**THE KYRGYZ REPUBLIC**

**RESILAND CA+: Kyrgyz Republic: Resilient Landscape Restoration Project (RESILAND)**

**SUBCOMPONENT 2.2. - RESTORING DOWNSTREAM LANDSCAPES WITH CLIMATE-RESILIENT NATURAL AND GRAY (CONVENTIONAL) SOLUTIONS**

**Terms of reference**

**Design and survey work and expertise (Feasibility Study Detailed Design and Estimate Documentation, and author's supervision)**

## **BACKGROUND**

The drylands in Central Asia are among the most rapidly degraded and climatically vulnerable areas in the world. The combination of natural arid conditions and increasing anthropogenic pressures, such as land conversion to intensified commercial agriculture, logging and grazing, has led to land degradation, deforestation, erosion, loss of vegetation cover and loss of biodiversity. This, in turn, has affected agricultural productivity, the sustainability of infrastructure and the potential for tourism development, while increasing the fragility of the region. The region is increasingly exposed to intense weather events and natural disasters, which further degrade landscapes, human living conditions, economic opportunities and infrastructure. Moreover, in Central Asia, land degradation is a crucial factor in migration in search of livelihoods. The effects of climate change are expected to worsen the state of countries' natural resources and the overall sustainability of their populations and ecosystems. Glaciers in Central Asia, which account for 10 percent of the annual river flow in the Amu Darya and Syr Darya basins, have already decreased by one third in volume since the beginning of the 20th century. The melting of glaciers and snow cover in upstream countries due to climate change will lead to an increase in mudflows, floods and the risk of glacial lakes breaking through (glacial lake outburst flood, GLOF), which will affect countries both in the upper and lower reaches of rivers.

The geography of the Kyrgyz Republic makes its territory highly prone to natural disasters. On average, 200 natural disasters occur in the country every year, including avalanches, earthquakes, floods, mudslides, landslides and droughts.

Land degradation, mountainous terrain and the effects of climate change make the country particularly vulnerable to mudslides, which further degrade its landscapes and affect communities and infrastructure. The combination of depleted lands, topography and unfavorable climatic conditions, especially heavy rainfall after prolonged periods of drought and rapid melting of glaciers and snow, led to 920 mudflows in 2010-2022, accounting for 35 percent of all natural disasters in the country.

Every year, mudflows affect an average of 17,000 people, costing the economy US $38 million. Mudflows eroded soils, destroyed vegetation, destroyed infrastructure, homes, agricultural activities and other economic assets, and threatened the lives and livelihoods of downstream populations. The effects of climate change are projected to increase the frequency and intensity of mudflows by 5-15 percent by 2050.

The World Bank's Program for the Resilient Landscape Restoration in Central Asia was established in 2019 with the aim of providing Central Asian countries with a regional framework to enhance the sustainability of regional landscapes and people through landscape restoration. This umbrella program funds landscape restoration analytics and consulting, as well as supports investment projects in Central Asian countries, namely, the Sustainable Landscape Restoration Project of Uzbekistan and the Sustainable Landscape Restoration Project of Tajikistan, united by a regional exchange platform for high–level dialogue on landscape restoration. The collective, harmonized and regional approach of the RESILAND CA+ program, in which common goals of regional cooperation are achieved through country-level interaction, is considered the most effective method of landscape restoration; at the same time, common border areas are hotspots of land degradation, deforestation and poverty, which makes national approaches less effective. The program also corresponds to the regional vision of solving the problem of degradation of regional public goods by working together within one region.

The project " Resilient Landscape Restoration in the Kyrgyz Republic" (hereinafter KG RESILAND) will apply green, NBS and grey solutions in increasing resilience of communities and landscapes against climate induced disasters, particularly mudflows and floods. The project is aimed at increasing the area in the Kyrgyz Republic where sustainable landscape management is carried out, and will promote cooperation between the Kyrgyz Republic and other Central Asian countries in the field of restoration of transboundary landscapes, and also to increase the potential and create a favorable environment for relevant organizations of the Kyrgyz Republic dealing with effective and sustainable monitoring of mudflows and glaciers in order to reduce their short-term long-term impact on livelihoods and land depletion.

The activities of Component 2 - Improving the sustainability of landscapes and livelihoods of the KG RESILAND project include activities aimed at carrying out works that include a combination of climate-resistant green solutions for landscaping and combating soil erosion upstream (slopes and gulleys stabilization, sediment and debris control systems, and other nature-based solutions, NBS, applied on mountain slopes) and gray solutions (embankments, or levees, riverbank protection structures, and other protective structures along rivers and flood plains most affected by mudslides, in addition to modernizing the country's soil erosion, mudflow, glacier and GLOF monitoring system to ensure more informed decisions are made to mitigate the impact of mudslides in the long term.

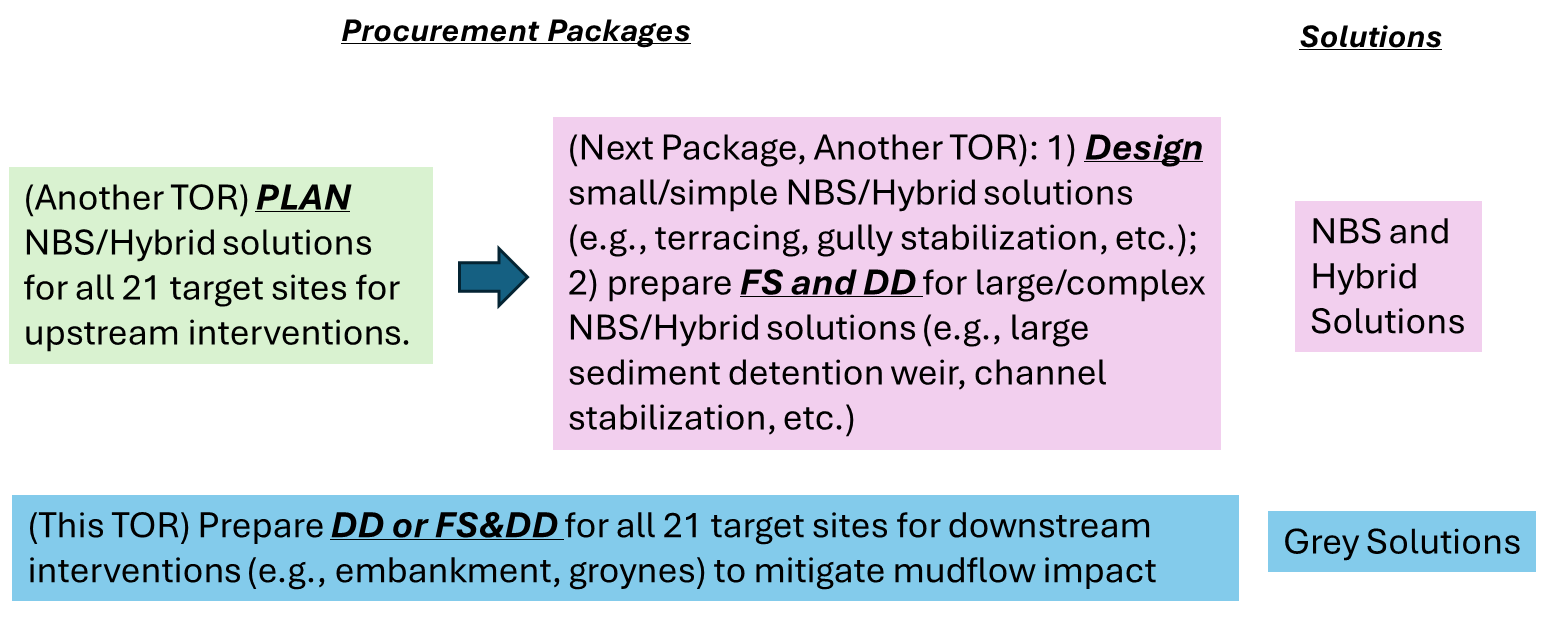
Climate-sustainable gray solutions will be implemented through the rehabilitation of existing embankments and riverbank protection structures and the construction of new ones. These efforts will take place in Jalal-Abad, Osh, Issyk-Kul and Naryn regions (oblasts) of the Kyrgyz Republic. Approximately 21 sites, spanning a total length of about 31.72 km will be targeted for these interventions; the exact number and location of these target sites may be updated during the project. The objective is to mitigate landscape depletion and safeguard communities, livelihoods, and infrastructure from the adverse effects of mudflows in these high-risk areas. This initiative aims to protect over 11,841 households. Additionally, 10,414 hectares of farmland and numerous social facilities will be secured from potential damage.

