer pipes. Laying of sewer pipes is done with a slope.

Septic tank construction. Construction of a septic tank is done on the educational institution territory according to the standard project 902-3-072.87 with a capacity of 6 m^3/day. The septic tank consists of factory-made 1.5 m diameter filter wells and a clarified water filtration field.

The planned septic tanks provide full biological treatment of domestic wastewater. Clarified and digested wastewater in septic tanks is then treated in filter wells, in underground filtration fields (in sandy and sandy loam soils) or in sand and gravel filters and filter trenches (in clay and loam soils).

Figure 18. Example works on the subproject sites – Septic tank construction

Interior work. It is planned to repair the premises, lay new sewer and water pipes, install water heaters, and plumbing fixtures (toilets, bowls, and hand basins). The rooms will be divided into separate cubicles by installing metal frames. Heaters will be provided in each room to maintain a comfortable temperature regime. The premises' floors and walls will be tiled, the ceilings painted with water-emulsion paint, and new doors with gender signs installed.

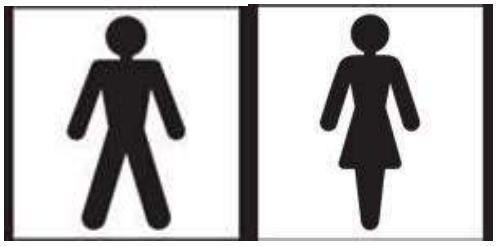

Figure 19. Example works on the subproject sites – Interior work

There will be mirrors, paper towel dispensers, and soap dishes near each hand basin. Hot water will be supplied to each hand basin.

Old electrical wires will also be replaced with new ones, considering the capacity of water heaters and heating appliances. Lighting and exhaust fans will be installed.

Fence. The perimeter of the constructed septic tanks will be fenced with galvanized mesh fencing on metal posts, and a metal gate will be provided for periodic inspection and maintenance of the septic tanks.

Figure 20. Example works on the subproject sites – Fence of the constructed septic tank

Component 3 – Performance-based Service Improvement Program will not have a physical impact on the environment. This component aims at enhancing institutional and service delivery capacity at the central, regional, district, and scheme levels. Specifically, the component will finance PBGs to selected water sector institutions to implement their institutional and WSS services development plans to improve the sustainability of WSS services. The PBG managed centrally by the SIDDWSWD will *at the central level:* (i) support the establishment of the national SOE "Kyrgyz-Suu" and (ii) the implementation of the "Professional and Vocational Development Program"[4] – a certificate-oriented, long-term capacity development program – in response to the

[4] Introduced through the SRWSSDP-AF1. This activity will be coordinated with the proposed "Water Research Center of Excellence" to be established under the Higher Education Quality and Innovation Project (HEQIP, P178592).

need for developing and creating a pipeline of professional staff and skilled workers in the water sector. *At the regional and district level*, it will support (i) the start-up activities and service improvement investments in selected regional and district-level SOEs to enable operational and financial efficiency and service expansion. The investments will focus on increasing SOE's planning and management capacity and operations, including innovative solutions for enhancing climate resilience, asset management and operations, customer services, tariff-setting procedures, financial management, and sector monitoring and reporting. *At the local level*, the component will build the capacity of local authorities (AOs) and rural water service providers responsible for water service delivery in the project areas. This will include training on topics and support for tariff setting, billing and collection systems, O&M, water quality testing, customer relations, human resources, and commercial management. It will also support the preparation of service contract agreements between the operator and asset owner.

As part of Component 4, analytical and consultation types of work will be implemented that will not have a physical impact on the environment. The goal of the component is to support the establishment of a program management framework and WSS infrastructure development capacity. Specifically, the component will finance

- TA and training for the development of the program management tools, including standard environmental and social instruments, implementation manuals and protocols, to enhance coordination and Program implantation efficiency, and a monitoring and evaluation (M&E) program;
- TA for the preparation of investment packages, engineering design, and safeguards instruments for future interventions planned for the subsequent phases of the MPA;
- TA and equipment for program management, including incremental costs; and
- TA, equipment and services to support a knowledge development program and communications strategy for the MPA.

This component provides Project Management and Technical Assistance. Technical assistance under the components is planned in information technology (IT), consulting and information services, which will include hiring consultants and project organizations; assisting in the organization and conduct of working group meetings in the preparation of investment programs, training programs and communication strategy MPA.

6.2 Classification of environmental and social risks

Actions planned under the Project may have certain environmental and social impacts, both positive and negative, as the Project involves the development of socially important local infrastructure and services.

Potential positive impact of the project.

Overall, the environmental impact of the project is expected to be positive, including (i) more efficient and rational water use as a result of replacing leaking pipes and networks, replacing permanently open public standpipes with yard connections, and installing water consumption meters (water meters), together with operational support; (ii) reduction of total water consumption in the respective rural settlements compared to the existing water consumption levels and initial project indicators by improving the efficiency of water supply systems and using water-saving technologies; and (iii) promoting ground and surface water protection by advancing the construction and use of environmentally safe sanitation facilities; (iv) increasing public skills and awareness in planning and implementing activities at the local level, necessarily taking into account environmental protection; and (v) sustainable management of upgraded infrastructure by local communities, which will provide environmental and social benefits related to environmental management.

Possible negative impacts of the project.

The environmental risk of the project is assessed as Substantial. Despite the positive environmental impacts of the project, some negative aspects are also possible. Potential adverse impacts that may result from project implementation are mainly related to construction works on water intakes, reservoirs / water towers, installation of water pipelines and water distribution networks in the subprojects.

Design Stage: Measures (e.g., siting, technology, and material) will be considered during the subprojects' design stage to minimize the potential negative environmental impact of implementing them. The ESIA and design and estimate documentation will also include projected withdrawal of water, contributing to depletion of water resources at basin level.

- The site selection during the planning stage will be undertaken to avoid sensitive ecosystems and biodiversity hotspots (adopting the mitigation hierarchy) to mitigate the loss of vegetation and habitat. By optimizing the project layout, engineers will minimize land clearing and preserve critical habitats.
- Sustainable design of well placement and water extraction systems will prevent over-extraction of groundwater and reduce the risk of aquifer depletion. This includes calculating sustainable yield and installing monitoring systems for groundwater levels during the ESIA and Detailed Project Report stage.

- Proper planning for material storage and disposal will be undertaken to mitigate environmental damage during the construction stage. These would be included in the ESMP for ensuing implementation during the construction stage.
- During the design phase, incorporating energy-efficient technologies and renewable energy sources (e.g., solar power for water pumps) will help reduce the project's carbon footprint and long-term environmental impacts.
- If surface water source is to be used, need to check impact on aquatic life. Water intake structure, preferably, should not create barrier to fish movement.

Construction stage: The following negative environmental impacts are expected during the construction phase: loss of vegetation due to cutting and removal of trees and exposure of land; fuel spills, hazardous liquids, hydrocarbons and other chemical pollutants spilling and discharged on the site/onto the ground; increased suspended sediment and reduced water quality near the intake, and near river crossings; increased dust near the settlements along the traffic route, in quarry/borrow pit areas during site preparatory works; increased noise levels on subprojects sites and near the settlements; vibration from vehicles and heavy plant equipment on site and impacting settlements during earthworks and site preparations; landslide and soil erosion (some construction sites may be in areas at risk of soil erosion and landslides; very wet conditions may trigger slope failures, and in many areas, construction is feasible only during the dry season); risks to biodiversity (local ichthyofauna, flora and small fauna of river ecosystems); loss of soil material and sedimentation to the surface and/or groundwater systems from site due to earthwork activities; soil contamination from construction activities; construction waste on site and potentially in surrounding villages; construction hazardous waste (asbestos).

Operation Stage: Some negative impacts are also possible during operation phase: risks of landslides, floods, and droughts, as well as the destruction of landscape ecosystems and how they impact local people; siltation caused by soil erosion or sediment spill, entering the water sources and pipes can occur both from natural causes such as heavy runoff and human behavior such as overgrazing or deforestation. Also, due to climatic conditions and extreme cold, pipes may burst. There may be potential risks resulting from increased volume of wastewater (groundwater and surface water pollution in the absence of effective wastewater treatment).

The listed potential environmental problems in connection with the implementation of small- and medium-scale activities would be limited, in the form of temporary inconvenience due to construction works. Such potential environmental impacts are easily identified, minor in scale and of minimal impact and can therefore be effectively avoided, minimized or mitigated through the inclusion of specific measures in the works contracts, which contractors will be required to implement under the supervision of PIU specialists.

Given the scale of the Project and environmental sensitivity (impact on all environmental components) the Project will avoid activities that may affect environmentally sensitive areas (wetlands, forests, etc.). The project will not have irreversible impacts, will not affect vulnerable national minorities and cultural heritage sites. All potential negative impacts will be mitigated through this framework document and individual plans to be developed for each subproject to prevent pollution, contamination and depletion of natural resources.

The bidding documents will require the Contractors to implement ESMP, LMP, SEP, GRM and COVID-19 security protocol. Contractors/subcontractors shall duly comply with the requirements of these documents. The contractor, in turn, will have to develop its own set of documents (site-specific ESMP, occupational health and safety plan) to ensure social and environmental safety.

The Social risk is assessed as Moderate.

In addition to environmental aspects, it is also important to consider social impacts, which include issues related to social issues as gender equality and the occurrence of conflict situations for resources during Project implementation. Therefore, in order to successfully implement and achieve the goals and objectives of the Project, it is crucial to take timely measures to ensure social safety in the project areas by achieving equal participation, consideration and reflection of the interests and opinions of the vulnerable population (especially women) throughout the Project implementation period. Potential conflict factors and preliminary ways to address and/or mitigate them in order to reduce social tensions among the residents of the project areas are presented below:

- Limited access of vulnerable groups to project information;
- Lack of or insufficient financial resources of vulnerable population for connection to WSS;
- Possible social resistance against an increase in the drinking water tariff - perhaps this issue will be a potential source of tension/conflict;
- conflicts with communities; Impacts on public health, safety and welfare - during construction and/or rehabilitation of the WSS;
- Perception or actual delays in implementation. Residents of the subprojects are very eager to receive better drinking water supply services, also they may not understand or may not perceive the timeframe

required for preparation, procurement and implementation, thus creating obstacles during Project implementation;

- Transparency and governance issues. On the ground, there may be perceptions of poor governance at local and national levels that can affect project sustainability and become a source of conflict.
- Gender issues;
- Land transformation. In some subprojects, land transformation (transfer from one category to another) may be required to accommodate engineering structures (tanks, boreholes, etc.). The rationale for selecting a site for construction of a water intake/reservoir in the rural settlements will be based on the conclusion of hydrogeological surveys. Thus, land for water supply facilities should be of the appropriate category - “Industry of transport, communication, defense and other purposes”.
- Involuntary Resettlement and Land Acquisition. Component 1 "Water Supply Investments" may have potential impacts on land acquisition and temporary restriction of land use in the area around the utility facilities if new facilities or additional land for infrastructure improvements are required for project activities. Component 2, “Sanitation Development”, may have potential impacts on temporary land use restriction in the area around utility facilities, temporary restriction to sanitation facilities. Physical displacement as well as economic displacement of households is not expected. Construction activities are expected to take place within existing infrastructure or on available state and/or municipally owned land. The physical investments include rehabilitation/construction of waterintakes, reservoirs, water towers etc; construction of new watermain and distribution network, and rehabilitation of sanitary facilities in schools, kindergartens, health centers and vulnerable households. For the construction of water supply facilities, additional land plots may be needed, and private assets may be affected when laying a water supply system. Project activities may also involve temporary restrictions in access to public facilities, as the majority of water networks are laid along the roads. At this stage the exact location of the physical footprint of the subprojects is not known, therefore a Resettlement Policy Framework, social risks screening check list has been prepared to prevent, avoid, and mitigate those impacts. The project investment aims to improve the living conditions of local community residents by creating access to safe drinking water. Risks will be addressed and/or mitigated through an information campaign in accordance with the project's SEP.

- Public consultation for the Project ensures that all relevant stakeholders have a voice in the planning, design, implementation and evaluation of the Project. Consultations help to adapt project activities to the local context. By involving local communities, their traditional knowledge and practices can be taken into account, leading to more effective and sustainable solutions. Transparent information sharing and clear communication about the benefits, goals, objectives and potential impacts of the project reduce risks.

Effective consultation requires the active participation of vulnerable groups, affected communities and other groups that may be affected by the project from the beginning.

Stakeholders may have different needs, perspectives, and priorities related to the project. Consultation should ensure that these diverse perspectives are heard and taken into account in project planning and decision making.

Consultation should continue throughout the life cycle of the project, allowing for regular monitoring and evaluation of its progress and impact. Ongoing consultation ensures that any isolation problems can be identified and resolved promptly, preventing long-term consequences.

Most of the manpower is expected to be hired locally, with the exception of skilled workers. Therefore, the risk of labor inflows is considered low.

The risk of child/forced labor is also assessed as low, as national legislation requires contractors to meet a minimum age for employment and to enter into mutually agreed written contracts..

All potential social risks will be identified through screening, monitoring and visual check/observation. This is expected that social risks to be temporary, predictable, avoidable and mitigated through the implementation of measures set out in the ESMF, SEP, site-specific ESMPs, RPF, RAPs, and LMP.

SEP - will be used to remove obstacles to participation, and how the views of differently affected groups will be captured. Where applicable, the SEP will include differentiated measures to allow the effective participation of those identified as disadvantaged or vulnerable.

RPF - the tool that will be used throughout project implementation. The RPF sets out the resettlement’s objectives and principles, organizational arrangements and financing mechanisms for any resettlement that may be required during project implementation. The RPF guides the preparation of resettlement action plans of individual subprojects to address the needs of people who may be affected by the project.

LMP - ensures compliance with relevant national laws, regulations, and labor standards related to labor rights, working conditions, occupational health and safety and ESS of the World Bank

The main potential environmental and social risks under the project implementation by component and their assessment are summarized in Table 27 below.

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Table 27. Assessment of environmental and social risks in the framework of the project

Component	Activity	Location	Potential impact: (+) – positive impact (-) – negative impact	Risk category	ESS tools to manage the risks/ impacts
Component 1:	Construction of new water supply systems in unserved settlements of priority areas of the country.	Subproject locations in settlements of Osh, Issylk-Kuland Chuy oblasts	(+) This Component will have a positive impact on: • more efficient and rational water use; • reduction of total water consumption by improving the efficiency of water supply systems and utilizing water-saving technologies; • assist in the protection of ground and surface water. (-) Potentially Negative Impact: • depletion of water resources; • pollution and contamination of water bodies; • increased suspended sediment and reduced water quality near the intake, and near river crossings; • air pollution from the operation of machinery and equipment; • pollution by construction and household waste and will be manifested in the form of dust generation, noise and vibration, movement of vehicles and machinery, dumping of construction materials and accumulation of construction scrap and debris. • improper disposal of construction waste, asbestos-containing materials, minor operational and accidental leaks of fuel and lubricants; • Damaging the asbestos containing materials can release small fibres into the air. It may cause risk of lung diseases of the workers from long exposures of asbestos fibres during construction works. • loss of vegetation due to cutting and removal of trees; • Impacts to vulnerable groups due to tariff increase and exclusion risks; • limited access of vulnerable groups to project information; Transparency and governance issues;	Substantial	Environmental and social screening check lists, ESIA, site specific ESMPs, OHS plans, EHS, asbestos management plan (if applicable). SEP, COVID-19 security protocol. To determine the risks to biodiversity, it will be necessary to use the environmental screening checklist (biodiversity) and determine if there will be an impact on elements of biodiversity, according to ESS 6. If application of ESS 6 requirements is necessary, a biodiversity Management Plan will be developed to mitigate impacts on elements of biodiversity. - Social impacts screening check list - Resettlement Framework Policy (RFP) - SEP, GRM - LMP - RAP

			• Gender issues; • Land acquisition and land use restrictions, involuntary ressetlment covering livelihood impacts if project operations will require new facilities or additional land for infrastructure improvements. • Perception or actual delays in implementation.		
Component 2:	Construction and/or rehabilitation/modernization of decentralized sanitation system, including upgrading of latrines for vulnerable households and selected public social institutions. The Component will also finance technical assistance, training and equipment for the development of faecal sludge management services, including collection, transport and treatment. In addition, the Project will finance the development and implementation of a sanitation and behavior change marketing strategy to encourage adoption and use of improved WASH systems at the household and public social facility levels. The Department of Disease Prevention and State Sanitary and Epidemiological Surveillance under the Ministry of Health of the Kyrgyz Republic and its district divisions will benefit from the Project in the form of laboratory equipment necessary for conducting laboratory research/analysis and monitoring the quality of drinking water. Also, the Department's database for monitoring water quality and diseases associated with drinking water quality is expected to be updated.	Schools, kindergartens, medical centers in subprojects of Osh, Issyk-Kul and Chuy oblasts	(+) This Component will have a positive impact on: • improvement of sanitary conditions in rural areas. • proper disposal of wastewater (-) Potentially Negative Impact: • increased noise and dust levels during dismantling operations; • construction debris generation; • possible impact on groundwater (in case of proximity to the water table); • possible disturbance of the natural level of groundwater flow (drainage, overwatering of soils); • loss of vegetation due to cutting and removal of trees; • land acquisition and land use restrictions, involuntary ressetlment covering livelihood impacts if project operations will require new facilities or additional land for infrastructure improvements. • temporary restriction of access to public facilities / and restriction of land use. • Impacts to vulnerable groups due to tariff increase and exclusion risks; • Limited access of vulnerable groups to project information; Transparency and governance issues; • Gender issues; • Perception or actual delays in implementation • Disposal of sewage sludge affects the environment as the sludge may contain harmful components such as pathogenic organisms, organic compounds, heavy metals and excess phosphorus and nitrogen.	Moderate	Environmental and social screening check lists, ESIA, site specific ESMPs, OHS plans, EHS, asbestos management plan (if applicable). SEP, COVID-19 security protocol. - Social impacts screening check list - Resettlement Framework Policy (RFP)

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Component 3:	The component will finance the costs of activities aimed at improving institutional and service delivery capacity at central, regional, district and scheme levels. Procurement of IT equipment.	On-site use of equipment - to be determined later.	(+) This item will make a positive contribution to the Results-Based Capacity Building Program (-) Potentially Negative Impact: • Waste generation, during operation. • During equipment decommissioning, proper disposal of electronic and electrical waste should be considered.	Moderate	ESMP, H&S, EHS, best management practices for electronic and electrical waste; SEP, LMP, GRM, COVID-19 safety protocol. Development of TOR consistent with the ESSs for implementing the activities.
Component 4 Project Management and Coordination. Technical assistance:	The Component will finance operating costs and other eligible costs associated with project implementation. The PIU will perform project management functions such as procurement, financial management, environmental and social risk management, monitoring and evaluation, reporting, communication and grievance redressal. Technical assistance and training to develop program management tools; Technical assistance for the preparation of investment packages, engineering design and ESF instruments for future activities planned in subsequent phases of **MOP**; Technical assistance and equipment to manage the program including; Technical assistance, equipment and services to support the knowledge development program and communications strategy for **MPA**. IT equipment procurement.	On-site use of equipment - to be determined later.	(+) This item will positively contribute to the program management structure and infrastructure development capacity of the WSS (-) Potentially Negative Impact: • Waste generation, during operation. • During equipment decommissioning, proper disposal of electronic and electrical waste should be considered.	Moderate	ESMP, H&S, EHS, best management practices for electronic and electrical waste; SEP, LMP, GRM, COVID-19 safety protocol. Development of TOR consistent with the ESSs for implementing the activities.
Component 5	This component will provide preparedness and rapid response measures to address disaster, emergency and/or catastrophic events in accordance with the applicable CERC Manual. Following an eligible crisis or emergency event, the Borrower may request the World Bank to reallocate project funds to support emergency response. This component would draw from the uncommitted grant resources under the project from other project components to cover emergency response.				

Source: SIDDWSWD

6.3 Social and environmental impacts and mitigation measures

Environmental impacts mitigation measures

Flora and fauna

In the areas where the pipeline will be laid underground along the route, vegetation clearing and excavation will occur. Once the pipeline route is established, trees must not be within a 1m radius from the pipeline to protect it, which means that shorter and seasonal vegetation will be along the pipeline route.

Trees and shrubs will be cut down or trimmed along the pipeline routes only after all necessary permits from local environmental agencies are obtained, in coordination with local authorities. No trees owned by the municipality will be cut down until all necessary permits are obtained. In the event of cutting municipal trees, the contractor must request permission to cut down from the local self-government body. Then the local self-government body, with the consent of local environmental authorities, will issue a Resolution authorizing the cutting down of the specified number of trees. In the event of cutting private trees, the RAP will be prepared. If there will be cutting of trees of several owners, it will be possible to prepare a single RAP for subproject. The proposed water supply works will not significantly change land use within the sub-project area; however, the sub-project will aim to minimise changes in the vegetation of the wider area beyond the sub-project footprint.

Some vegetation will be disturbed for the construction of the intake structure, watermain and distribution network.

Earth works activities which will include minor excavation and excavation for pipe laying, will be implemented to ensure that they do not encroach beyond the permitted area and will use manual methods to ensure that existing trees are retained as far as possible.

The clearance of vegetation will increase the risk of erosion of exposed soil, sedimentation of water courses and could increase the risk of dust in the air.

There is a risk of degradation of habitat quality due to construction activities and construction camps, and presence of workers which could impact wildlife as well as domesticated animals. Noise generated due to construction and transport could disrupt communication systems of fauna. Lighting from the vehicles during their movements could result in behavioral change, collision of animals and road kills.

The following mitigation and management measures have been identified to further avoid and reduce the impacts of the above risks.

Vegetation clearance

- Vegetation on the sub-project site and adjacent area preserved as far as possible;
- Boundaries of operation areas and traffic routes strictly observed during construction;
- Use of labour-based methods which preserve environment, based on a knowledge of important species, and where possible by only reducing the height of trees rather than complete removal (such as uprooting) but if required rooting of the trees while laying the water supply pipelines will use the best practices.
- Keep clearing to a minimum and only what is necessary
- Compliance with good practice of waste management ensured;
- Use temporary fencing protection for root critical zone of the trees that might be accidentally disturbed during construction by off-site and on-site traffic;
- Vegetation to be removed is clearly marked using paint or flagging tape;
- Revegetation of disturbed sites after completion of works
- During revegetation do not include trees along the pipeline route with a 1m radius.
- Other dust, soil and water impact mitigation measures implemented;
- Staff trained/briefed in, and aware of, construction best practice.

Biodiversity and habitat conservation and protection

Subprojects are not within any areas protected for their biodiversity or sensitivity. The estimated distances to such protected areas, critical habitats or areas with high biodiversity importance or value is about 10 km.

The project will ensure the following biodiversity safeguards:

- Ensure work is done during the dry season, if possible, to minimise impacts on rivers and streams.
- Ensure no wild animals or endangered species are affected by the proposed works.
- Tree and vegetation habitat protection - Minimizing loss of trees and other vegetation;
- Measures for mitigation of impact on soil, water, air and vegetation, noise and waste management/reduction implemented;
- Habitat disturbance minimised through adequate protection and management of retained vegetation;
- No harm policy implemented;
- Trenches or pits that might be required during construction fenced/protected to avoid entrapping and injuries of the fauna species;
- Poaching prohibited;

- Conduct works during the daytime (wherever required) to avoid light impact on avian fauna;
- All personnel aware of sensitive fauna/habitat areas and the requirements for the protection of these areas.

Water Quality and quantity

Water Quality

Direct risks to water quality may result from pollution of sources as well as changes to the hydrological regime of surface and sub-surface flows. Increased surface runoff that carries fecal matter from soil and latrines into surface and groundwater sources; contamination of groundwater sources from sanitation containment units via underground pathways through soil or aquifers.

Pollution of surface and groundwater as a result of construction and operation works could occur from spillages and leaks from construction equipment and vehicles, site waste and wastewater, materials and stockpiled waste, and wash from disturbed and/or polluted soils. Contamination of spring water may also occur due to cracks in the seal, human activities that promote pollution, and animal activity. Erosion and/or collapse of spring box could be caused by large surface runoff flows and animal trampling. The effects of sheet erosion on loose soil if left unattended could trigger a host of negative impacts on water quality, levels and the capacity of sources.

In periods of drought diminished groundwater recharge, combined with over-abstraction could lead to salinization of groundwater sources.

Water source quality protection

If the water supply source is a well, drainage should be away from the well. The casings of the well should be sealed with grout or some other mastic material to ensure that surface water does not seep along the well casing to the water source. At least 3m of soil is essential to filter unwanted biological organisms from the water source. However, if the area of well construction has any sources of chemical contamination nearby, the Department of Disease Prevention and State Sanitary and Epidemiological Surveillance should be contacted.

In determining where a water well is to be located, several factors should be considered:

- the groundwater aquifer to be developed,
- depth of the water-bearing formations,
- the type of rock formations that will be encountered, free from flooding, and
- relation to existing or potential sources of contamination.

The overriding concern is to protect any kind of well from pollution, primarily bacterial contamination. Groundwater found in sand, clay, and gravel formations is more likely to be safer than groundwater extracted from limestone and other fractured rock formations. Whatever the strata, wells should be protected from:

- surface water entering directly into the top of the well,
- groundwater entering below ground level without filtering through at least 3m of earth, and
- surface water entering the space between the well casing and surrounding soil.

Also, a well should be located in such a way that it is accessible for maintenance, inspection, and pump or pipe replacement when necessary. Driven wells are typically installed in sand or soil and do not penetrate base rock. They are, as a result, hammered into the ground and are quite shallow, resulting in frequent contamination by both chemical and bacterial sources.

If the source of water is a natural spring, which is groundwater that has reached the surface because of the natural contours of the land, while it may provide an ample supply of water, it is likely to provide water only seasonally. Without proper precautions, the water may be biologically or chemically contaminated and not considered potable.

To ensure satisfactory (potable) water from a spring, it is necessary to eliminate surface water outcroppings above the spring to its source, prevent animals from accessing the spring area, and provide continuous chlorination. It is essential to ensure that the spring box is watertight, and surface water runoff is diverted away from the area. Also be aware that the water quality of a spring can changes rapidly.

Water Quantity

Direct effects on water quantity may include reduction in downstream river flow due to water storage in the water supply system and changes to natural surface and groundwater flows downstream of the scheme.

Decreased flows may occur due to clogged collection/source capture system caused by siltation and plant roots, spring drying up, blocked supply pipe, leakage or bypass, or a silted spring box. These are likely to occur in the operation phase of the project and will need to be addressed by regular maintenance of the system which should include siltation management of source capture/collection structure, cleaning pipes, ensure pipes are laid at degrees' gradient, and vegetation management at sources and along the distribution pipeline route.

An important risk regarding water quantity which should be considered during the design is that arising from changes in the availability of water at the sources due to climate change which could lead to accelerated depletion of the water source.

To avoid or mitigate impact**, construction** works should be performed with due consideration of the following environmental risk mitigation and management measures:

- Most of the sensitive works which could impact water quality or quantity will be mainly implemented during the dry season, so as to avoid potential risks to water quality and damage and loss during the rainy season.
- Avoid discharge of water on to unstable slopes.
- Discharge of storm-water run-off from construction areas over a vegetated surface to trap sediments
- Staff trained in small spill response measures;
- Onsite vehicles and equipment repairs /maintenance and fueling activities avoided.
- On-site vehicles and equipment inspected regularly for leaks; immediate repair of damages;
- Incoming vehicles and equipment checked for leaks. (Leaking vehicles/equipment shall not be allowed on-site);
- Washing of the vehicles on site prohibited;
- Provision of mobile toilets advisable;
- Untreated effluents discharge into the environment banned;
- Discharge of cement contaminated water avoided as cement pollution results in high alkalinity and raises the pH, which can be toxic to aquatic life;
- Materials and waste stockpiled to avoid erosion and washing off into watercourses;
- Waste removed from the site regularly, the sites kept clean and tidy;
- Blockage of the sources and streams avoided through proper management of material/waste;
- Waste collection area sited to avoid receiving a substantial amount of runoff from upland areas and draining directly to a water body;
- In disturbed soil areas sediment control measures implemented;
- Construction equipment removed from proximity to the riverine environment at the end of each working day or if heavy rainfall is predicted;
- Discharge of sediment-laden construction water (e.g., from areas containing dredged soil) directly into surface watercourses prohibited. (Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge);
- For all sources (including wells and springs), test the water for bacteriologic quality with several samples taken over a period of time to establish a history of water quality at the source. With a few exceptions, surface water and groundwater sources should always be presumed to be bacteriologically unsafe and, as a minimum, must be disinfected.
- Ensure water chemical quality, including both legal (primary drinking water) standards and aesthetic (secondary) standards are met.
- Staff trained/briefed in and aware of construction best practice.
- Should any temporary fuel tank be required onsite, it must be located within at least 100m from the riverbed. The tank must be placed in covered areas with berms or dikes installed to intercept spills, if any. Any spill should be immediately intercepted and cleaned up with absorbent materials;
- If case emergency repair is required, any spill of oil/lubricant material must be adequately addressed without delay. If feasible, fueling/maintenance must be carried away from drainage channels and surface water bodies. (Distance between the maintenance site and any river/water course should be at least 100m). Secondary containment devices (drop cloths, drain pans) shall be used to catch leaks or spills, absorbent materials must be used.

