Draft Environmental Assessment and Review Framework

July 2023

Georgia: Climate Smart Irrigation Sector Development Program

Prepared by the Ministry of Environmental Protection and Agriculture, Government of Georgia, for the Asian Development Bank.

CURRENCY EQUIVALENTS

(As of 18 June 2023)

GEL 1.00	=	$ 0.3846
$1.00	=	GEL 2.60

ABBREVIATIONS

ACM	-	Asbestos-Containing Material
ADB	-	Asian Development Bank
CSISDP	-	Climate Smart Irrigation Sector Development Program
EAC	-	Environmental Assessment Code
EHS	-	Environmental Health and Safety
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
GA	-	Georgian Amelioration
GOG	-	Government of Georgia
GRM	-	Grievance Redress Mechanism
HIA	-	Heritage Impact Assessment
IEE	-	Initial Environmental Examination
MEPA	-	Ministry of Environmental Protection and Agriculture
MOF	-	Ministry of Finance
PAM	-	Project Administration Manual
PCRs	-	Physical Cultural Resources
PIC	-	Project Implementation Consultants
PIU	-	Project Implementation Unit
REA	-	Rapid Environmental Assessment
ROW	-	Right-of-way
SDP	-	Sector Development Programs
SPS	-	Safeguard Policy Statement, 2009
SSEMP	-	Site Specific Environmental Management Plan

WEIGHTS AND MEASURES

°C	degree Celsius
km	kilometer
lpcd	litres per capita per day
mm	milli meter
m	meter
mld	million liters per day
mm	millimeter
Nos	numbers
Sq.km	square kilometer

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I. INTRODUCTION

A. Background

1. Georgia needs to take significant steps to ensure the development of an efficient and sustainable irrigation subsector. The 2017 Irrigation Strategy highlighted the key legal and institutional reforms that are needed to facilitate irrigation expansion, main system management, local management, irrigation tariffs, and regulation. It encompasses the rehabilitation of decayed irrigation infrastructure and the development of modern data-based professional and participatory irrigation management.

2. The government requested various development partners, including the Asian Development Bank (ADB), to provide policy and investment support. This is to implement its ambitious Irrigation Strategy for increased agricultural production, food security, and livelihood opportunities for farming communities. Significant investments are also required to upgrade and modernize poorly functioning irrigation infrastructure. More efficient on-farm agricultural practices, including innovative technologies, increased water productivity, and improved water governance, need to be introduced. This is consistent with the government's climate change adaptation strategies.

3. ADB will draw on valuable experiences from preparing other sector development programs (SDP) in Georgia, including best practices from other developing member countries. These will contribute to preparing the first SDP in the agriculture, natural resources, and rural development sector in Georgia. ADB-financed SDPs have to date been efficient and effective in supporting the implementation of the government's sector strategies and have contributed to diversifying the portfolio. The SDP is aligned with the study conducted by the ADB Independent Evaluation Department. It highlights the importance of integrated approaches for irrigation projects to also include production factors, and increase the attention paid to agricultural activities. It also recommends policy and institutional reforms, and private sector engagement to address key constraints on sector outcomes. Similarly, the World Bank highlighted the importance of legal, institutional, and policy reforms in parallel with irrigation infrastructure improvements to improve crop yields resulting from adequate irrigation.

B. Project Impact, Outcome, and Outputs

4. The program is aligned with the following impact: food security in Georgia improved. The outcome will be sustainable, productive, and resilient agriculture system in Eastern Georgia strengthened.

5. The program will have three outputs. The policy-based loan will support water resources management and irrigation reforms under output 1. The project loan will support modernization of the Kvemo Samgori Left Main Canal Irrigation Scheme (KSL) under output 2, and the demonstration of climate-smart irrigation and agricultural production technologies and pilot windbreaks under output 3.

6. **Output 1: Institutional, governance, management, and financial management enhanced.** This will support the Ministry of Environmental Protection and Agriculture (MEPA) to strengthen its water resources management and irrigation policies, institutional capacity, and financial management. It will improve the irrigation subsector and increase its contribution to the economy and development objectives of Georgia. The policy actions under the policy-based loan focus on (i) enhanced legal and institutional framework to achieve irrigation policy outcomes and

ensure a sustainable management of water resources; (ii) pricing and contracting change to ensure improved efficiency of water use and financial sustainability of irrigation systems in face of current and expected impact of climate change on water resources; and (iii) enhancing governance and management controls to increase the Georgian Amelioration accountability, transparency, and efficiency of its service delivery. The policy reforms will create an enabling environment for outputs 2 and 3. A policy matrix was developed to identify and address any safeguarding concerns.

7. **Output 2: Irrigation schemes modernized.** Output 2 will support the modernization of the dilapidated, under-utilized KSL in Kakheti region in eastern Georgia. Modernization of the scheme includes repairs to the main canal and installation of pressurized pipe on-farm irrigation networks. Modernization will take place in two phases. Figure 1 shows the areas to be modernized according to the distributaries serving each area and the reaches of main canal to be modernized. Phase 1 areas are net command areas based on the detailed concept design for each area. Phase 2 areas are gross areas based on GA estimates. Table 1 lists the areas to be modernized in each phase. Modernization of the main canal will include changes to meet the needs of the area modernization design concept. The main canal will be also modernized in two phases (Figure 1). The first section of 8.4 kilometers (Ch 313+42 to Ch 397+00) is required to serve Areas 3 (G-38) and 4 (G-39) in Phase 1 of modernization. The second section of 9.2 kilometers (Ch 397+00 to Ch 488+66.7) will serve Areas 5 (G-41) and 6 (G-42) in Phase 2 of modernization.