The selection of sites under Component 2 is based on the occurrence of mudflows, transboundary impacts downstream, their intensity and impact on households and farmland. Seventeen sites are located on the territory of Osh and Jalal-Abad regions (bordering Uzbekistan) along mudflow tributaries of the transboundary Kara-Darya River, such as Kugart, Kara-Unkur, and Aravan-Sai. The remaining five sites will be located on the territory of Issyk-Kul (bordering Kazakhstan) and Naryn region in the north, in the areas with a high level of mudflow risk. Significant protective effects are expected on cross-border road infrastructure, households, and environmental safety in the Issyk-Kul region, and on households and agricultural land in the Naryn region.

The Ministry of Emergency Situations (MoES) is mainly focusing on maintaining the existing flood protective infrastructure, which requires significant strengthening. In addition, the reliance on temporary protective measures results -in high expenses without providing adequate long-term sustainability for the protective infrastructures overall.

The measures to be implemented under Component 2 will mainly consist of repairing and restoring a high-priority selection of existing infrastructure (embankments and riverbank protection structures) built during the Soviet era. The selected sites include defective structures, which will be repaired and, where needed, enhanced, and non-functional structures, which will be restored and where needed enhanced. The project will apply hybrid approach in increasing resilience and protecting landscapes and communities. Thus, the FS and DD of embankment will need to consider the assessment for NBS and green solutions upstream and downstream (which will be covered in a separate TOR) and will need to work closely with the relevant teams to incorporate their solutions in the final product. Selected interventions also include the reconstruction or new construction of groynes to protect the riverbank from ongoing erosion, and drainage channels to collect runoff water during flood events.

The project will apply hybrid approach in increasing resilience and protecting landscapes and communities as depicted in the diagram below. Parallel to this ToR, another consultant firm/consortium prepares plans of NBS and hybrid solutions for upstream of all 21 sites (NBS planning consultant), followed by 1) design of small or simple NBS/hybrid solutions and 2) FS and DD of large and complex NBS/hybrid solutions. Thus, the FS and DD of embankment will need to communicate with the NBS planning consultant on upstream NBS and hybrid solutions. For example, it is critical to understand the types and amount of NBS and hybrid solutions planned upstream of each downstream interventions with its downstream impact.



**Organization of the Terms of Reference (TOR)**

This Terms of Reference (TOR) is prepared in accordance with the goals and objectives of Component 2 of the KG RESILAND project, which focuses on landscape restoration through climate-resilient “green” (natural), nature-based and "gray" solutions or ‘hybrid solutions’. The consultant to be engaged, thereafter the *Consultant*, is to follow the instructions described in the following Sections. Section II outlines the objectives of the assignment for conducting a feasibility study and design estimates for developing gray solutions for the selected 21 intervention sites. Section III provides a comprehensive overview of the scope of work under this TOR, including background information (location) for the selected 21 sites, the conditions to be adhered to when developing gray intervention strategies, including collaboration with the team in charge of undertaking FS and DD for NBS solutions (under a separate TOR), and the detailed requirements for the feasibility study and design estimates.

Section IV specifies the reporting and approval procedures, detailing the reporting requirements, including format and substantive content, and explaining the process for approving deliverables.

Section V outlines the support and information that the Client will provide to the Consultant.

Section VI specifies duration of assignment, while Section VII details the expected deliverables. Section VIII provides the payment schedule and expected time frames for these services, outlines the payment schedule for the required outputs at various stages.

Section IX defines qualification requirements and selection criteria, specifying the Consultant’s experience and the personnel capabilities required to provide these services.

Section X includes attachments of all supporting documents.

Annex A lists the 21 project sites for gray interventions, noting that some changes may occur.

Annex B to the ToR describes in detail the requirements of national legislation for conducting an Environmental Impact Assessment (EIA).

**II. OBJECTIVES OF THE ASSINGMENT**

**PART A: Preparation of the Feasibility Study (FS) and Detailed Design and Estimate Documentation (DED)**

The first objective of this part of the assignment is to conduct a feasibility study (FS) on each of the target intervention sites for gray interventions requiring scope confirmation, for a total of 10 facilities (sites 1 to 10 in Appendix A), to confirm the nature of the proposed flood protection interventions (reconstruction and restoration/enhancement of embankments, riverbank protection works, groynes, and drainage channels). Based on existing information, it is currently necessary to conduct a potential adverse environment and social impact assessment (ESIA), and the FSs should include consideration in this regard for each site. The remaining 11 facilities (sites 11 to 21 in Appendix A) do not require FSs, since these sites consist of existing flood protection structures requiring modernization[[1]](#footnote-1).

The second objective of this part of the assignment is to develop detailed design and cost estimate documentation (DED), based on RIC -State method[[2]](#footnote-2) and BoQ- based on market prices[[3]](#footnote-3), for each of the 21 sites (refer to Appendix A). The FS and Detailed Design should be built strictly on thorough survey data, up-to-date data and information on geological, seismological, hydrologic, climate, soil, meteorological data. For the draft Detailed design, the ESIA will be developed (if necessary) with detailed forecast and risk exclusion as well as overcome and mitigation measures according to the local legislation. Also, as per WB requirement, it will be necessary to develop the environmental and social management plan (ESMP) for each site.

The Feasibility Study and the Detailed Design and Estimate Documentation must comply with local building legislation, regulations, and construction rules applicable in the Kyrgyz Republic, and with the requirements of the World Bank's environmental and social policy framework and global construction best practices. In concert with the preparation of draft Detailed designs, allowance should be made for preparing the ESIA, for the sites deemed required during the FS studies (the ESIA needs to include detailed forecast and risk avoidance, minimization, and mitigation measures according to local legislation) and ESMPs for each site.

**PART B: Author's Supervision**

The objective of the second part of the assignment is to provide the author's supervision during the reconstruction or new construction of protection structures, according to the approved detailed designs.