During **operation** the following risk management and mitigation measures are required:

- Efficient use of water supply systems should be practiced avoiding water loss and to control vector breeding and water related diseases.
- Training of the community and O&M personnel in water management of the water supply schemes.
- Ongoing economic evaluation of water consumption requirements and utilization to ensure continued efficiency of the water supply schemes to meet (changing) needs.
- Regular water quality monitoring. For all sources (including wells and springs), test the water for bacteriologic quality with several samples taken over a period of time to establish a history of water quality at the source. With a few exceptions, surface water and groundwater sources should always be presumed to be bacteriologically unsafe and, as a minimum, must be disinfected.
- Ensure water chemical quality, including both legal (primary drinking water) standards and aesthetic (secondary) standards are met.
- Empowerment and awareness raising of local communities - Awareness of hygienic handling of water and household water treatment/purification methods should be introduced.

Groundwater quality protection

- Periodically inspect exposed parts of wells for cracked, corroded, or damaged well casings; broken or missing well caps; and settling and cracking of surface seals.

- Slope the area around wells to drain surface runoff away from the well.
- Install a well cap or sanitary seal to prevent unauthorized use of, or entry into, a well.
- Disinfect wells at least once a year according to the manufacturer's directions.
- Have wells tested once a year for coliform bacteria, nitrates, and other constituents of concern.
- Keep accurate records of any well maintenance, such as disinfection or sediment removal, that require the use of chemicals in the well.
- Hire a certified well driller for new well construction, modification, or abandonment and closure.
- Avoid mixing or using pesticides, fertilizers, herbicides, degreasers, fuels, and other pollutants near wells.
- Do not dispose of waste in dry or abandoned wells.
- Do not cut off well casings below the land surface.
- Never dispose of hazardous materials near a well.
- Define/differentiate at least three types of source protection zones: the wellhead protection zone (zone I), inner protection zone (zone II), and outer protection zone (zone III). In the simplest case, these zones are arranged in succession around a groundwater pumping well or up-gradient from a tapped spring. Implement relevant restrictions within each zone.
    - Zone I - is usually fenced and all activities not directly related to drinking water supply are forbidden.
    - Zone II - Activities releasing microbial contaminants, such as the application of manure, are prohibited in zone II; other types of polluting land-use practices and construction works that might obstruct groundwater flow are also restricted.
    - Zone III – This zone either comprises the entire catchment area of a spring or pumping well or is delineated on the basis of distance or travel time. Facilities that pose a substantial threat to groundwater, such as fuel stations or wastewater seepage, are not allowed in this zone.

Air Quality

The subproject areas are predominantly village or rural in character. Existing air quality reflects those environments, with dust being the main air quality nuisance. The proposed sub-project is not expected to contribute significantly to air pollution and as such long-term adverse impacts to air quality are not anticipated. None the less, all construction activities have the potential to cause air quality nuisance. Mitigation measures should include:

- Restricting active construction activities to not more than a total of 500 meters' sections at a time to minimize dust as far as practicable
- Use of labour-based methods
- Provide masks for the workers
- Dampen/spray all unpaved roads and significant areas of uncovered soil with water at regular intervals (as required) on working days, during dry and windy weather;
- Cover loose material (if any), with tarpaulins when transported to or off-site on trucks;
- Proper maintenance of vehicles and machinery to minimise emissions;
- Optimum speed while moving through the communities set to reduce dust emissions;
- Prohibit leaving vehicles with the engine idling;
- Staff trained/briefed in, and aware of, construction best practice.

Noise and Vibration

All construction and operation activities have the potential to cause noise nuisance. The use of machinery or introduction of noise generating facilities could have an adverse effect on the environment and residents if not appropriately managed. Potential noise sources during construction may include:

- heavy construction machinery;
- power tools and compressors;
- delivery vehicles.

Noise from vehicles is a concern in the areas around the sub-project area as traffic from construction vehicles will increase. Vibration disturbance to nearby residents and sensitive habitats is likely caused by vibrating equipment. Blasting is not required to be undertaken as part of the sub-project.

Contractors involved in construction activities should be familiar with methods of controlling noisy machines and alternative construction procedures.

Mitigation measures should include:

- Restrictions on working hours on weekdays, weekends or public holidays set and complied with, no night-time working allowed;
- Issue protective equipment to onsite employees and those operating heavy machine and power tools
- Install silencers and mufflers as appropriate to site plant and equipment
- Optimum travel speed during offsite travel set and complied with;

- Travel speed in residential areas reduced to reduce vibration
- Prohibit leaving vehicles with the engine idling;
- Staff trained/briefed in and aware of construction best practice.

Erosion, drainage and sediment control

Some construction sites may be in areas at risk of soil erosion and landslides. Very wet conditions may trigger slope failures, and in many areas, construction is feasible only during the dry season. Landslides and erosion are two of the most common environmental risks in the project areas, resulting from interactions between water flow and soil. The water supply pipe route may pass along sloping areas and small stream crossings due to the hilly and steeply sloping sections along the route.

Erosion, drainage and sediment control are therefore critical to reducing the associated environmental risks. A key erosion risk during the construction and operation of the scheme comes from lateral slope erosion which could occur from runoff, erosion of the water source area and erosion at river crossings are also risks. In addition, there is potential for erosion trenching and other earth works but its duration is limited to the construction phase only, the spatial scale is limited to the pipeline route, and the impact can easily be mitigated. The soil will be used to cover the pipes once the laying process has been completed. It is recommended that this is done immediately to avoid having mounds of soil lying around.

The works will include climate proofing approaches that have been adopted by the sub-project to ensure that these issues are addressed and factored into the design and construction. They include spring source with gabion wall protection and combination with soil bioengineering on the vetiver grass planting and tree planting to reduce the erosion and landslides during rainy time. All steep slopes/gradients along the route are provided with bioengineering measures to safeguard against erosion.

The following additional mitigation measures have been identified for erosion drainage and sediment control during construction

Erosion and Sediment Control

- Vegetation on the project site and adjacent area preserved;
- Site revegetated after completion of construction works;
- Slope stabilisation provided - slope drainage, contour drainage trenches (where required);
- Erosion and sediment control devices installed, inspected and maintained as required;
- Works scheduled/staged to minimise cleared areas and exposed soils at all times;
- Major vegetation disturbance and earthworks are carried out during periods of lower rainfall and wind speeds;
- Stormwater management measures to reduce flow velocities and avoid concentrating runoff designed and implemented;
- Silt curtain installed to protect from increased sediment loads;
- Ground clearance minimized;
- Topsoil removed from all areas required for permanent and temporary needs of the project, stored separately from subsoil;
- Stockpiles of removed topsoil and subsoil properly designed and managed - the piles must be placed and managed so as to avoid erosion and washing off. Stockpile storage areas located away from erosion sensitive locations. Drainage trenches around the piles must be provided.
- Soil compaction reduced by strictly keeping to temporary roads (if required) and operation ground boundaries;
- Disturbed vegetation replanted immediately after the construction/disturbance stops;
- Using permeable construction materials and surfaces where possible, such as gravel paths or porous paving, can allow water infiltration, reducing surface runoff;
- Installing geotextiles, mulch, or erosion control blankets on exposed soil can prevent soil displacement during rainfall and wind;
- Employing proper grading techniques to reduce the steepness of slopes and using terracing or benching methods can reduce the speed of surface runoff, thus controlling erosion;
- Use of Bioengineering techniques.

Waste Management

Various wastes will be produced throughout the construction process. The main waste producing areas will be construction sites and construction camps (in case of existence). Small amounts of waste are expected along the access and heavy equipment movement routes with ground and soil pollution.

The following types of waste will be produced during construction activities:

- Inert construction waste – cement and concrete residue, loose and debris, stones and gravel, wood etc.
- Excavation waste unsuitable for re-use during earthworks;

- Small amount of hazardous waste – from cleaning, repairing and maintenance of the equipment, polluted soil and water from leakage or spillage of fuels/oils, polluted rags and oil absorbing fabric, polluted personal safety equipment and clothing;
- Non-hazardous waste - paper, glass, plastic and biodegradable waste;
- Sewage - generated through the use of workers' facilities like toilets.

The preferred waste management hierarchy and principles for achieving good waste management is as follows:

- waste avoidance (avoid using unnecessary material on the projects); waste re-use (re-use material and reduce disposing);
- waste recycling (recycle material such as cans, bottles, etc.); and
- waste disposal (all putrescible and/or contaminated waste to be dumped at approved landfills).

Workers involved in construction and operational activities should be familiar with methods minimising the impacts of clearing vegetation to minimise the footprint to that essential for the works and rehabilitate disturbed areas. By doing these activities, the projects should minimise the impact of waste generated by the sub-project.

Waste will be collected and removed from the work camps and disposed in waste disposal areas which will be agreed with local government bodies (Aiyl Okmotu); Segregation of hazardous wastes (oily wastes, used batteries, fuel drums) to ensure that storage, transport, and disposal shall not cause pollution, consistent with national regulations.

- On-site vehicles and equipment will be inspected regularly for leaks. All leaks/damages immediately repaired.
- Incoming vehicles and equipment will be checked for leaks. Leaking vehicles/equipment will not be allowed on-site;
- waste will be regularly removed from the site; littering prohibited. Sites kept clean and tidy;
- untreated effluents discharge into the environment banned;
- staff trained/briefed in and aware of construction best practice.

Handling of asbestos-containing materials (ACM).

Some risks associated with the project activities are conditioned by improper utilization of asbestos –containing materials. Use of construction materials that are hazardous to human health (e.g., asbestos, asbestos contained materials) will not be permitted.

In most villages of the Kyrgyz Republic existing water distribution network is made of asbestos cement (AC) pipes. During water system rehabilitation, existing old asbestos cement pipes will not be removed. Every effort will be made to leave the old pipes in the ground. New pipelines will be installed parallel to the existing ones. In the event of removal of asbestos cement pipes asbestos contained materials waste will be collected, transported and finally disposed by applying special protective measures in accordance with the hazardous waste handling standards. In this case, the Contractor will develop an Asbestos-containing materials Management Plan and must implement it. ***Main issues regarding asbestos containing materials (acm) and asbestos waste to be considered within the site-specific ESMP***

Asbestos is a group of naturally occurring fibrous silicate minerals. It was once used widely in the production of many industrial and household products because of its useful properties, including fire retardation, electrical and thermal insulation, chemical and thermal stability, and high tensile strength. Today, however, asbestos is recognized as a cause of various diseases and cancers and is considered a health hazard if inhaled. Because the health risks associated with exposure to asbestos area now widely recognized, global health and worker organizations, research institutes, and some governments have enacted bans on the commercial use of asbestos. Good practice is to minimize the health risks associated with ACM by avoiding their use in new construction and renovation, and, if installed asbestos-containing materials are encountered, by using internationally recognized standards and best practices to mitigate their impact. In all cases, the World Bank expects borrowers and other clients to use alternative materials wherever feasible. ACM must be avoided in new construction. In reconstruction, demolition, and removal of damaged infrastructure, asbestos hazards must be identified and a risk management plan adopted that includes disposal techniques and end-of-life sites. Asbestos-containing (AC) products include flat panels, corrugated panels used for roofing, water storage tanks, water, and sewer pipes etc. Thermal insulation containing asbestos and sprayed asbestos for insulation and acoustic damping were widely used through the 1970s and should be looked for in any project involving boilers and insulated pipes. As asbestos is often used in construction (mainly for roofing) in the Kyrgyz Republic, it can present a risk for the health of workers and population, who live near buildings that need capital repair with replacement of roofing or demolition. ARIS specialists must inform beneficiaries on potential risk for their health and instruct not using asbestos as construction material during construction/rehabilitation works. AC sheets used as roofing Any asbestos product or material that is ready for disposal is defined as asbestos waste. Asbestos waste also includes contaminated building materials, tools that cannot be decontaminated, personal protective equipment and damp rags used for cleaning. Always this type of waste must be treated as 'Hazardous Waste'. In this regards, ACM and asbestos waste must be properly removed, stored in a separate closed area and disposed (with the consent of local administration and environmental inspectors) on a landfill on the special area for disposal of that type of waste.

ARIS must require the contractors that the removal, repair, and disposal of ACM shall be carried out in a way that minimizes worker and community asbestos exposure. During reconstruction works, workers must avoid destroying asbestos sheets and properly dispose them at construction sites until final disposal happens. Workers must wear protective over garment, gloves and respirators during work with asbestos sheets. Proper disposal of ACM is important not only to protect the community and environment but also to prevent scavenging and reuse of removed material. ACM must be transported in leak-tight containers to a secure landfill operated in a manner that precludes air and water contamination that could result from ruptured containers. The removal and disposal of ACM and asbestos waste as well as all other ESMP measures have to be included in both the technical specifications and bill of quantities (BoQs). Contractor shall develop site-specific ESMP where requirements to ACM and asbestos waste will be contained.

Social impact mitigation measures. Chance finds of cultural heritage - chance archaeological finds, tangible and intangible cultural objects - may be discovered. All civil works will have special clauses on the application of a "chance finds procedure" that will specify how chance finds associated with the project will be managed.

Road traffic. Every effort will be made to minimize the time spent transporting workers to the job site, moving construction equipment, machinery and other special vehicles to prevent any incident or damage to property.

Mitigation Measures: Drivers will be warned to drive with caution. Speed limits in work areas and the movement of heavy equipment will also be regulated. Proper organization of traffic will also prevent negative impacts as much as possible. The measures will be included in the site-specific ESMPs.

OHS. Hazardous production factors as a result of construction work. A variety of factors can have a direct impact on the safety and health of people, such as: the operation of machinery with moving and rotating mechanisms, dust, noise, vibration; work at heights; operation of excavators and bulldozers; welding and electric shock; health status, etc.

Mitigation Measures: Contractors will follow safety guidelines for various types of work. Logs will be kept of the conduct and training of briefings. Will provide workers with the necessary equipment and means of protection and PPE. The measures will be included in the site-specific ESMPs.

Worker and community health. The COVID-19 pandemic also poses a risk to all project participants and local beneficiary communities due to increased engagement with stakeholders.

Mitigation Measures: The Project will mitigate this risk by strictly adhering to the World Bank Group Interim Note on COVID-19 and relevant WHO guidance.

PIU has prepared an LMP that specifies the types of project workers, working conditions and associated labor risks, and mitigation measures. Efforts are also being made to train and hire as many workers as possible from the local communities where the events are held. The LMP will be made public, consulted and adopted prior to project appraisal and the PIU will oversee the implementation of the contracts while contractors will be required to comply with the LMP in their contracts.

OHS risks can be caused by non-compliance with safety and health requirements at construction sites. Contractors will be required to comply with occupational health and safety regulations, which include, among other things, strict adherence to established health and safety regulations and procedures, which depend on the type of work carried out, the use of PPE, training and monitoring. In addition, all workers must be familiar with the handling of hazardous materials. Contractors must provide workers with appropriate working conditions: PPE, safe water supply, laundry facilities, rest areas, etc.

Community safety. The increase in traffic due to the movement of trucks and vehicles to construction sites can also create inconvenience for the local population. In addition, some construction/rehabilitation works will cause temporary blocking of household access. Untimely and inefficient disposal of municipal solid waste and inadequate sanitary conditions created by construction workers at construction sites and labor camps can lead to environmental pollution and affect the health of the local population. In addition, the movement of heavy tracks can destroy or worsen the condition of roads inside settlements.

Mitigation Measures: Necessary safety measures will be installed during construction works, in the form of fences, signs. A campaign will be held to inform the public about the planned work and periods, as part of the SEP. To receive grievances during the period of work, the project provides for a grievance redress mechanism (GRM). Mitigation measures will be considered in the site specific ESMPs.

The site-specific ESMPs will include emergency preparedness and response plans to manage natural or man-made hazards/incidents (floods, mudflows, fires, etc.) in the intervention zones during both the implementation and operation phases of the project.

Under the project, at the level of each subproject, the development and compliance with Environmental and Social Management Plans (ESMPs) will be regulated. Also, compliance with health and safety and occupational health and safety rules and regulations (ESMP, OHS) will be monitored and will be required to be developed by the Contractors. The population will be notified in a timely manner about the schedules of upcoming construction works through WhatsApp groups established under the Project in each subproject;

Exclusion of vulnerable groups. Persons from socially disadvantaged groups may have limited access to various opportunities and resources, for example, women, female-headed households have weak links with government structures, as a result of low awareness and lack of interest in public life.

Mitigation measures: Risks will be eliminated and/or mitigated through an information campaign in accordance with the project SEP. Social Screening Check List (Annex 3) also includes screening of **«**risks of exclusion/discrimination».

Consultations ensure that all relevant stakeholders have a voice in the planning, design, implementation, and evaluation of a project. Consultations help in tailoring project interventions to the local context. By involving local communities, their traditional knowledge, practices can be considered, leading to more effective and sustainable solutions. Transparent information sharing and clear communication about project benefits, goals, objectives, and potential impacts reduce the risk of exclusion.

Effective consultation requires active involvement of vulnerable groups, affected communities and other groups who may be impacted by the project from the outset of the project.

Stakeholders may have diverse needs, perspectives, and priorities related to a project. Consultations should ensure that these diverse perspectives are heard and taken into account in project planning and decision-making.

Consultations should continue throughout the project lifecycle, enabling regular monitoring and evaluation of its progress and impact. Ongoing consultations ensure that any issues of exclusion can be identified and addressed promptly, preventing long-term consequences.

The project will take steps to ensure equal opportunities in accessing project information and benefits, and to provide appeals, complaints and feedback by providing equal opportunities to participate in project activities. Also, representatives of vulnerable groups will be included in the water committees of rural settlement that will be established in each target community in order to facilitate the Project to widely involve residents in the process of addressing water supply and sanitation issues in the rural settlement, as well as to disseminate among residents reliable information on the progress of the project on construction/rehabilitation of WSS and modernization of sanitation facilities of social institutions, and to promote transparency and publicity in the process of implementation of the Project activities;
Lack of or insufficient financial resources of vulnerable population for connection to WSS - the Project will assist Aiyl Okmotu and Rural Public Associations of Drinking Water Consumers (RPADWC) and/or Municipal Water Utilities (MWU): in developing an action plan to provide material and financial support for connection of needy households to the water supply system through water meters;

Risk of child and forced labor. In rural areas, where child labor is widely seen as supporting parents to spend their free time without being distracted from school, there is still a risk of using it in contravention of national legislation that establishes a minimum age for admission to work. According to the Labor Code of the Kyrgyz Republic, “an employee may be a person who has reached the age of 16. In exceptional cases, in agreement with the representative body of employees of the organization or the authorized state body in the field of labor, persons who have reached the age of 15 may be hired, "students who have reached the age of 14 may enter into an employment contract with the written consent of one of the parents (guardian, trustee) or a guardianship and guardianship body, to perform light work in their free time from study that does not harm health and does not violate the learning process.

Mitigation measures: The risks associated with child and forced labor in this project are considered low, and mitigation measures are included in the LMP, which details the applicable sections of national labor laws and measures in order to ensure consistency with WB ESS 2. Also, according to the LMP, persons under the age of 16 are prohibited from working or entering into contracts within the framework of the Project. Compliance by contractors/subcontractors with national legislation as well as ESS 2 on the use of forced child labor will be strictly monitored and awareness raising efforts will be undertaken.

Labor risks associated with the influx of labor.

The majority of the workforce is expected to be local. Sourcing of labor and implications of any potential labor influx will be closely monitored by the safeguard’s specialists. Civil works contractors will be advised to recruit necessary labor, where feasible, locally. Labor recruited from outside the community where civil works will be done will abide by a 'code of conduct'.

Gender-based violence/sexual exploitation and harassment (GBV/SEA/SH). To prevent and address GBV/SEA/SH risks there will be established guidelines, codes of conduct, and monitoring systems in place. Use of Site Management and Security Measures: restricted access to the site, identity verification for personnel, and regular monitoring.

Mitigation measures: All employees must complete GBV/SEA/SH training and sign a code of conduct. The SEP, LMP also describe a Grievance Redress Mechanism (GRM) that will receive, review and seek to resolve any issues or feedback related to the project and will be easily accessible to project-affected parties and local communities, among other stakeholders.

The project will take steps on gender aspects in areas such as (i) gender analysis, (ii) specific actions to address the special needs of women and girls or men and boys, and (iii) mechanisms to monitor gender impacts or facilitate the gender-disaggregated analysis. This means the inclusion of certain activities designed to address specific gender issues and to mainstream gender in support of the coverage of such issues and equality in general. The following activities will be carried out as informing women about the upcoming project, women will be involved in the meetings and their opinions will be taken into account. Women will be invited to the Project's informational and educational events. Also, the inclusion of women on the staff of the Rural Public Associations of Drinking Water Consumers (RPADWC) and/or Municipal Water Utilities (MWU) will be recommended. These activities will be integrated into the Project design, including the community consultation process.

Involuntary Resettlement and Land Acquisition. Project activities may have potential impacts on land acquisition, temporary restriction of land use in the area around the utility facilities, and temporary restriction to sanitation facilities.

Mitigation measures: At this stage the exact location of the physical footprint of the subprojects is not known, therefore a Resettlement Policy Framework, Social Impacts Screening Check List has been prepared to prevent, avoid, and mitigate those impacts.

In case of impacts on temporary and/or permanent land acquisition, which will be identified at the stage of subproject implementation (target sites are finalized, scopes of work are determined and designs are prepared), a site-specific Resettlement Action Plans (RAPs) will be prepared based on the RPF.

Any project activity will be carried out only after the full implementation of the relevant RAPs and the preparation of a report on its implementation. Until such documents are developed, disclosed and approved by the WB, the IA will not start implementing specific sub-projects for which the impacts of temporary or permanent land acquisition, temporary restrictions in access to land has been identified.

Possible social resistance against an increase in the drinking water tariff - perhaps this issue will be a potential source of tension/conflict. Under the Project, each household will be connected to the WSS individually by means of water metering device and household will pay for actually consumed water according to the established tariff, annually approved by the Resolution of the Ayil kenesh session. On the part of the Project, during the information and education campaign at the level of each household, the importance of safe drinking water tariff will be explained, which covers operational and maintenance costs of the WSS, which will ensure sustainable use of the WSS for many years.

Perception or actual delays in implementation. Residents of the subprojects are very eager to receive better drinking water supply services, also they may not understand or may not perceive the timeframe required for preparation, procurement and implementation, thus creating obstacles during Project implementation. In total, it is expected that the planned construction and rehabilitation works of the project will be realized within 18 months starting from March-April to October-November months.

Mitigation measures: In order to reduce dissatisfaction among the population, contractor organizations will provide schedules of construction and installation works in planned areas in advance, as well as install information stands indicating the dates and times of work of both workers and special machinery and equipment.

Transparency and governance issues. On the ground, there may be perceptions of poor governance at local and national levels that can affect project sustainability and become a source of conflict.

Mitigation measures: This risk will be mitigated by the fact that the Project will be implemented predominantly by the PIU of the DDWSSD. In addition, the project envisages separate activities aimed at strengthening the capacity of local authorities and local service providers represented by the Rural Public Associations of Drinking Water Consumers (RPADWC) and/or Municipal Water Utilities (MWU). Upon completion of construction and installation works of WSS, the object will be officially handed over to Aiyl okmotu, and in turn the AO will transfer the WSS object for operational management to the Local Rural Public Associations of Drinking Water Consumers (RPADWC) and/or Municipal Water Utilities (MWU). Due to the approved reasonably balanced tariff for drinking water and timely payment of the population for drinking water supply services, the sustainable functioning of the WSS in the settlements will depend. All of the above issues will be addressed and promoted by the Project through outreach, education and communication campaigns at both local and national levels;

Table 28. Environmental and Social Risk Management and Monitoring Plan

Issues/Activities	Potential ES Impacts	Proposed Mitigation Measures	Means of Monitoring	Frequency	Responsibility	
					Implementation (Cost of mitigation activities)	Supervision
Preconstruction						
Pre-construction sites preparation	• Site Clearance (clearing of the site so that it becomes accessible for further works); • Vegetation loss (mainly grass/shrubs but also possibly some trees); • Potential increase in soil erosion; • Air Pollution due to vehicular movement, and dust emissions from construction debris stockpiles; • Water pollution – construction transports and mechanisms.	• Restrict site clearance to the required extent as part of the design; • Preserve trees, if present, as far as practicable; • Water sprinkling compaction of soil covering of construction debris and waste stockpiles; • Diversion of the riverbed during construction work; • Carry out work during low water periods; • Information campaign with local community.	Visual inspection & consultation with localpeople	During pre-construction sites preparation	Contractors	PIU
Land Acquisition, Involuntary Resettlement (IR)	• Temporary land acquisition for civil works • Permanent land acquisition for civil works, construction or as part of the first sanitary protection zone • Temporary restriction of access to public utilities • Livelihood impacts	• At the design stage social screening will be carried out to determine the impact. All measures will be taken to avoid such impact, for example, adjustment of design and estimate documentation. • In case of such an impact, a RAP is prepared and implemented in accordance with the RPF prior to commencement of civil works .	Field inspection & consultation with local people	During design period	Design institute, PIU, local administrations	PIU
Awareness raising, inclusion of Vulnerable and disadvantaged group/ communities/ individuals	• Limited job opportunities for vulnerable group of people; • Limited access to information. • Involuntary resettlement impacts	• Equal opportunities for vulnerable groups participation in capacity building, citizen engagements • SEP, RPF, RAP implementation • GRM accessibilty and efficiency	Consultations with local administration, people.	During pre-construction sites preparation	Contractors, PIU, local administration	PIU
Construction						
Biodiversity (flora and fauna)	The potential impact on biodiversity (local ichthyofauna, flora and small fauna of river ecosystems) is expected to be minimal due to anthropogenic disturbance of the territory and the predominance of synatropic species in the area of planned works. Construction works will be mainly within the village, far from sensitive zones. Habitat loss and disturbance of fauna (Sensitive habitat destruction and disturbance	• Contractor will be strictly prohibited from hunting, gathering, logging or other activities. • Avoid unnecessary exposure to sensitive and wildlife or other important habitat areas • All suspected sensitive areas (wetlands/swamps), should be inspected prior to start construction activities • It is necessary to conduct educational and informational trainings and seminar for operating organization and land owners	Visual inspection & consultation with Municipality	Visual monitoring on a daily basis.	Contractors - (Costs are included in EBOQ (Environmental Bill of Quantities)) At the subproject design stage, the estimated costs for managing the	PIU

	of fauna, loss of vegetation due to cutting and removal of trees and exposure of land)	whose plots are in the second zone of the water intake Sanitary Protection Zone on the correct use of pesticides and, as an alternative, the use of organic fertilizers. Vegetation on the sub-project site and adjacent area preserved as far as possible - Limit vegetation clearing to operational areas and minimise habitat disturbance through adequate protection and management of retained vegetation. Use temporary fencing protection for root critical zone of the trees. Use labour-based methods as far as possible. Trees and shrubs will be cut down or trimmed along the pipeline routes only after all necessary permits from local environmental agencies are obtained, in coordination with local authorities and with due regard to compensatory planting. All permits will be obtained before the start of construction. In the event of cutting municipal trees, there will be compensation in the form of seedlings (the amount for compensation is in the BoQ). For 1 tree cut down, 3 seedlings will be provided. The contractor will give seedlings to municipality, and they will be planted in the places where the municipality points out. In the event of cutting private trees, the RAP will be prepared according to ESS5. If there will be cutting of trees of several owners, it will be possible to prepare a single RAP for subproject.			identified potentially significant impacts will be included.	
Groundwater Quality and quantity	Fuel spills, hazardous liquids, hydrocarbons and other chemical pollutants spilling and discharged on the site/onto the ground	• Prevent contaminated surface water from entering aquifers via boreholes and wells - protect from runoff and flooding and keep surroundings clean. Implement best-practise for drilling wells which minimises contamination risk. Ensure design and construction minimises backflow within the water distribution system. • Designated areas for storage of fuels, oils, chemicals or other hazardous liquids should have compacted impermeable bases and be surrounded by a bund to contain any spillage. Refuelling to be undertaken in areas away from water systems. • Check all vehicles, equipment and material storage areas daily for possible	Visual inspection. Water quality test report, if it is required.	Visual monitoring on a daily basis Measurements during construction period, if it will be required.	Contractors Criteria / specifications to be incorporated into bidding and contract documents. It is not considered as a separate cost item	PIU

		fuel, oil and chemical leaks. Undertake refuelling at designated places away from water systems. • Implement groundwater quality protection measures e.g. slope the area around wells to drain surface runoff away from the well; Install a well cap or sanitary seal to prevent unauthorized use of, or entry into, a well.				
Surface water Quality and quantity	Increased suspended sediment and reduced water quality near the intake, and near river crossings.	• Designated areas for storage of fuels, oils, chemicals or other hazardous liquids should have compacted impermeable bases and be surrounded by a bund to contain any spillage. Refuelling to be undertaken in areas away from water systems. • Conduct surface water quality and quantity monitoring in locations where the surface water is likely to be impacted including assessing the changes to water quality. • Schedule works in stages to ensure that disturbed areas are revegetated and stabilised progressively and as soon as practicable after completion of works. • Construction materials will not be stockpiled in proximity to aquatic environment that may allow for release into the environment. Construction equipment will be removed from in proximity to the aquatic environment at the end of each working day or if heavy rainfall is predicted				
	Establishing buffer zones/ Creation and control of regime in sanitary protection zone	The sanitary protection zones are enforced in three rings: • First ring (strict access area) covers location sites for water intakes, all water supply facilities and transmission pipelines. Its purpose is to protect water intakes and facilities from incidental or deliberate contamination and damage; • Second and third rings (restricted areas) include sites meant for prevention of water sources contamination. The boundaries of SPZs are determined and sets of necessary organizational, technical, hygiene and anti-epidemic measures are				

		prepared depending on the sources of water (underground or surface) designed or used for drinking, on the level of their natural protection and potential microbial or chemical contamination. Statement of Selection of Site (route) is countersigned on the basis of availability of favorable sanitary epidemiological conclusion to be issued by Office for State Sanitary Epidemiological Surveillance (SES). The SPZ should be an integrated part of a design for water supply scheme and prepared in parallel with the latter.				
Air Quality	Increased dust near the settlements along the traffic route (offsite and onsite traffic), in quarry/borrow pit areas during site preparatory works	• Implement effective dust management measures in all areas during design, construction and operation. • Restrict speeds on roads and access tracks. Optimum speed while moving through the communities set to reduce dust emissions; • Manage dust/particulate matter generating activities to ensure that emissions do not cause an environmental nuisance at any sensitive locations. Dampen/spray all unpaved roads and significant areas of uncovered soil with water at regular intervals (as required) on working days, during dry and windy weather; • Construction activities should minimize risks associated with climatic events (check forecasts). • Implement scheduling/staging of proposed works to ensure major vegetation disturbance and earthworks are minimized. • Locate material stockpile areas as far as practicable from sensitive receptors. Cover if appropriate. • Source sufficient water of a suitable quality for dust suppression activities complying with any water restrictions. • Schedule revegetation activities to ensure optimum survival of vegetation species. • Rubbish receptacles should be covered and located as far as practicable from sensitive locations	Visual inspection & consultation with local people.	Visual monitoring on a daily basis.	Contractors Irrigation of dirt roads with water (wet dust suppression of in-site roads and sites) is considered as a separate cost item in EBOQ. At the design stage the estimated costs for managing the identified potentially significant impacts will be included.	PIU