Figure 1: Kvemo Samgori Areas to be Modernized

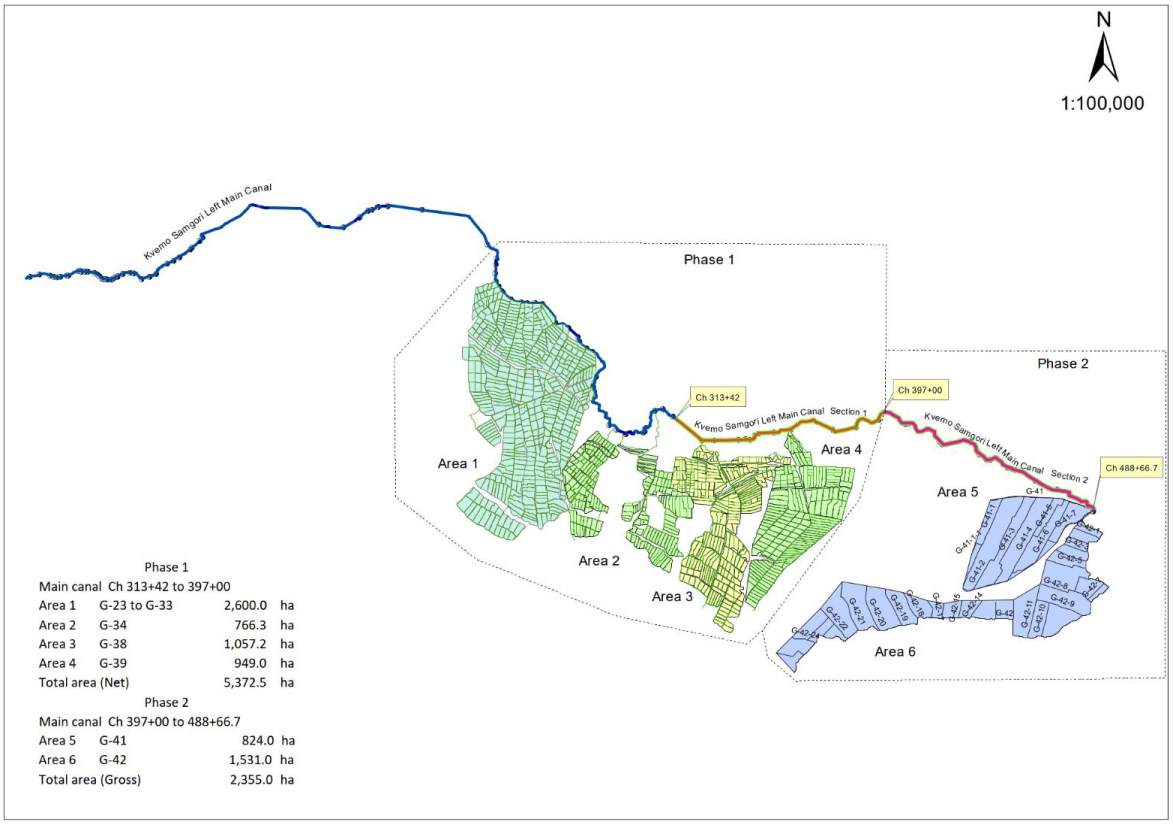


Table 1: Kvemo Samgori Phasing and Areas to be Modernized

Phase/Area	Gross Area (hectare)	Net Area (hectare)
Phase 1		
Area 1 (G-23 to G-33)	3,141	2,600
Area 2 (G-34)	1,074	766
Area 3 (G-38)	1,252	1,057
Area 4 (G-39)	1,047	949
	6,514	**5,373**
Phase 2		
Area 5 (G-41)	824	680
Area 6 (G-42)	1,531	1,263
	2,355	**1,943**
Total Phases 1 and 2	**8,869**	**7,316**

Note: Gross areas are based on Georgian Amelioration (GA) estimates except for Area 3 for which the GA estimate was lower than the net area identified by the concept design for that area. The gross area for Area 3 is based on the transaction technical assistance TA) consultants' estimate. Net areas for Areas 5 and 6 are based on the ratio of net area to gross area for Phase 1 areas since concept designs have been completed only for Areas 1 to 4 prior to implementation.
Figures may not sum due to rounding.
Source: Georgian Amelioration and TA 6648-GEO consultants.

8. **Output 3: Innovative Agriculture Production Systems Demonstrated.** Output 3 will support farmers to modernize and improve their irrigation and agricultural production technologies. The output will:

- Demonstrate innovative irrigation and agricultural production technologies.– The potential benefit of introducing such technologies will be assessed in terms of both improved water productivity and incremental financial and economic returns, for instance from diversification to high value crops. For farm irrigation, demonstration of gravity feed and solar powered systems, where practical, for water distribution.

- Provide capacity development for farmers and scheme stakeholders through training in technology implementation that will facilitate adoption of successful technologies.

- Identify constraints and means of addressing them such as access to finance, market information, adoption of new technologies, smart farming technologies, and mobile technologies and applications to aid decision making by farmers and other value chain actors.

- Establish pilot windbreaks to address soil erosion and to enhance crop protection. Demonstrations will be established on areas modernized in the Kvemo Samgori scheme.

9. **Implementation Arrangement.** The executive agency will be responsible for overall strategic guidance and for ensuring compliance with ADB's loan covenants for their respective outputs. For Output 1, the Ministry of Finance is the executive agency. For the investment component (outputs 2 and 3), the executive agency is MEPA.

10. The implementation agency for Output 1 is the MEPA. the MEPA Project Implementation Unit (PIU) is the implementation agency for outputs 2 and 3.

11. MEPA PIU is already set up and headed by the project director, they will be overall responsible for the implementation and overall responsibility for environmental compliance of Outputs 2 and 3. The PIU has a dedicated Environment Officer.

12. Georgian Amelioration has been given the responsibility to evaluate the design documentation and provide recommendations. After project completion, GA will take over the responsibility for the operation and maintenance of the system. Including ensuring any repairs and any works follow good environmental practices and national legislation and supporting the sustainable use of the irrigation system,.

13. **Project Components.** Under Output 2 the civil works have been split into two phases that contain different irrigation command areas which have been grouped into 6 Packages (Refer to Figure 1). Two of these are active and the last three are indicative, listed below.

14. Phase 1 - Active Packages:

- Package 1 (CSISDP NCW 01) Advanced Procurement. This comprises of the Left Main Canal Ch 313+42 to 397+00 which will focus on the repair and modernisation of the main canal, access roads and bridges and supporting structures and pipelines
- Package 2 (CSISDP NCW 02) Advanced Procurement for Area 1 (GA distribution branches G23 to G33). This is for the design and build of a pressurised pipe distribution network, structures and hydrants and SCADA.

15. Phase 2 - Indicative Packages:

- Package 3 (CSISDP NCW 03) Area 2 to 4 (GA distribution branches G34 to G39). For the design and build of the pressurised pipe distribution network, structures and hydrants and SCADA.
- Package 4 (CSISDP NCW 04) This covers the repair and modernisation of the main canal, access roads and bridges and supporting structures and pipelines of the Left Main Canal Ch 397+00 to 488+66.7.
- Package 5 (CSISDP NCW 05) Area 5 and 6 (GA distribution branches G41 and G42). For the design and build of the pressurised pipe distribution network, structures and hydrants and SCADA.

16. For phase 1, the Main Canal Ch 313+42 to Ch 397+00, Area 1 (G-23 and G-33) and Area 2 to 4 (G-34, G-38 and G-39), Draft IEEs and EMPs have been developed based on the concept and preliminary designs and these will be updated as required at the detailed design phase.

17. For phase 2, Main Canal Ch 397+00 to Ch488+66.7, Area 5 (G41) and Area 6 (G42), design activities have not yet commenced and shall be undertaken later.