**III. SCOPE OF SERVICES**

**PART A: Preparation of feasibility study, Detailed Design, and Estimate Documentation.**

**3.1. Feasibility study**

Planning of NBS interventions to be undertaken upstream of each of the 21 project sites will take place (under a separate TOR) prior to this task. The plan will become available to the selected consultant firm. The consultant will review this document before conducting the feasibility study and liaise with MoES to ensure there is maximum synergy between proposed green and gray interventions.

The feasibility study aims to provide technical recommendations regarding areas that should undergo reconstruction, as well as areas that should be rebuilt. In frames of feasibility study, it is required, but not limited to:

1. **Site Assessment and Data Collection** (conduct comprehensive site visits to all 11 selected locations requiring FS and DD (refer to Appendix A), gather existing data and documentation on the current state of existing flood protection structures, perform topographical and hydrological surveys to understand the physical and environmental conditions, etc.;
2. **Study the suitability of the selected interventions**, in terms of limiting the land area and the impact of other types of natural disasters.
3. **Hydrological, Geological and Seismological Analysis** (analyze river flow patterns, sediment transport, and erosion rates, conduct soil and geotechnical investigations, seasonal changes and extreme weather events on riverbank stability). This analysis includes estimation of upstream flood and sediment erosion mitigation benefit from NBS and hybrid solutions planned by the NBS planning consultant;
4. **Structural Evaluation:** assess the condition and effectiveness of existing flood protection structures, recommend whether to repair, restore, dismantle, or reconstruct existing structures, etc.;
5. **Environmental (and Social) Impact Assessment. Risk Assessment and Management (**potential risks associated with the proposed interventions, including technical, environmental, and social risks);
6. **Development of conceptual projects** for the reconstruction or new construction of flood protection engineering structures with an analytical justification for improving the characteristics of the structure and preliminary cost estimates;
7. **Stakeholder Consultation.** Provide intervention solutions (reconstruction or replacement) to the PIU for each site with adequate analytical justification and gather feedback for plan finalization.
8. **Project Implementation plan** (phased implementation plan for the recommended interventions outlining timelines, permits, milestones, and resource requirements for each phase of the project).

The study should provide a quantitative technical basis to support recommendations based on engineering principles and cost-effectiveness aspects. It shall be in the form of a technical report, including technical analysis and preliminary drawings suitable for cost estimation, geotechnical, hydrologic reports, and cost estimates. The report is considered appropriate and complete after its review by the relevant government agencies of the Kyrgyz Republic.

Following engineering surveys, which is required to assess the geotechnical conditions of all sites, and additional investigation works, which may be necessary for some sites to further assess the condition of structures, foundation pits, etc., the sites must be brought to their original condition at the expense of the Consultant.

An international firm has undertaken a pre-feasibility study for the Kara Darya River basin during the preparation of the Kyrgyz RESILAND project. The study's result will become available to the selected consultant firm and all other relevant existing studies. The consultant will review these documents before conducting the feasibility study and advise during the feasibility study if further analysis is needed to confirm the scope of each structure.

**3.2. Engineering, hydrologic and geological surveys of the construction sites**

The Consultant shall undertake engineering and geological up-do-date surveys of all proposed construction sites in accordance with the requirements of SNiP KR 11-01-98 and other applicable standards.

The Consultant will coordinate liaison with relevant government agencies, as required, including relevant Institutes under the National Academy of Sciences of the KR (of Geology, of Forestry, of Water Problems and Hydropower, of Seismology), Soil and Agro-chemical Station, Hydromet and other departments of the MoES.

The surveys shall cover the following information:

• *General information collection and review*. This includes stocktaking and reviewing of all relevant data and reports that MoES or other agencies may have such as past feasibility studies, detailed design, and/or geological survey reports of the proposed interventions;

• *Brief physical and geographical characteristics of the area (site)* where the work will be performed;

• *Research of engineering and geological conditions* – up-to-date data.

*Climatic and Hydrologic Survey*

* 1. The Consultant shall collect all relevant historical and up-to-date data and from public sources and from MoES HydroMet Agency regarding the climate, including temperature, rainfalls, snowfalls etc., from the long-term observations of meteorological stations located near the target areas, including water consumption data of each target river. Climate projections are also to be considered, especially regarding expected impacts on mudflows.
  2. The Consultants shall consider the climatic conditions and specify the period of the year when various construction activities may be carried out. The historical and up-to-date maximum intensity of rainfall, flow, floods, and snowfall shall be used for the design.

*Topographic Survey*

The Consultant shall carry out a topographic survey involving temporary benchmarks, and control leveling, using global positioning system (GPS) coordinates.

*Soils and Materials Investigations*

* + - * 1. The survey should be based on up-to-date data and include geotechnical investigations, including topographic surveys, soil sampling, and analysis of foundation materials.
        2. Review the data obtained during the previous design studies and undertake additional soils and materials investigations for up-to-date status.
        3. Identify suitable materials for the embankment and riverbank protection structures and propose using the most cost-effective and fit-for-purpose materials almost the available options. Prepare a comprehensive materials report on suitability of materials for various components of work, giving all the required information on selected borrow areas and quarries including material properties, quantities available, haul distance and cost.
        4. The Consultants will coordinate with relevant government agencies e.g. the Ministry of Natural Resources, Environment and Technical Supervision, Ministry of Water Resources and other agencies before determining suitability of borrow pits area.
        5. Identify suitable materials for the embankment and riverbank protection structures, using the most economical and fit-for-purpose materials required, and advice on access roads and structures required equipment. The Consultant shall prepare a comprehensive materials report on the suitability of materials for various components of work, giving all the required information on selected borrow pits areas and quarries including material properties, quantities available, haul distance and cost. The *Consultant* shall undertake any additional sub-soil and geotechnical investigation if required for some specific sites.

*Seismology and soil movements*

1. Assess the risk of mass movement. The variety and complexity of mass movement of soil and rocks is one of the major problems in the southern area; this is why, needs a detailed study of the potential landslide areas is required.
2. Advice on stabilization requirements. Where necessary, embankments must be stabilized using local methods and materials like benching, breast/retaining walls, gabions, wire meshes and vegetation. Heavy and expensive structures must be avoided as far as possible. Potentially use of ecological/bio-engineering practices, geotextiles for stability, improved gabion design, and wooden structures for erosion protection.
3. However, if necessary various alternatives will be suggested with detailed evaluation:

• Geomorphological data;

• Climatological data;

• Seismological studies. The specified seismicity of the construction site, the category of soils according to seismic properties. Information about the presence or absence of tectonic faults, if any, it is necessary to specify the distance from the sites to the fault;

• Perform the opening of existing foundations (at least two foundation pits) to determine the technical condition of the foundations, as well as the bearing capacity of the soils in the base;

• Geological and lithological structure;

• Hydrogeological conditions and forecast of mudflows and flooding of the territory;

• Soil properties - physico-mechanical and corrosion properties of the base soils;

• Geographical and topographic survey of the site indicating the existing underground and aboveground infrastructure;

• Assessment of the existing drainage system and site functionality;

• Conclusions and other data.

The data of geological and engineering surveys should be sufficient for the development of design estimates for the modernization and new construction of engineering structures. The graphical part of the report should contain: maps of existing materials (by sites, routes, territories and their variants); maps of engineering and geological conditions; engineering and geological sections; columns or descriptions of mine workings and others. When drawing up the graphic part of the technical report, symbols should be used in accordance with the requirements of GOST 21.302-2013 "Conditional graphic designations in documentation on engineering and geological surveys". Appendices to the report should contain: tables of laboratory definitions of indicators of soil properties and chemical composition of groundwater with the results of their statistical processing; tables of results of geophysical and field studies of soils and other works, if performed; catalogs of coordinates and marks of workings, sounding points, geophysical surveys and, if necessary, other materials.