		• Maintenance of vehicles and construction equipment in good working condition, including regular servicing; • Stored materials such as excavated earth, dredged soil, gravel and sand shall be covered and confined; Establish adequate locations for storage, mixing and loading of construction materials in a way that dust dispersion is prevented because of such operations.				
Noise and Vibration	Increased noise levels Increased noise levels on subprojects sites and near the settlements	• Select equipment and specify design work practices to ensure that noise emissions are minimized during construction • Specific noise reduction devices such as silencers and mufflers shall be installed as appropriate to site plant and equipment to limit allowable noise levels • Restrict working hours on weekdays, weekends or public holidays. Minimize the need for noise generating construction works to be carried out outside of the hours: 7am-5.30pm as far as practicable • Consultation with nearby residents in advance of construction activities particularly if noise generating construction activities are to be carried out outside of 'daytime' hours: 7am-5.30pm. • The use of substitution control strategies shall be implemented, whereby excessive noise generating equipment items onsite are replaced with other alternatives. • The contractor should conduct employee and operator training to improve awareness of the need to minimize excessive noise in work practices through implementation of measures. Issue protective equipment to onsite employees and those operating heavy machine and power tools. Optimum travel speed during offsite travel set and complied with. Prohibit leaving vehicles with the engine idling	Visual inspection & consultation with local people.	Visual monitoring on a daily basis. Measurements during construction period, if it will be required.	Contractors	PIU

	Vibration due to construction Vibration from vehicles and heavy plant equipment on site and impacting settlements during earthworks and site preparations	• During construction, standard measure shall be taken to locate and protect underground services from construction and operational vibration impacts. • Identify properties, structures and habitat locations that will be sensitive to vibration impacts resulting from construction and operation of the subproject.				
Erosion, Drainage and Sediment Control	Loss of soil material and sedimentation to the surface and/or groundwater systems from site due to earthwork activities	• Ensure that erosion and sediment control devices are installed, inspected and maintained as required. • Schedule/stage works to minimize cleared areas and exposed soils at all times. Vegetation on the sub-project site and adjacent area preserved. Topsoil stripped and stockpiled (away from sensitive locations) for use during revegetation protected from erosion. Topsoil removed from all areas required for permanent and temporary needs of the sub-project, stored separately from subsoil. Excavated soil from digging the trench for the pipeline should be used to cover the pipes once the laying process has been completed. This should be done as soon as possible to avoid erosions and loss of soil. • Incorporate the design and location of temporary and permanent Erosion, Drainage and Sediment Control (EDSC) measures for all exposed areas and drainage lines. These shall be implemented prior to pre-construction activities and shall remain onsite during work • Schedule/stage proposed works to ensure that major vegetation disturbance and earthworks are carried out during periods of lower rainfall and wind speeds • Strip and stockpile topsoil for use during revegetation and/or place removed soils back on to agricultural lands. • Schedule/stage works to minimize the duration of stockpiling topsoil material. Vegetate stockpiles if storage required for long periods. • Locate stockpile areas away from drainage pathways, waterways and	Visual inspection & consultation with local people.	Visual monitoring on a daily basis.	Contractors	PIU

		sensitive locations. • Mulching shall be used as a form of erosion and sediment control and were used on any slopes (dependent on-site selection), include extra sediment fencing during high rainfall. Use mulching to provide adequate vegetation for erosion protection on slopes prior to harsh weather conditions, at sites with surface erosion, daily temperature fluctuations, lack of available moisture, acidic soils, lack of nutrients, and lack of organic material and to supplement other erosion control treatments such as seeding and soil bioengineering. Use soil stabilizers to tack mulches on hard-to-reach areas and increase mulch durability				
	Soil contamination from construction activities	• Adherence to best practice for the removal and disposal of contaminated soil/ material from site (if required), including contaminated soil within the sub-project footprints. • Drainage control measures to ensure runoff does not contact contaminated areas (including contaminated material within the sub-project footprints) and is directed/diverted to stable areas for release.				
Waste Management	Construction waste on site and potentially in surrounding villages	• Preference shall be given to materials that can be used to construct the sub-project that would reduce the direct and indirect waste generated. • Daily waste practices shall be carried out unless these are delegated to the activities of external waste management bodies. Waste will be collected and removed from the work camps and disposed in waste disposal areas; Waste to be disposed of offsite at an approved facility agreed with the municipality. • The use of construction materials shall be optimized and where possible a recycling policy adopted. • Separate waste streams shall be maintained at all times i.e. general domestic waste, construction and contaminated waste. Specific areas on				

		site shall be designated for the temporary management of the various waste streams. Segregation of hazardous wastes (oily wastes, used batteries, fuel drums) to ensure that storage, transport, and disposal shall not cause pollution, consistent with national/municipal authorities in accordance with National Environmental Law. • Any contaminated waste shall be disposed of at an approved facility. • Recyclable waste (including oil and some construction waste) shall be collected separately and disposed of correctly, and/or designated facility • Fuel and lubricant leakages from vehicles and plant shall be immediately rectified. • Major maintenance and repairs shall be carried out off-site whenever practicable. • Where possible, fuel and chemical storage and handling shall be undertaken at central fuel and chemical storage facilities, such as petrol stations. • On-site storage of fuel and chemicals shall be kept to a minimum. • Any waste oils and lubricants are to be collected and transported to recyclers or designated disposal sites as soon as possible. • Any dangerous goods stored on site shall be stored in accordance with Kyrgyz regulations. • Accidental spillage of hazardous waste should be managed by spreading wood powder on the surface of the oil • Make sure all containers, drums and tanks that are used for storage are in good condition.				
	Construction hazardous waste **(asbestos)**	Some construction debris may contain asbestos. The Contractor shall train its workers in assessing the presence of asbestos-containing materials and determining procedures for the safe disposal of asbestos using appropriate safety equipment, storage in sealed containers. Safeguard requirements for dealing with asbestos are specified in Annex 10. This plan refers to	Field inspection	Continuous, during construction period	Contractors Criteria / specifications to be incorporated into bidding and contract documents. It is	PIU

		managing existing asbestos that may be encountered during the project implementation.			not considered as a separate cost item Contractor shall develop site-specific measures where requirements to ACM and asbestos waste will be contained.	
Labor management	Unscrupulous and discriminatory labor practices	• Recruit as much as local labor possible • Working conditions and terms of employment will be fully compliant with the labor laws. • Train the workers by providing health and safety training on communicable diseases; • No child and/or forced labor will be employed by the contractor; • Signing of Code of Conduct and training on GBV/SEA/SH • Project workers GRM accessibility and efficiency	Field inspection & consultation with local people Visual inspection & consultation with worker	Continuous, during construction and Implementation period	Contractors	PIU
	Risk of potential transmission of COVID-19	• Conducting pre-employment health checks; • Control entry and exit from site/workplace; • Quarantine immediately any suspected COVID-19 employees; • Contractor should undertake a COVID-19 risk assessment prior to commencement of site work.	Visual inspection & consultation with worker	Continuous, during Implementation	Contractors	PIU
Occupational Health and Safety	• Construction work may pose health and safety risks to the construction workers and site visitors, leading to severe injuries and deaths. • Lack of first aid facilities and health care facilities in the immediate vicinity will aggravate the health conditions of the victim.	• Provide the workers with a safe and healthy work environment; adequate health care and sanitation facilities; • Provide appropriate PPE for workers, such as safety boots, helmets, masks, gloves, protective clothing, goggles, full-face eye shields and ear protection; • Maintain the PPE properly by cleaning dirty ones and replacing them with damaged ones; • Appoint an environment, health and safety manager to look after the health and safety	Visual inspection & consultation with worker	Continuous, during construction period		

		of the workers; • Inform the local authorities responsible for health, religion and security before the commencement of civil works and establishment of construction camps so as to maintain effective surveillance over public health, social and security matters. • OHS job training. • OHS management plan. • Project workers GRM • Code of Conduct to prevent SEA/SH risks				
Community Health and Safety	• Accidents on the approach road and construction site; • Noise and dust pollution; • Communicable diseases can spread among the local community.	• Prior to starting the construction activities contractor will be informed the local community; • Instruct the drivers and limit the speed of the vehicles; • Regular health check-ups of the workers and awareness training about the communicable diseases; • Proper lighting at the project site during the night time; • Avoid unnecessary noise pollution, especially night time; • Spraying water on the dry surface to reduce the dust pollution • Provide proper access control to the project site and unauthorized entry to the project site will be controlled by deploying security personnel. • Fencing and installation of warning signs of trenches • Installation of transition bridges over trenches • Raise community awareness about GBV/SEA/SH, GRM to address GBV/SEA/SH and sensitize the PIUs • Project GRM • Code of Conduct signed by Project workers	Field inspection & consultation with local people Visual inspection & consultation with worker	Continuous, during construction period	Contractors	PIU
Land Acquisition, Involuntary Resettlement (IR)	• Temporary land acquisition for civil works • Permanent land acquisition for civil works, construction or as part of the first sanitary protection zone • Temporary restriction of access to public utilities • Livelihood impacts	• Avoid IR impacts, restriction of access to land use as much as possible; • Provide compensation in a timely manner, if applicable; In case of such an impact, a RAP is prepared and implemented in accordance with the RPF prior to commencement of civil works.	Field inspection & consultation with local people	Continuous, during construction and Implementation period	Contractors, PIU, local administrations	PIU

Archaeological/ Historical/ Social/ Cultural/ Religious Sites	Negative impact on cultural heritage may destroy its value and the loss will be irreparable	• Avoid Archaeological/ Historical/ Social/ Cultural/ Religious sites during the site selection; • Provide Chance Finds Procedure in bidding document.	Field inspection & consultation with local people	Continuous, during construction and Implementation period	Contractors	PIU
Post-construction clean-up	Risk of soil, water, waste impacts from residuals left after project completion	• Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; • The construction camp is to be checked for spills of substances such as used container/water bottles, paint, etc. and these shall be cleaned up, if applicable.	Visual inspection & consultation with localpeople Reporting	At the end of construction period along with the ESMP implementation report	Contractors	PIU
Operation phase						
Monitor and reduce Climate risks	Risks of landslides, floods, and droughts, as well as the destruction of landscape ecosystems and how they impact local people.	• The project will support operations and management of all project-financed infrastructure to improve their technical capacity so that they can properly manage climate risks and respond to operational disruptions related to climate and geophysical hazards. • The proposed project consists of the climate resilience application and methods to help safeguard the infrastructure from climate induced disasters while at the same time enhancing the community's access and livelihood opportunities. • The positive impacts of the project will be to reduce the risks of landslides, floods and droughts, as well as increase the resilience of local people and ecosystems.	Events, trainings and meetings	During operation period	PIU, working groups	Relevant Ministries
Water system leaks, water discharges when flushing water lines	Water system leaks and reduction in the pressure could cause water quality deterioration (dirty water getting into the pipeline). Also, some households may temporarily lack water.	• In the event of a leak, the operating organization must shut off the water supply, determine the site and nature of the accident, and then carry out repair work • Component 3 includes the purchase of equipment for Operation and Maintenance, as well as training on how to operate the system • When flushing water pipelines water will be discharged into irrigation canals.	Events, trainings and meetings	During operation period	- Municipal water supply enterprise - PIU	SIDDWS WD
Using calcium hypochlorite (or Calcium Hypochlorite or any other chemicals)	During the construction period, work with chlorine or other chemicals is not expected, so exposure is excluded. During the operation of the water supply system, exposure is possible for people working directly with chlorine or any	• The contractor will develop instructions for maintaining the water supply system, including instructions for working with chlorine (or Calcium Hypochlorite or any other chemicals)	Events, trainings and meetings	During operation period	Municipal water supply enterprise	Department of Disease Prevention and

	other chemicals (in the work area/ chlorination cabin).	• Under the project, training and information work will be carried out				State Sanitary and Epidemiological Surveillance
Community Health & Safety/ improving livelihoods	Increased vulnerability to water borne diseases. Contamination of the water sources resulting in water borne diseases	• Regular water quality monitoring. For all sources (including wells and springs). • Regular monitoring and restriction/zoning of landuse practices upstream of water sources • Awareness of hygienic handling of water and on household water treatment/purification methods should be introduced	Water quality test, Events, trainings and meetings	During operation period	Municipal water supply enterprise	Department of Disease Prevention and State Sanitary and Epidemiological Surveillance
Wastewater management	Groundwater pollution in the absence of effective wastewater treatment and discharge of untreated water into the area.	• Proper control over the operation and efficiency of local treatment facilities • Regular monitoring of the efficiency of treatment facilities • Obtain permission for water use in accordance with the requirements of Kurgyz legislation • Timely cleaning of the outdoor toilet, which will be used when necessary	Events, trainings and meetings	During operation period	School/kindergarten administration	Department of Disease Prevention and State Sanitary and Epidemiological Surveillance
Sediment management	Siltation caused by soil erosion or sediment spill, entering the water sources and pipes can occur both from natural causes such as heavy runoff and human behaviour such as overgrazing or deforestation. Silt in the water collection system and pipeline may need to be periodically removed.	Silt in the water collection system and pipeline may need to be periodically removed. Effective drainage control on site	Events, trainings and meetings	During operation period	Municipal water supply enterprise	SIDDWS WD
Possible increase of water tariff	Currently utility rates are below cost recovery levels and it is likely that water tariff will be revised upward once the system is operational. This may lead to community discontent.	The Project will include capacity building for local local authorities and municipalities responsible for water service delivery in the project areas. This will include topics and support for tariff setting, billing and collection systems, operations and maintenance training (for example, disinfection), water quality testing, customer relations, complaints mechanisms, human resources, and commercial management. The project will also support the preparation of service	Events, trainings and meetings	During operation period	Municipal water supply enterprise	SIDDWS WD

		contract agreements, to clarify and formalize respective responsibilities of the operator and asset owner and to support governance of service performance, tariffs and financing mechanisms. Local level institutional support will also seek to strengthen Department capacity at the rayon level, focusing sector monitoring and technical support for complex operational and maintenance issues. The project will support the development of connection subsidy strategies and tariff determination mechanisms to meet the needs and demands of the poorest and most vulnerable segments of the population.				
Note: Specific Mitigation/enhancement measures and cost will be determined during the site-specific screening by ESMPs						

Source: SIDDWSWD

VII. ESMF IMPLEMENTATION MECHANISM

According to the WB ESF, the Borrower will ensure that the environmental and social assessment takes into account the country's applicable policy framework, national laws, and regulations, and institutional capabilities (including implementation) relating to environment and social issues and applicable requirements under the WB ESSs. The following paragraph provides guidance on the actions required for environmental and social assessment in accordance with national legislation and the WB ESSs applicable to this project. The following tools can be used to conduct environmental and social assessment:

Environmental and Social Impact Assessment (ESIA) is a tool for identifying and evaluating the potential environmental and social impacts – direct, indirect and cumulative – of a proposed project, evaluating alternatives and developing appropriate mitigation, management and monitoring measures. In some cases, a small-scale project may be subject to a partial ESIA to assess its location in relation to protected areas or habitat availability. An indicative ESIA plan is presented in Annex 5.

Cumulative impact assessment (under an ESIA) is a tool for considering the cumulative impacts of a project in combination with the impacts of other relevant past, present and reasonably foreseeable events, as well as unplanned but predictable project activities that may occur later or at other times, location.

Cumulative impact assessment and management is appropriate whenever there is concern that a project or activity under review may contribute to cumulative impacts on one or more Valued Environmental and Social Component (VEC)s.

This concern may be preexisting or a consequence of the potential cumulative impacts of the development and other projects or actions, human activities, or exogenous factors (e.g., natural drivers). CIA is also appropriate whenever a given development is expected to have significant or irreversible impacts on the future condition of one or more VECs that also are, or will be, affected by other developments. The other developments may already exist, be reasonably predictable, or be a mix of existing and reasonably anticipated developments. In circumstances where a series of developments of the same type is occurring, or being planned, the need for CIA can be fairly obvious. For example:

• when a series of water supply constructions occur within an area where they will impact the same VECs (perhaps common water bodies or watercourses, wildlife populations, community health, community loss of access to assets, or multiple land takings);

• when a series of water supply constructions occur within the same river or within the same watershed with cumulative impacts in common on flora and fauna, on downstream water availability or quality, on watershed sediment dynamics, on navigation, on local communities' livelihoods, or on adjacent land uses.

In some cases, CIA may be needed to assess and manage the impacts of several new projects, activities, or actions that are being developed or planned. In other situations, CIA of a single new development may be appropriate when it occurs in an area where concerns exist about cumulative impacts—concerns that are either well documented or identified through consultation with affected communities and other stakeholders. In some situations, different components of the same development13 are assessed in separate ESIAs, and the cumulative impacts from these components should be subject to CIA. The key point in determining the need for CIA is that one or more VECs will be cumulatively impacted by different developments, whatever they may be.

During the design phase a social and environmental screening will be carried out by the PIU safeguard specialist to identify all background risks and assess the impact of the project. Taking these factors into account, the safeguard specialist in conjunction with the PIU Director will decide whether to conduct a CIA.

Resettlement policy framework (RPF) is to clarify resettlement principles, organizational arrangements, and design criteria to be applied to subprojects or project components to be prepared during project implementation.

Environmental and Social Management Plan (ESMP) is a tool that details (a) the measures to be taken during project implementation and operation to eliminate or offset adverse environmental and social impacts or to reduce them to an acceptable level; (b) the actions required to implement those measures. A template of an ESMP is provided in Annex 6.

The site specific ESMP is specified in order to describe the mitigation measures for all the impacts associated with the project during its implementation phase. The site specific ESMP includes the monitoring and management measures to minimize such impacts by allocating management responsibility and suggesting skill requirement for implementation of these specific measures during the implementation phase.

The site specific ESMP includes the following:

- mitigations suggested for adverse environmental and social impacts and associated risks;
- institutional arrangement for the implementation of suggested measures;

- monitoring arrangements for effective implementation of suggested mitigations for the project;
- reporting requirement to the regulatory agencies and funding institutions.

ESMP checklist is a simplified ESMP that is generally used for construction and rehabilitation small works with more typical impacts. An example of an ESMP checklist is provided in Annex 7.

Environmental and social screening checklists - these checklists are used to review the potential environmental and social safeguard impacts of subprojects and determine whether the subprojects will trigger relevant ESSs of World Bank. There is a tool to screen, classify and evaluate the project activities during project preparation. This checklist shall be used in conjunction with Annex 2 and 3 and an Exclusion list of subprojects in Annex 4.

Biodiversity Management Plan (BMP) (if applicable) is an implementation plan for conserving, restoration, and enhancement of biodiversity value. The BMP establishes the objectives and defines the management measures required to achieve the intended results, Annex 8.

Waste management plan - should ensure compliance with existing requirements for the management (including storage, transportation and disposal) of various types of waste, including national legislation and applicable international conventions. Where such requirements do not exist, PIUs will accept alternatives to GIIP for its environmentally sound management and disposal.

Occupational Health and Safety Plan (OHS) is a definite plan of action designed to prevent incidents and occupational diseases. Some form of a program is required under occupational health and safety legislation. A health and safety program must include the elements required by the health and safety legislation as a minimum.as part

Asbestos management plan - should ensure compliance with existing requirements for the management (including storage, transportation and disposal) of asbestos, including national legislation and applicable international conventions. Where such requirements do not exist, PIUs will accept alternatives to GIIP for its environmentally sound management and disposal, Annex 10. This plan refers to managing existing asbestos that may be encountered during the project implementation.

Resettlement Action Plan (RAP) - the scope of requirements and level of detail of the resettlement plan vary with the magnitude and complexity of resettlement. The plan is based on up-to-date and reliable information about (a) the proposed project and its potential impacts on the displaced persons and other adversely affected groups, (b) appropriate and feasible mitigation measures, and (c) the legal and institutional arrangements required for effective implementation of resettlement measures. The RAP must be prepared in accordance with the requirements of RPF.

Stakeholder engagement and GRM.

Stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive, and responsive relationships that are important for successful management of a project's environmental and social risks. Stakeholder engagement is most effective when initiated at an early stage of the project development process, and is an integral part of early project decisions and the assessment, management, and monitoring of the project's environmental and social risks and impacts. In consultation with the Bank, the PIU will develop and implement a Stakeholder Engagement Plan proportionate to the nature and scale of the project and its potential risks and impacts.

The **GRM** is the process of receiving, considering and resolving complaints that may arise as a result of the implementation of the activities of this Project. The GRM process is necessary to ensure that direct and indirect beneficiaries, stakeholders and Project staff have the opportunity, at all stages of Project implementation: access to information about the Project; at all stages of the Project, the direct and indirect affected people and beneficiaries of the Project can submit their complaints or wishes for improving the Project activities; in increasing transparency and publicity in the process of implementing Project activities; timely eliminating of issues/problems, preferably without any costs and with a guarantee of their timely solution.

7.1. Procedure for environmental and social assessment and management of Project activities

7.1.1. Environmental and social screening of subprojects

Diagram of the step-by-step ESF process for subproject development and implementation is in Annex 1.

Social and environmental management begins with the environmental and social screening of proposed subprojects. The main goal of environmental and social screening is to identify and assess environmental and social risks at an early stage of subproject preparation and design. Environmental and social screening will determine which subproject-specific tools (ESIA, ESMP, ESMP Checklist) will need to be prepared.

The proposed sub-projects will be first screen against the eligibility criteria. Ineligible subproject should be excluded. Once the exact locations and details of the subprojects are identified, a detailed screening shall be carried out by the PIU's safeguards specialists using the environmental and social screening checklist templates (Annex 2, 3). Screening results will be shared with the World Bank for review and approval. Based on the screening results and the subprojects proposed risk rating the PIU should initiate the preparation of the site specific environmental and social management tools for subprojects.

The environmental and social screening will include:

- reconnaissance of the subproject area and its environs;
- identification of the main activities of the subproject; and
- a preliminary assessment of the impact of these activities on the environmental, physico-chemical and socio-economic environment of the surrounding areas of the subproject and considerations that need to be further explored through a specific ESIA or ESMP for sites. The screening checklist should be applied to all subprojects; the format of the screening checklist is attached in Annex 2,3;
- Stakeholder engagement and consultations with affected communities.

In cases where several separate investments (activities) are linked and constitute components of one subproject, all activities will be evaluated as one subproject. The ESIA/ESMP prepared for such a subproject should consolidate all activities to be implemented under the subproject. In cases where the components are technically independent of each other, the ESIA/ESMP of activities can be prepared separately and work can start at different times. Based on the results of additional surveys and assessments, municipalities in coordination with the PIU, will confirm and submit the proposed screening categories for subprojects to the PIU for approval and forward to the WB for review and approval.

7.1.2. Risk classification and preparation of ES documents

The type and content of an environmental and social assessment of a specific subproject that will meet the requirements of the ESSs will be determined by the risk rating and specific issues associated with the subprojects, as discussed above. Appropriate risk assessment tools will be used to assign a risk category.

According to the project design Technical Assistance (TA) within the components is planned in the field of information technology (IT), consulting and information services. The consultancies, studies (including feasibility studies, if applicable), and any other technical assistance activities under the Project will be carried out consistently with the ESSs requirement. Main risks will have considered to OHS issues.

In accordance with the selection procedure, subprojects with a **high-risk category** will be excluded from the scope of the project. Annex 4 includes an Exclusion list of subprojects.

The classification of environmental and social risks takes into account relevant potential risks and impacts, such as:

- type, location, sensitivity and scale of the Project, including the physical aspects of the Project; type of infrastructure; waste management and disposal, etc.
- the nature and extent of potential environmental and social risks and impacts, including impacts on new sites; impacts on abandoned sites, including (e.g. rehabilitation, maintenance or upgrades); the nature of the potential risks and impacts (for example, whether they are irreversible, unprecedented, or complex); presence of vulnerable groups/people; possible mitigation measures given the hierarchy of mitigation measures;
- the ability and readiness of the PIU to manage such risks and impacts in accordance with the WB ESS, including the country's policy, legal and institutional framework; laws, regulations, rules and procedures applicable to the project sector; technical and institutional capacity of the PIU; track record of implementing past projects; and the financial and human resources available to manage the Project; and
- other areas of risk that may be relevant to the implementation of E&S measures and mitigation outcomes, depending on the particular Project and the context in which it is being developed, including the nature of proposed mitigation measures and technology, domestic and/or regional stability considerations, conflict or security.

Within the scope of this Project, subprojects may be classified as “moderate risk” to “substantial risk," and Technical Assistance may be classified as “moderate risk," where it will be necessary to prepare an ESIA and site-specific ESMPs and RAPs (if applicable). Outlines for ESIA and ESMP are indicated in Annexes 5, 6. The outline for RAP is indicated in the RPF, in the separate document. ESIA, site specific ESMPs and RAPs for substantial and moderate risk subprojects will be prepared by the PIU. The site-specific ESMPs may include additional management plans as required based on the results of environmental and social screening: eg, Waste Management Plan, Asbestos Management Plan, Biodiversity Management Planetc., if applicable.

The structure of the ESMP is given in Annex 6. The PIU will check the results of the subproject ESMPs and submit it to the World Bank for approval. The PIU will responsible for the preparation and implementation of the site-specific ESMPs.

A **low-risk category** of the subproject is identified if its potential adverse risks and impacts on the public and/or the environment are likely to be minimal or negligible. Thus, low-risk subprojects with little or no adverse risks, impacts, and issues will not require further environmental and social assessment after initial screening in accordance with the World Bank ESF requirements. The PIU is responsible for the implementation of a satisfactory ESMP checklist (simplified type, Annex 7). The PIU will prepare simplified ESMPs checklist in accordance with the subproject if such is determined. The site-specific ESMP checklists cost estimates will contain details of the responsible agency and associated costs for each mitigation/monitoring activity. The PIU will perform an overall quality assurance function to ensure that the documents produced are in line with the World Bank's requirements. In reviewing the ESMP checklists, the PIU will also confirm that they are clear, feasible and appropriate, and that they comply with the ESSs requirements applicable to the project. In addition, the PIU will monitor the implementation of the ESMP checklists and ensure that regular reporting tools are in place.