18. Both Phase I and II shall be covered and need to comply with the EARF.

Figure 1: Coverage of the Program

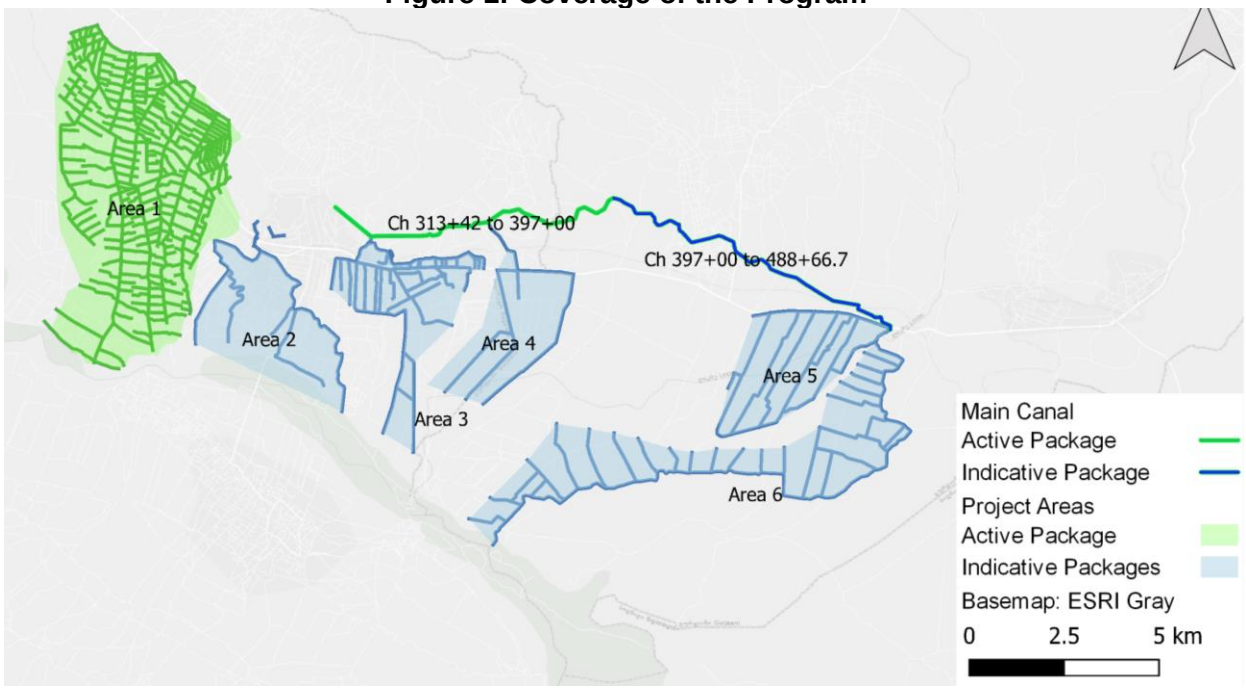
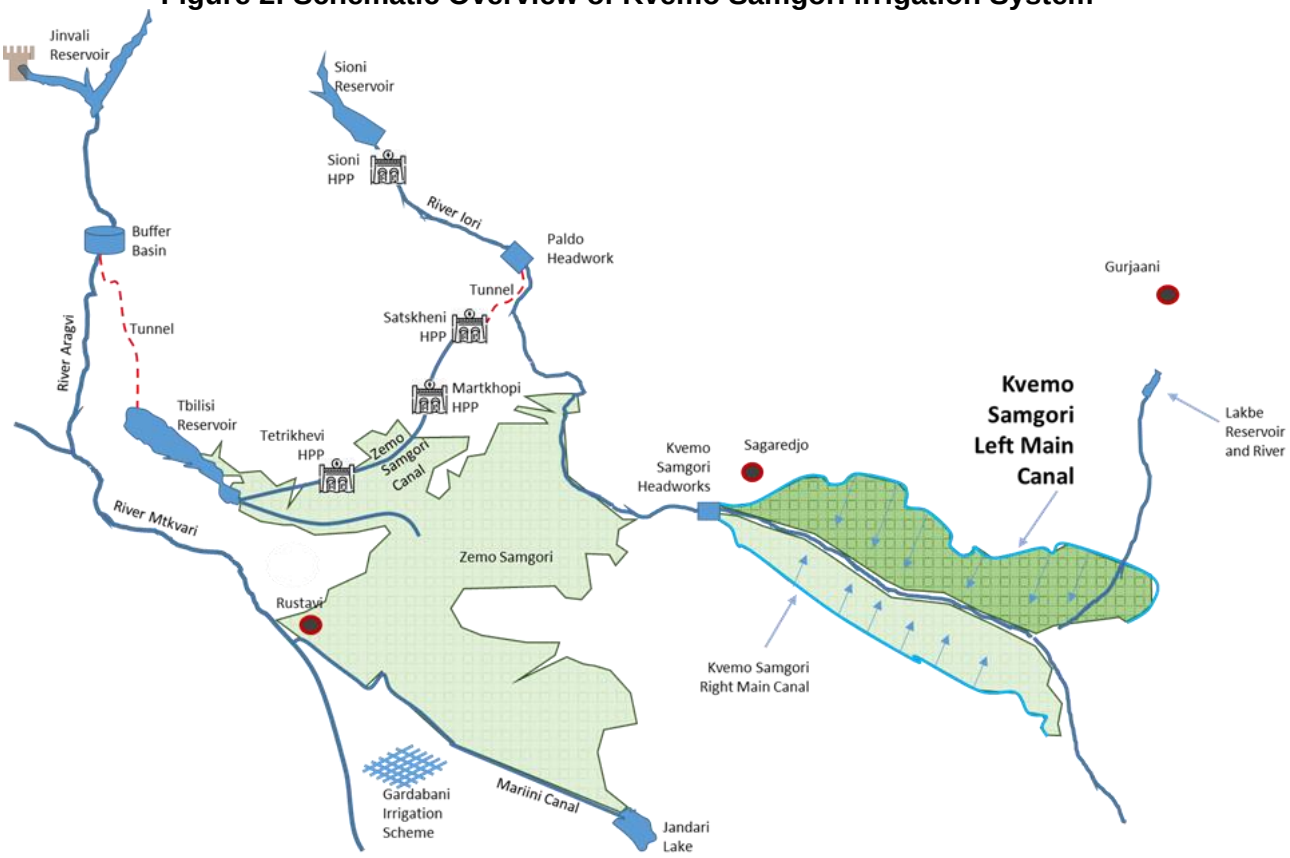