**3.3. Assessment of the condition of engineering structures, land ownership, ecology, and historical sites**

Engineering inspection of building structures of engineering structures must be carried out in accordance with the requirements in force in the Kyrgyz Republic. Based on the results of the survey, a technical conclusion should be drawn up for all sites (see Appendix A) provided for in this TOR.

In addition, the Consultant perform the following:

• To determine, with the involvement of archaeologists, the presence/absence of cultural heritage sites at project sites and quarry sites;

• Determine the form of ownership of the land where restoration work is planned to be carried out to exclude private plots;

• To determine, with the involvement of specialized specialists, the presence/absence of protected species of flora and fauna.

**3.4. Detailed design: plan for development of design documentation and implementation**

Design development should allow for future improvements to increase protection levels. This ensures that the embankments can adapt to changing flood conditions and provide effective long-term protection.

The design should consider the availability of materials for embankment construction, including foundation materials and materials available for the embankments. The selection of materials should be based on a study of foundation materials, depth and duration of flooding, and expected construction and maintenance procedures

Embankment designs should take into account the potential impacts on biodiversity, natural and cultural heritage, landscape, and visual amenity. Measures should be taken to minimize negative impacts and promote sustainable land use.

For sites to be upgraded (sites 11 to 21 in Appendix A), in accordance with the instructions of the PIU, it is necessary to:

- Provide a detailed modernization. Measures such as vegetation, geotextiles, or hard surfacing can be used to stabilize the slopes and prevent soil erosion.

- Technical solutions will need to consider already existing parts of engineering structures and suggest the ways to strengthen the protective functions of a whole system.

- Provide detailed cost estimates for modernization projects.

For sites subject to new construction (sites 1 to 10 in Appendix A), in accordance with the instructions of the PIU on the basis of information on the results of the feasibility study, it is necessary to:

- Provide a plan for dismantling existing engineering structures;

- To propose at least 2 unique conceptual designs for each site with preliminary cost estimates, from which the PIU will select a project for further detailed design- Provide detailed architectural design drawings that comply with the current regulatory requirements of the Kyrgyz Republic. Measures such as vegetation, geotextiles, or hard surfacing can be used to stabilize the slopes and prevent soil erosion.

- Provide a detailed cost estimate for the construction of new engineering structures.

The Consultant will need to work closely with another consultants on greening and nature-based solutions, that are expected to focus on the relevant topic, but at the end all three consultancies need to have integrated solutions. Thus, regular consultations are important. Vegetation on the embankment can help stabilize the soil and prevent erosion. Suitable vegetation should be selected and maintained to ensure the long-term stability of the embankment.

**3.4.1. Obtaining permits/conclusions**

A preliminary design for the new construction of engineering structures for the selected option should be developed based on the results of a feasibility study with the requirements of local architectural authorities.

Draft designs for areas where modernization (reconstruction) is planned must be developed in accordance with the requirements of local architectural authorities.

For the developed preliminary designs, obtain an Architectural and Urban Planning Conclusion (AGZ - architectural and urban planning report) from local architectural authorities in the manner established in the Kyrgyz Republic.

According to the received AGZ, develop a design and estimate documentation and obtain a positive conclusion from the relevant state examinations through a single window of the State Construction Committee of the Kyrgyz Republic in the prescribed manner in the Kyrgyz Republic.

Obtain a conclusion from the competent government agency on the presence/absence of cultural heritage objects.

Develop an ESIA and ESMP based on the pre-feasibility study and obtain a positive conclusion from the state environmental assessment. At the design stage, develop a Section on “Environmental Protection” and obtain a positive conclusion from the state environmental assessment for it.

***All financial expenses for obtaining permits and opinions are paid by the Consultant.***

**3.4.2. Architectural Engineering Design**

**Engineering structures subject to reconstruction**

As part of the design estimate documentation (DED) for sites 11 to 21 (refer to Appendix A), the following must be provided, among other things:

**3.4.2.1 General Explanatory Note, including:**

- General information about the construction site and description of activities.

- Descriptive part on the territory of the object.

- Survey data on the population, land area (with mark the type of the land destination- arable, dry lands, etc.) under project protection, and civil infrastructure located in the flood risk zone.

- Description of existing problems in the issue of insufficient protection of the population, lands, and infrastructure from floods, requiring intervention in the current situation.

- Indication of the number of households and extent of farmland area (ha) that may be protected by the new structure.

- Initial permitting documents.

-A summary of the rationale behind renovation decisions and materials used, including an assessment of the initial design options for the retrofit (based on a feasibility study).

**3.4.2.2 Engineering survey, including:**

- Geological report including actual climate data, seismic zoning data, soil, and morphological data (based on the results of boring), soil freezing depth, groundwater table, etc.

- Hydrological report with long-term monitoring data for annual and monthly river flows, geodetic survey report with a list of benchmarks.

- All specified reports must be provided at the FS stage and at the DD stage. Both historical and actual data need to be used.

**3.4.2.3** **Architectural and construction part**, **including**:

-Architectural and engineering drawings for modernization (restoration) or new construction design

- masterplans integrated into the geodetical layouts, longitudinal profiles, and cross sections every 50 m. and at characteristic points, detailing drawings showing the integration of structural modernization solutions.

- Acquired engineering survey data has to be used for design preparation in repair, restoration, or new constructions.

Drawings- Technical drawings shall include:

* + - Site plan(s)
    - Basic layout drawing
    - Detailed drawings.
* The drawings must represent a working drawing with sufficient data so that the Client can request the proposals for the construction of facilities and hire a successful bidder without having to develop additional drawings. If there are substantial errors discovered in the design during the works, the Consultant shall resolve them and change the design at his own expense. The scale of drawings must meet the required standard. The layout and axial sections for all repair/rehabilitation /enhancement schemes must be of scale 1:500 or 1:1000 in horizontal alignment and 1:100 in vertical scale.
* All drawings shall reflect the required axial sections, materials, and structural descriptions.

Calculations

* The Consultant shall prepare hydraulic, stability, and reliability calculations for necessary infrastructure.
* The design shall provide at least 50 years of operation (service life) for all infrastructure.

Monitoring and Maintenance

* The Consultant shall also provide guidance for the monitoring and maintenance requirements to ensure the structures' appropriate operation and life expectancy.

**3.4.2.4 –** **ESIA and ESMP**

**Environmental and Social Management**

The *Consultant* shall develop, in line with national legislation, a preliminary environmental and social impact assessment at the feasibility study stage (pre-ESIA) for 10 sites, and an environmental and social impact assessment at the detailed design stage for 21 sites (if necessary), including obtaining of positive conclusion from the State Environmental Examination and development of ESMP for each subproject site according to social and ecological standards of the World Bank.

The documents must identify:

- assessment of the baseline of the environment of the territory within the boundaries of the potential zone of possible impact of the planned activities;

- potential adverse environmental and social risks and impacts during civil works;

- development of measures to prevent, minimize and/or compensate for significant harmful impacts on the environment during the construction, operation and decommissioning of proposed facilities;

- safe methods of the subproject sites management and maintenance from the perspective of ecological and social environment protection;

- management and monitoring plan, including the relevant responsible players and timeline for measures;

The *Consultant* shall consult stakeholders and local communities regarding the ESIA and ESMP.