The purpose of the ESMP is to improve the environmental and social aspects of subprojects by minimizing, mitigating or offsetting negative impacts. The ESMP checklists will be used mainly for **moderate/low risk** sub-projects that may have a low environmental impact and are typical of small construction and rehabilitation investments. The ESMP checklist consists of three sections:

- Part 1 is a descriptive part (“object passport”), which describes the features of the project in terms of physical location, a description of the project and a list of permitting or notification procedures with reference to the relevant rules. Annexes for additional information can be supplemented if necessary;
- Part 2 includes environmental and social due diligence in a simple Yes/No EMS format and also identifies mitigation measures; And
- Part 3 is a plan for monitoring activities carried out during the restoration work.

According to the Law "On Environmental Protection No. 53 of 1999", the Law "On General Technical Regulation in the Field of Environmental Safety". No. 151 of 2009, Annex 1 of the Regulations on the procedure for conducting an environmental impact assessment in the Kyrgyz Republic in accordance with the Government Decree of February 13, 2015 No. 60 - Groundwater intakes and water supply systems for settlements, drainage systems are included in the mandatory List of economic activities subject to environmental impact assessment (national draft EIA - rus. OVOS).

However, according to Article 17 of the Law “On Environmental Protection No. 53 of 1999” – “When designing, locating, building, reconstructing, commissioning facilities that have a direct or indirect impact on the state of the environment, measures should be provided for and implemented for nature protection, rational use, reproduction of natural resources, and improvement of the environment in accordance with environmental standards and carry out an assessment of the impact of the proposed activity on the environment (OVOS)”. Based on Regulation on the procedure for conducting environmental impact assessment in the Kyrgyz Republic, according to Government Decree No. 60 of February 13, 2015, it will be necessary to pass the 3rd stage environmental impact assessment (OVOS)- development of the Section of Environmental Protection for project documentation for the rehabilitation of water supply system, which includes an Environmental Management Plan (EMP). The EIA is carried out by an EIA consultant hired by the Project Proponent. As a result of the environmental assessment, EIA documents are produced, which are subject to further review. The resulting EIA document is then submitted for public consultation, after which amendments are made in accordance with public feedback. Public environmental expertise (PEE) is organized and conducted on the initiative of local residents, local administrations and civil societies registered in the Kyrgyz Republic. The conclusions of the public environmental review are sent to the body that carries out the state environmental review. Subsequently, the EIA report, Statement of Environmental Consequences and other supporting documentation are submitted to the State Ecological Expertise (SEE). After that, the project will be approved, rejected or sent for revision, followed by a re-examination. Completion of the SEE depends on the project, but cannot be more than 3 months after the submission by the Project Initiator of all EIA documents to the SEE.

For subprojects with **significant risk** an ESIA (partial or full, which includes ESMP) or only ESMP will be prepared, for subprojects with **moderate risk –** ESMP/ ESMP check-list. It is necessary to disclose the ESIA or ESMP documents orand conduct public consultations with people affected by the project and stakeholders. For all projects that require an ESIA and/or site-specific ESMPs, RAPs (if applicable) on-site consultations should be arranged. To do this, it is necessary to publish the ESIA document in advance (about two weeks) on the website of the PIU and the municipalities involved, as well as provide hard copies to local district administrations and key stakeholders.

During the consultation, the subproject applicants will register all comments and proposals for improving the ESIA

and/or ESMP documents for a particular site and prepare the relevant reports for inclusion in the final version of the ESIA documents. In addition, information relating to project activities and ESIA should also be publicly available online on the PIU website. In some cases, public consultations can be carried out virtually, receiving relevant questions/proposals online and taking them into account when finalizing the ESMP/RAP of subprojects - such consultations can only be carried out when it is clear that there are no direct impacts on local communities, - mainly when the proposed activities are located far from residential areas and will not adversely affect environmentally sensitive areas such as wetlands, forests, legally protected areas, etc.

Technical Assistance (TA)

Technical assistance under the components is planned in the area of information technology (IT), consulting and information services, which will include hiring consultants and project organizations; assisting in the organization and conduct of working group meetings in the preparation of investment programs, training programs and communication strategy MPA.

IT technical assistance describes the following support: acquiring, installing a computer network, operating and maintaining office computer systems and other communication systems, assisting to hardware and software configuration, setting up peripheral devices, providing support for system users, assisting with work such as answering phones, writing reports, developing action plans or work programs.

TORs will be prepared to include ESF/ESS requirements for IT equipment purchases. These requirements include energy efficiency, a quality certificate (electricity consumption, electromagnetic field creation, ultraviolet, infrared, and X-ray radiation levels, and the quality of materials used to make the equipment, which can release various chemical compounds).

7.1.3. Procedure for conducting social and environmental assessment for the Project

Once the sites are identified, the PIU E&S specialists will conduct a rapid assessment of the likely environmental impact based on the requirements of national legislation and the WB ESSs by completing the verification form provided in Annexes 2 and 3. The activities of the subprojects will also be checked against WB criteria for high-risk projects.

At the same time, at the stage of developing environmental and social instruments, it is necessary to take into account that if the requirements for an environmental and social instrument of activity differ in national rules and the rules of the Bank, then the more stringent of them applies.

This will identify the type and extent of potential environmental impacts and determine which risk category the subproject should be assigned to. Generally, the significance of impacts and risks affecting the resulting ES categorization will depend on the type and scale of the subproject, its location, the sensitivity of environmental issues, and the nature and magnitude of potential risks and impacts.

If the competent government authorities require an EIA for subprojects, then it is necessary to provide for a social part in the EIA, taking into account the requirements of the World Bank.

Type and scale of projects. Subprojects that are considered "**high risk”** subprojects will not be funded. A "high risk" rating typically implies the following: significant impact on the population, including settlements and local communities;

- alteration of ecologically important areas, including wetlands, natural forests, pastures and other “critical” natural habitats and ecosystem services;
- direct discharges of pollutants that are large enough to cause degradation of air, water or soil, endangered species and "critical" habitats;
- large-scale physical disturbances of the facility and/or its surroundings;
- extraction, consumption or transformation of significant amounts of forests and other important natural habitats, including aboveground and underground and aquatic ecosystems;
- measurable change in the hydrological cycle;
- hazardous materials in excess of accidental quantities.

Location. There are a number of places to consider when deciding whether to rate a project as "**high risk**":

- in or near sensitive and valuable ecosystems and "critical" habitats - juniper forests, wetlands, wild lands, vulnerable soils and special habitats of endangered rare and endemic species;
- in areas or close to archaeological and/or historical monuments or existing cultural and social institutions;
- in densely populated areas where relocation may be required or the potential impact of pollution and other disturbances may significantly impact communities;
- higher risk dam, and
- activities likely to have significant adverse environmental and social impacts that are irreversible, cumulative,

diverse or unprecedented;

- in regions where active development activities are carried out or where there are conflicts regarding the distribution of natural resources; along watercourses, in places of replenishment of aquifers or in catchment areas of reservoirs used for drinking water supply; and on lands or waters containing valuable resources (such as fisheries, minerals, medicinal plants, better agricultural soils).

Subprojects located in close proximity to such areas will be classified as "**high risk"** projects and will not be considered for project support.

Sensitivity. Sensitive issues may include (but are not limited to): wetland conversion, potential adverse impacts on endangered species and habitats as well as protected areas or sites, impacts on international waterways and other transboundary issues, and disposal of toxic waste.

Value. There are several ways to measure scale, such as the absolute value of the affected resource or ecosystem, the magnitude of the affected impact in relation to the existing stock of the resource or ecosystem, the intensity of the impact, its time and duration. In addition, consideration may need to be given to the likelihood of a cumulative impact of the proposed action and other planned or ongoing actions. ***Given the scale of the proposed subprojects, the magnitude of their environmental and social impacts*** is expected to be moderate to substantial. Therefore, sub-projects rated low to substantial risk will be considered for project support.

In addition to high-risk subprojects, the Bank will also not finance several types of subprojects that are listed in the WB exclusion list, Annex 4.

7.2. Environmental Impact Assessment (EIA) Procedure in the Kyrgyz Republic

The legal framework for environmental and social assessment in the country includes several laws and regulations. The Law on Ecological Expertise ensures that economic and other activities comply with environmental requirements. This Law applies to projects that may have an impact on the environment, including feasibility studies, as well as construction, reconstruction, development, technical re-equipment projects, other objects that may have an impact on the environment, regardless of their estimated cost, ownership or form of ownership.

The law obliges the project initiator to submit to the State Ecological Expertise the necessary documentation regarding the project and its impact on the environment. The expert commission of the Committee of the Ministry of Natural Resources and Technical Supervision is responsible for reviewing the submitted documentation. To start financing or implementing a project, a positive decision of the state environmental review is required. A negative conclusion will prohibit the implementation of the project.

One of the main opportunities for the participation of citizens and their associations in decision-making on environmental protection and rational nature management is public environmental expertise. Two types of ecological expertise are carried out in the Kyrgyz Republic: state ecological expertise and public ecological expertise.

The Law "On General Technical Regulations for Ensuring Environmental Safety in the Kyrgyz Republic" establishes general requirements for ensuring environmental safety in the design and implementation of economic and other activities for the production, storage, transportation and disposal of products.

The process of environmental impact assessment (EIA – "OVOS"), according to the terminology of national legislation, is carried out in accordance with the following provisions:

- Regulations on the procedure for conducting environmental impact assessment in the Kyrgyz Republic (February 13, 2015, No. 60);
- Regulations on the procedure for conducting state environmental expertise in the Kyrgyz Republic (May 7, 2014, No. 248);
- Law "On Ecological Expertise" No. 54 of 1999 (as amended on 04 May 2015),
- Law on Environmental Protection No. 53 of 1999, and
- Law "General Technical Regulations on Environmental Safety" No. 151 of 2009.

Environmental assessment in the Kyrgyz Republic is based on two subsystems:

- conducting an EIA and preparing a relevant document;
- passing the state ecological expertise (SEE).

The environmental risk classification system under Kyrgyz law is based on the inclusion of a "List" of activities that are either subject to or not subject to EIA.

According to the Law "On Environmental Protection No. 53 of 1999", the Law "On General Technical Regulation in the Field of Environmental Safety". No. 151 of 2009, Appendix 1 of the Regulations on the procedure for conducting environmental impact assessment in the Kyrgyz Republic in accordance with Government Decree No.

60 dated February 13, 2015 – Groundwater intakes and water supply systems for settlements, drainage systems are included in the mandatory List of economic activities subject to environmental impact assessment (EIA).

The project will be required to undergo the third stage of EIA - assessment of the environmental impact of the proposed activity accompanying the project documentation (Project, Detailed Design). The results of the impact assessment should be formalized as the “Environment” section of the Project (Detailed Design), which includes the Environmental Management Plan.

The EIA is carried out by an EIA consultant hired by the Project Proponent. As a result of the environmental assessment, EIA documents are produced, which are subject to further review.

The resulting EIA document is then submitted for public consultation, after which amendments are made in accordance with public feedback.

Public environmental expertise (PEE) is organized and conducted on the initiative of local residents, local administrations and civil societies registered in the Kyrgyz Republic. The conclusions of the public environmental review are sent to the body that carries out the state environmental review.

Subsequently, the EIA report, Statement of Environmental Consequences and other supporting documentation are submitted to the State Ecological Expertise (SEE). After that, the project will be approved, rejected or sent for revision, followed by a re-examination.

The completion of the SEE depends on the project, but cannot be more than 3 months after the submission by the Project Initiator of all EIA documents to the SEE.

VIII. INSTITUTIONAL ARRANGEMENT FOR THE IMPLEMENTATION OF THE ESMF

8.1 Project Implementation Arrangements

The key institutions involved in the management, coordination and implementation of the project are the Ministry of Finance of the Kyrgyz Republic, The World Bank, State Institution for Development of Drinking Water Supply and Wastewater Disposal under the Water Resources Service of the Ministry of Water Resources Agriculture and Processing Industry of the Kyrgyz Rebublic, Ministry of Health of the Kyrgyz Republic, the Department of Disease Prevention and State Sanitary and Epidemiological Surveillance (DDPSSES) under the Ministry of Health of the Kyrgyz Republic, National Center for Health Promotion and Mass Communication (NCHPMC), the Ministry of Education and Science, local government bodies (represented by Aiyl Okmotu) and Municipal Water Supply Enterprises/Rural Public Associations of Drinking Water Consumers. Below is the project management diagram.

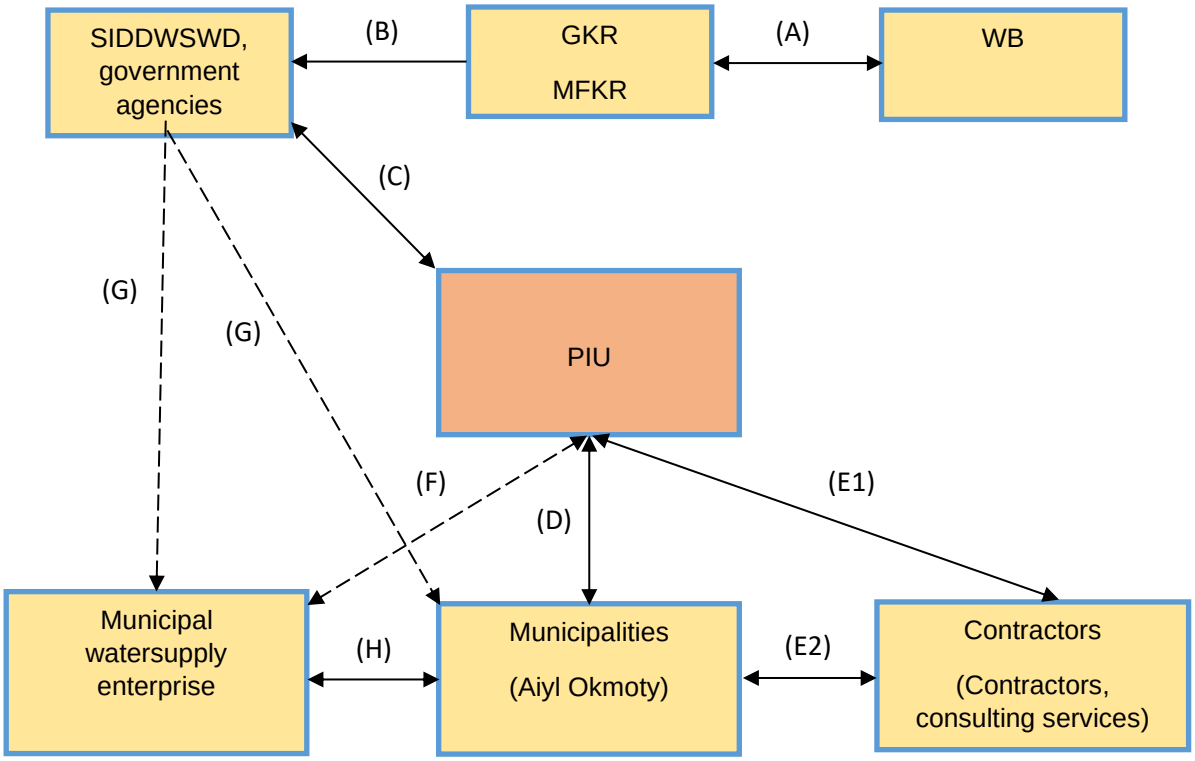


Figure 21. General scheme of project management. Source: PIU SIDDWSWD

(A) - Financial agreement between the Kyrgyz Republic and IDA

(B) - Implementation of state policy in the field of development of the water and wastewater sector through authorized bodies. SIDDWSWD will participate in the project with policy support and coordination in water supply issues, and Department of Disease Prevention and State Sanitary, Epidemiologic Surveillance of the Ministry of Health is responsible for sanitation issues, the Ministry of Education, and Science of the Kyrgyz Republic will support activities in schools.

(C) - Memorandum of cooperation between SIDDWSWD and PIU under the project; SIDDWSWD provides political support in the preparation and implementation of Projects, assists in resolving issues that require the participation and/or contribution of government authorities to promote Projects;

(D) - Agreement on cooperation between PIU and participating municipalities;

(E) - Contractual obligations for the project implementation;

(F) - PIU provides training, consultation and technical support to municipalities and municipal water supply enterprises;

(G) - SIDDWSWD is responsible for the overall coordination and provision of policy support to municipalities and municipal water supply enterprises;

(H) - The municipality transfers the water supply assets to municipal water supply enterprises on the basis of the right of economic management in the manner determined by law. The Service Agreement will regulate the relationship between the Aiyl okmotu and the municipal water supply enterprises.

Ministry of Finance of the Kyrgyz Republic. The borrower will be the Kyrgyz Republic, represented by the Ministry of Finance of the Kyrgyz Republic. As the representative of the Borrower, the Ministry will ensure that the SIDDWSWD and PIU fulfill their obligations in accordance with the terms of the Financing Agreement.

The World Bank team is responsible for providing guidance, reviewing, and approving the relevant documentation and conducting regular implementation support for the project.

State Institution for Development of Drinking Water Supply and Wastewater Disposal (hereinafter - SIDDWSWD) under the Water Resources Service of the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Rebublic. The project will be implemented under the overall responsibility of the State Institution for Development of Drinking Water Supply and Wastewater Disposal under the Water Resources Service of the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Rebublic.The State Institution is responsible for the development of the rural and urban water supply and sanitation sector, including policy development, planning and coordination of activities within the sector. The role of the SIDDWSWD includes overall coordination of work in the sector and support for the implementation of the sector development policy, communication and work with the Government of the Kyrgyz Republic and donors, as well as participation in all procurement processes (e.g. as a member of the Evaluation Commission), selection of priority sector activities (including infrastructure investments and institutional support), and the role of responsible agency to the Government of the Kyrgyz Republic, providing support to the PIU in project implementation (if necessary). SIDDWSWD will coordinate the project and build the necessary capacity at the regional and local level to deliver services, including implementation of reforms and results-based grants to establish autonomous service providers and, where possible, public-private partnerships.

Regional departments of SIDDWSWD will provide full support to establish regular communication with the target sites to ensure that PIU has extensive information (technical characteristics of the water supply system, results of previous monitoring, information from the SIDDWSWD database), as well as to facilitate field visits wherever those are possible.

The Project implementation unit under State Institution for Development of Drinking Water Supply and Wastewater Disposal under the Water Resources Service of the Ministry of Water Resources, Agriculture and Processing Industry of the Kyrgyz Rebubli of the DWSWD will manage the proposed project. The PIU will be responsible for overall project implementation, including compliance with fiduciary requirements and safety measures for the proposed project. Which will include procurement implementation, financial management and accounting, ESF, citizen engagement, monitoring and evaluation, reporting, and regular relationship with the World Bank.

Ministry of Health of the Kyrgyz Republic, the Department of Disease Prevention and State Sanitary and Epidemiological Surveillance (DDPSSES) under the Ministry of Health of the Kyrgyz Republic and National Center for Health Promotion and Mass Communication (NCHPMC) are government institutions that are authorized to deal with issues of sanitation, health care and disease prevention. DDPSSES will participate in the project as the main partner of activities under Component 2. At the local level, district units of DDPSSES are responsible for water quality control and testing. The Ministry of Health, DDPSSES and NCHPMC will also provide methodological and administrative support for AOs, local municipalities/public health organizations, schools, medical centers and village health committee at the local level.

The Ministry of Education and Science will be the other main partner for Component 2, which will implement the project by providing policy and methodological support to activities in schools and other educational organizations.

Municipalities - participants (Aiyl keneshes and Aiyl okmotu). Local self-government bodies will be owners of water supply systems, and municipal water supply enterprises will be operators (service providers) in the project regions. Relations between the AO and the municipal water supply enterprises will be regulated by the Agreement on the provision of water supply services.

Municipal water supply enterprises are the main organization that, by decision of the local self-government, will be responsible for the management and operation of water supply systems. The MWE will organize the provision of water supply services and the collection of revenues on the basis of the Agreement on the Provision of Water Supply Services between the MWE and the Aiyl Okmotu. The enterprise shall plan, finance and manage the operation of the water supply system. Municipal water supply enterprises with feldsher-midwife stations and Rural Health Committees will be responsible for activities related to education in the field of sanitation and hygiene.

Contractors. Technical studies and design estimates will be prepared by third party companies (**consulting services**) selected in accordance with World Bank procurement policies and procedures. Responsibilities for design verification and technical supervision of construction works (including construction contract management) are assigned to the PIU. The PIU will conclude the Cooperation Agreements with participating local governments to define roles and responsibilities at all stages of project implementation. Technical assistance under the

components is planned in the area of information technology, consulting and information services, which will include hiring consultants and project organizations; assisting in the organization and conduct of working group meetings in the preparation of investment programs, training programs and communication strategy MPA.

Communities of participating villages will be involved in the process of selecting priority project activities through consultations with various stakeholder groups and collecting opinions from direct and indirect beneficiaries regarding the proposed project activities. In addition, in each participating municipality, informal community organizations will be created by the community, which will be called “Village Water Committees”. These committees will be formed from community leaders, women, youth, street and neighborhood activists, and other village residents. They will be involved in all major project activities: detailed design, monitoring and evaluation/lesson learning, the process of generating and communicating information, collecting consumer opinions regarding the quality of service, and other project activities.

School WASH Committees. WASH Committees will be established at the school level. WASH committees will be responsible for promoting WASH activities in school

SIDDWSWD, participating Aiyl Okmotu, Municipal Water Supply Enterprises and other representatives of the Government of the Kyrgyz Republic will be involved at various levels during the implementation phase of relevant project activities.

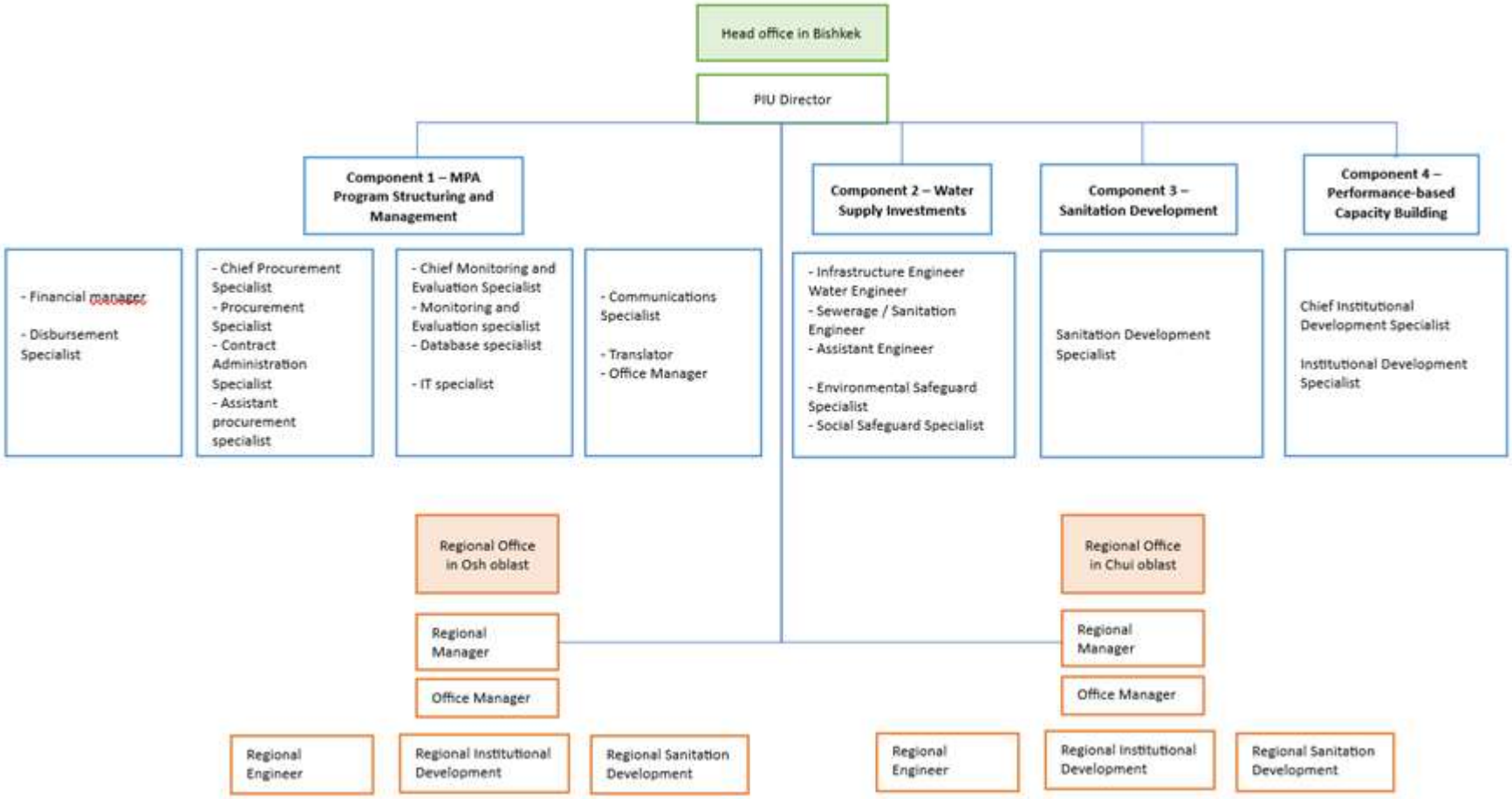


Figure 222. Structure of the Project Implementation Unit. Source: SIDDWSWD

The PIU will consist of key project staff within the components. Also, Regional Offices will be established in each oblast where the project is being implemented, with project staff reporting to the Head Office of staff in Bishkek.

The PIU Head Office in Bishkek will include the following active employees:

- PIU Director
- Financial manager (time-based combination)
- Disbursement Specialist (time based) combination
- Chief Procurement Specialist
- Procurement Specialist (time-based combination
- Contract Administration Specialist
- Assistant procurement specialist
- Chief Monitoring and Evaluation Specialist
- Monitoring and Evaluation specialist
- IT specialist
- Database specialist
- Communications Specialist
- Translator
- Office Manager
- Infrastructure Engineer
  Water Engineer
- Sewerage / Sanitation Engineer
- Assistant Engineer
- Chief Institutional Development Specialist
- Institutional Development Specialist
- Sanitation Development Specialist
- Environmental Specialist
- Social Development Specialist

Each regional office will include the following staff members:

- Regional Manager
- Office Manager
- Regional Engineer
- Regional Institutional Development Specialist
- Regional Sanitation Development Specialist

For the project PIU will hire one environmental and one social safeguard specialist for implementation of ESMF. PIU environmental and social safeguard specialists are responsible for daily operation, screening and monitoring, preparation of ESF documentation and ensuring that ESMPs and are followed by the contractors. ES specialists be overseeing components 2 and 3 as well. Regional Engineer will be responsible for ES at the regional office.

Consulting companies will be selected to carry out technical and environmental and social supervision of construction, institutional development activities and sanitation and hygiene activities at the local level. The company team will include a specialist who will conduct social and environmental monitoring, as well as regular training and be responsible for implementation ES requirements.

8.2 ESMF implementation arrangements

The PIU has the responsibility to ensure implementation of and compliance with the World Bank Environmental and Social framework (ESF) and the specific instruments prepared and disclosed that are relevant to the Project. The Bank will continuously assess performance of the PIU during project implementation in managing project environmental and social (E&S) risks. Project-specific targeted training on environmental and social management aspects will be provided to the PIU, supervision consultant and contractors on an ongoing basis including on topics such as the ESMF implementation, ESMF/ESMP reporting, World Bank ESF and EHS Guidelines and etc. Specific PIU capacity building measures such as training needs are identified and listed in this ESMF.

The PIU is specifically responsible for:

- Ensuring full compliance with the fiduciary requirements, rules and procedures of the World Bank;
- Coordinating and ensuring the implementation of the project;

- Provision of timely information on the progress of the project implementation to interested participants;
- Maintaining ongoing communication and making necessary inquiries to and from the WB, including no-objection requests and organizing videoconferences, meetings and missions;
- Ensuring compliance with the requirements, rules and procedures of the national legislation of the Kyrgyz Republic, environmental and social standards (ESS) of the World Bank, the implementation of measures and actions set out in the Environmental and Social Commitment Plan (ESCP) the Environmental and Social Management Framework (ESMF), the Stakeholder Engagement Plan (SEP), RPF, Labor Management Procedures (LMP);
- ES risk management, monitoring, and reporting as part of the quarterly reports to the Bank;
- Notify the Bank of any incident or accident relating to the project that has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers, including those resulting in death or significant injury to workers or the public no later than 48 hours after learning of the incident or accident;
- Preparation and implementation of site-specific ESF instruments;
- Supervise Contractors;
- Implement the ES actions enunciated in the ESCP;
- Any other responsibility necessary to ensure the successful implementation of the Projects;
- Assistance to the Department in ensuring the coordination of activities within the framework of the project.
- Environmental and Social development specialists will have a separate ToRs which will be reviewed by WB.