Figure 2: Schematic Overview of Kvemo Samgori Irrigation System



19. The infrastructure components are shown in Table 1.

Table 1: Subprojects and Components Under CSISDP

Subproject	Components	Proposed Infrastructure *(New / Refurbishment)*
Phase 1 – Active Packages		
Package 1 - Main Canal Ch 313+42 to 397+00	Rehabilitation works for the main canal - 8,358 m canal comprising of 10 tunnels, an inverted siphon and open trapezoidal and rectangular open canals - This is a gravity-fed system and there are no water storage systems within this section. Modernization Approach and Construction Works	Modernisation of the primary main canal including repairs to the access roads, removing encroaching vegetation and sediment build-up, repairs to inlets and outlets of tunnels and inverted siphon, repairs to the side and base of the canals and repairs to the tunnel sides. There are 12 outlets in various conditions where valves and Supervisory control and data acquisition (SCADA) system will be introduced. Repairs to bridges over the canal.
Package 2 - Area 1 (GA distribution branches G23 to G33)	Modernisation of the distribution branches G23 to G33. - Total length is 46.2km with 34% earth channels and 19% distributor pipes - 1,273 hydrants and 241 distribution wells	The detailed design has not yet been completed. Based on the concept design the following will likely occur: - Excavation of trenches (ground III category in a trench with an excavator and manual digging) - Bedding the pipes in sand - Laying polyethylene HDPE pipes - Installation of 451 electric valves at key junctions - Backfilling of the soil with a bulldozer - Installation of 306 flow meters - Arrangement of prefabricated reinforced concrete wells
Phase 2 – Indicative Packages		
Package 3 - Area 2 to 4 (GA distribution branches G34 to G39)	Modernisation of the distribution branches G34 to G39	No design information is available but likely – - Excavation of trenches (ground III category in a trench with an excavator and manual digging) - Bedding the pipes in sand - Laying polyethylene HDPE pipes - Installation of electric valves at key junctions - Backfilling of the soil with a bulldozer - Installation of flow meters - Arrangement of prefabricated reinforced concrete wells
Package 4 - Main Canal Ch 397+00 to 488+66.7	Rehabilitation works for main canal Modernization Approach and Construction Works	No design information is available but likely – Modernisation of the primary main canal including repairs to the access roads, removing encroaching vegetation and sediment build-up, repairs to inlets and outlets of tunnels and inverted siphon, repairs to the side and base of the canals and repairs to the tunnel sides.

Subproject	Components	Proposed Infrastructure *(New / Refurbishment)*
		Improvements to water outlets and repairs to bridges over the canal.
Package 5 - Area 5 and 6 (GA distribution branches G41 and G42)	Modernisation of the distribution branches G41 and G42	No design information is available but likely – - Excavation of trenches (ground III category in a trench with an excavator and manual digging) - Bedding the pipes in sand - Laying polyethylene HDPE pipes - Installation of electric valves at key junctions - Backfilling of the soil with a bulldozer - Installation of flow meters - Arrangement of prefabricated reinforced concrete wells
Output 3: Innovative agriculture production systems		
Climate Smart Water Management	Best Practices in surface irrigation for suitable crops. Expansion of pressurised irrigation systems for suitable crops Farm water storage and conservation	To be confirmed: - Tank storage - SCADA system with farm supply points - Expand the use of wells in areas not reached by the irrigation
Climate Smart Soil Management	Soil Organic Cabon Capture and Storage Healthy soil and social carbon management	To be confirmed: - Modify animal structures for ventilation and heat management

A. Purpose of the Environmental Assessment and Review Framework

20. The environmental assessment and review framework (EARF) has been prepared in accordance with ADB Safeguards Policy Statement (ADB SPS) and Government Acts, Rules and Regulations. This document aims to provide guidance on safeguard screening, assessment, institutional arrangements, and processes to be followed for components/subprojects of the program where the design takes place after Board approval. Environmental screening of the succeeding components/subprojects will be in accordance with the environmental subproject selection criteria as outlined in this EARF. MEPA PIU has agreed with ADB on screening and categorization, environmental assessment, preparation and implementation, monitoring, and updating existing safeguard documents to comply with the requirements specified in ADB SPS 2009 and Government Acts, Rules and Regulations.

21. This EARF (i) describes the program and its components, (ii) explains the general anticipated environmental impacts and mitigation measures for the subprojects which will be financed under the project after ADB Board approval, (iii) specifies the requirements that will be followed in relation to screening and categorization, assessment, and preparation of the environmental management plans; (iv) specifies the arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements, (v) assesses the capability of the executing and implementing agencies to implement national laws and ADB's requirements, and identifies needs for capacity building, (vi) specifies implementation procedures, institutional arrangements, and capacity development requirements, and (vii) specifies monitoring and reporting requirements.

22. The EARF ensures that all subprojects, in the entirety of their project cycle, will not deteriorate or interfere with the environmental sensitivity of a project area, but rather improve environmental quality.

23. An IEE has been prepared for the Active Packages - Package 1 and Package 2[1] as part of the loan approval providing generic mitigation measures and monitoring plans based on preliminary designs. It is expected that the IEE will be updated based on detailed engineering designs and integrated measures in bidding and contract documents. [2]

B. Environmental Categorization of CSISDP

24. An environmental assessment was undertaken for the active packages: (i) Package I: Main Channel and (ii) Package II: Area 1. The assessment was conducted using the ADB tools such as the Rapid Environmental Assessment (REA), and various technical discussions and site visits. Potential impacts are unlikely to affect areas larger than the sites or facilities subject to physical works.

25. The project is classified as Category B for environment per ADB SPS. The sample IEEs[3] prepared for the project concluded that these subprojects would have only small-scale, localized impacts on the environment which are readily mitigated. The potential adverse environmental impacts are mainly related to the construction and operation phases of the project period, which can be minimized by mitigating measures and environmentally sound engineering and construction practices. Future subprojects will likely replicate the sample subprojects in other areas and are thus expected to be category B. No category A-type works (having significant impacts) will be considered. Sample IEEs include environmental management plans (EMP) which outline mitigation measures for potential negative environmental impacts and monitoring plans. All IEEs will be finalized before the start of the works.

C. Subproject Selection Guidelines

1. Exclusion Criteria

26. The following criteria will be used for excluding subprojects/activities which have significant negative environmental impacts. No Category A per ADB SPS[4] will be considered, including but not limited to subprojects that would directly affect environmentally protected areas and highly valued cultural property. Potential Category A subprojects/activities shall be strictly avoided, relocated, redesigned or suitable alternatives derived.