**Land Acquisition and Resettlement**

The *Consultant* shall conduct a socio-economic survey of the project impact area, trying where possible to avoid or minimize involuntary resettlement after reviewing and assessing all technically feasible alternatives. Should any impact be unavoidable, the *Consultant* will need to prepare a Resettlement Action Plan, which should be coordinated with PIU MoES KR, following World Bank policies and standards.[[4]](#footnote-4)

**Coordination of quarries, landfills, dumps**

The Consultant shall conduct an analysis (at the FS stage) and obtain approval with local authorities (at the DD stage) of closest to the project sites areas of possible gravel and ragged stone (riprap) quarries with the provision of documentation for the right to access and operate the quarries. The locations should consider avoidance of impacts on riverbed and flow, hillslope and etc. Also, the consultant should coordinate with local authorities the location of sites for the temporary storage of excess soil and landfills and the management of waste and potential hazardous pollutants.

**3.4.2.5** **Cost estimates**:

The *Consultant* should complete the statement of scope of work and estimate documentation. Prepare estimate documentation in the following two versions:

i) based on the definitions of the current unit prices of the State Construction Committee of the Kyrgyz Republic (RIC program method);

ii) according to market prices for construction services, construction materials, equipment, and mechanisms exploitation.

If during construction works, unaccounted quantities of work and materials arise, the Consultant shall make appropriate adjustments to the design estimates and obtain the required state examinations/expertise at its own expense.

**3.4.2.6** **Specifications**

The specifications must be developed according to current GOST and SNiP standards. Without an appropriate standard for a specific design element, the relevant international standard shall apply. All technical specifications must comply with BoQ.

The specifications reflect all types of works or materials supplementary to data shown in the drawings and plans. They also set detailed data on performance of work, including the required timeline and requirements for insurance, licensing and other special procedures or requirements.

The specifications are fully descriptive and specify a full list of requirements related to the following aspects, but not limited to:

i) Standards for materials

ii) Standards and procedure for qualification

iii) Information on production tests or other required tests;

iv) Information on pre-commissioning and commissioning activities.

The links to brands, numbers in catalogues and other information that limits any materials or product of a specific manufacturer are restricted. At the mention of standard specification or construction codes, specify that other equivalent national or international standards are acceptable.

**PART B: Design supervision**

**Author's supervision during construction work**

Architectural supervision services required during the construction phase will be provided in accordance with the contract within the framework of the prepared detailed design and concluded contracts for construction work.

Design supervision must be carried out in accordance with SNiP KR 11-02-00 “Regulations on designer supervision of design organizations over the construction of enterprises, buildings and structures” and other current regulatory documents of the Kyrgyz Republic on designer supervision.

**APPLICABLE LEGISLATION AND TECHNICAL REGULATIONS**

**Construction codes and regulations, legislation of the Kyrgyz Republic:**

Design and estimate documentation must be developed properly for the reconstruction and construction of bank protection engineering structures in accordance with the regulatory legal and technical acts in force on the territory of the Kyrgyz Republic.

Please note: a condition for awarding the contract will be the mandatory availability of a License for the development of design and estimate documentation of at least Level II (second), valid in the Kyrgyz Republic, and a License for conducting engineering and geological surveys of at least Level II (second), valid in the Kyrgyz Republic.

Foreign firms and joint ventures are encouraged to submit Expressions of Interest and should be aware that the winning firm/joint venture must have the required licenses at the time of signing the contract to complete the assignment.

**IV.** **REPORTING AND APPROVAL PROCEDURES**

**PART A: Preparation of feasibility study and design documentation**

The selected Consultant will develop the requested reports, as well as design and estimate documentation for each 21 selected sites in accordance with this TOR.

• The consultant shall prepare reports describing design assumptions and their rationale, design methodology, design decisions, conclusions and recommendations.

• Reports should be illustrated with relevant drawings, sketches, tables, analytical results and graphs to facilitate understanding and digestion of their contents.

• With the exception of the Initial Report and Final Report completed as part of the assignment, all other reports must be prepared separately for each site.

**1. Inception report must include:**

- Work schedule. Provide a detailed calendar schedule for visiting all 21 sites to carry out survey work, taking into account the implementation stages (see Annex A);

- Methodology of work. Provide a detailed action plan and methodology for conducting survey work.

The Client will make every effort to provide comments on the Initial Report within two weeks from the date of its receipt.

**2. Progress report No. 1 must include the following documents for all objects:**

|  |  |
| --- | --- |
| **№** | **Name** |
| 1 | Report on geological, hydrologic and engineering survey for 5 sites |
| 2 | Scaled topographic map of the area indicating all utilities for 5 sites |
| 3 | Draft Feasibility Study and Pre-ESIA for 5 sites |
| 4 | Final Feasibility Study and ESIA Report for 5 sites |

**3. Progress report No. 1a should include:**

|  |  |
| --- | --- |
| **№** | **Name** |
| 1 | Permitting documents: AGZ for 6 sites |
| 2 | Report on geological, hydrological and engineering survey for 6 sites |
| 3 | Scaled topographic map of the area indicating all utilities for 6 sites |
| 4 | For 6 sites, an architectural and engineering design package (DED) and cost estimates for modernization or replacement of existing bank protection structures |

**4. Progress report No. 2 should include:**

|  |  |
| --- | --- |
| **№** | **Name** |
| 1 | Permitting documents: AGZ for 5 sites |
| 2 | Report on geological, hydrologi and engineering survey for 5 sites |
| 3 | Scaled topographic map of the area indicating all utilities for 5 sites |
| 4 | For 5 sites, an architectural and engineering design package (DED) and cost estimates for modernization or replacement of existing bank protection structures |

**5. Progress report No. 2a should include:**

|  |  |
| --- | --- |
| **№** | **Name** |
| 1 | Permitting documents: AGZ for 5 sites |
| 2 | Report on geological, hydrologic and engineering survey for 5 sites |
| 3 | Scaled topographic map of the area indicating all utilities for 5 sites |
| 4 | For 5 sites, an architectural and engineering design package (DED) and cost estimates for modernization or replacement of existing bank protection structures |

**6. Progress report No. 3 should include:**

|  |  |
| --- | --- |
| **№** | **Name** |
| 1 | Report on geological, hydrologic and engineering survey for 5 sites |
| 2 | Scaled topographic map of the area indicating all utilities for 5 sites |
| 3 | Draft Feasibility Study and Pre-ESIA for 5 sites |
| 4 | Final Feasibility Study and ESIA Report for 5 sites |

**7. Progress report No. 4 should include:**

|  |  |
| --- | --- |
| **№** | **Name** |
| 1 | Permitting documents: AGZ for 5 sites |
| 2 | Report on geological, hydrologic and engineering survey for 5 sites |
| 3 | Scaled topographic map of the area indicating all utilities for 5 sites |
| 4 | For 5 sites, an architectural and engineering design package (DED) and cost estimates for modernization or replacement of existing bank protection structures |

**Final report must include:**

- Brief description of the work performed within the framework of this assignment;

- Proposals for any additional works recommended for future, if any;

The Client will endeavor to provide comments within two weeks of receipt of draft reports. The final report should be prepared taking into account the comments received on the draft reports.