Table 29. Task table of key participants

Key participants of ESMF implementation	Task
World Bank	-Supports KR (with implementation of the sub-project through the established PIU) -Supports the PIU, regular monitoring and annual reporting on the implementation of the ESMF. -Reviews and approve the ESIA, ESMP prior to commencement of the construction works
SIDDWSWD	Responsible for the development of the rural and urban water supply and sanitation sector, including policy development, planning and coordination of activities within the sector.
PIU Director	Responsible for planning and management of all Project operations and activities in accordance with the agreed Project documentation, including ESF.
PIU Environmental Specialist	Ensures compliance with the requirements of the legislation of the Kyrgyz Republic in the field of environmental protection and in accordance with the environmental standards of the World Bank (ESS)/ 1. Oversee the ESIA process to identify potential environmental risks associated with the project. 2. Oversee the implementation of environmental mitigation measures (e.g., soil erosion control, sediment management) to minimize negative impacts during construction and operation 3. Raise awareness about environmental issues and sustainable practices, ensuring that project participants understand the importance of minimizing environmental harm. 4. Document and report the environmental performance of the project to relevant authorities and stakeholders. 5. Work with local communities to ensure that their concerns about environmental impacts are addressed, and ensure that they are informed of the project's environmental management strategies.
PIU Social Development Specialist	Ensures compliance with the requirements of the legislation of the Kyrgyz Republic in the field of social safeguards and in accordance with the social standards of the World Bank (ESS)
PIU Regional Manager	Assists central office specialists in implementing on site social and environmental safeguard measures
Municipality Administration	Municipality participates in the monitoring of the Contractor performance in ESMP implementation and involved in grievance resolution in accordance with the established grievance redress mechanism
Design Institute	-Development of design and estimate documentation and the section «Environmental protection» with obtaining a positive conclusion of the state ecological expertise.
Contractor	- Complies with all ESMP requirements, implements all environmental mitigation and protection measures, conduct environmental monitoring activities - Participates when needed and observes the GRM process in addressing complaints - Prepare and submit monthly and quarterly reporting on the ESMP implementation and compliance
Supervision company	- Daily social and environmental monitoring of construction work - A daily environmental checklist be completed at each work site and maintained within a register and logged in the on-site logbook. - Instruction and training of contractor employees on ESMP requirements - Prepare and submit monthly and quarterly reporting on the ESMP implementation and compliance - Provide all requested information to state supervisory authorities - Conduct appropriate consultation to community
State supervisory authorities	-Ensures that the sub-project, complies with the provisions of the requirements for compliance with the environmental laws and regulations -State environmental inspection
NGOs	-Participates in any consultation that may be required during the implementation or post-construction maintenance period

	-Acts as an independent third party in the implementation and post-construction monitoring of the sub-project
Beneficiaries, host community	Supports the contractor in the implementation of the environmental mitigation and protection measures • participates in any meeting or consultation that may be required during the implementation or post-construction maintenance period

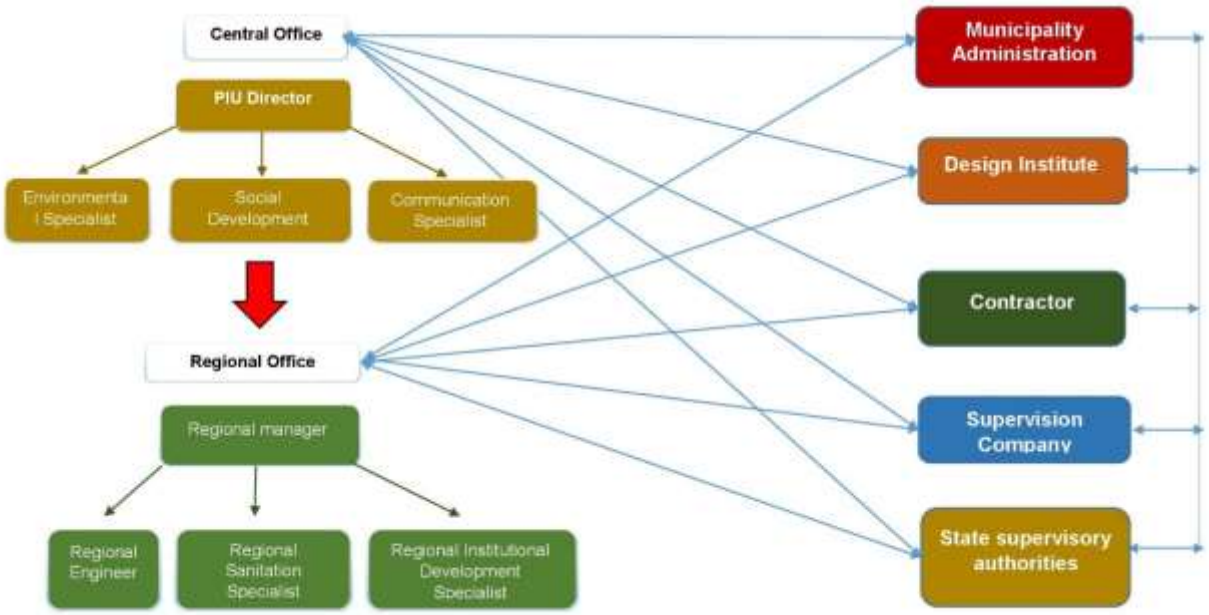


Figure 233. Coordination mechanism between key participants of ESMF implementation

The PIU Social Development Specialist of the project is assigned to perform the following responsibilities related to the LMP implementation:

- Ensures the implementation of this labor management procedures;
- Ensures that construction contractors adhere to labour management procedures and (before work begins on site) prepares health and safety plans;
- Ensures that contracts with contractors are prepared in accordance with the provisions of the Labour Management Procedures (LMP), ESMP and ESMF of the project, in the manner provided in the Project Operational Manual (POM);
- Conducts appropriate monitoring - ensures that contractors comply with their obligations and labor safety and health (OHS) requirements in relation to contractors 'and subcontractors' employees, which are established by the legislation of the Kyrgyz Republic and contracts between PIU and contractors;
- Monitors contractors and subcontractors' adherence to labor management procedures;
- Ensures that occupational safety and health standards in the workplace of project workers are in line with ESS2 and Kyrgyz legislation in the field of occupational safety and health;
- Conducts appropriate monitoring and conducts trainings for project workers on LMP and OHS;
- Ensures that a grievance redress mechanism is developed and implemented, and that workers are informed about its purpose and how to use it;
- Regularly monitors and reports on the effectiveness of the occupational safety and health system;
- Monitors compliance with the Employee Code of Conduct.

When preparing standard contracts with contractors, PIU will include requirements in terms of LMP and OHS implementation. In accordance with the requirements of the LMP and OHS, contractors shall:

- Comply with labour management procedures and health and safety requirements. If the number of workers (core + under the contract) exceeds 50 people, then the contractors must develop their own LMP and OHS plans.

- Monitor contractors' adherence to human resources management and health and safety requirements.
- Maintain records of contract workers and their employment conditions.
- Disseminate (in accessible form) job descriptions and terms of employment to all employees.
- Ensure that every employee hired by the contractor/subcontractor knows the telephone number, e-mail address and Internet site to which he or she can file a complaint with the PIU.
- Familiarize employees with the requirements related to labor protection; to conduct regular trainings on the right to safe working conditions (which is guaranteed by the legislation of the Kyrgyz Republic), the risks associated with their work, and measures to reduce these risks to an acceptable level.
- Conduct trainings on human resource management and labor safety procedures to ensure efficient work of subcontractors.
- Ensure that all employees of contractors and subcontractors understand and sign the Code of Conduct before commencing work; monitor compliance with the Code.

Contractors will need to:

- Comply with national legislation and these labor management procedures;
- Keep records of hiring and subsequent work of contract workers;
- Explain the duties and conditions of employment to contract employees in an accessible manner;
- Implement a system to ensure regular monitoring and reporting on labor relations and occupational safety and health.

PIU Environmental specialist will perform following responsibilities*:*

- Ensuring compliance with the requirements of the legislation of the Kyrgyz Republic in the field of environmental protection and in accordance with the environmental standards of the World Bank (ESS), based on the developed tools for environmental protection: Environmental Management Plans/Checklists (EMP);
- Ensuring the inclusion of requirements for environmental protection measures in tender documents for the provision of services and in contracts for the implementation of repair work;
- Ensuring the inclusion of ESMP/Checklists of a specific site as an integral part of the contract;
- Ensuring the implementation of environmental measures and measures provided for in the Environmental and Social Commitment Plan (ESCP), the Environmental and Social Management Framework (ESMF);
- Conducting an environmental assessment of the project in accordance with the ESS1 standard;
- Screen subprojects for potential environmental risks and impacts;
- Ensure that ineligible activities, such as activities that are categorized from the screening exercise as “High” are excluded from the project;
- Ensure that ES activities, including the preparation of site-specific instruments, are included in PIU’s annual work plan and procurement plan;
- Make certain that ES activities are well sequenced ahead of the corresponding activities in the annual work plan and procurement plan;
- Review and approve of Construction ESMP;
- Preparation, approval, disclosure, adoption and implementation of documents on environmental safety measures in accordance with the principles of the World Bank: Environmental and Social Management Plans (ESMPs) for each subproject;
- Inclusion of relevant environmental aspects of the ESMP, including, in particular, any environmental management plans or other instruments, ESS1 requirements and any other necessary environmental measures contained in procurement documents and contracts with contractors and oversight firms.
- Conducting public consultations on the developed documents on environmental safety measures (posting information, announcements, discussion, if necessary).
- Ensuring the preparation of training materials on environmental protection, and conducting training activities on environmental protection, if necessary.
- Conducting OHS monitorings, trainings, reporting along with Social Development Speacialist;
- Development of requirements for the Contractor's reports and control of the plan for the implementation of environmental mitigation measures and environmental measures, the contractor's monitoring plan and analysis of the reports provided.
- Ensuring control over compliance by contractors with the safety requirements of the supplied goods and services;
- Preparation and submission of regular reports on the implementation of environmental obligations, documents on environmental safety measures, on the results of monitoring the indicators of the environmental protection project.

- Monitoring the contractor's implementation of the environmental management plan for a specific site.
- Conducting frequent field visits and monitoring the implementation of ESMP.
- Ensuring the implementation of the project in accordance with the ESMP developed for the project;
- Preparation of periodic reports on the work carried out within the framework of the project and timely submission of quarterly, semi-annual and annual reports on environmental safety measures;
- Participation in ensuring the disclosure of environmental information, development and implementation of a complaint mechanism on environmental issues;
- Definition and preparation of educational materials on environmental protection;
- Response and documentation of environmental incidents/accidents, based on reports;
- Providing and assisting contractors and supervision consultants in documenting and maintaining records (written, photographic) for environmental safety.

Communications Specialist will perform following responsibilities:

- Develop and maintain the DDWWD's public relations work plan.
- Review and analyze the DDWWD's approaches and activities for conducting information and communications work, including coordination and collaboration with other public agencies and stakeholders, citizen engagement, and public awareness;
- Development of a communication strategy, with key messages, clear timeframes, target audiences and key performance indicators, aimed at raising awareness on the issues of the DDWWD's activities, implementation of government policies and WSS projects, including sector reforms, tariff-related issues, positive results of water saving, hygiene compliance, etc.;
- Organize discussions and consultations with key stakeholders, including development partners, relevant government agencies, NGOs, local self-governments (LSGs) and WSS service providers, when developing the communication strategy;
- Development of annual action plans with estimated costs for the implementation of the DDWWD's Communication Strategy;
- Support the DDWWD in implementing the communication strategy and action plans;
- Developing instruments to engage citizens and inform local communities;
- Develop key messages for target groups (including gender-sensitive messages) and identify effective dissemination tools, strategic communication channels to reach different target groups;
- Development of media products (press releases, video and audio clips, articles for mass media, etc.) on the progress and results of the Project implementation, their posting and publication in mass media, on the website and social pages of the DDWWD as part of the communication strategy implementation;
- Creating printed products: Development of various printed materials such as informational brochures, flyers, reports and other materials needed to present the project and its achievements. Create content, design and appeal of printed materials that effectively communicate project information to the target audience.
- Support communication with external suppliers, contractors and consultants to edit, write, design, develop and translate products for audiences.
- Develop and publish content for the Department's website, social media, newsletter, bulletins, and other informational materials published by the Department. Designing branded templates.
- Developing detailed concepts and scenarios for WSS videos and films for promotion to target groups and stakeholders, ensuring quality assurance in the development of water and sanitation videos;
- Organization of participation of senior and key persons of the Gosstroy/DDWWD and PIU in TV and radio programs on issues related to the development of the WSS sector and implementation of the Project;
- Mobilization of media support for official events of the Gosstroy and the DDWWD under the Project, including invitation of journalists and media representatives, preparation and distribution of press releases.
- Organization of activities and presentations: Plan, organize and coordinate various activities and presentations related to the project. This may include conferences, workshops, public hearings, and other events at which the project will be presented. The communications specialist's task is to ensure effective communication and maximum awareness of the project among participants.
- Creation of a database of photo/video/audio materials prepared under the Project;
- Regular updates to the PIU website and social pages;

- Social Media Community Management and Online Content Management: Manage the project's social media accounts (e.g. Facebook, Twitter, Instagram and others). Creating quality content, publishing and engaging with communities to increase awareness and involvement in the project.
- Monitoring of mass media and social networks on issues related to WSS, activities of the Gosstroy, DDWWD and PIU, as well as implementation of government programs and projects in this sector;
- Preparation of success stories (case studies) of Project beneficiaries and stakeholders;
- Organizing and conducting press tours together with media representatives in the target rural settlements of the Project;
- Other public relations and community outreach duties and activities.

Supervision Company shall perform the following duties*:*

- Maintain ongoing technical supervision at construction sites and will be responsible for supervising the implementation of all Contractors contracts, taking into account energy efficiency, water supply, sanitation and hygiene, engineering systems, environmental issues. And also, the Consultant will manage contracts and ensure compliance with contractual provisions regarding the quality and quantity of work.
- Be guided by the current regulatory and technical documents of the Kyrgyz Republic;
- Promptly inform the PIU of any omission that may have a significant effect on contracts in terms of performance of work at the time of disclosure or discovery of commissions.
- Assist the PIU in monitoring compliance during the construction works with the environmental and social requirements of the World Bank;
- Ensure the availability of all required documents for the commissioning of the completed facility in accordance with the current legislation of the Kyrgyz Republic;
- Take all necessary measures and control the quality of construction work.
- Together with the PIU representatives, will make all the necessary engineering decisions required for the successful and timely execution of the contract within the planned timeframe and budget.
- To carry out daily general supervision of construction works in the field, including monitoring the implementation of measures to reduce environmental and social impacts;
- Carry out ongoing supervision of compliance with labor protection, occupational health and safety (OHS);
- In case of non-compliance with protective measures, shall draw up a violation report indicating the period for the elimination of violations for the Contractor;
- Monitor the availability and execution of the necessary permits for construction and installation works, including in the field of environmental protection, labor protection and working conditions, occupational health and safety;
- Participate in the conduct of supervision by state regulatory authorities;
- Maintain a daily facility log including the following: major materials and equipment, daily and major activities performed during construction shifts, tests performed, results, unusual site conditions, contractor employers and supervisors, etc. and keep a photo report on the daily progress of work.
- Copies of logs and photographs must be submitted to the PIU representative;
- To monitor the implementation of the terms of construction works (according to the contract);
- Control the timely receipt of all permits from the relevant organizations for the construction of the facility and, if necessary, register for such permits with the relevant state bodies.ESF institutional capacity building activities

The implementation of the ESMF requires specific knowledge from the beneficiaries and operators involved in the various stages of project implementation. To ensure effective project implementation and a clear understanding of the environmental and social risk management requirements in accordance with the new WB ESSs, this project proposes a Capacity Building Plan (CBP). The CBP provides training in both the general principles of the World Bank's environmental policy, relevant national legislation, and some specific aspects related to this project. It is planned to conduct training and provide information on topics such as ESMF implementation, ESMP reporting, first aid.

After the project comes into force PIU will hire social and environmental specialists with knowledge of national environmental and social management requirements, as well as sufficient knowledge of the provisions and requirements of the World Bank ESSs to develop training materials and trainings. The training will include the basic requirements of the World Bank, national rules and procedures for managing environmental and social risks, as well as case studies in this regard.

The following are estimated costs associated with implementing capacity building for environmental and social safeguards, developing and implementing site-specific tools, and monitoring.

The Environmental and social risk management project's capacity building plan will cover the following activities as shown in Table 30.

Table 30. Preliminary training plan

№	The name of the training	Time and estimateddura	Target group	Arranger	Estimatedcost
1.	Review of WB ESSs and their implementation during the project cycle. National environmental requirements for project preparation and implementation	During the first year of the Project implementation Duration – 0.5 days	PIU staff, including regional project office staff	ESF specialists	As part of the salary of Safeguard specialists / Consulting company
2.	Implementation ESMF, LMP, SEP, GRM, RPF	Duration – 2 days	PIU staff, including regional project office staff	Safeguard specialists	As part of the salary of Safeguard specialists / Consulting company
3.	Environmental and social screening of subprojects/ activities; preparation of site-specific ESMP, and RAP and monitoring and reporting on their implementation.	Duration – 0.5 days and repeated as needed	PIU staff, including regional project office staff. Contractors, supervision engineers.	Safeguard specialists	As part of the salary of Safeguard specialists / Consulting company
4.	SEA/SH training and awareness raising/implementation of GBV action plan	Seminars for half a day at the beginning and in the middle of the project	PIU staff Contractor, supervision. Local authorities, community members	Safeguard specialists	As part of the salary of Safeguard specialists / Consulting company
5	Reporting on performance and environmental and social, including OHS compliance	During the first six months of the project Duration - 0.5 days.	PIU staff, including regional project office staff, supervision engineers.	Safeguard specialists	As part of the salary of Safeguard specialists / Consulting company

Source: SIDDWSWD

IX. MONITORING AND REPORTING

9.1. General requirements

Environmental and social monitoring during the implementation of subprojects should contain information on the key environmental and social aspects of the subprojects, their impact on the environment, the social consequences of the impacts and the effectiveness of the measures taken to mitigate the consequences. This information allows the PIU/local district officials to monitor the effectiveness of the implementation of environmental measures, evaluate the effectiveness of mitigation measures and ensure that corrective actions are taken in a timely manner, to be followed, how often, where and in what order, and who will monitor.

Monitoring of the implementation of environmental protection measures will be carried out by the PIU E&S specialists. Stakeholder representatives (e.g., government agencies, as appropriate) may also be involved in the monitoring. The goal is to check the main points of compliance with the ESMF, the progress of implementation, the scope of consultations and the participation of local communities. A standard checklist prepared during the assessment studies will be used for the monitoring report.

Monitoring of part of the social risk management measures will be carried out on an ongoing basis by the PIU social development specialist to ensure that there are no unforeseen impacts during construction work on land, production assets, illegal users, people's livelihood, asset valuation, etc. Monitoring is also will cover health and labor issues, as well as stakeholder engagement activities. If any problems are identified, mitigation measures will be proposed in progress reports or in separate Corrective Action Plans (CAPs) (details are provided below in the section on environmental and social reporting).

The PIU E&S specialists will be responsible for reporting on the implementation of the ESMP by doing the following:

- Record and store the results of supervision and monitoring of the PIU throughout the life of the project. Submit summary reports on the progress of the ESMP implementation, as well as the environmental and social aspects of the subprojects, and update information on any complaints / reactions that have been considered and are under consideration to the World Bank on a semi-annual basis.
- Prepare quarterly progress reports on the implementation of measures proposed by the ESMP for individual subprojects;
- Prepare semi-annual environmental and social performance reports as a result of the implementation of subprojects and analyze the effectiveness of mitigation measures used to minimize the negative impact.
- Prepare outlines and requirements for contractor's environmental and social mitigation reports, and review contractor's monitoring plan and reports.
- Provide the general public with mitigation and environmental and social protection measures through special publications and/or annual public seminars.

Contractor should prepare and submit monthly monitoring report using the sample monitoring report which will be developed by PIU ESF specialists.

Supervision engineer / company should submit monthly report on quality control of construction works in accordance with the design, E&S requirements and design and estimate documentation with supporting documents (photo and video materials).

9.2. Environmental and Social monitoring

To ensure the implementation of environmental protection measures specified in the ESMP, monitoring is carried out as follows:

- Visual monitoring – during the construction phase of the subprojects, the Safeguards specialists will continuously monitor the implementation of the ESMP. This will be achieved through monthly inspections of construction/reconstruction facilities by specialists throughout the construction period. The specialists have the right to suspend work or payments if the contractor violates any obligation to implement the ESMP. For monitoring, it is recommended to use special checklists, which can be compiled on the basis of the ESMP (generic checklist in Annex 6) with attached photos from the monitoring site.
- In order for construction work not to cause inconvenience to local residents, regular monitoring of noise, vibration and dust content should be carried out. Measures to mitigate the effects of dust, vibration and noise will be included in the 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 case of complaints about violations or inconveniences from the local population, instrumental measurements of air or water quality are carried

out by the PIU by hiring a certified laboratory. In case of exceeding national standards, the contractor is obliged to take additional measures to reduce the identified excesses to meet the standards.

Each facility will be surveyed and based on the survey, an assessment of environmental and social impact risks will be carried out. A separate ESMP will be developed for each specific site. The environmental and social issues included in the mitigation framework are monitored by designated specialists through the PIU. Monitoring is based on impact/mitigation/monitoring aspects as defined in the ESMPs and/or subproject ESMP checklists. Supervisory monitoring will be carried out through monthly inspections of contractors' environmental and social performance throughout the construction period. The PIU has the right to suspend work or payments if the Contractor is in breach of any of its obligations to implement the ESMP.

Separately, World Bank experts will also visit certain sites as part of the project implementation support to monitor compliance with the measures agreed in the ESMP and other relevant documents. As mentioned above, in the event of non-compliance, the PIU specialists investigate the nature and cause of non-compliance and, if necessary, decide what is necessary to ensure compliance with the subproject or funding should be suspended.

9.3. Environmental and Social Performance Report

The environmental and social monitoring system begins with the preparation phase of the project sub-component, including the operation phase, to prevent negative project impacts and monitor the effectiveness of mitigation measures. This system helps the WB and the EA to evaluate the success of mitigation within project supervision and allows action to be taken when needed. The monitoring system provides technical assistance and oversight when needed, early detection of conditions associated with mitigation measures, monitors mitigation results and provides information on project progress. The monitoring plan defines the monitoring objectives and determines the type of monitoring as well as their relationship to impacts and mitigation measures. In particular, the monitoring section of the ESMP contains:

- details of monitoring measures, including measured parameters, methods used, sampling locations, frequency of measurements; and
- monitoring and reporting procedures to:
  - ensure early detection of conditions requiring mitigation measures; and
  - provide information on the progress and results of mitigation.

Environmental and social performance, including monitoring, should be properly documented and reported. In accordance with national legislation for construction sites, each contractor must keep a log of information on the training of workers in health and safety and another log of accidents during construction work. During instrumental control, the original records of the results of mandatory instrumental monitoring of the environment (air and water quality) are also stored in a separate file for records.

For construction/rehabilitation sub-project, it is recommended that contractors, with the assistance of the PIU, develop a site inspection checklist format to streamline the environmental and social oversight process prior to commencement of work. The format could be in the form of a checklist listing the mitigation measures to be implemented at construction sites, the status of their implementation, and some explanation of the implementation status, as needed. On a monthly basis, the contractor will submit summary reports on the implementation of the ESMP. The list of activities that are checked by the safeguard specialists during the site visit should correspond to the activities specified in the ESMP for the controlled subproject.

If social monitoring reveals any impacts, they should be mitigated immediately. If there is an impact on land, production assets, illegal users, people's livelihood, asset valuation, etc., construction work should be stopped and the PIU should be informed immediately. Constant monitoring on the ground is carried out by technical supervision consultant / company. If consultant / company finds violations, they must notify the employees of the PIU and the competent state authorities. Also, the technical supervision consultant / company notifies the management of the contractor organization and demands the suspension of work until violations are excluded. Regular monitoring is carried out by PIU employees. If, during the monitoring, non-compliance with the requirements of the ESMP is found, the PIU employees give a written notification of the elimination of violations. If the violations are not eliminated, the employees of the PIU notify the competent state authorities, which may decide to suspend the work. A Corrective Action Plan (CAP) needs to be developed. The CAP should contain information on the subproject, the status of civil works, impact types and social impact assessment, proposed mitigation measures. The CAP should be prepared by the sub-project implementer and approved by the PIU. All unforeseen impacts within the framework of the subproject that occurred outside the right-of-way must be compensated/mitigated by the Contractor. This should be reflected in the tender documentation. All impacts in the exclusion zone must be compensated by the contractor of the subproject.

The PIU will prepare a summary report on the implementation of the ESMP, which will be included in the regular progress reports submitted to the World Bank.

Monitoring reports during project implementation will contain information on key environmental and social aspects of project activities, especially in relation to environmental impact and the effectiveness of mitigation measures. Such information will allow the PIU and the World Bank to evaluate the success of the project supervision mitigation measures and to take corrective action as necessary.

The PIU will be responsible for the implementation and success of the project, as well as financial reports, project implementation reports, social audit meetings, as well as feedback and complaints received and preparation of a completion report. All environmental and social issues are monitored and controlled by the PIU. Potential negative impacts need to be prevented or mitigated during the construction and operation phases.

9.4. ESMF integration into project documentation

ESMF requirements will be integrated into the Project Operations Manual, and ESMP requirements will be included in construction contracts for all subprojects, both in the specification and bill of quantities. Contractors will be required to include the cost of implementing the ESMP in their financial proposals. Based on the ESMF, the roles and responsibilities of all parties involved in the ES assessment process will be outlined.

The provisions of the ESMF will be used for the following:

- Inclusion of ESMF requirements in the Project Operational Manual;
- Inclusion of environmental recommendations, ESMPs in construction contracts for individual subprojects, both in the specification and in the work orders, sub-borrowers should include the cost of implementing the ESMP in their financial proposals;
- Allocation of subsequent responsibilities of the ESMF within the PIU;
- Identification of mitigation and prevention measures during the implementation of the selected sub-component of projects
- Monitoring and evaluation of mitigation/prevention measures identified in the site-specific review and ESMP. Necessary mitigation measures will be an integral part of the subproject, including contracts requiring contractors to meet environmental and social obligations during construction

For construction and/or rehabilitation works PIU are required to prepare an ESMP prepared as part of the preparation of the tender.

All contractors must use environmentally sound technical standards and procedures during their work. In addition, the terms of the contract must specify the requirements for compliance with all national building codes and regulations, sanitary codes, protective procedures and regulations, as well as environmental protection, as well as the requirements of the WB ESSs and EHS rules.

X. GRIEVANCE REDRESS MECHANISM

In accordance with the requirements of the ESS10, the PIU SIDDWSWD will apply its Grievance Redress Mechanism (GRM) to relevant component activities during the Project implementation. The GRM will streamline the process of receiving, considering and resolving complaints that may arise as a result of the implementation of the activities of this Project.

The GRM process is necessary to ensure that direct and indirect beneficiaries, stakeholders and Project staff have the opportunity, at all stages of Project implementation:

- access to information about the Project;
- at all stages of the Project, the direct and indirect affected people and beneficiaries of the Project can submit their complaints or wishes for improving the Project activities;
- in increasing transparency and publicity in the process of implementing Project activities;
- timely eliminating of issues/problems, preferably without any costs and with a guarantee of their timely solution.

10.1 Grievance review and resolution process

A mechanism for reviewing complaints/appeals of citizens affected during the Project implementation period and providing appropriate responses in all interested issues of the project activities including social and environmental safety measures and gender issues will be implemented according to the following three levels, i.e. Commissions for consideration of appeals are created at all levels as:

- at subproject level;
- at Aiyl Okmotu level;
- at national level.

10.2 PIU GRM Channels

The PIU SIDDWSWD has organized the following channels through mobile phone with support for voice and video communications:

by mail: Bishkek City, 34, Str. Baytik Baatyr.
by telephone – +996 312 54-45-75
by WhatsApp channel – +996 555 54-45-75 & +996 707 54-45-75
by e-mails: piu@tunuksuu.kg

Under the Project the Stakeholder Engagement Plan was prepared that describes in detail the entire Grievance Redress Mechanism. The SEP describes the ways in which the Project team will interact with stakeholders, including a mechanism through which people can express concerns, provide feedback, or apply complaints about the project and any activities related to the project.

XI. PUBLIC CONSULTATIONS AND INFORMATION DISCLOSURE

11.1 ESMF Disclosure

As required by World Bank ESS 10, the PIU will disclose the ESMF to the public, including all information on potential environmental and social risks and impacts.

Such information will be posted on the website of the PIU in an accessible form and in an accessible language for the public. and stakeholders so that they can fully contribute to project design and mitigation measures.