Table 2: Exclusion Criteria

S. No	Projects / Components to be Excluded from CSISDP
I	**Type of Irrigation projects excluded from CSISDP**
A	New water source development - Dams or reservoirs
II	**Projects that are in the following environmentally sensitive areas excluded**
A	All new projects/components are located within: • Wildlife sanctuaries

[1] Draft IEE for Package 1: Main Canal Ch 313+42 to Ch 397+00 and Package 2: Area 1 – Irrigation area G 23 to G 33
[2] ADB TRTA 6648 Georgia: Climate Smart Irrigation Sector Development Program
[3] The sample IEEs were prepared based on conceptual preliminary design. The detailed design will be completed after contract award. The sites are unlikely to be changed during implementation. Thus, the impacts are expected to be of the same magnitude, duration and significance and will not affect the categorization.
[4] ADB Safeguards Policy Statement, 2009

S. No	Projects / Components to be Excluded from CSISDP
	• National parks • Tiger reserves • Elephant reserves • Core Zone of Biosphere reserves
B	Rehabilitation works of existing projects/facilities located in the environmentally-sensitive areas (wildlife sanctuaries, national parks, biodiversity conservation areas, etc.), shall be excluded if the following criteria are not met: • Proposed rehabilitation works will be confined to the existing footprint, and within the right of way of existing infrastructure • Proposed rehabilitation works will not require any new clearance/permissions. A written confirmation to that effect from the environmental regulatory agency/office shall be obtained.
III	**Projects with significant adverse impacts**
A	Projects likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works

2. Environmental Guidelines for Subproject Selection

27. In addition to the exclusion criteria, further guidance to avoid or minimize potential adverse environmental impacts will be followed for all subprojects/activities as shown in Table 3:

Table 3: Environmental Guidelines for Sub-project Selection

Components	Criteria	Design Considerations
All Activities	Avoid potentially significant adverse impacts that are diverse, irreversible, or unprecedented (ADB SPS Category A for the environment).	Seek ADB clearance and confirmation that the subproject/activity falls within Category B per ADB SPS.
	Comply with applicable national, and local laws, rules and regulations regarding environmental assessment, environmental protection, pollution prevention (water, air, noise, solid waste, etc.) wildlife protection, core labour standards, physical cultural resources, health and safety, and other laws	Include conditions/provisions from permits and clearances in bidding and contract documents
	Should not include and/or involve any activities listed in ADB's Prohibited Investment Activities List[5]	
	Reflect inputs from public consultations and stakeholder engagement	Refer to ADB SPS requirements on meaning consultations[6]
Location	Avoid involuntary resettlement by prioritizing rehabilitation over new	If cannot be avoided, prepare Resettlement Plan.

[5] ADB SPS Appendix 5

[6] Per ADB SPS, meaningful consultation is defined as "a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues"

Components	Criteria	Design Considerations
	construction using vacant government land where possible, and taking all possible measures in the design and selection of site or alignment to avoid resettlement impacts	
Biodiversity	Avoid or minimize the cutting of trees	If trees are to be cut, obtain the required permits. Consider a minimum of 1:3 replacement.
	Avoid environmentally-sensitive areas (wildlife sanctuaries, national parks, biodiversity conservation areas, etc.)	If cannot be avoided, seek ADB's approval and confirm: (i) rehabilitation works will be confined to the existing footprint, and within the right of way of existing infrastructure (ii) rehabilitation works will not require any new clearance/permissions. A written confirmation to that effect from the environmental regulatory agency/office shall be obtained
Physical Cultural Resources	Avoid destruction/damage of or encroachment onto physical cultural resources (PCR)[7] such as archaeological monuments; heritage sites and movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.	If the location is within 300 m of notified protected monuments/ sites and there are no alternatives, permissions from the Ministry of Culture, Sports and Youth are to be obtained prior to the finalization of detailed engineering design. If potential physical cultural resources are found within or adjacent to project sites, a Heritage Impact Assessment is required to be conducted by a competent expert.
Existing facilities to be rehabilitated or expanded	Conduct environmental audit of existing facilities[8] per ADB SPS	For non-compliances, provide corrective action for each area of concern including cost and schedule to be included in the subproject EMP.
Associated Facilities[9]	Analyze environmental impacts and risks	Include in detailed engineering design and IEEs
Asbestos-containing materials (ACM) including old pipes and stored materials, etc.	Avoid handling or removing any ACM. Ensure asbestos concrete (AC) pipes facilities containing asbestos will not be disturbed and left in situ.	If ACM is suspected, asbestos verification by a competent expert is required.

[7] Physical cultural resources as defined as "movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level."

[8] ADB SPS Appendix 4 para 12 on Existing Facilities

[9] ADB SPS Appendix 1 para 6 defines associated facilities as "not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project"

Components	Criteria	Design Considerations
		Prior to the start of the civil works, the competent expert should prepare an asbestos management plan (AMP) according to ADB Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks (https://www.adb.org/publications/good-practice-management-control-asbestos) MEPA and PIU shall include the requirements and costs related to asbestos management in bidding and contract documents. The contractor shall be required to have the qualifications, expertise, and skills to handle ACM.
Excavation	When designing subproject infrastructure that involves excavation, the relevant authorities must be consulted to ascertain the location of any ACM prior to any subproject activity. Locations of new infrastructure must then be designed to avoid excavating or disturbing any ACM.	
Sustainability	Ensure sustainable flow of water.	Ensure rehabilitation activities do not impact water flow, quality, and quantity available to other users. Maintaining slope stability and preventing sediment flow in the canal,

28. **Asbestos-containing Materials (ACMs).** Based on (i) field visits of subproject areas and (ii) available records from the MEPA and PIU, ACMs are used in secondary canals and will need to be decommissioned/dismantled during project implementation. International guidelines and national policies provide a framework for the identification, management, handling, and disposal of ACM in situ or stored in existing CSISDP sites. These include the following:

- ADB Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks (https://www.adb.org/publications/good-practice-management-control-asbestos)
- International Finance Corporation's Guidance Notes: Performance Standards on Environmental and Social Sustainability [Jan 2012]
- World Bank Group's Good Practice Note: Asbestos: Occupational and Community Health Issues [May 2009]
- Georgian Standard IS 11451- 1986: Recommendations for Safety and Health Requirements relating to Occupational Exposure to Asbestos

- Georgian Standard IS 11768 – 1986: Recommendations for Disposal of Asbestos Waste Material

29. The IEEs of each subproject/activity where asbestos is present will include a detailed asbestos management plan, including specific requirements for the contractor during the dismantling and decommissioning of the existing canals.

30. **Natural,[10] Modified,[11] or Critical Habitat.[12]** ADB SPS 2009 does not allow implementing subproject activities in areas of critical habitats or in areas that would lead to significant conversion and degradation of natural/modified habitats[13]. A precautionary approach shall be applied to the management and use of renewable natural resources.

31. A global database such as the Integrated Biodiversity Assessment Tool (IBAT)[14] will be used to conduct a preliminary assessment of the site locations in reference to critical habitats, key biodiversity, and key protected areas alongside the IUCN red list of species affected – critically endangered, endangered, endemic or restricted-range.

32. **Physical Cultural Resources.** ADB SPS 2009 defines Physical Cultural Resources as movable or immovable objects, sites, structures, groups of structures and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or underwater. Their cultural interest may be at the local, provincial, national, or international level.

33. Georgia has a long history, rich heritage, and culture. There are several places of archaeological, historical and cultural importance. As of 2020, Georgia has four sites on the UNESCO world heritage list and a further fourteen on the tentative list. The first two sites inscribed to the list were the Historical Monuments of Mtskheta and the site comprising Bagrati Cathedral and Gelati Monastery, in 1994.

34. The IEEs of the subprojects/activities will provide detailed information on physical cultural resources within the direct and indirect impact zones and adjacent areas.