Upon completion of each stage of work, the Consultant must provide a complete package of reports in the following format:

• 4 (four) copies of bound sets of documentation (DED) in paper form in Russian;

• 1 (one) copy of bound sets of documentation (DED) in paper form in English;

• 2 (two) copies of bound sets of documentation (FS) in paper form in Russian;

• 1 (one) copy of bound sets of documentation (FS) in paper form in English;

• 1 (one) copy of a set of documentation on electronic media (in Russian and English).

• All reports must be submitted in Russian and English.

File formats:

- Text documents: \* .doc, \* .xls, \* .pdf (with the ability to copy text);

- Graphic applications: drawings, diagrams: \* .dwg, \* .pdf (in color);

- GIS data (shapefiles, raster images, and GIS project files);

- Analytical calculation models: \* .lir or other formats;

- Images, illustrations: \* .pdf, \* .gif, \* .jpeg;

- Estimated calculations must be presented in the format of a certified program, as well as \* .xls (\* .xlsx). With signatures and seals, duplicated in \* .pdf format;

- The statement of quantities must be presented in \* .xls (\* .xlsx) and \* .doc (\* .docx) format, and also duplicated in \* .pdf format with the signatures of the developers;

- Documents justifying the cost of materials that are not in the price lists of the base period (price lists) must be submitted in \* .pdf format.

**PART B: Author’s supervision**

A report on the implementation of architectural supervision must be provided to the Client monthly within 5 days after each visit to the site to perform architectural supervision.

The report should include the following summary information:

(a) work performed in the previous month in accordance with the work plan;

(b) a record of each field visit details, including site locations, photos, and videos.

(c) submitted invoices for payment;

(d) any difficulties preventing the achievement of full effectiveness of the work performed, and recommended measures to solve them;

(e) a description of the work planned for the next month;

(f) the conclusions of the technical experts after visiting the sites for a month, as well as a summary of their instructions.

The consultant must maintain supervision logs in accordance with the planned visits to the contract sites, providing information on each type of work: progress, compliance with the schedule agreed with the PIU, problems encountered in achieving progress, errors made in achieving quality of construction, main conclusions and recommendations (if any) for future reference.

The Consultant should be able to visit construction sites between approved milestones to prevent possible disruptions during this period.

The main attention should be paid to the quality of work and compliance of all work with design and estimate documentation, and approved additional work (if any).

The Consultant promptly informs the Client about any problems that arise. The Consultant must agree with the Client on any changes made to the design solutions during implementation. Reports provided by the Consultant shall contain information on the work performed during site visits and information on the actual time spent.

**V. CLIENT INPUT**

1. When carrying out engineering and survey work, the PIU will ensure cooperation with the Aiyl Okmotu on issues of providing free access to objects and the necessary information.

2. When developing design and estimate documentation, the PIU will ensure interaction with the Aiyl Okmotu through their consulting assistance for obtaining permits.

3. When designing environmental and social sections, the PIU will provide sample Environmental and Social Management Plans (ESMPs) developed for retrofits and new construction.

4. The PIU, through the Ail Okmotu, will assist in the development of the Involuntary Resettlement Plan (if necessary).

5. Will assist in the timely resolution of any issues that arise that impede the implementation of design and survey work.

6. The PIU will provide support in the discussion of feasibility study and EIA materials by posting information in public places and websites, as well as measures to ensure the participation of village residents, including women, in the decision-making process.

7. The PIU agrees on the received Action Plan for carrying out designer’s supervision and pays monthly expenses in accordance with the received reports on designer’s supervision.

**VI. DURATION OF ASSIGNMENT**

According to calculations, the estimated duration of Part A (Preparation of feasibility study and design estimates) of this TOR for consulting services is 17 months from the contract effectiveness date.

Part B (author's supervision) will come into force after the award and signing of contracts for modernization work or construction of bank protection engineering structures. The duration of Part B services will depend on the time available for completion of construction contracts under Part A. The assignment contract for Part B will be signed with the Consultant upon engagement of the contractor for the construction work.

**Contract type**

**PART A: Preparation of feasibility study and design documentation**

The contract between the Client and the Consultant for the preparation of the feasibility study and design estimates will be based on a Lump Sum Contract. Payments under a fixed fee contract will be made based on deliverables completed and approval of reports provided in accordance with the schedule of submitting reports and invoices. The consultant provides invoices and reports on services performed in accordance with the terms of the contract.

**PART B: Author’s supervision**

The contract between the Client and the Consultant for the designer's supervision of construction work will be a Time-Based Contract. Payments under a time-based contract for supervisory consulting services are made monthly based on a submitted timesheets that reflects the actual time spent on services performed as described in the ToR. For payment (remuneration and reimbursement of expenses), the Consultant must provide supporting documentation of visits, including travel and hotel expenses.

The Consultant must provide financial reports for payments of remuneration and reimbursable expenses along with site visit reports. The Client will pay for the services based on the above documents and approved documents on the visit to the construction site by the Consultant.

**VII.** **EXPECTED DELIVERABLES**

|  |  |  |
| --- | --- | --- |
| **#** | **Reports** | **Deadlines** |
| 1 | Inception report | Within 0.5 month after the effective date of the contract |
| **For sites where FS and DED are required** | | |
| 2 | Progress Report No. 1 Preparation of FS for 5 sites (1-5) | Within 4 months after the effective date of the contract |
| 3 | Progress Report No. 2: Preparation of DED for 5 sites (1-5) | Within 8 months after the effective date of the contract |
| 4 | Progress Report No. 3: Preparation of FS for 5 sites (6-10) | Within 12 months after the effective date of the contract |
| 5 | Progress Report No. 4: Preparation of DED for 5 sites (6-10) | Within 16 months after the effective date of the contract |
| **For sites where only DED is required** | | |
| 6 | Progress Report No.1a: Preparation of DED for 6 sites (11-16) | Within 4 months after the effective date of the contract |
| 7 | Progress Report No.2a: Preparation of DED for 5 sites (17-21) | Within 8 months after the effective date of the contract |
|  | | |
| 8 | Final report | Within 17 months after the effective date of the contract |

**VIII.** **PAYMENT SCHEDULE**

|  |  |  |
| --- | --- | --- |
| **№** | **Deliverable** | **Payment from total contract amount for Part A** |
| **PART A: Preparation of FS and DED** | | |
| 1 | Inception report | 10 % |
| 2 | Progress report No. 1 – FS for 5 sites (1-5) | 10 % |
| 3 | Progress report No. 1a – DED for 6 sites (11-16) | 10 % |
| 4 | Progress report No. 2 – DED for 5 sites (1-5) | 10 % |
| 5 | Progress report No. 2a – DED for 5 sites (17-21) | 10 % |
| 6 | Progress report No. 3 – FS for 5 sites (6-10) | 10 % |
| 7 | Progress report No. 4 – DED for 5 sites (6-10) | 10 % |
| 8 | Final report | 30% |
| Total for PART A: | | **100%** |
| **PART B: Author’s supervision** | | |
| 9 | Supervision report | Monthly |
|  | Total for PART B | **100 %** |

**IX.** **QUALIFICATION REQUIREMENTS AND SELECTION CRITERIA**

**Minimum qualification requirements for the evaluation of expressions of interest:**

At the EOI assessment stage, consultants must meet the following minimum qualification requirements to be shortlisted:

* General experience of at least 7 years in the field of design of hydraulic structures, embankments, geotechnical surveys and field supervision;
* Special knowledge – implementation experience at least 2 projects in the development of design estimates for reconstruction or new construction of embankments and riverbank protection engineering structures;
* Experience in at least 2 projects financed by international organizations.