The ESMF will be presented in a preliminary version; later, after revision, the final (updated) version will be disclosed. The document should adequately analyze the main risks and impacts of the project in sufficient detail to inform the Bank's stakeholder engagement and decision-making processes.

In general, the process of interaction with stakeholders (district authorities, state bodies, representatives of the Bank, etc.) is also carried out at the stage of preparing ESMF/ project, through meetings, discussions and recommendations, and consideration of potential target sites.

11.2 Public consultations

Informing and disclosure of the results of social and environmental documents

Ten-Fifteen (10-15) days after posting information on the website of the PIU, together with representatives of local government authorities, will conduct local public consultations on the results of environmental and social analysis and research in Chu, Issyk-Kul and Osh regions. Public consultations will be held at the rayon/oblast level.

Based on the results of public consultations, protocols and lists of participants will be drawn up, and the draft ESMF document will be finalized taking into account the recommendations of the participants. The final version of the document will be posted on the website of the PIU and on the website of the World Bank.

11.3 Subproject Consulting

In the case of small local works that include subproject activities and that will not have a significant impact on the environment, public consultations can be held virtually or in local district administrations. For small construction works, information boards will be installed on the sites.

Disclosure of environmental and social documents should be made available to affected groups and local NGOs. Consultations and information will be held after the preparation of the ESMP (public disclosure of the ESMP checklists can be done by posting on the PIU website and providing hard copies to the local governments).

XII. BUDGET FOR ESMF IMPLEMENTATION

Below are the estimated costs associated with the implementation of capacity building of specialists involved in the implementation of the project on ESF, as well as the development and implementation of tools for specific sites of subprojects and monitoring.

a) Proposal for capacity building of the environmental and social risk management of the project`s staff/workers will cover the following activities indicated in the Table 31.

Table 31. Preliminary Capacity Building Plan

№	The name of the training	Time and estimated duration	Target group	Arranger	Estimated cost
1.	Review of WB ESSs and their implementation during the project cycle. National environmental requirements for project preparation and implementation	During the first year of the Project implementation Duration – 0.5 days	PIU staff, including regional project office staff	ESF specialists	As part of the Safeguard specialists / Consulting company
2.	Implementation ESMF, LMP, SEP, GRM, RPF	Duration – 2 days	PIU staff, including regional project office staff	Safeguard specialists	As part of the Safeguard specialists / Consulting company
3.	Implementation of environmental screening/ESMP, social screening Preparation of site-specific ESMP reporting	Duration – 0.5 days	PIU staff, including regional project office staff. Contractors, supervision engineers.	Safeguard specialists	As part of the Safeguard specialists / Consulting company
4.	SEA/SH training and awareness raising/implementation of GBV action plan	Seminars for half a day at the beginning and in the middle of the project	PIU staff Contractor, supervision. Local authorities, community members	Safeguard specialists	As part of the Safeguard specialists / Consulting company
5	Reporting on performance and environmental and social compliance	During the first six months of the project Duration - 0.5 days.	PIU staff, including regional project office staff, supervision engineers.	Safeguard specialists	As part of the Safeguard specialists / Consulting company

Source: SIDDWSWD

b) Budget and timeline for the implementation of the ESMF provided in the Table 32.

Table 32. Budget and timeline for the implementation of the ESMF

Description of expenses	Quantity	Approximate cost per unit (USD)	Period / years	Total (USD)	Notes
Hiring a Communications Specialist	1	1 000	4	48 000	
Travel expenses for staff (cost per year)		3 000	4	12 000	
Information stands in each subproject	80	120	1	9 600	
Meetings to launch the Project in the oblasts	3	2 500	1	7 500	Rental of a conference room, coffee break, printed materials)
Community meetings	50	100		5 000	
Information materials (brochures, posters, PR materials, including design)				25 000	different topics, community health/ safety, environment and land acquisition, etc.
Press tours about the Project / Program for the media and online publications	7	1 000	2	14 000	
Training for relevant PIU staff and contractor/consultant	5	1 000		5 000	
Conduct environmental screening and prepare ESIA / site-specific ESMPs	As part of reimbursement for Environmental Specialist	1	During project implementation	As part of the salary of Safeguard specialists	

Conduct Cumulative impact assessment (if needed)	8	20 000		160 000	At the rate of 1 CIA for 1 rayon
Conducting social screening, screening for the identification of risks for temporary land acquisition and / or temporary restriction of land use; and prepare ESIA /site-specific ESMPs	As part of reimbursement for Social Development Specialist	1	During project implementation	As part of the salary of Safeguard specialists	
Preparation of RAPs for specific sites, if necessary	As part of reimbursement for Social Safeguards Specialist	1	During project implementation	As part of the salary of Safeguard specialists	
ESMP monitoring	As part of reimbursement for Social Safeguards Specialist	2	As part of the salary of Safeguard specialists	During project implementation	
GRM expenses					
Information materials (GRM brochures)	100 000	0,5	1	50 000	
GRM training for project staff and contractors	1	1 000	4	4 000	
Laboratory measurements of environmental factors	1	4 000	4	16 000	
Total:				**356 100**	

Source: SIDDWSWD

XIII. CONCLUSIONS

During the project implementation period, the PIU will liaise with the relevant agencies currently involved in environmental and social management under the SEP; and will be responsible for preparing relevant environmental and social documents and providing information to the WB, as well as for addressing environmental and social risks under the ESMF and be responsible for compliance with the ESMF requirements.

The proposed physical works of Component 2, 3 require a large amount of civil and earthworks. During construction, earthworks will be carried out, such as excavation, clearing, mass transfer of soil and stones, soil cultivation, which can potentially damage the vegetation cover and lead to the clearing of vegetation. Therefore, the movement and storage of building materials, disposal of surplus, waste and construction debris can affect the natural environment and biodiversity habitat, if not adequately managed.

Identified impacts can be avoided or minimized with the appropriate mitigation measures, most of which are common good practice for small-scale remediation.

In addition to the requirements of good social behavior, health and safety, the Code of Conduct covers the requirements of best practice in the field of environmental protection, including the prohibition of hunting, fishing, trapping of wild animals, burning vegetation, off-road driving, speeding etc. In addition, improper interaction with local residents and the transparent application of sanctions for non-compliance should be carefully considered during implementation. As a result, adequate local oversight by qualified staff is needed, as well as transparent sanctions for non-compliance.

The PIU will appoint a project-specific GRM to address all complaints and inquiries from citizens related to the project. The PIU will be responsible for the day-to-day implementation of the GRM and reporting to the World Bank. The project will encourage the receipt of complaints through various channels, including anonymous complaints, at various levels of detail. The system and requirements for the chain of action for dealing with complaints – from registration, sorting and processing, confirmation and follow-up to verification and action, and finally feedback – are included in the GRM. In order to ensure management oversight of the handling of complaints, the PIU will be responsible for monitoring the entire process, including verifying the implementation of the agreed decisions.

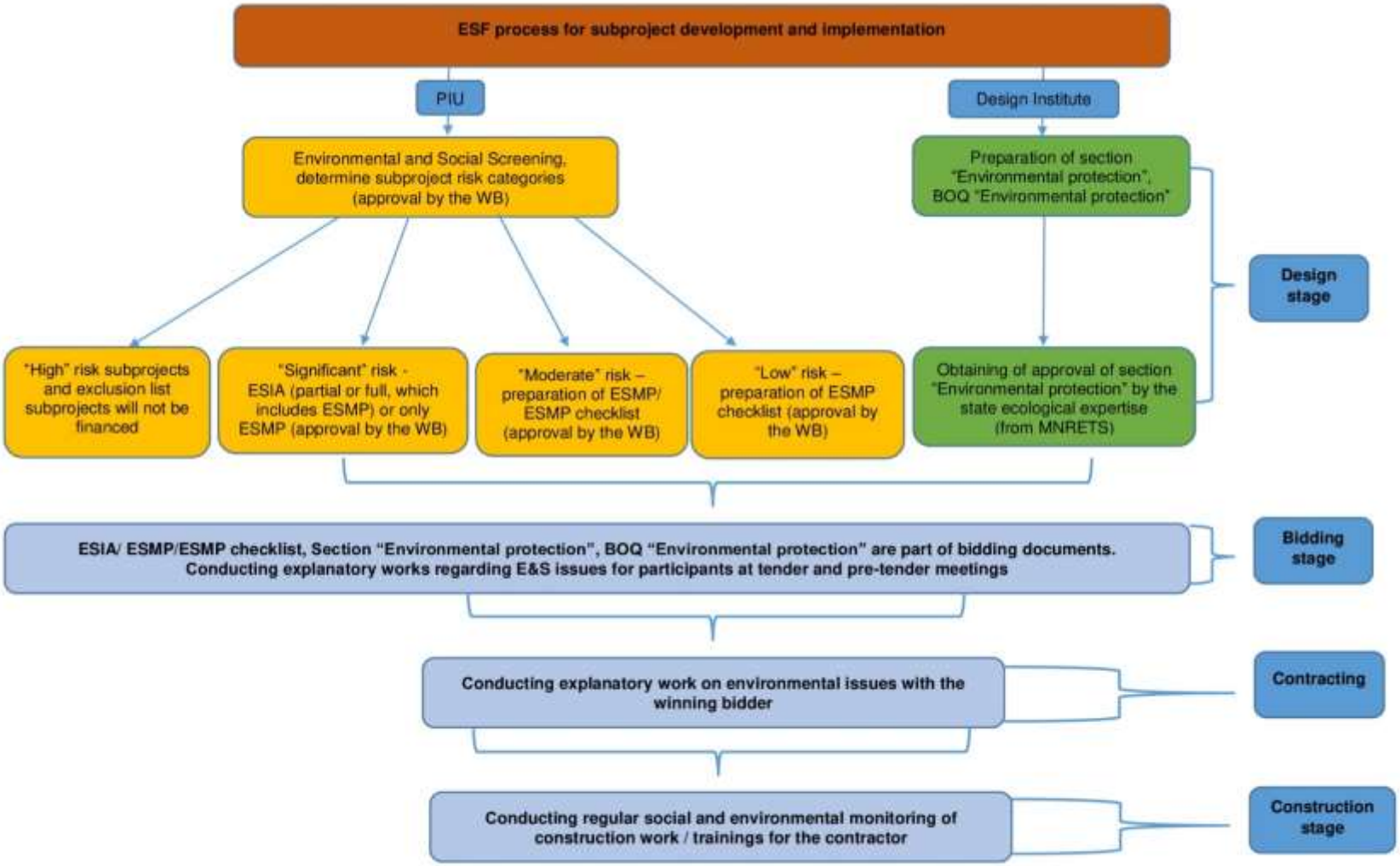
The overall environmental impact of the project investments is supposed to be largely positive and include (i) improved water management and efficiency through replacement of leaking pipes and production systems, replacement of continuously running communal stand pipes with household stand-pipes, and installation of individual meters, together with support for improved operations; (ii) the overall water consumption for respective rural systems will be less than actual quantities and original design/planning estimates due to efficiency gains and use of water-saving technologies in public water supply systems; (iii) help in protecting ground and surface water resources by promoting the construction and use of environmentally sound sanitation facilities for human waste disposal; (iv) improved citizens' skills and awareness in planning and implementation of local activities, with particular attention to environment protection, and (v) sustainable management of improved infrastructure by communities, which will bring environmental and social benefits related to natural resources management.

The social impact of the project investments will also have a positive effect as people living in the project area will have improved health, hygiene and well-being, especially children and vulnerable populations, by guaranteeing consistent access to clean water through the replacement of leaking pipes and communal standpipes with household standpipes. Improved sanitation facilities will address specific sanitation needs of people with disabilities. Safe drinking water is necessary to preserve public health and prevent waterborne illnesses, and it will be more readily available with less water wasted and more efficient water supply systems. Individual meter installation will also encourage households to use water responsibly.

The Project risks moderate, with an overall substantial risk rating. These risks can be predicted, avoided, or mitigated through assessment, adequate management, and monitoring. The project will consider all required mitigation measures in the implementation stage.

XIV. ANNEXES

Annex 1. ESF process for subproject development and implementation



Annex 2. Environmental Screening Form

Part 1. GENERAL INFORMATION

Sub project Name	
Estimated Cost	
Sub project Site	
Sub project Objectives	
Proposed Main Activities:	
Name of Evaluator/s	
Date of Field Appraisal	

Part 2. BRIEF DESCRIPTION OF THE PROPOSED ACTIVITIES

Provide information on the type and scale of the construction/rehabilitation activity (e.g., area, land required and approximate size of structures)

Provide information on the construction activities including support/ancillary structures and activities required to build them, e.g., need to quarry or excavate borrow materials, water source, access roads, etc. Describe how the construction/rehabilitation activities will be carried out. Include description of support/activities and resources required for the construction/rehabilitation.

Part 3. ENVIRONMENTAL BASELINE INFORMATION OF THE SUBPROJECT SITE BRIEF DESCRIPTION

Category of Baseline Information	Brief Description
GEOGRAPHICAL LOCATION ***** Name of the Area (District, T/A, Village) * Proposed location of the sub project (Include a site map)	
LAND RESOURCES * Topography and Geology of the area * Soils of the area * Main land uses and economic activities	
WATER RESOURCES * Surface water resources (e.g., rivers, lakes, etc.) quantity and quality * Ground water resources quantity and quality	
BIOLOGICAL RESOURCES * Flora (include threatened/endangered/endemic species) * Fauna (include hreatened/endangered/endemic species) * Sensitive habitats including protected areas e.g. nature reserves and forest reserves	
CLIMATE * Temperature * Rainfall	
SOCIAL * Number of people potentially impacted * Type and magnitude of impacts (i.e., impact on land, structures, crops, standard of living) * Socio-economic overview of persons impacted	

PART 4: SCREENING CRITERIA FOR IMPACTS DURING SUBPROJECT IMPLEMENTATION, AREAS OF IMPACTS AND IMPACTS EVALUATION AND POTENTIAL MITIGATION MEASURES

Screening Criteria for Environmental Impacts

Item	Areas of Impacts			Impacts Evaluation						Potential Mitigation Measures/ Remarks
	Is this subproject site/activity within and/or will it affect the following environmentally sensitive areas?			Extent or coverage (on site, within 3-5km or beyond 5km)			Significance (Low, Medium, High)			
		No	Yes	On Site	Within 3-5 km	Beyond 5 km	Low	Med ium	High	
1.0	Screening Criteria for Environmental Impacts									
1.1	National parks or game reserve									
1.2	Wetlands									
1.3	Productive traditional agricultural /grazing lands									
1.4	Areas with rare, endangered or other interest flora or fauna									
1.5	Areas with outstanding scenery/tourist site									

1.6	Within steep slopes									
1.7	Forested or near forest or will impact forest									
1.8	Along lakes, beach or river									
1.9	Near industrial activities									
1.10	Near cultural heritage sites									
1.11	Within prime surface run off									
1.12	Will the subproject discharge to or otherwise impact water bodies?									
2.0	Screening Criteria for Impacts during Implementation and Operation									
	Will the implementation and operation of the subproject within the selected site generate the following externalities/ costs/impacts?									
2.1	Deforestation									
2.2	Soil erosion and siltation									
2.3	Siltation of watercourses, dams									
2.4	Environmental degradation arising from mining of construction materials									
2.5	Damage to wildlife species and habitat									
2.6	Increased exposure of communities/ workers to agro-chemical pollutants									
2.7	Hazardous wastes (pipes, etc.)									
2.8	Nuisance - smell or noise									
2.9	Ground and surface water quality									
2.10	Increase in costs of water treatment									
2.11	Soil contamination									
2.12	Loss of soil fertility									
2.13	Salinization or alkalinisation of soils									
2.14	Reduced flow and availability of water									
2.15	Long term depletion of water resources									
2.16	Incidence of flooding									
3.0	Consultation (comments from beneficiaries and other project affected peoples)									

Summary: CHECKED AND CATEGORIZED AS (LOW, MODERATE, SUBSTANTIAL, HIGH)

Any sub-project annexes that include actions that are coincident with actions that are included in sub- project lists of excluded sub-projects for financing and that may have significant environmental or social risks will be disqualified. If the answer to one of the following questions is YES, then the application should be excluded.
Risk rating justification:

Annex 3. Social Screening Form

Sub-project Information

Sub-project name	
Procurement Plan Item No	
Type of sub-project	
Implementing authority/ies	
Location of sub-project (Neighborhood(s), District, Province)	
Brief Description of Subproject activities: (construction and operation/ implementation activities)	
Geographical coordinates of the Site:	
Area of land that will be used for the sub-project:	
Current Land use	
Land ownership	
Access routes to the Site	

Social Impacts on Communities

Will the subproject or its components cause any of the following impacts on nearby communities?

Impacts	Yes	No	Details
1. Health & Safety risks in nearby communities (major accident risks such as explosions, fires, toxic releases, etc.)			
2. Potential noise/vibration to nearby communities			
3. Potential damages to common property, roads, etc.			
4. Potential risks of traffic accidents			
5. Labor risks			
6. Other risks (please specify)			

Impacts on Land Use and Assets

	Activities	Yes	No	Notes
1	Acquisitions of land, buildings (residential and business)			If yes, provide more details
2	Acquisitions or expansion of the business, which will be implemented by the demolition/ relocation homeowners, renters, formal and informaluser assets			If yes, provide more details
3	Acquisition of assets, which will cause the loss of access of people or a particular community/group, especially ethnic minorities to: – Natural resources – The traditional habitat – The traditional activities – Communal utilities			If yes, provide more details
4	Acquisitions/or expansion of a business that can promote/ increase the risk of: – Violation of the labor code and laws including the useof child labor – Harassment of ethnic minority groups in the areas of project (related to their identity, dignity and livelihoods of the system of subsistence, cultural identity) – Human trafficking and forced labor			If yes, provide more details
5	Will there be land acquisition using eminent domain law?			If yes, provide more details
6	Will there be permanent or temporary loss of shelter and residential land due to land acquisition?			If yes, provide more details
7	Will there be permanent or temporary loss of agricultural and other productive assets due to land acquisition?			If yes, provide more details
8	Will there be losses of crops, trees, and fixed assets due to land acquisition?			If yes, provide more details
9	Will there be permanent or temporary loss of businesses or enterprises due to land acquisition?			If yes, provide more details
10	Will there be permanent or temporary loss of income sources and means of livelihoods due to land acquisition?			If yes, provide more details

11	If land or private property is purchased through negotiated settlement or willing buyer-willing seller, willit result in the permanent or temporary removal or displacement of renters, or leaseholders?			If yes, provide more details
12	If land or private property is purchased through negotiated settlement or willing buyer-willing seller, willit result in the permanent or temporary removal or displacement of informal land-users (people without legal rights on the land) or squatters?			If yes, provide more details
13	Will the project involve any permanent or temporary restrictions in land use or access to legally designated parks or protected areas and cause people or any community to lose access to natural resources, traditional habitats, communal land, or communal facilities?			If yes, provide more details
14	Will the project use government land or any public land or property, which will require the permanent or temporary removal of informal occupants or users (residential or economic)?			If yes, provide more details

Risks of exclusion/discrimination

	Impacts	Yes	No	Details
1	Have the potential beneficiaries/stakeholders been clearly defined and documented, including vulnerable groups?			
2	Are there specific risks related to gender, ethnicity, disability, or other factors that may impact access to project benefits?			
3	Are there different sub-groups within the affected population/stakeholders that may be at higher risk of exclusion or discrimination?			
	Are there any language barriers, lack of awareness, cultural biases or possible inadequate participation risks?			
4	Does the project address the needs and priorities of different groups within the affected population, such as women, young people, people with disabilities, and low-income groups?			
5	Are there mechanisms to address the concerns and needs of different stakeholder groups?			
6	Are there mechanisms in place to monitor the distribution of project benefits?			
7	Are there mechanisms to capture concerns of project beneficiaries?			

The Social Development Specialist confirms that the assigned land / proposed subproject:

☐ **Has Involuntary Resettlement (IR) impact, a Resettlement Action Plan is required**

☐ **Will not have IR impact**

Completed by (full name and contacts): _____

Signature: _____ **Date:** _____

Annex 4. Risk rating justification Form and WB Exclusion List

Risk rating justification:	
The risk category is **"High"**. Significant impact, exclude from financing The risk category is **"Significant".** Limited or temporary impact requiring significant mitigation, excluded from financing The risk category is **"Moderate".** Limited or temporary impact The risk category is **"Low".** No impact	Prep. By: Name and Signature: Designation: Date: Approved by: Name and Signature: Designation: Date:

Any sub-project annexes that include actions that are coincident with actions that are included in sub- project lists of excluded sub-projects for financing and that may have significant environmental or social risks will be disqualified. If the answer to one of the following questions is YES, then the application should be excluded.

Risk rating justification:

<u>Annex……. Exclusion List</u> defines the types of projects that WB does not finance

The WB does not finance the following projects:

- High risk subprojects that have negative environmental or social impacts that are irreversible, create cumulative impacts and/or cannot be adequately mitigated;
- Activities that may cause significant impacts on biodiversity and ecosystem services.
  Activities that may cause significant impacts on cultural heritage resources.
- Production or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements, or subject to international bans, such as pharmaceuticals, pesticides/herbicides, ozone depleting substances, PCB's, wildlife or products regulated under CITES.
- Production or trade in weapons and munitions.
- Production or trade in alcoholic beverages (excluding beer and wine).
- Production or trade in tobacco.
- Gambling, casinos and equivalent enterprises.
- Production or trade in radioactive materials. This does not apply to the purchase of medical equipment, quality control (measurement) equipment and any equipment where IFC considers the radioactive source to be trivial and/or adequately shielded.
- Production or trade in unbounded asbestos fibers. This does not apply to purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.
- Drift net fishing in the marine environment using nets in excess of 2.5 km. in length.
- Production or activities involving harmful or exploitative forms of forced labor[5]/harmful child labor[6].
- Production or trade in wood or other forestry products other than from sustainably managed forests.
- Production, trade, storage, or transport of significant volumes of hazardous chemicals, or commercial scale usage of hazardous chemicals. Hazardous chemicals include gasoline, kerosene, and other petroleum products.
- Trade in wildlife or production of, or trade in, wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Transboundary movements of waste prohibited under international law (Basel Convention).
- Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests.
- Thermal coal mining, coal-fired power and heating plants or Projects that are functionally related to coal.
- Water supply systems that will depend on the storage and operation of reservoirs controlled by existing dams / hydraulic structures.

A reasonableness test will be applied when the activities of the project company would have a significant development impact, but circumstances of the country require adjustment to the Exclusion List.

[5] Forced labor means all work or service, not voluntarily performed, that is extracted from an individual under threat of force or penalty.
[6] Harmful child labor means the employment of children that is economically exploitive, or is likely to be hazardous to, or to interfere with, the child's education, or to be harmful to the child's health, or physical, mental, spiritual, moral, or social development

Any subprojects that include activities that coincide with those included in the lists of excluded subprojects for financing and that which may have significant environmental and social risks will be disqualified. If the answer to one of the following questions is YES, the subproject application shall be excluded.

Below are the criteria for determining the risk rating.

High Risk. A proposed subproject is classified as High Risk after considering the following factors:
a) a project is likely to generate a wide range of significant adverse risks and impacts on human populations or the environment. This could be because of the complex nature or scale of a subproject, and/or the sensitivity of the location(s) of a project. This would take into account whether the potential E&S risks and impacts associated with a subproject have the majority or all of the following characteristics:
1. long term, permanent, and/or irreversible impacts that are impossible to avoid entirely due to the nature of a project;
2. high in magnitude and/or in spatial extent;
3. significant adverse cumulative impacts;
4. significant adverse transboundary impacts;
5. a high probability of significant adverse impacts to human health and/or the environment.
b) area likely to be affected is of high value and sensitivity, intensive or complex land acquisition and land use restriction, impacts on cultural heritage.
c) some of the significant adverse E&S risks and impacts of a project cannot be mitigated or specific mitigation measures require complex and/or unproven mitigation, compensatory measures or technology.

Substantial Risk. A proposed subproject is classified as Substantial Risk after considering the following factors:

a) a subproject may not be as complex as a High Risk project, the nature and scale of its E&S risks and impacts may be smaller and the location may not be in such a highly sensitive area, but some adverse risks and impacts may be significant. This would take into account whether the potential E&S risks and impacts have the majority or all of the following characteristics:

1. they are mostly temporary, predictable and/or reversible, and the nature of a project does not preclude the possibility of avoiding or reversing them;
2. here are concerns that the adverse social impacts of a project, and the associated mitigation measures, may give rise to a limited degree of social conflict, harm, or risks to human security;
3. 3. they are medium in magnitude and/or in spatial extent;
4. 4. the potential for cumulative and/or transboundary impacts may exist, but they are less severe and more readily avoided or mitigated than for High Risk projects; and
5. 5. there is medium to low probability of significant adverse impacts to human health and/or the environment, and there are known and reliable mechanisms available to prevent or minimize such incidents.

b) the effects of a project on areas of high value or sensitivity are expected to be lower than High Risk projects.
c) mitigation and/or compensatory measures may be designed more readily and be more reliable than those of High Risk projects.

Moderate Risk. A proposed subproject is classified as Moderate Risk after considering the following factors:
a) the potential adverse risks and impacts on human populations and/or the environment are not likely to be significant. This is because a project is not complex and/or large, does not involve activities that have a high potential for harming people or the environment, and is located away from environmentally or socially sensitive areas. As such, the potential E&S risks and impacts are likely to have the following characteristics:
1. predictable and expected to be temporary and/or reversible;
2. low in magnitude;
3. site-specific, without likelihood of impacts beyond the actual
footprint of a subproject;
4. low probability of significant adverse impacts to human health and/or the environment.
b) A project's E&S risks and impacts can be easily mitigated in a predictable manner.

Low Risk. A proposed project is classified as Low Risk if its potential adverse risks to and impact on human populations and/or the environment are likely to be minimal or negligible.

Annex 5. Indicative outline of ESIA

Environmental and social impact assessments for projects involving significant risk are focused on specific environmental issues raised by the sub-project. Its main purpose is to identify environmental impact and those measures that, if they are included in the project and in the implementation of the project, can ensure the minimization of negative environmental impacts. The volume and level of detail required in the analysis depends on the magnitude and severity of the potential impacts.

Where an environmental and social impact assessment is prepared as part of the environmental and social assessment, it will include the following:

Executive Summary

- Concisely discusses significant findings and recommended actions.

Legal and Institutional Framework

- Analyzes the legal and institutional framework for the project, within which the environmental and social assessment is carried out, including the issues set out in ESS1, paragraph 26[7];
- Compares the Borrower's existing environmental and social framework and the ESSs and identifies the gaps between them;
- Identifies and assesses the environmental and social requirements of any co-financiers.

Project Description

- Concisely describes the proposed project and its geographic, environmental, social, and temporal context, including any offsite investments that may be required (e.g., dedicated pipelines, access roads, power supply, water supply, housing, and raw material and product storage facilities), as well as the project's primary suppliers;
- Through consideration of the details of the project, indicates the need for any plan to meet the requirements of ESS1 through 10;
- Includes a map of sufficient detail, showing the project site and the area that may be affected by the project's direct, indirect, and cumulative impacts.

Baseline Data

- Sets out in detail the baseline data that is relevant to decisions about project location, design, operation, or mitigation measures. This should include a discussion of the accuracy, reliability, and sources of the data as well as information about dates surrounding project identification, planning and implementation;
- Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions;
- Based on current information, assesses the scope of the area to be studied and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences;
- Takes into account current and proposed development activities within the project area but not directly connected to the project.

Environmental and Social Risks and Impacts

- Takes into account all relevant environmental and social risks and impacts of the project. This will include the environmental and social risks and impacts specifically identified in ESS2, and any other environmental and social risks and impacts arising as a consequence of the specific nature and context of the project, including the risks and impacts identified in ESS1;
- Direct, indirect and cumulative impacts should be identified and assessed.

Mitigation Measures

- Identifies mitigation measures and significant residual negative impacts that cannot be mitigated and, to the extent possible, assesses the acceptability of those residual negative impacts;
- Identifies differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable;
- Assesses the feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of proposed mitigation measures, and their suitability under local conditions; and the institutional, training, and monitoring requirements for the proposed mitigation measures;
- Specifies issues that do not require further attention, providing the basis for this determination.

Analysis of Alternatives

- Systematically compares feasible alternatives to the proposed project site, technology, design, and operation—including the "without project" situation—in terms of their potential environmental and social impacts;
- Assesses the alternatives' feasibility of mitigating the environmental and social impacts; the capital and recurrent costs of alternative mitigation measures, and their suitability under local conditions; and the institutional, training, and monitoring requirements for the alternative mitigation measures;
- For each of the alternatives, quantifies the environmental and social impacts to the extent possible, and attaches economic values where feasible.

Design Measures

- Sets out the basis for selecting the particular project design proposed and specifies the applicable EHSGs or if the ESHGs are determined to be inapplicable, justifies recommended emission levels and approaches to pollution prevention and abatement that are consistent with GIIP.