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[10] Natural Habitat is land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions

[11] Modified habitat is where natural habitat has been apparently been altered, often through introduction of alien species of plants and/or animals;

[12] Critical habitat is a subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites.

[13] Significant conversion or degradation is (i) the elimination or severe diminution of the integrity of a habitat caused by a major, long-term change in land or water use; or (ii) the modification of a habitat that substantially reduces the habitat's ability to maintain viable populations of its native species. Significant conversion may include, for example, land clearing; replacement of natural vegetation (for example, by crops or tree plantations); permanent flooding (by a reservoir for instance); drainage, dredging, filling, or canalization of wetlands; or surface mining;

[14] The PIU may use a different screening tool or will request for ADB support on IBAT.

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Country Environmental Safeguard Policies

35. Implementation will be governed by applicable Government of Georgia environmental acts, rules, policies, and regulations as shown in Table 4. In general, Georgian standards for environmental quality correspond to international IFC/WB standards, however in case of differences more stringent standards are applicable.

Table 4: Applicable Government of Georgia Environmental Legislations and Specific Requirements for Project

Law	Description	Requirement for Project
The Constitution of Georgia [adopted in 1995]	The Constitution of Georgia lay down the legal framework that guarantees environmental protection and public access to information with regard to environmental conditions. Article 37 states that "any person has the right to live in a healthy environment, and use the natural and cultural environment. Any person is obliged to take care of the natural and cultural environment." And that: "an individual has the right to obtain full, unbiased and timely information regarding his working and living Environment." Article 41 states that "a citizen of Georgia is entitled to access information on such citizen as well as official documents available in State Institutions provided it does not contain confidential information of state, professional or commercial importance, in accordance with the applicable legal rules.	The legal agreement between Georgia and the ADB prevails over the national legislation in case of contradiction. This extends to any statement made in the present EARF and IEEs.
Environmental Assessment Code (EAC) [adopted in June 2017]	The Environmental Assessment Code sets up regulations and procedures for Environmental Impact Assessment, Strategic Environmental Assessment, Transboundary Environmental Assessment, Public Participation and Expertise in the Decision-Making Process. The Environmental Impact Assessment (EIA) shall be subject to the activities envisaged by Annex I and the activities envisaged by the Annex II of EAC, which will be subject to EIA based on the screening procedure set out in Article 7 of this Code (Article 5 of Chapter 2).	The law will help the Municipal Development Fund determine what additional permits or licenses will be required under the subprojects.
Law of Georgia on Licenses and Permits [adopted in 2005]	The law defines the list of activities needing licenses or permits, including the "Environmental Decision". It also defines the requirements for the license or permit issue. The Law, together with the normative by-laws, regulates such organized activity or action, which relates to an indefinite circle of entities, is	The law will help the IAs to determine what additional permits or licenses will be required under the subprojects.

Law	Description	Requirement for Project
	characterized by increased hazard to human life or health, affects particularly important state or public interests or is related to the use of a state resource. It gives a thorough list of licenses and permits, establishes the rules to issue the licenses and permits, and makes amendments to them or abolishes them. Under the law, state regulation of the activity or action through a license or permit is undertaken only when the given activity or action is directly associated with the increased hazard to human life or health or fields of state or public interests. The state regulation is undertaken only when the issuance of a license or permit is a real means to reduce the hazard in question or consider state or public interests.	
Law of Georgia on Water Resources Management [adopted in 2023]	There is a duty to ensure the sustainable use and protection of water, and prevent its contamination, pollution and depletion.	The law regulates the water intake and water discharge processes. To meet the requirements, actions to avoid, reduce or manage the pollution or strongly negative impact on the rivers in the project zones under Project must be identified.
Waste Management Code [adopted in January 2015]	Law provides the legal conditions for the implementation of measures aiming at the prevention of the generation of waste and increased re-use, environmentally-sound treatment of waste (including recycling and extraction of secondary raw materials, energy recovery from waste, as well as safe disposal).	If over 200 tons of non-hazardous waste, 1,000 tons of inert waste or any hazardous waste is produced annually then the Construction Contractor(s) must hire a qualified environmental manager(s) who will be obliged to develop Waste Management Plan and submit it to MEPA for approval. In line with the requirements of the Waste Code, the Construction Company is obliged to control the process of managing the originated waste through the final disposal of the waste.
Law of Georgia on Cultural Heritage [adopted in 2007]	The law defines cultural heritage, its protection and permitting process. For 'large-scale' construction works, it requires archaeological research to be carried out by the entity wishing to accomplish the groundworks. In case of identifying an archaeological object on the territory to study, the conclusion of the archaeological research should contain the following information: (a) a thorough field study of the archaeological layers and objects identified on the study territory by using modern methodologies, (b) recommendations about the problem of conservation of the identified objects and planning of the building activity on the	This law obliges the design consultant to study the project area and, in case the project will have an impact on the cultural heritage sites during the construction or operation phase, develop additional mitigation measures. Also, the law defines what procedure the construction contractor must go through if, during the construction works, such archaeological objects have been found that may belong to the cultural heritage.

Law	Description	Requirement for Project
	design territory, based on the archaeological research.	
Law on Ambient air protection [adopted in 1999]	The Law regulates the protection of ambient air from the harmful anthropogenic influence on the entire territory of Georgia and focuses on four types of pollution: (i) Pollution of the environment with hazardous matter; (ii) Radiation pollution of ambient air; (iii) Pollution with microorganisms and biologically active matter of microbial origin; and (iv) Noise, vibration, electromagnetic fields, and other physical impacts. This sets maximum permitted limits for the concentration of hazardous substances into the ambient air. Emissions are required to be monitored and this information is transparent and accessible to the public.	At the stage of construction and rehabilitation under the Project, the requirements of the said law will regulate the level of noise, vibration and emissions on the territory of project zones.
Law of Georgia on Public Health [adopted in 2007]	The Law promotes good health and a healthy lifestyle for the population; an environment safe for human health; protects the reproductive health of a family, and prevents diseases. The Law defines the rights and obligations of the population and legal entities in the field of public health. Qualitative standards for the environment safe for human health (ambient air, water, soil, noise, vibration, electromagnetic radiation), are set.	The law regulates all actions that may affect the local population during the construction and operation of subprojects under the Project. This includes environmental standards which should be followed.
Law on Soil Protection [adopted in 1994]	The law provides the principles of the protection and preservation of fertility soil resources against negative impacts. The Law establishes the rights and duties of landholders, landowners, and the state in soil protection. The law defines soil protection measures and methods and prohibits certain activities, e.g. use of fertile soil for non-agricultural purposes; implementation of non-agricultural activity without topsoil removal and conservation; any activity, which results in deterioration of soil properties, etc.	Within the scope of the project, the requirements of the said law regulate the rules of topsoil removal, storage and further management in the process of construction or rehabilitation.
Labor Code	The code regulates employment relations unless such relations are otherwise regulated by international treaties that have been implemented in Georgia. Employers are obliged to comply with the requirements and clauses of the document to ensure that the rights of employees are protected.	The rights of all employees engaged in the construction of the Project will be protected in line with the requirements of this law.
Law of Georgia on Labor Safety	The Law defines basic requirements and preventive measures in terms of workplace safety for employers. The Law applies to jobs considered to be of	The rights of all employees engaged in the construction of the project will be protected in line with the requirements of this law.