**Requirements to key personal at the technical proposal evaluation stage.**

It will take professional experts to prepare a well-researched, analyzed and developed product. Accordingly, the professional resumes of 10 key specialists will be evaluated during the selection process. The team of specialists can be supplemented depending on the needs of the project team as needed. In addition to key positions, this assignment will require several support technical and non-technical personnel. Some of the support specialists may have experience in areas such as hydraulic engineering, geology, seismology, biology, economics and communications, etc.

| № | **Position** | **General qualifications (general education, qualification certificates): 20%** | **Compliance with the assignment (specific experience/similar assignments): 70%** | **Relevant experience in the region (fluency in the local language at a working level / knowledge of the local culture or administrative system, government organization, etc.): 10%** |
| --- | --- | --- | --- | --- |
| 1. | **Chief Project Engineer and Team Leader (national experience).** | Higher education/master's degree in the specialty of hydrotechnical structures, civil engineer, qualification certificate of the Kyrgyz Republic for performing the work specified in this TOR | Relevant experience as a team leader for at least 2 projects where the scope and complexity of the work is similar to the proposed assignment. At least 7 years of relevant professional experience in areas related to the design of hydraulic structures using modern technologies, as well as construction supervision. International design experience in the field of hydraulic structures is an advantage. | Relevant experience in the region (knowledge of the Kyrgyz or Russian language at a working level / knowledge of the local culture or administrative system, government organization). Knowledge of English language will be asset . |
| 2. | **Hydraulic engineer (national experience)** | Higher education/master's degree in the specialty of hydraulic engineer and qualification certificate of the Kyrgyz Republic as a design engineer. | Relevant experience in hydraulic engineering design. At least 10 years of relevant experience in design related fields. | Relevant experience in the region (knowledge of the Kyrgyz or Russian language at a working level / knowledge of the local culture or administrative system, government organization). |
| 3. | **Hydraulic engineer (national experience)** | Higher education/master's degree in the specialty of hydraulic engineer and qualification certificate of the Kyrgyz Republic as a design engineer. | Relevant experience in hydraulic engineering design. At least 10 years of relevant experience in design related fields. | Relevant experience in the region (knowledge of the Kyrgyz or Russian language at a working level / knowledge of the local culture or administrative system, government organization). |
| 4. | **Hydrological engineer (international experience)** | Higher education/master's degree in the specialty of hydrological engineer and a qualification certificate of a hydrologist | Relevant work experience in at least 5 similar project. At least 10 years of relevant experience in the fields of studying (designing) the distribution and movement of surface and groundwater and sediment transport. | Relevant experience in the region. Knowledge of Russian language will be asset. Relevant experience in the CIS, Europe countries is preferable. |
| 5. | **Hydrological engineer (national experience)** | Higher education/master's degree in the specialty of hydrological engineer and a qualification certificate of the Kyrgyz Republic as a hydrologist | Relevant work experience in at least 1 similar project. At least 5 years of relevant experience in the fields of studying (designing) the distribution and movement of surface and groundwater and sediment transport. | Relevant experience in the region (knowledge of the Kyrgyz or Russian language at a working level / knowledge of the local culture or administrative system, government organization). |
| 6. | **Estimating engineer (national experience)** | Higher education/master's degree in a technical or economic specialty and a qualification certificate as an estimator | Relevant experience in the field of hydraulic engineering design. At least 5 years of relevant experience in fields related to civil engineering design, broad economic knowledge. | Relevant experience in the region (knowledge of the Kyrgyz or Russian language at a working level / knowledge of the local culture or administrative system, government organization). |
| 7. | **Geotechnical engineer (national experience)** | Higher education/master's degree in a technical | 5 years of relevant experience in assessing the condition of existing structures, conducting geotechnical assessments for new structures, and designing foundations and structural elements. At least 2 similar projects implemented. | Relevant experience in the region (knowledge of the Kyrgyz or Russian language at a working level / knowledge of the local culture or administrative system, government organization). |
| 8. | **Geodetic engineer (national experience)** | Higher education/master's degree in the specialty of surveying engineer and qualification certificate of the Kyrgyz Republic as an geodetic engineer for construction purposes | Relevant work experience in at least 1 similar project. At least 5 years of relevant experience in the fields of surveying in construction | Relevant experience in the region (fluency in the local languages at a working level / knowledge of the local culture or administrative system, government organization, etc.) |
| 9. | **Ecologist/environmental specialist (national experience)** | Higher education/master's degree in ecology/environmental protection specialist. The qualification certificate of the State Construction Committee of the Kyrgyz Republic “Environmental Protection Specialist” is an advantage. | Relevant work experience for at least 2 projects, where the volume and complexity of the work is not less than that of the proposed assignment. At least 5 years of experience in the field of environmental protection and development of environmental impact assessment (EIA). Experience in planning, design and development of environmental sections, as well as analysis of environmental management plans. Experience in working on social and environmental standards of the World Bank is an advantage. | Relevant experience in the region (fluency in the local languages at a working level / knowledge of the local culture or administrative system, government organization, etc.) |
| 10. | **Sociologist (national experience)** | Higher education/master's degree in sociology/land planning/law | Relevant work experience for at least 2 projects, where the volume and complexity of the work is not less than that of the proposed assignment. At least 5 years of experience in the field of social development/social research. Experience in planning, design and development of social documents (Relocation Plan/Resettlement Plan)  Experience in working on social and environmental standards of the World Bank is an advantage. | Relevant experience in the region (fluency in the local languages at a working level / knowledge of the local culture or administrative system, government organization, etc.) |