Stakeholder Engagement and GRM

- Stakeholder Engagement Plan (SEP) identifies the various stakeholders and provides an approach for engaging with them throughout the project life cycle.
- GRM addresses all complaints and inquiries from citizens related to the project activities.

[7]ESS1, paragraph 26, states that the environmental and social assessment takes into account in an appropriate manner all issues relevant to the project, including: (a) the country's applicable policy framework, national laws and regulations, and institutional capabilities (including implementation) relating to environment and social issues; variations in country conditions and project context; country environmental or social studies; national environmental or social action plans; and obligations of the country directly applicable to the project under relevant international treaties and agreements; (b) applicable requirements under the ESSs; and (c) the EHSGs, and other relevant GIIP.

Appendices

- List of the individuals or organizations that prepared or contributed to the environmental and social assessment;
- References—setting out the written materials both published and unpublished, that have been used;
- Record of meetings, consultations and surveys with stakeholders, including those with affected people and other interested parties;
- The record specifies the means of such stakeholder engagement that were used to obtain the views of affected people and other interested parties;
- Tables presenting the relevant data referred to or summarized in the main text;
- List of associated reports or plan.

Annex 6. Environmental and Social Management Plan (ESMP)

General Remarks. If an ESIA is required, then the ESMP should be part of the ESIA. For small to medium size activities, an ESMP or ESMP checklist could be prepared. An Environmental and Social Management Plan (ESMP) should outline the mitigation, monitoring and administrative measures to be taken during project implementation to avoid or eliminate negative environmental and social impacts.

Description of the of the Environmental and Social Management Plan

The PIU will:

- identify the set of responses to potentially adverse impacts;
- determine requirements for ensuring that those responses are made effectively and in a timely manner; and
- describe the means for meeting those requirements.

Specifically, the ESMP's content will include:

Mitigation

(a) identifies and summarizes all anticipated significant adverse environmental and social impacts (including those involving indigenous people or involuntary resettlement); (b) describes--with technical details- -each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; (c) estimates any potential environmental and social impacts of these measures; and (d) provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

Monitoring

Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision and allows corrective action to be taken whenneeded. Therefore, the ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the ESMP. Specifically, the monitoring section of the ESMP provides(a) a specific description, andtechnical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; 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.

Capacity Development and Training

To support timely and effective implementation of environmental project components and mitigationmeasures, the ESMP draws on the EA's assessment of the existence, role, and capability of environmental units on site or at the agency and ministry level. If necessary, the ESMP recommends the establishment or expansion of such units, and the training of staff, to allow implementation of ESA recommendations. Specifically, the ESMP provides a specific description of institutional arrangements - who is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training). To strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics: (a) technical assistance programs, (b) procurement of equipment and supplies, and (c) organizational changes.

Implementation Schedule and Cost Estimates

For all three aspects (mitigation, monitoring, and capacity development), the ESMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the project cost tables.

Integration of ESMP with Project

The borrower's decision to proceed with a project, and the Bank's decision to support it, is predicated inpart on the expectation that the EMP will be executed effectively. Consequently, the Bank expects the plan to be specific in its description of the individual mitigation and monitoring measures and itsassignment of institutional responsibilities, and it must be integrated into the project's overall planning, design, budget, and implementation. Such integration is achieved by establishing the ESMPwithin the project so that the plan will receive funding and supervision along with the other components.

The Environmental and Social Management Plan format provided in **Form below.** It represents a model for development of an ESMP. The ESMP should cover the three phases of the project: construction, operation and decommissioning. For each phase, the preparation team identifies any significant environmental impacts that are anticipated based on the analysis done in the context of preparing an environmental assessment. For each impact, mitigation measures are to be identified andlisted. Estimates are made of the cost of mitigation actions broken down by estimates for installation(investment cost) and operation (recurrent cost). The EMP format also provides for the identificationof institutional responsibilities for "installation" and operation of mitigation devices and methods.

To keep track of the requirements, responsibilities and costs for monitoring the implementation of environmental mitigation identified in the analysis included in an environmental assessment a monitoring plan is necessary. A **Monitoring Plan format** is provided below and includes a row for baseline information that is critical to achieving reliable and credible monitoring. The key elements of the matrix are:

- What is being monitored?
- Where is monitoring done?
- How is the parameter to be monitored to ensure meaningful comparisons?
- When or how frequently is monitoring necessary or most effective?
- Why is the parameter being monitored (what does it tell us about environmental impact)?

In addition to these questions, it is necessary to identify the costs associated with monitoring (both investment and recurrent) and the institutional responsibilities.

When a monitoring plan is developed and put in place in the context of project implementation, the PIU will request reports at appropriate intervals and include the findings in its periodic reportingto the World Bank and make the findings available to Bank staff during supervision missions.

Format of Environmental and Social Management Plan

Phase	Environmental Impact	Mitigating measures	Cost		Institutional responsibility		Remarks
			Install	Operate	Install	Operate	
Construction							
Operation							
Decommissioning							

Format of Environmental monitoring plan

Phase	Which parameter should be controlled?	Where will parameter be tracked?	How will parameter be controlled?	When will parameter be controlled?	Why is this parameter controlled?	Cost		Institutional responsibility	
						Install	Work	Install	Work
Basic									
Construction									
Operation									
Decommissioning									

Annex 7. Environmental and Social Management Plan - Checklist (ESMP Checklist)

General Guidelines for Using the ESMP Checklist

These general guidelines are presented in abbreviated form and prepared for projects with low, moderate and significant risks of environmental and social impact. It is expected that the best practices provided in the manual will be applicable to the use of a checklist for ESMP for small construction.

The checklist type format was developed to provide “best practice examples” and is intended for the convenience of users and is compatible with the requirements of WB social and environmental framework.

The Environmental and Social Management Plan (ESMP) checklist type format attempts to cover typical core approaches to mitigate construction contracts with little local impact. It is generally accepted that this format provides key elements of a Socialand Environmental Management Plan (ESMP) or the Fundamentals of Environmental and Social Management (FESM) to meet the requirements of the World Bank's environmental and social assessment according to ESS1. The purpose of this checklist is that it will be applicable as a guide for small-scale contractors and will become an integral part of tender documentation for contractors performing minor construction work under projects funded by the Bank.

The checklist consists of four sections:

Part 1 includes a narrative part that describes the project and defines technical content of the project in terms of institutional and legislative aspects, potential need for capacity building program and description of public consultation process. This sectioncan contain up to two pages. Applications for additional information can be supplemented if necessary.

Part 2 includes a checklist of environmental and social audits where activities and potential environmental issues can be checked in a simple Yes / No format. If any specific activity / problem is caused by a “yes” check, a link is made to appropriate section in the following table, which contains clearly defined measures for management and mitigation.

Part 3 presents a plan for monitoring activities during construction and project implementation. It retains the same format as that required by the ESMP proposed in accordance with the Bank’s usual requirements for projects with significant risk. The purpose of this checklist is to ensure that part 2 and part 3 are included in the tender documentation for contractors whose valueis determined during the bidding process, and careful implementation is monitored during the implementation of work.

Content of ESMP checklist include next points:

A. General information on project and sub-projects/works
B. Environmental and social impact analysis
C. Mitigation measures
D. Monitoring plan

Part 1. Project Information (point A)

INSTITUTIONAL & ADMINISTRATIVE ARRANGEMENTS				
Country				
Project title				
Scope activity of project				
Institutional arrangements (names and contacts)	WB (Project Team Leader)	Project Management	Local Counterpart and/or Recipient	
Implementation arrangements (name and contacts)	Safeguard Supervision	Local Counterpart Supervision	Local Inspectorate Supervision	Contactor
SITE DESCRIPTION				
Name of site				
Describe site location			*Attachment 1*: Site Map [ ]Y / [ ]N	
Who owns the land?				
Geographic description				
LEGISLATION				
Identify national & locallegislation & permits that apply to project activity				
PUBLIC CONSULTATION				
Identify when / where thepublic consultation process took place				
INSTITUTIONAL CAPACITY BUILDING				
Will there be any capacity building? (Yes/No)	[ ], if Yes, *Attachment 2* includes the capacity building program			

Beneficiary: **Signature:** **Date:**

Part 2. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (point B) AND MITIGATION MANAGEMENT PLAN (point C) (CHECKLIST)

ENVIRONMENTAL /SOCIAL SCREENING				
Will the site activity include/involve any of the following:	**Activity**		**Status**	**Additional references**
	Building rehabilitation	[ ] Yes	[ ] No	See Section **B** below
	New construction	[ ] Yes	[ ] No	See Section **B** below
	Individual wastewater treatment system	[ ] Yes	[ ] No	See Section **C** below
	Historic building(s) and districts	[ ] Yes	[ ] No	See Section **D** below
	Acquisition of land or loss of assets	[ ] Yes	[ ] No	See Section **E** below
	Hazardous or toxic materials[8]	[ ] Yes	[ ] No	See Section **F** below
	Impacts on forests and/or protected areas	[ ] Yes	[ ] No	See Section **G** below
	Handling / management of medical waste	[ ] Yes	[ ] No	See Section **H** below
	Traffic and Pedestrian Safety	[ ] Yes	[ ] No	See Section **I** below
	Labor Conditions and OHS	[ ] Yes	[ ] No	See Section J below
	Occupational Health and Safety of Workers	[ ] Yes	[ ] No	See Section K below
	Community outreach and GRM	[ ] Yes	[ ] No	See Section L below
	Community health and safety	[ ] Yes	[ ] No	See Section M below

ACTIVITY	**PARAMETER**	**MITIGATION MEASURES CHECKLIST**
A. General Conditions	Notification and WorkerSafety	– The local construction and environment inspectorates and communities have been notified of upcomingactivities – The public has been notified of the works through appropriate notification in the media and/or at publiclyaccessible sites (including the site of the works) – All legally required permits have been acquired for construction and/or rehabilitation – All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboringresidents and environment. – Workers will comply with international good practice (always hardhats, as needed masks and safety glasses,harnesses and safety boots) – Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
B. General Rehabilitation and /or Construction Activities	Air Quality	– During interior demolition use debris-chutes above the first floor – Keep demolition debris in controlled area and spray with water mist to reduce debris dust – Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site – Keep surrounding environment (sidewalks, roads) free of debris to minimize dust There will be no open burning of construction / waste material at the site – There will be no excessive idling of construction vehicles at sites

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

	Noise	– Construction noise will be limited to restricted times agreed to in the permit – During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible
	Water Quality	– The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers.
	Waste management	– Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. – Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. – Construction waste will be collected and disposed properly by licensed collectors – The records of waste disposal will be maintained as proof for proper management as designed. – Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)
C. Individual wastewater treatment system	Water Quality	– The approach to handling sanitary wastes and wastewater from building sites (installation or reconstruction) must be approved by the local authorities – Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment – Monitoring of new wastewater systems (before/after) will be carried out
D. Historic building(s)	Cultural Heritage	– If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation – Ensure that provisions are put in place so that artifacts or other possible “chance finds” encountered in – excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.
E. Acquisition of land or loss of assets	Activity will not eligible	– If the activity will result in the taking of land resulting in: involuntary land acquisition or displacement of third parties using land; loss of assets or access to assets; or loss of income sources or means of livelihood, whether or not the affected persons must move to another location it will not be financed.
F. Toxic Materials	Asbestos management	– If asbestos is located on the project site, mark clearly as hazardous material – When possible the asbestos will be appropriately contained and sealed to minimize exposure – The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust – Asbestos will be handled and disposed by skilled & experienced professionals – If asbestos material is being stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately – The removed asbestos will not be reused
	Toxic / hazardous waste management	– Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information – The containers of hazardous substances should be placed in a leak-proof container to prevent spillage and leaching – The wastes are transported by specially licensed carriers and disposed in a licensed facility.
		– Paints with toxic ingredients or solvents or lead-based paints will not be used
G. Affects forests and/or protected areas	Protection	– All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. – For large trees in the vicinity of the activity, mark and cordon off with a fence large tress and protect root system and avoid any damage to the trees – Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include by not limited to hay bales, silt fences – There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.

H. Disposal of medical waste	Infrastructure for medical waste management	– In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to: – Special facilities for segregated healthcare waste (including soiled instruments “sharps”, and human tissue or fluids) from other waste disposal; and – Appropriate storage facilities for medical waste are in place; and – If the activity includes facility-based treatment, appropriate disposal options are in place and operational
I. Traffic and Pedestrian Safety	Direct or indirect hazards to public traffic and pedestrians by construction activity	– In compliance with national regulations the contractor will insure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to – Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards – Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. – Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement – Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public. – Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.
S. Labor Conditions	Child and Forced Labor, Working conditions, Worker GRM	Labor relations: The workers involved are considered to be the contractor's labor force and therefore the following requirements must be met: – Child labor (children under 18 years of age) to perform any type of work at the facility is completely prohibited; – The contractor signs contract with each worker, which will have rights and obligations with observance of labor norms, that is • 8-hour working day, and if it exceeds the set time, take into account extra-time with appropriate payment; • 40-hour work week; • 1 hour for lunch; – The Contractor shall sign with each worker a code of conduct consistent with international practice which should be followed, otherwise dismissal of workers and collection of proportionate financial penalties are possible; – Raise workers' awareness of the general principles of communication management with the local population;
		– Organize access of workers to toilets and areas for hand washing, which should be provided with hot and cold water, soap and a hand dryer in sufficient volume; – Develop a system for worker’s grievance redress. Living conditions: Given that planned work is short-term, unskilled workers should, whenever possible, be recruited from local communities, and women should be recruited to do light work. If local workers will be involved in the work, then there is no need to provide jobs for temporary residence, but there is need to providethem with adequate conditions (sleeping places, kitchen, showers, toilets, etc.). If workers from other regions or cities and villages who do not have their homes in the place of repair work willbe involved in the work, then the contractor must provide them with housing. Housing must be provided with thefollowing conditions: – Bedrooms with beds; – Kitchens with the ability to cook food, store food; – Sanitary conditions (shower or bath, toilet, place where clothes can be washed); – In the cold season - heating; – Central power supply.

T. Occupational Health and Safety of Workers	COVID prevention measures, safety measures	Health protection: – At the construction site, it is necessary to have a medical first aid kit for persons who have been injured. – Daily measurement of the temperature of employees before the start of work on the construction site. – Regular activities with all employees at the construction site regarding compliance with the requirements for COVID-19 prevention; Safety of employees: – Provide safety training prior to commencement of each type of work and regularly check safety compliance. – Provide special clothing (masks, gloves and safety glasses, for repair work also helmets and protective shoes), personal protective equipment, tools, materials; – Provide necessary equipment for high-altitude works (temporary fences, safety belts and ropes, etc.)
U. Community Outreach	Public relations and Grievance Redress Mechanism	– The contractor will appoint one of his employees as a contact person who is responsible for communication with the local community, as well as for receiving complaints / complaints from the local community. – The contractor is obliged to consult with local communities to resolve conflict situations between interested parties, including between workers and local communities. – Inform the nearby population about the repair schedule. Limit construction work at night. – Provide a Grievance Redress Mechanism for stakeholders and communicate information to them.
V. Community health and safety	Exposure to dangerous agrochemicals	– Prepare, consult and disclose the site-specific Pest Management Plans – Implement and report on information and education campaigns among farmers or their family members who perform manual labor in areas treated with pesticides, and can also face major exposure from direct spray, drift from neighboring fields, or by contact with pesticide residues on the crop or soil.

PART 3: MONITORING PLAN (point D)

Phase	**What** (Is the parameter to be monitored?)	**Where** (Is the parameter to bemonitored?)	**How** (Is the parameter tobe monitored?)	**When** (Define the frequency / or continuous?)	**Why?** (Is the parameterto be monitored?)	**Cost** (if not included in project budget)	**Who** (Is responsible for monitoring?)
During activity **preparation**							
During activity **implementation**							
During activity **supervision**							

Annex 8. Indicative Outline of Biodiversity Management Plan

Biodiversity Management Plan (BMP) is an implementation plan for conserving, restoration, and enhancement of biodiversity value. The BMP establishes the objectives and defines the management measures required to achieve the intended results.

1) Objectives of BMP

- The objective of this BMP is to reduce the impact of the Project activities on biodiversity at and surrounding the Project through,
- Identifying the key biodiversity issues that require control measures
- To study the existing anthropogenic stresses on the prevailing ecosystem
- Developing strategies to manage impacts on biodiversity and implementing those strategies
- Assigning responsibilities for impact monitoring and management
- Providing sufficient information to assist with auditing the implementation of the BMP; and
- Establishing a biodiversity monitoring program and management measures

2) Purpose of BMP

- Project activities can create negative outcomes on the ecological environment through which some of the areas as highly sensitive and highly valued ecological sites exhibiting a wide range of biodiversity. This BMP therefore,
- Outlines actions and measures necessary for the effective management of biodiversity along the route
- Covers identified impacts upon biodiversity
- Details specific control measures to be implemented
- Incorporates the requirements of the study findings, international standards, l legislation, and Project-specific permits conditions

3) Methodology

- The impact due to construction phase and operation phase of the project and its activities on the ecological parameters like natural vegetation, cropping pattern, fisheries and aquatic life, forests and species diversity. Ecological Impact Assessment considered the following stages:
- Identification of the likely zone of influence arising from the whole lifespan of the project; assessment of the ecological impacts of the project and definition of the significance of these impacts.
- Identification and evaluation of ecological resources and features likely to be affected. Identification of the biophysical changes likely to affect valued ecological resources and features;
- Assessment of whether these biophysical changes are likely to give rise to a significant ecological impact, defined as an impact on the integrity of a defined site or ecosystem.
- The conservation status of habitats or species within a given geographical area, including cumulative impacts.
- Refinement of the project to incorporate ecological enhancement measures, mitigation measures to avoid or reduce negative impacts, and compensation measures for any residual significant negative impacts.
- Provision for monitoring and following up the implementation and success of mitigation measures and ecological outcomes, including feedback in relation to predicted outcomes.

When describing changes/activities and impacts on ecosystem structure and function, reference will be made to the following parameters

- Magnitude of Impact
- Extent
- Duration
- Reversibility
- Timing and frequency

Annex 9. Grievance Form

A) GRM Form

<table>
<tr><td colspan="4">Number of the appeal and the date of filing (to be filled in by the responsible person who received thecomplaint):</td></tr>
<tr><td>Surname, first name:

Note: You can remain anonymous if you wish, or you can ask to keep your personally identifiable information private.</td><td colspan="3">I request not to disclose information that would allow my identification

I would like to make an appeal ANONYMOUSLY.</td></tr>
<tr><td rowspan="3">Contact info</td><td colspan="3">Address:</td></tr>
<tr><td colspan="3">Tel:</td></tr>
<tr><td colspan="3">E-mail:</td></tr>
<tr><td>How would you like us to contact you? Please check the box</td><td>By mail</td><td>By phone</td><td>By email</td></tr>
<tr><td colspan="4">Complaint content: (Please describe the complaint, indicate: who it happened to, when, where, and with what frequency). Make sure you include information that is important for a fuller understanding of the situation.</td></tr>
<tr><td colspan="4">What solution, if any, would you suggest to the complaint?</td></tr>
<tr><td colspan="4">Signature: _____</td></tr>
</table>

B) FORM OF GRM PROTOCOL

[grievance number: _____]
Date: __" _____" _____
Place: village _____, aiyl okmotu _____,
Agenda:

1. _____
2. _____
3. _____
4. _____

Decision on issue №:

1. _____
2. _____
3. _____
4. _____

Note: A short report on the results of the meeting is attached

Chairman: _____(signature)
Secretary: _____ (signature)

C) GRM Log Template

#	Brief description of the complaint	Name of the applicant	Date of registration of the complaint	Result of grievance review	Date the complaint was resolved	Applicant's signature

Annex 10. Asbestos Containing Material Management Plan (Example)

Applicability

The Asbestos Containing Material Management Plan (ACMMP) applies to all project construction or reconstruction sites and any related areas. Contractors employed by Project are legally responsible for their construction sites and related areas and must follow the provisions of the Project ACMMP within those locations. Specifically, this procedure must be used to ensure the safe handling, removal and disposal of any and all Asbestos Containing Materials (ACM) from those areas.

Immediate Action

- On discovering ACM on a Project site, the contractor must:
- Stop all work within a 5 m radius of the ACM and evacuate all personnel from this area;
- Delimit the 5 m radius with secure fencing posts, warning tape and easily visible signs warning of the presence of asbestos;
- If the site is in an inhabited area, place a security guard at the edge of the site with instructions to keep the general public away;
- Notify the RPCU's ESF Specialist and arrange an immediate site inspection.

Equipment

- To remove asbestos from a construction site, contractors must provide the following equipment:
- Warning tape, sturdy fence posts and warning notices;
- Shovels;
- Water supply and hose, fitted with a garden-type spray attachment;
- Bucket of water and rags;
- Sacks of clear, strong polythene that can be tied to close;
- Asbestos waste containers (empty, clean, sealable metal drums, clearly labelled as containing asbestos).
- Personal Protective Equipment (PPE)

All personnel involved in handling ACM must wear the following equipment, provided by the contractor:

- Disposable overalls fitted with a hood;
- Boots without laces;
- New, strong rubber gloves;
- A respirator is not normally required if there are only a few pieces of ACM in a small area, and if the ACM is damp;
- There must be no smoking, eating or drinking on a site containing ACM.

Decontamination Procedure 1: Removing small pieces of ACM

- Identify the location of all visible ACM and spray each lightly but thoroughly with water;
- Once the ACM is damp, pick up all visible ACM with shovels and place in a clear plastic bag;
- If ACM debris is partially buried in soil, remove it from the soil using a shovel and place it in the plastic bag;
- Insert a large label inside each plastic bag stating clearly that the contents contain asbestos and are dangerous to human health and must not be handled;
- Tie the plastic bags securely and place them into labelled asbestos waste containers (clean metal drums) and seal each drum;
- Soil that contained ACM debris must not be used for backfill and must instead be shovelled by hand into asbestos waste containers;
- At the end of the operation, clean all shovels and any other equipment with wet rags and place the rags into plastic disposal bags inside asbestos waste containers.

Decontamination Procedure 2: Removing ACM-contaminated backfill

- If soil containing ACM debris has inadvertently been used for backfill this must be sprayed lightly with water and shovelled out by hand to a depth of 300 mm and placed directly into asbestos waste containers (i.e. not stored temporarily beside the trench);
- Any ACM uncovered during the hand shovelling must be placed in a clear plastic bag;
- Once the trench has been re-excavated to 300 mm, if there is no visible ACM remaining, the trench may be refilled by excavator using imported clean topsoil.

Disposal

- ACM should be disposed of safely at a local hazardous-waste disposal site if available, or at the city municipal dumpsite after making prior arrangement for safe storage with the site operator.
- The Contractor must arrange for the disposal site operator to collect the sealed asbestos waste containers as soon as possible and store them undisturbed at the disposal site.
- At the end of construction Contractors must arrange for the disposal site operator to bury all ACM containers in a separate, suitably-sized pit, covered with a layer of clay that is at least 250 mm deep.

Personal Decontamination

- At the end of each day, all personnel involved in handling ACM must comply with the following decontamination procedure:
- At the end of the decontamination operation, clean the boots thoroughly with damp rags;
- Peel off the disposable overalls and plastic gloves so that they are inside-out and place them in a plastic sack with the rags used to clean the boots;
- If a disposable respirator has been used, place that in the plastic sack, seal the sack and place it in an asbestos waste container;
- All personnel should wash thoroughly before leaving the site, and the washing area must be cleaned with damp rags afterwards, which are placed in plastic sacks as above.

Clearance and Checking-Off

- The decontamination exercise must be supervised by site supervisors (engineering or environmental).
- After successful completion of the decontamination and disposal, the Contractor should visually inspect the area and sign-off the operation if the site has been cleaned satisfactorily.
- The contractor should send a copy of the completion notice to the PIU, with photographs of the operation in progress and the site on completion.

Training

- Environmental Specialist may hire the specialized companies to conduct training on ACCMP implementation for Contractors staff and PIU. The training will include a session focusing on ACM, which covered:
- Risks of contact with ACM;
- Responsibilities for dealing with ACM on project's construction sites;
- The Project's ACMMP and the Protocol for site clean-up;
- Awareness-raising for the contractors' workforce.

Cost estimate

Costs incurred by contractors in implementing the ACMMP are included in their budget in ESMP budget.

Annex 11. Occupational Health and Safety Plan (template)

The Occupational Health and Safety Plan (OHS Plan) applies to all project construction or reconstruction sites and any related areas. Contractors employed by Project are legally responsible for their construction sites and related areas and must follow the provisions of the Project OHS Plan within those locations.

An Occupational Health and Safety (OHS) Plan is a comprehensive approach aimed at ensuring the safety and health of employees within a working environment. The plan sets out processes and practices to help prevent injuries, illnesses, and fatalities on the job. Its emphasis is on proactive measures to identify and manage workplace hazards, thereby reducing risks.
Here's a structured approach to documenting an OHS plan for construction activities:

1. Introduction:
   - Purpose of the OHS plan.
   - Scope (covering which areas, departments, or activities).
   - Objectives and goals.
2. Policy Statement:
   - A formal statement by senior management outlining the organisation's commitment to health and safety.
3. Roles and Responsibilities:
   - Clearly define the responsibilities of everyone from senior management to individual employees.
   - Include any dedicated safety roles, like Safety Officers or Safety Committee members.
4. Hazard Identification and Risk Assessment:
   - Detailed procedure for identifying hazards.
   - Methodology for assessing the risks associated with those hazards.
5. Control Measures:
   - Procedures to eliminate or mitigate identified risks.
   - Hierarchy of control measures: elimination, substitution, engineering controls, administrative controls, and personal protective equipment (PPE).
6. Training and Education:
   - List of required training programs.
   - Schedule for regular training and refresher courses.
   - Procedure for documenting training and maintaining records.
7. Emergency Procedures:
   - Detailed plans for various emergency scenarios (e.g., fire, chemical spills, medical emergencies).
   - Evacuation routes and assembly points.
   - Contact details for emergency services.
8. Monitoring and Review:
   - Inspection schedules and procedures.
   - Health surveillance programs (if required).
   - Process for regular review of the OHS plan's effectiveness.
9. Incident Reporting and Investigation:
   - Procedures for reporting incidents, accidents, or near misses.
   - Steps for conducting investigations.
   - Corrective action processes.
10. Communication and Consultation:
    - Mechanisms for sharing safety-related information.
    - Procedures for addressing concerns or feedback from employees.
11. Documentation and Record Keeping:
    - List of essential safety records.
    - Procedures for maintaining, storing, and accessing these records.
12. Legal and Regulatory Compliance:
    - Reference to applicable laws, regulations, and standards.
    - Procedures to ensure ongoing compliance

Once the Occupational Health and Safety plan is documented, it should be shared throughout the organisation, ensuring all employees have access to it. Regularly review and update the document, especially after significant changes in operations, after incidents, or when new information becomes available.

Annex 12. COVID-19 World Bank ESF/SAFEGUARDS Interim Note

This note was issued on April 7, 2020 and includes links to the latest guidance as of this date (e.g. from WHO). Given the COVID-19 situation is rapidly evolving, when using this note it is important to check whether any updates to these external resources have been issued.

1. INTRODUCTION

The COVID-19 pandemic presents Governments with unprecedented challenges. Addressing COVID-19 related issues in both existing and new operations starts with recognizing that this is not business as usual and that circumstances require a highly adaptive responsive management design to avoid, minimize and manage what may be a rapidly evolving situation. In many cases, we will ask Borrowers to use reasonable efforts in the circumstances, recognizing that what may be possible today may be different next week (both positively, because more supplies and guidance may be available, and negatively, because the spread of the virus may have accelerated).

This interim note is intended to provide guidance to teams on how to support Borrowers in addressing key issues associated with COVID-19 and consolidates the advice that has already been provided over the past month. As such, it should be used in place of other guidance that has been provided to date. This note will be developed as the global situation and the Bank's learning (and that of others) develops. This is not a time when 'one size fits all'. More than ever, teams will need to work with Borrowers and projects to understand the activities being carried out and the risks that these activities may entail. Support will be needed in designing mitigation measures that are implementable in the context of the project. These measures will need to take into account capacity of the Government agencies, availability of supplies and the practical challenges of operations on-the-ground, including stakeholder engagement, supervision and monitoring. In many circumstances, communication itself may be challenging, where face-to-face meetings are restricted or prohibited, and where IT solutions are limited or unreliable.

This note emphasizes the importance of careful scenario planning, clear procedures and protocols, management systems, effective communication and coordination, and the need for high levels of responsiveness in a changing environment. It recommends assessing the current situation of the project, putting in place mitigation measures to avoid or minimize the chance of infection, and planning what to do if either project workers become infected or the work force includes workers from proximate communities affected by COVID-19. In many projects, measures to avoid or minimize will need to be implemented at the same time as dealing with sick workers and relations with the community, some of whom may also be ill or concerned about infection. Borrowers should understand the obligations that contractors have under their existing contracts (see Section 3), require contractors to put in place appropriate organizational structures (see Section 4) and develop procedures to address different aspects of COVID-19 (see Section 5).