Law	Description	Requirement for Project
	increased danger, hard, harmful, and hazardous. The employer's compliance with the labour safety regulations in Georgia is overseen by the Ministry of Health, Labor and Social Affairs of Georgia through its respective departments.	
Air, noise and water standards and requirements		Specific details are provided in Appendix 4

36. **Clearances / Permissions to be obtained prior to the start of construction.** Table 5 below shows the list of clearances or permissions required for the subprojects/activities. The PIU will ensure that these are obtained prior to the start of works. PIU will not allow the contractor to start civil works if permits/clearances are not complete. The PIU shall report to ADB the status of compliance with clearances/permits as part of the project progress reporting.

Table 5: Clearances and Permissions Required

Construction Activity	Clearance Required	Responsibility to Obtain
Land for Project Activity	Allotment and approval for specific land use in the pre-construction stage	PIU
Construction in heritage areas	Relevant conclusion of the National Agency for Cultural Heritage Preservation of Georgia	Design Contractors and PIU
Tree Cutting	Relevant conclusion of the National Forestry Agency under the MEPA.	Construction Contractor
Hot mix plants, crushers, batching plants	Relevant conclusion of the MEPA	Construction Contractor
Storage, handling, and transport of hazardous materials	Relevant conclusion of the MEPA	Construction Contractor
Sand mining, quarries and borrow areas	LEPL National Agency of Mineral Resources	Construction Contractor
Temporary traffic diversion during construction	Relevant conclusion from the Ministry of Internal Affairs of Georgia (Patrol Police Department)	Construction Contractor
Establishment of construction camps	Relevant conclusion of the MEPA	Construction Contractor
Disposal of Construction waste and demolition debris	Relevant conclusion of the MEPA	Construction Contractor
Pipe laying and other construction works	For pipe laying activities with a length of 5km and it is necessary to prepare a screening report for submission to MEPA.	Construction Contractor
Construction of new tube wells or any new extraction of groundwater	Relevant conclusion of the MEPA.	Construction Contractor

B. International Environmental Agreements and Applicability to Project

37. Georgia is a party to various international agreements and conventions related to the environment, which include the following:

Table 6: International Conventions and Treaties and Applicability to CSISDP

Date	Title	Status in Georgia/Year	Applicability to CSIDSP
Natural Environment			
1961	International Convention for The Protection of New Varieties of Plants	Entry in force 2008	Applicable
1971	Ramsar Convention on Wetlands of International Importance Especially as Wildfowl Habitat The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. Georgia is one of the signatories to the treaty. The Ramsar convention made it mandatory for the signatory countries to include wetland conservation in their national land use plans.	Entry in force 1987	Not applicable as no Ramsar sites in any of the subproject areas.
1973	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Entry in force 1996	Not applicable to this project as no endangered species of wild fauna and flora are found in subproject areas.
1991	Agreement on The Conservation of Populations of European Bats	Entry in force 2002	Applicable if bats are present
1995	Agreement on The Conservation of African-Eurasian Migratory Water birds	Entry in force 2021	Applicable if one of the 255 species of wetland birds are present
1997	International Plant Protection Convention (1997 Revised Text)	Entry in force 2007	Applicable regarding ensuring sustainable agriculture and the prevention of pests.
1983	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (CMS)	Entry in force 2000	Applicable if migratory species are present
1992	Rio Convention on Biological Diversity	Entry in force 1994	Applicable regarding preventing biodiversity loss
2000	Cartagena Protocol on Biosafety to the Convention on Biological Diversity	Entry in force 2009	Not applicable in this project as there is no modification of organisms
2000	European Landscape Convention	Entry in force 2011	Not applicable to this project as this project is not altering the “character” of the landscape
2008	Convention on the Conservation of European Wildlife and Natural Habitats (Bern)	Entry in force 2010	Applicable regarding preventing biodiversity loss
Environmental pollution, waste			
1997	Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management	Entry in force 2009	Not applicable to this project as no radioactive waste

Date	Title	Status in Georgia/Year	Applicability to CSIDSP
1998	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Entry in force 2007	Not applicable in this project is not involved in the trade of chemicals and pesticides
1989	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Entry in force 2007	Not applicable to this project as should not involve the transboundary movement of waste
2001	Stockholm Convention on Persistent Organic Pollutants	Entry in force 2007	Applicable regarding pesticides and fertiliser
Climate			
1994	UN Framework Convention on Climate Change (UNFCCC)	Entry in force 1994	Applicable
1985	Vienna Convention for the Protection of the Ozone Layer	Entry in force 1994	Not applicable to this project as this does not use or produce CFCs, HCFCs & HCF
1987	Montreal Protocol on Substances that Deplete the Ozone Layer, (and its London, Copenhagen, Montreal and Beijing Amendments 2000 and 2011)	Entry in force 1996	Not applicable to this project as this does not use or produce CFCs, HCFCs & HCF
1997	Kyoto Protocol to UNFCCC	Entry in force 2005	Applicable
1999	Geneva Convention on Long-Range Transboundary Air Pollution	Entry in force 1999	Not applicable to this project as long-range pollution is unlikely
Cultural heritage			
1954	European Cultural Convention	Entry in force 1997	Applicable
1972	Paris Convention Concerning the Protection of the World Cultural and Natural Heritage	Entry in force 1992	Applicable
1982	European Convention on the Protection of the Archaeological Heritage	Entry in force 2000	Applicable
1985	Convention for the Protection of the Architectural Heritage of Europe	Entry in force 2000	Applicable
2005	Council of Europe Framework Convention on the Value of Cultural Heritage for Society (Faro convention)	Entry in force 2011	Applicable
Public participation and information accessibility			
1998	Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters	Entry in force 2000	Applicable
Labour and Workforce			
1930	Forced labour Convention	Entry in force 1993	Applicable
1936	Holidays with Pay Convention	Entry in force 1993	Applicable
1949	Freedom of Association and Protection of the Right to Organize Convention	Entry in force 1999	Applicable
1948	Right to Organize and Collective Bargaining Convention	Entry in force 1993	Applicable