**X. ANNEXES**

A. Site Information

B. Environmental Impact Assessment

Annex A. Site information

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Site name** | **Site coordinates** | | **Length, (km)** | **Preliminary planned works** | **Required works** | **Site prioritization** |
| **Starting point** | **End point** |
| **Phase I for sites where FS and DED are required** | | | | | | | |
| 1 | Embankment on the Kara-Unkur-Say river, "Kokcho-Koz" site, Bazar-Korgon town, Bazar-Korgon rayon | 41.057857 72.753201 | 41.051613 72.744010 | 1,100 | new construction | FS and DED development | 1 |
| 2 | Embankment on the Aravan-Sai River, village of Zhany-Aravan, Pakhta-Tobo site, a/a of Allya-Anarova in Aravan rayon | 40.477949 72.553512 | 40.490702 72.540808 | 1,530 | new construction | FS and DED development | 1 |
| 3 | Embankment on the Aravan-Sai river, Kessek site, a/a of Mangit in Aravan rayon. | 40.446580 72.583995 | 40.455022 72.579997 | 0,800 | new construction | FS and DED development | 2 |
| 4 | Embankment on the Kugart river at “Kyzyl-Tuu” site, a/a of Lenin in Suzak rayon. | 41.019967 73.016039 | 41.000850 72.998316 | 3,000 | new construction | FS and DED development | 2 |
| 5 | Embankment on the Kara-Darya river, “Chynbai” site in Uzgen rayon | 40.711171 73.364722 | 40.721498 73.353175 | 1,500 | new construction | FS and DED development | 2 |
| **Phase II for sites where FS and DED are required** | | | | | | | |
| 6 | Embankment on the Terek-Suu River, Bokoymo site, Sopu-Korgon, a/a Uch-Dobo-Alay, Alai rayon. | 40.014816 73.514406 | 40.014910 73.510946 | 0,550 | new construction | FS and DED development | 2 |
| 7 | Embankment on the At-Bashy river, Zhybek-Zholu site (Brick Factory), Kara-Suu a/a, At-Bashy rayon. | 41.201848 75.736271 | 41.205249 75.735412 | 0,38 | new construction | FS and DED development | 2 |
| 8 | Embankment in Balykchy town (north-eastern part) Issyk-Kul oblast | 42.487721  76.244834 | 42.470349  76.264855 | 2,45 | new construction | FS and DED development | 2 |
| 9 | Embankment on the Yassy River, “Working town” site in Uzgen rayon | 40.778698 73.343215 | 40.782243 73.331806 | 1,000 | new construction | FS and DED development | 2 |
| 10 | Embankment on the Yassy River, a/a Salam-Alik, Kyzyl-Charba site, Uzgen rayon | 40.811520 73.585808 | 40.814548 73.573999 | 0,700 | new construction | FS and DED development | 3 |
| **Phase I for sites where only DED is required** | | | | | | | |
| 11 | Embankment No.4 on Kugart river, Blagoveshenka site, a/a Suzak, Suzak rayon | 40.960310 72.964284 | 40.953096 72.957070 | 1,000 | repair and restoration work | DED development | 1 |
| 12 | Embankment No. 10 on the Kugart river, Yntymak site, a/a Tash-Bulak, Suzak rayon. | 40.969679 72.977128 | 40.956203 72.961316 | 2,000 | repair and restoration work | DED development | 1 |
| 13 | Embankment on the Gulcha River, a/a Gulcha, “Bus station, Stadium, Park” site, Alay rayon | 40.310631 73.434949 | 40.313359 73.430710 | 0,707 | repair and restoration work | DED development | 1 |
| 14 | Groynes on the At-Bashy River, Bash-Kaiyndy village | 41.160441 75.889395 | 41.164774 75.908815 | 1,7 | extension of the existing dam | DED development | 1 |
| 15 | Mudflow diversion canal at Ottuk site, a/a Ulakhol in Ton rayon | 42.295683 76.310006 | 42.317006 76.341882 | 3,229 | extension of the existing dam | DED development | 1 |
| 16 | Embankment on the Kugart river, "Zhygach-korgon" site, a/ a Lenin, Suzak rayon | 41.076211  73.079771 | 41.067737  73.074435 | 0,963 | extension of the existing dam | DED development | 2 |
| **Phase II for sites where only DED is required** | | | | | | | |
| 17 | Embankment on the Kugart river, "Zhygach-korgon-2" site, a/ a Lenin, Suzak rayon | 41.056593  73.059419 | 41.054582  73.054060 | 0,500 | extension of the existing dam | DED development | 2 |
| 18 | Embankment No. 2 on the Karaunkursay river, Aral site, a/a Aral, Nooken rayon | 40.997320 72.666472 | 40.979012 72.638931 | 3,100 | extension of the existing dam | DED development | 3 |
| 19 | Embankment No. 6 on the Karaunkursay River, Kyrgyzstan site, a/a Sakaldy, Nooken rayon | 40.966874 72.619885 | 40.960775 72.589251 | 2,600 | repair and restoration work | DED development | 3 |
| 20 | Embankment No. 15 on the Karaunkursay River, Khajirabad site, a/a Seidikum, Bazar-Korgon rayon | 40.965630  72.621825 | 40.961086 72.599314 | 1,940 | repair and restoration work | DED development | 3 |
| 21 | Embankment on the Gulcha river, a/a Gulcha, Yr-Kese site, Alay rayon | 40.303358 73.461873 | 40.304011 73.457160 | 0,370 | repair and restoration work | DED development | 2 |



**Annex B. Environmental Impact Assessment**

In accordance with the Law of the Kyrgyz Republic “On Environmental Protection”, “On Environmental Expertise”, feasibility studies, construction projects, reconstruction of facilities and other projects, regardless of their estimated cost, departmental affiliation and forms of ownership, the implementation of which may affect the environment are subject to environmental impact assessment and state environmental impact assessment.

The presence of an environmental impact assessment, as part of all types and stages of development of project documentation, is mandatory and serves as the basis for decision-making by a specially authorized state body for environmental impact assessment.

It is prohibited to finance and implement projects related to environmental management without a positive conclusion from the state environmental assessment.

Environmental Impact Assessment (EIA) is carried out in accordance with the current regulatory legal acts of the Kyrgyz Republic.

**At the stage of the feasibility study**, a Preliminary Environmental Impact Assessment (pre-EIA) should be developed, which will assess the socio-economic feasibility of the implementation (location) of the planned activity (facility) in terms of the significance of the impact on the environment and the goals of the planned activity with taking into account the costs of implementing measures to prevent, minimize and (or) compensate for possible significant harmful impacts and the choice of a technological solution and a priority implementation option that is a justified object.

**The preliminary EIA must contain:**

• brief description of the planned activity;

• assessment of the existing state of the environment of the territory within the boundaries of the potential zone of possible impact of the planned activity;

• assessment of the possible impacts of the planned activity on the environment;

• assessment of the impact of alternative options for the planned activity on the environment;

• forecast and assessment of changes in the state of the environment during construction, operation and decommissioning of objects of planned activity;

• development of measures to prevent, minimize and/or compensate for significant harmful impacts on the environment during the construction, operation and decommissioning of proposed activity facilities;

• conclusions based on the results of the EIA;

• Environmental Impact Statement (EIS).

The results of the preliminary impact assessment are presented in the form of an EIA report.

**At the design stage**, the “Environmental Protection” section of the design document should be developed, including:

• updated comprehensive assessment of the impact of the selected base case on the implementation of activities;

• updated technical solutions and a set of measures to prevent, mitigate and minimize the impact of the planned activity on the environment and public health, its operation and liquidation;

• a resource-supported program of production control and environmental monitoring for each component during construction, operation and decommissioning of planned work;

• standards for the design of emissions, discharges of pollutants, generation and disposal of waste;

• Environmental Impact Statement (EIS).

1. In the case of site 11, groynes in the At Bashi river, this is not existing but MoES has already done FS. [↑](#footnote-ref-1)
2. RIC is a software with unified prices for all construction works approved by the Gosstroy. Cost estimates prepared using this software will be used for passing the State expertise of DD. [↑](#footnote-ref-2)
3. BoQ is compiled by the Consultant during the DD development. The market price is required to determine the budget and compare it to Gosstroy prices (using RIC software). Market prices will be used in the bidding documentation for works. [↑](#footnote-ref-3)
4. Refer to the WB [framework for involuntary resettlement](https://policies.worldbank.org/en/policies/all/ppfdetail/1572?ver=current) [and annex](https://policies.worldbank.org/en/policies/all/ppfdetail/1573?ver=current) [↑](#footnote-ref-4)