2. CHALLENGES WITH CONSTRUCTION/CIVIL WORKS

Projects involving construction/civil works frequently involve a large work force, together with suppliers and supporting functions and services. The work force may comprise workers from international, national, regional, and local labor markets. They may need to live in on-site accommodation, lodge within communities close to work sites or return to their homes after work. There may be different contractors permanently present on site, carrying out different activities, each with their own dedicated workers. Supply chains may involve international, regional and national suppliers facilitating the regular flow of goods and services to the project (including supplies essential to the project such as fuel, food, and water). As such there will also be regular flow of parties entering and exiting the site; support services, such as catering, cleaning services, equipment, material and supply deliveries, and specialist sub-contractors, brought in to deliver specific elements of the works. Given the complexity and the concentrated number of workers, the potential for the spread of infectious disease in projects involving construction is extremely serious, as are the implications of such a spread. Projects may experience large numbers of the work force becoming ill, which will strain the project's health facilities, have implications for local emergency and health services and may jeopardize the progress of the construction work and the schedule of the project. Such impacts will be exacerbated where a work force is large and/or the project is in remote or under-serviced areas. In such circumstances, relationships with the community can be strained or difficult and conflict can arise, particularly if people feel they are being exposed to disease by the project or are having to compete for scarce resources. The project must also exercise appropriate precautions against introducing the infection to local communities.

3. DOES THE CONSTRUCTION CONTRACT COVER THIS SITUATION?

Given the unprecedented nature of the COVID-19 pandemic, it is unlikely that the existing construction/civil works contracts will cover all the things that a prudent contractor will need to do. Nevertheless, the first place for a Borrower to start is with the contract, determining what a contractor's existing obligations are, and how these relate to the current situation.

The obligations on health and safety will depend on what kind of contract exists (between the Borrower and the main contractor; between the main contractors and the sub-contractors). It will differ if the Borrower used the World Bank's standard procurement documents (SPDs) or used national bidding documents. If a FIDIC document has been used, there will be general provisions relating to health and safety. For example, the standard FIDIC, Conditions of Contract for Construction (Second Edition 2017), which contains no 'ESF enhancements', states (in the General Conditions, clause 6.7) that the Contractor will be required:

- to take all necessary precautions to maintain the health and safety of the Contractor's Personnel
- to appoint a health and safety officer at site, who will have the authority to issue directives for the purpose of maintaining the health and safety of all personnel authorized to enter and or work on the site and to take protective measures to prevent accidents
- to ensure, in collaboration with local health authorities, that medical staff, first aid facilities, sick bay, ambulance services and any other medical services specified are available at all times at the site and at any accommodation
- to ensure suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics

These requirements have been enhanced through the introduction of the ESF into the SPDs (edition dated July 2019). The general FIDIC clause referred to above has been strengthened to reflect the requirements of the ESF. Beyond FIDIC's general requirements discussed above, the Bank's Particular Conditions include a number of relevant requirements on the Contractor, including:

- to provide health and safety training for Contractor's Personnel (which include project workers and all personnel that the Contractor uses on site, including staff and other employees of the Contractor and Subcontractors and any other personnel assisting the Contractor in carrying out project activities)
- to put in place workplace processes for Contractor's Personnel to report work situations that are not safe or healthy

- gives Contractor's Personnel the right to report work situations which they believe are not safe or healthy, and to remove themselves from a work situation which they have a reasonable justification to believe presents an imminent and serious danger to their life or health (with no reprisal for reporting or removing themselves)
- requires measures to be in place to avoid or minimize the spread of diseases including measures to avoid or minimize the transmission of communicable diseases that may be associated with the influx of temporary or permanent contract-related labor
- to provide an easily accessible grievance mechanism to raise workplace concerns

Where the contract form used is FIDIC, the Borrower (as the Employer) will be represented by the Engineer (also referred to in this note as the Supervising Engineer). The Engineer will be authorized to exercise authority specifiedin or necessarily implied from the construction contract. In such cases, the Engineer (through its staff on site) will bethe interface between the PMU and the Contractor. It is important therefore to understand the scope of the Engineer's responsibilities. It is also important to recognize that in the case of infectious diseases such as COVID-19,project management – through the Contractor/subcontractor hierarchy – is only as effective as the weakest link. A thorough review of management procedures/plans as they will be implemented through the entire contractor hierarchy is important. Existing contracts provide the outline of this structure; they form the basis for the Borrowerto understand how proposed mitigation measures will be designed and how adaptive management will be implemented, and to start a conversation with the Contractor on measures to address COVID-19 in the project.

4. WHAT PLANNING SHOULD THE BORROWER BE DOING?

Task teams should work with Borrowers (PMUs) to confirm that projects (i) are taking adequate precautions to prevent or minimize an outbreak of COVID-19, and (ii) have identified what to do in the event of an outbreak. Suggestions on how to do this are set out below:

- The PMU, either directly or through the Supervising Engineer, should request details in writing from the main Contractor of the measures being taken to address the risks. As stated in Section 3, the construction contract should include health and safety requirements, and these can be used as the basis for identification of, and requirements to implement, COVID-19 specific measures. The measures may be presented as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures. The measures may be reflected in revisions to the project's health and safety manual. This request should be made in writing (following any relevant procedure set out in the contract between the Borrower and the contractor).
- In making the request, it may be helpful for the PMU to specify the areas that should be covered. This should include the items set out in Section 5 below and take into account current and relevant guidance provided by national authorities, WHO and other organizations. See the list of references in the Annex to this note.
- The PMU should require the Contractor to convene regular meetings with the project health and safety specialists and medical staff (and where appropriate the local health authorities), and to take their advice in designing and implementing the agreed measures.
- Where possible, a senior person should be identified as a focal point to deal with COVID-19 issues. This can be a work supervisor or a health and safety specialist. This person can be responsible for coordinating preparation of the site and making sure that the measures taken are communicated to the workers, those entering the site and the local community. It is also advisable to designate at least one back-up person; in case the focal point becomes ill; that person should be aware of the arrangements that are in place.
- On sites where there are a number of contractors and therefore (in effect) different work forces, the request should emphasize the importance of coordination and communication between the different parties. Where necessary, the PMU should request the main contractor to put in place a protocol for regular meetings of the different contractors, requiring each to appoint a designated staff member (with back up) to attend such meetings. If meetings cannot be held in person, they should be conducted using whatever
- IT is available. The effectiveness of mitigation measures will depend on the weakest implementation, and therefore it is important that all contractors and sub-contractors understand the risks and the procedure to be followed.
- The PMU, either directly or through the Supervising Engineer, may provide support to projects in identifying appropriate mitigation measures, particularly where these will involve interface with local services, in particular health and emergency services. In many cases, the PMU can play a valuable role in connecting project representatives with local Government agencies, and helping coordinate a strategic response, which takes into account the availability of resources. To be most effective, projects should consult and coordinate with relevant Government agencies and other projects in the vicinity.
- Workers should be encouraged to use the existing project grievance mechanism to report concerns relating to COVID-19, preparations being made by the project to address COVID-19 related issues, how procedures are being implemented, and concerns about the health of their co-workers and other staff.

5. WHAT SHOULD THE CONTRACTOR COVER?

The Contractor should identify measures to address the COVID-19 situation. What will be possible will depend on the context of the project: the location, existing project resources, availability of supplies, capacity of local emergency/health services, the extent to which the virus already exist in the area. A systematic approach to planning, recognizing the challenges associated with rapidly changing circumstances, will help the project put in place the best measures possible to address the situation. As discussed above, measures to address COVID-19 may be presented in different ways (as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures). PMUs and contractors should refer to guidance issued by relevantauthorities, both national and international (e.g. WHO), which is regularly updated (see sample References and links provided in the Annex 10).

Addressing COVID-19 at a project site goes beyond occupational health and safety, and is a broader project issue which will require the involvement of different members of a project management team. In many cases, the most effective approach will be to establish procedures to address the issues, and then to ensure that these procedures are implemented systematically. Where appropriate given the project context, a designated team should beestablished to address COVID-19 issues, including PMU representatives, the Supervising Engineer, management (e.g. the project manager) of the contractor and sub-contractors, security, and medical and OHS professionals. Procedures should be clear and straightforward, improved as necessary, and supervised and monitored by the COVID-19 focal point(s). Procedures should be documented, distributed to all contractors, and discussed at regular meetings to facilitate adaptive management. The issues set out below include a number that represent expected good workplace management but are especially pertinent in preparing the project response to COVID-19.

(a) ASSESSING WORKFORCE CHARACTERISTICS

Many construction sites will have a mix of workers e.g. workers from the local communities; workers from a different part of the country; workers from another country. Workers will be employed under different terms andconditions and be accommodated in different ways. Assessing these different aspects of the workforce will help inidentifying appropriate mitigation measures:

- The Contractor should prepare a detailed profile of the project work force, key work activities, schedule for carrying out such activities, different durations of contract and rotations (e.g. 4 weeks on, 4 weeks off).
- This should include a breakdown of workers who reside at home (i.e. workers from the community), workers who lodge within the local community and workers in on-site accommodation. Where possible, it should also identify workers that may be more at risk from COVID-19, those with underlying health issues or who may be otherwise at risk.
- Consideration should be given to ways in which to minimize movement in and out of site. This could include lengthening the term of existing contracts, to avoid workers returning home to affected areas, or returning to site from affected areas.
- Workers accommodated on site should be required to minimize contact with people near the site, and in certaincases be prohibited from leaving the site for the duration of their contract, so that contact with local communities is avoided.
- Consideration should be given to requiring workers lodging in the local community to move to site accommodation (subject to availability) where they would be subject to the same restrictions.
- Workers from local communities, who return home daily, weekly or monthly, will be more difficult to manage.They should be subject to health checks at entry to the site (as set out above) and at some point, circumstancesmay make it necessary to require them to either use accommodation on site or not to come to work.

(b) ENTRY/EXIT TO THE WORK SITE AND CHECKS ON COMMENCEMENT OF WORK

Entry/exit to the work site should be controlled and documented for both workers and other parties, includingsupport staff and suppliers. Possible measures may include:

Establishing a system for controlling entry/exit to the site, securing the boundaries of the site, and establishingdesignating entry/exit points (if they do not already exist). Entry/exit to the site should be documented.

- Training security staff on the (enhanced) system that has been put in place for securing the site and controllingentry and exit, the behaviors required of them in enforcing such system and any COVID 19 specific considerations.
- Training staff who will be monitoring entry to the site, providing them with the resources they need to documententry of workers, conducting temperature checks and recording details of any worker that is denied entry.
- Confirming that workers are fit for work before they enter the site or start work. While procedures should already be in place for this, special attention should be paid to workers with underlying health issues or who may be otherwise at risk. Consideration should be given to demobilization of staff with underlying health issues.
- Checking and recording temperatures of workers and other people entering the site or requiring self-reportingprior to or on entering the site.
- Providing daily briefings to workers prior to commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene and distancing measures, using demonstrations and participatory methods.
- During the daily briefings, reminding workers to self-monitor for possible symptoms (fever, cough) and to reportto their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell.
- Preventing a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or (if that is not possible) isolating such worker for 14 days.
- Preventing a sick worker from entering the site, referring them to local health facilities if necessary or requiringthem to isolate at home for 14 days.

(c) GENERAL HYGIENE

Requirements on general hygiene should be communicated and monitored, to include:

- Training workers and staff on site on the signs and symptoms of COVID-19, how it is spread, how to protect themselves (including regular handwashing and social distancing) and what to do if they or other people have symptoms (for further information see WHO COVID-19 advice for the public).
- Placing posters and signs around the site, with images and text in local languages.
- Ensuring handwashing facilities supplied with soap, disposable paper towels and closed waste bins exist at keyplaces throughout site, including at entrances/exits to work areas; where there is a toilet, canteen or food distribution, or provision of drinking water; in worker accommodation; at waste stations; at stores; and in common spaces. Where handwashing facilities do not exist or are not adequate, arrangements should be madeto set them up. Alcohol based sanitizer (if available, 60-95% alcohol) can also be used.
- Review worker accommodations, and assess them in light of the requirements set out in IFC/EBRD guidance on Workers' Accommodation: processes and standards, which provides valuable guidance as to good practice for accommodation.
- Setting aside part of worker accommodation for precautionary self-quarantine as well as more formal isolationof staff who may be infected (see paragraph (f)).

(d) CLEANING AND WASTE DISPOSAL

Conduct regular and thorough cleaning of all site facilities, including offices, accommodation, canteens, common spaces. Review cleaning protocols for key construction equipment (particularly if it is being operated by different workers). This should include:

- Providing cleaning staff with adequate cleaning equipment, materials and disinfectant.
- Review general cleaning systems, training cleaning staff on appropriate cleaning procedures and appropriate frequency in high use or high-risk areas.
- Where it is anticipated that cleaners will be required to clean areas that have been or are suspected to have been contaminated with COVID-19, providing them with appropriate PPE: gowns or aprons, gloves, eyeprotection (masks, goggles or face screens) and boots or closed work shoes. If appropriate PPE is not available,cleaners should be provided with best available alternatives.
- Training cleaners in proper hygiene (including handwashing) prior to, during and after conducting cleaning activities; how to safely use PPE (where required); in waste control (including for used PPE and cleaning materials).
- Any medical waste produced during the care of ill workers should be collected safely in designated containers or bags and treated and disposed of following relevant requirements (e.g., national, WHO). If open burning andincineration of medical wastes is necessary, this should be for as limited a duration as possible. Waste should be reduced and segregated, so that only the smallest amount of waste is incinerated (for further information see WHO interim guidance on water, sanitation and waste management for COVID-19).

(e) ADJUSTING WORK PRACTICES

Consider changes to work processes and timings to reduce or minimize contact between workers, recognizing thatthis is likely to impact the project schedule. Such measures could include:

- Decreasing the size of work teams.
- Limiting the number of workers on site at any one time.
- Changing to a 24-hour work rotation.
- Adapting or redesigning work processes for specific work activities and tasks to enable social distancing, and training workers on these processes.
- Continuing with the usual safety trainings, adding COVID-19 specific considerations. Training should include proper use of normal PPE. While as of the date of this note, general advice is that construction workers do not require COVID-19 specific PPE, this should be kept under review (for further information see WHO interim guidance on rational use of personal protective equipment (PPE) for COVID-19).
- Reviewing work methods to reduce use of construction PPE, in case supplies become scarce or the PPE is neededfor medical workers or cleaners. This could include, e.g. trying to reduce the need for dust masks by checking that water sprinkling systems are in good working order and are maintained or reducing the speed limit for haultrucks.
- Arranging (where possible) for work breaks to be taken in outdoor areas within the site.
- Consider changing canteen layouts and phasing mealtimes to allow for social distancing and phasing access to and/or temporarily restricting access to leisure facilities that may exist on site, including gyms.
- At some point, it may be necessary to review the overall project schedule, to assess the extent to which it needsto be adjusted (or work stopped completely) to reflect prudent work practices, potential exposure of both workers and the community and availability of supplies, taking into account Government advice and instructions.

(f) PROJECT MEDICAL SERVICES

Consider whether existing project medical services are adequate, taking into account existing infrastructure (size ofclinic/medical post, number of beds, isolation facilities), medical staff, equipment and supplies, procedures and training. Where these are not adequate, consider upgrading services where possible, including:

- Expanding medical infrastructure and preparing areas where patients can be isolated. Guidance on setting up isolation facilities is set out in WHO interim guidance on considerations for quarantine of individuals in the context of containment for COVID-19). Isolation facilities should be located away from worker accommodationand ongoing work activities. Where possible, workers should be provided with a single well-ventilated room (open windows and door). Where this is not possible, isolation facilities should allow at least 1 meter between workers in the same room, separating workers with curtains, if possible. Sick workers should limit their movements, avoiding common areas and facilities and not be allowed visitors until they have been clear of symptoms for 14 days. If they need to use common areas and facilities (e.g. kitchens or canteens), they should only do so when unaffected workers are not present and the area/facilities should be cleaned prior to and after such use.
- Training medical staff, which should include current WHO advice on COVID-19 and recommendations on the specifics of COVID-19. Where COVID-19 infection is suspected, medical providers on site should follow WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected.
- Training medical staff in testing, if testing is available.
- Assessing the current stock of equipment, supplies and medicines on site, and obtaining additional stock, where required and possible. This could include medical PPE, such as gowns, aprons, medical masks, gloves, and eye protection. Refer to WHO guidance as to what is advised (for further information see WHO interim guidance onrational use of personal protective equipment (PPE) for COVID-19).
- If PPE items are unavailable due to world-wide shortages, medical staff on the project should agree on alternatives and try to procure them. Alternatives that may commonly be found on constructions sites include dust masks, construction gloves and eye goggles. While these items are not recommended, they should be usedas a last resort if no medical PPE is available.
- Ventilators will not normally be available on work sites, and in any event, intubation should only be conductedby experienced medical staff. If a worker is extremely ill and unable to breathe properly on his or her own, theyshould be referred immediately to the local hospital (see (g) below).
- Review existing methods for dealing with medical waste, including systems for storage and disposal (for furtherinformation see WHO interim guidance on water, sanitation and waste management for COVID-19, and WHO guidance on safe management of wastes from health-care activities).

(g) LOCAL MEDICAL AND OTHER SERVICES

Given the limited scope of project medical services, the project may need to refer sick workers to local medicalservices. Preparation for this includes:

- Obtaining information as to the resources and capacity of local medical services (e.g. number of beds, availabilityof trained staff and essential supplies).
- Conducting preliminary discussions with specific medical facilities, to agree what should be done in the event of ill workers needing to be referred.
- Considering ways in which the project may be able to support local medical services in preparing for members of the community becoming ill, recognizing that the elderly or those with pre-existing medical conditions requireadditional support to access appropriate treatment if they become ill.
- Clarifying the way in which an ill worker will be transported to the medical facility, and checking availability of such transportation.
- Establishing an agreed protocol for communications with local emergency/medical services.
- Agreeing with the local medical services/specific medical facilities the scope of services to be provided, the procedure for in-take of patients and (where relevant) any costs or payments that may be involved.
- A procedure should also be prepared so that project management knows what to do in the unfortunate event that a worker ill with COVID-19 dies. While normal project procedures will continue to apply, COVID-19 may raise other issues because of the infectious nature of the disease. The project should liaise with the relevant local authorities to coordinate what should be done, including any reporting or other requirements under national law.

(h) INSTANCES OR SPREAD OF THE VIRUS

WHO provides detailed advice on what should be done to treat a person who becomes sick or displays symptoms that could be associated with the COVID-19 virus (for further information see WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected). The project shouldset out risk-based procedures to be followed, with differentiated approaches based on case severity (mild, moderate, severe, critical) and risk factors (such as age, hypertension, diabetes) (for further information see WHO interim guidance on operational considerations for case management of COVID-19 in health facility and community). These may include the following:

- If a worker has symptoms of COVID-19 (e.g. fever, dry cough, fatigue) the worker should be removed immediately from work activities and isolated on site.
- If testing is available on site, the worker should be tested on site. If a test is not available at site, the worker should be transported to the local health facilities to be tested (if testing is available).
- If the test is positive for COVID-19 or no testing is available, the worker should continue to be isolated. This willeither be at the work site or at home. If at home, the worker should be transported to their home in transportation provided by the project.
- Extensive cleaning procedures with high-alcohol content disinfectant should be undertaken in the area where the worker was present, prior to any further work being undertaken in that area. Tools used by the worker should be cleaned using disinfectant and PPE disposed of.
- Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, andbe required to quarantine themselves for 14 days, even if they have no symptoms.
- Family and other close contacts of the worker should be required to quarantine themselves for 14 days, evenif they have no symptoms.
- If a case of COVID-19 is confirmed in a worker on the site, visitors should be restricted from entering the site and worker groups should be isolated from each other as much as possible.
- If workers live at home and has a family member who has a confirmed or suspected case of COVID19, the workershould quarantine themselves and not be allowed on the project site for 14 days, even if they have no symptoms.
- Workers should continue to be paid throughout periods of illness, isolation or quarantine, or if they are requiredto stop work, in accordance with national law.
- Medical care (whether on site or in a local hospital or clinic) required by a worker should be paid for by the employer.

(i) CONTINUITY OF SUPPLIES AND PROJECT ACTIVITIES

Where COVID-19 occurs, either in the project site or the community, access to the project site may be restricted,and movement of supplies may be affected.

- Identify back-up individuals, in case key people within the project management team (PMU, Supervising Engineer, Contractor, sub-contractors) become ill, and communicate who these are so that people are aware ofthe arrangements that have been put in place.
- Document procedures, so that people know what they are, and are not reliant on one person's knowledge.
- Understand the supply chain for necessary supplies of energy, water, food, medical supplies and cleaning equipment, consider how it could be impacted, and what alternatives are available. Early pro-active review of international, regional and national supply chains, especially for those supplies that are critical for the project, is important (e.g. fuel, food, medical, cleaning and other essential supplies). Planning for a 1-2-month interruption of critical goods may be appropriate for projects in more remote areas.
- Place orders for/procure critical supplies. If not available, consider alternatives (where feasible).
- Consider existing security arrangements, and whether these will be adequate in the event of interruption to normal project operations.
- Consider at what point it may become necessary for the project to significantly reduce activities or to stop workcompletely, and what should be done to prepare for this, and to re-start work when it becomes possible or feasible.

(j) TRAINING AND COMMUNICATION WITH WORKERS

Workers need to be provided with regular opportunities to understand their situation, and how they can best protect themselves, their families and the community. They should be made aware of the procedures that havebeen put in place by the project, and their own responsibilities in implementing them.

- It is important to be aware that in communities close to the site and amongst workers without access to projectmanagement, social media is likely to be a major source of information. This raises the importance of regular information and engagement with workers (e.g. through training, town halls, toolboxes) that emphasizes whatmanagement is doing to deal with the risks of COVID-19. Allaying fear is an important aspect of work force peace of mind and business continuity. Workers should be given an opportunity to ask questions, express their concerns, and make suggestions.
- Training of workers should be conducted regularly, as discussed in the sections above, providing workers with a clear understanding of how they are expected to behave and carry out their work duties.
- Training should address issues of discrimination or prejudice if a worker becomes ill and provide an understanding of the trajectory of the virus, where workers return to work.
- Training should cover all issues that would normally be required on the work site, including use of safety procedures, use of construction PPE, occupational health and safety issues, and code of conduct, taking into account that work practices may have been adjusted.
- Communications should be clear, based on fact and designed to be easily understood by workers, for exampleby displaying posters on handwashing and social distancing, and what to do if a worker displays symptoms.

(k) COMMUNICATION AND CONTACT WITH THE COMMUNITY

Relations with the community should be carefully managed, with a focus on measures that are being implementedto safeguard both workers and the community. The community may be concerned about the presence of non-localworkers, or the risks posed to the community by local worker's presence on the project site. The project should set out risk-based procedures to be followed , which may reflect WHO guidance (for further information see WHO RiskCommunication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response).The following good practice should be considered:

- Communications should be clear, regular, based on fact and designed to be easily understood by community members.
- Communications should utilize available means. In most cases, face-to-face meetings with the community or community representatives will not be possible. Other forms of communication should be used; posters, pamphlets, radio, text message,

electronic meetings. The means used should take into account the ability of different members of the community to access them, to make sure that communication reaches these groups.

- The community should be made aware of procedures put in place at site to address issues related to COVID-19.This should include all measures being implemented to limit or prohibit contact between workers and the community. These need to be communicated clearly, as some measures will have financial implications for thecommunity (e.g. if workers are paying for lodging or using local facilities). The community should be made aware of the procedure for entry/exit to the site, the training being given to workers and the procedure that will be followed by the project if a worker becomes sick.
- If project representatives, contractors or workers are interacting with the community, they should practice social distancing and follow other COVID-19 guidance issued by relevant authorities, both national and international (e.g. WHO).

6. EMERGENCY POWERS AND LEGISLATION

Many Borrowers are enacting emergency legislation. The scope of such legislation, and the way it interacts with other legal requirements, will vary from country to country. Such legislation can cover a range of issues, for example:

- Declaring a public health emergency
- Authorizing the use of police or military in certain activities (e.g. enforcing curfews or restrictions onmovement)
- Ordering certain categories of employees to work longer hours, not to take holiday or not to leave their job (e.g.health workers)
- Ordering non-essential workers to stay at home, for reduced pay or compulsory holiday

Except in exceptional circumstances (after referral to the World Bank's Operations Environmental and Social ReviewCommittee (OESRC)), projects will need to follow emergency legislation to the extent that these are mandatory or advisable. It is important that the Borrower understands how mandatory requirements of the legislation will impactthe project. Teams should require Borrowers (and in turn, Borrowers should request Contractors) to consider how the emergency legislation will impact the obligations of the Borrower set out in the legal agreement and the obligations set out in the construction contracts. Where the legislation requires a material departure from existing contractual obligations, this should be documented, setting out the relevant provisions.

Resource List: COVID-19 Guidance

Given the COVID-19 situation is rapidly evolving, a version of this resource list will be regularly updated and madeavailable on the World Bank COVID-19 operations intranet page (http://covidoperations/).

WHO Guidance Advice for the public

- WHO advice for the public, including on social distancing, respiratory hygiene, self-quarantine, and seeking medical advice, can be consulted on this WHO website: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public

Technical guidance

- Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected, issued on March 19, 2020
- Recommendations to Member States to Improve Hygiene Practices, issued on April 1, 2020
- Severe Acute Respiratory Infections Treatment Center, issued on March 28, 2020
- Infection prevention and control at health care facilities (with a focus on settings with limited resources), issued in 2018
- Laboratory biosafety guidance related to coronavirus disease 2019 (COVID-19), issued on March 18, 2020
- Laboratory Biosafety Manual, 3rd edition, issued in 2014
- Laboratory testing for COVID-19, including specimen collection and shipment, issued on March 19, 2020
- Prioritized Laboratory Testing Strategy According to 4Cs Transmission Scenarios, issued on March 21, 2020
- Infection Prevention and Control for the safe management of a dead body in the context of COVID-19, issued on March 24, 2020
- Key considerations for repatriation and quarantine of travelers in relation to the outbreak COVID-19, issued on February 11, 2020
- Preparedness, prevention and control of COVID-19 for refugees and migrants in non-camp settings, issued on April 17, 2020
- Coronavirus disease (COVID-19) outbreak: rights, roles and responsibilities of health workers, including key considerations for occupational safety and health, issued on March 18, 2020
- Oxygen sources and distribution for COVID-19 treatment centers, issued on April 4, 2020
- Risk Communication and Community Engagement (RCCE) Action Plan Guidance COVID-19 Preparedness and Response, issued on March 16, 2020
- Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19), issued on March 19, 2020
- Operational considerations for case management of COVID-19 in health facility and community, issued on March 19, 2020
- Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19), issued on February 27, 2020
- Getting your workplace ready for COVID-19, issued on March 19, 2020
- Water, sanitation, hygiene and waste management for COVID-19, issued on March 19, 2020
- Safe management of wastes from health-care activities, issued in 2014
- Advice on the use of masks in the community, during home care and in healthcare settings in the context of the novel coronavirus (COVID-19) outbreak, issued on March 19, 2020
- Disability Considerations during the COVID-19 outbreak, issued on March 26, 2020

WORLD BANK GROUP GUIDANCE

- Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings, issued on March 20, 2020

- Technical Note: Use of Military Forces to Assist in COVID-19 Operations, issued on March 25, 2020
- ESF/Safeguards Interim Note: COVID-19 Considerations in Construction/Civil Works Projects, issued on April 7, 2020
- Technical Note on SEA/H for HNP COVID Response Operations, issued in March 2020
- Interim Advice for IFC Clients on Preventing and Managing Health Risks of COVID-19 in the Workplace, issued on April 6, 2020
- Interim Advice for IFC Clients on Supporting Workers in the Context of COVID-19, issued on April 6, 2020
- IFC Tip Sheet for Company Leadership on Crisis Response: Facing the COVID-19 Pandemic, issued on April 6, 2020
- WBG EHS Guidelines for Healthcare Facilities, issued on April 30, 2007

ILO GUIDANCE

- ILO Standards and COVID-19 FAQ, issued on March 23, 2020 (provides a compilation of answers to most frequently asked questions related to international labor standards and COVID-19)

MFI GUIDANCE

- ADB Managing Infectious Medical Waste during the COVID-19 Pandemic
- IDB Invest Guidance for Infrastructure Projects on COVID-19: A Rapid Risk Profile and Decision Framework
- KfW DEG COVID-19 Guidance for employers, issued on March 31, 2020
- CDC Group COVID-19 Guidance for Employers, issued on March 23, 2020

Annex 13. Minutes of Public Consultations (Will be added)