Date	Title	Status in Georgia/Year	Applicability to CSIDSP
1950	European Convention for the Protection of Human Rights and Fundamental Freedoms	Entry in force 1999	Applicable
1951	Equal Remuneration Convention	Entry in force 1993	Applicable
1957	Abolition of Forced Labor Convention	Entry in force 1993	Applicable
1958	Discrimination (Employment and Occupation) Convention	Entry in force 1993	Applicable
1962	ILO Social Policy (Basic Aims and Standards) Convention	Entry in force 1997	Applicable
1964	Employment Policy Convention (Geneva)	Entry in force 1993	Applicable
1973	Geneva Convention concerning Minimum Age for Admission to Employment	Entry in force 1996	Applicable
1975	Human Resources Development Convention	Entry in force 1996	Applicable
1978	Labor Relations (Public Service) Convention	Entry in force 2003	Applicable
1997	Employment Service Convention	Entry in force 2002	Applicable
1997	Private Employment Agencies Convention	Entry in force 2002	Applicable
1999	Worst Forms of Child Labor Convention	Entry in force 2002	Applicable

C. Regional Cooperation

38. Georgia has worked with its neighbouring countries to create an “Ecoregion Conservation Plan for the Caucasus” (2006, updated 2012), in line with the Aichi biodiversity goals. This identifies 56 regional hotspots and 60 regional corridors to be prioritized for conservation 30 and also proposed specific actions to be taken with regard to the establishment of a protected area network, enhancement of transboundary connectivity, restoration of degraded ecosystems, harmonization of policies and legislation, coordination of scientific researches and monitoring activities, environmental education and raising awareness. A “Regional Biodiversity Council” facilitates the coordination of activities at the Ecoregion level.

39. In addition, the Transboundary Joint Secretariat in South Caucasus (TJS) assists Environmental Ministries/Protected Area Management Structures of Georgia, Azerbaijan and Armenia in strengthening regional cooperation and development and harmonization of the nature conservation sector. The TJS was founded in 2007, under the Ecoregional program “Sustainable Management of Biodiversity, South Caucasus”, and contributes to the development of tools for sustainable funding of policy and strategic documents and protected areas.

40. If the CSISDP subproject/activity will be located in or near the sites notified under the Ramsar convention, World Heritage Sites, and Biosphere reserves, then the project will need to comply to the provisions and/or respective site management plans drawn up as per the convention guidelines. As these sites also enjoy protected sites under Georgia legislation, the international requirements will also be considered by the government regulatory agencies during the clearance and permission process.

41. On climate change conventions, CSISDP will be designed, constructed, and operated with minimal greenhouse gas emissions and infrastructure be built as climate resilient as far as possible.

D. Georgian Legislation Related to Environmental Permitting.

42. At present, the environmental permitting procedure in Georgia is set out in two laws: (i) The Law on Licenses and Permits (2005); and (ii) Environmental Assessment Code (EAC) adopted in June 2017

43. In line with the mentioned laws, a provision "On the environmental Impact Assessment" is proved by Decree No. 14 of October 4, 2011, of the Minister of Environment and regulates the legal relations associated with the assessment of environmental impacts.

44. The Law on Licenses and Permits was adopted by the Parliament of Georgia, on June 24, 2005. The new Law regulates legally organized activities posing certain threats to human life and health and addresses specific state or public interests, including the usage of state resources.

45. It also regulates activities requiring licenses or permits, determines types of licenses and permits, and defines the procedures for issuing, revising and cancelling of licenses and permits (Article 1, Paragraph 1).

46. The Law of Georgia on Environmental Impact Permit determines the complete list of the activities and projects subject to the ecological examination (clause 4 p.1) and the legal basis for public participation in the process of environmental assessment, environmental impact permit. ecological examination and decision-making on the issuance of an environmental impact permit.

E. Public Consultation Procedures

47. Environmental Assessment Code (EAC) adopted in June 2017 provides detailed requirements and procedures for conducting public consultations and establishes timeframes for information disclosure and discussion. According to Article 6, the developer is obliged to carry out public discussion of the EIA before its submission to an administrative body responsible for issuing a permit. Where an activity requires a construction permit this must be done before initiating stage 2 of the process for issuing a construction permit.

F. ADB Safeguard Policy Statement's Environmental Requirements

48. **ADB SPS** requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires an environmental assessment of all ADB investments.

49. **Screening and Categorization.** ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, sensitivity and magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

- **Category A.** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These

impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.

- **Category B.** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases, mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
- **Category C.** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- **Category FI.** A proposed project is classified as category FI (Financial Intermediary) if it involves investment of ADB funds to or through a FI.

50. **Environmental Audit of Existing Facilities.** ADB SPS requires an environmental audit if a subproject involves facilities and/or business activities that already exist or are under construction, including an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of this compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients and to identify and plan appropriate measures to address outstanding compliance issues.

51. SPS environmental safeguard policy principles require the conservation of physical cultural resources, and avoid destroying or damaging them by using field-based surveys employing qualified and experienced experts during environmental assessment. It also emphasizes the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

52. **Environmental Management Plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

53. **Public Disclosure.** ADB will post the safeguard documents on its website as well as disclose relevant information in an accessible manner in local communities:

- for environmental category A projects, draft the EIA report at least 120 days before Board consideration;
- final or updated EIA and/or IEE upon receipt; and
- environmental monitoring reports submitted by the implementing agency during project implementation upon receipt.

54. **Consultation and Participation.** Meaningful consultation shall be carried out with affected people and other concerned stakeholders including civil society and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

55. Grievance **Redress Mechanism.** PIU shall establish a mechanism to receive and facilitate the resolution of affected people's concerns, complaints and grievances about the subproject's environmental performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

56. **Occupational Health and Safety.** ADB requires that the borrowers shall ensure that the workers are provided with a safe and healthy environment, considering risks inherent to the sector and specific classes of hazards in the subproject areas including physical, chemical, biological and radiological hazards.

57. **Unanticipated Environmental Impacts.** Where unanticipated environmental impacts become apparent during the implementation, PIU shall update the EMP to assess the potential impacts, evaluate the alternatives and outline mitigation measures and resources to address those impacts.

4. **ADB SPS International Best Practice Requirements.** Following the requirements of ADB SPS, PIU shall apply pollution prevention and control technologies and practices consistent with international good practices. When the Government of Georgia regulations differ from these levels and measures, PIU shall achieve whichever is more stringent. Appendix 4 provides applicable standards. If less stringent levels or measures are appropriate in view of specific subproject circumstances, PIU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

G. Compatibility between Country's and ADB Safeguard Policy

58. The Government of Georgia has a different but robust environmental legislative framework, embedded in various acts, policies, rules and regulations. While the ADB SPS is in line with the multilateral development financing institutions, Government's policies are also comparable to the international environmental framework including that of the ADB (Table 7).

59. The Government of Georgia's environmental assessment and clearance process is, in principle, consistent with ADB's environmental assessment process and public disclosure requirements.

60. CSISDP will require clearances or permission under Georgian legislation or decrees as applicable and if the project location is sensitive or notified. Such as if a project is in forest lands or near protected monuments, it will require approvals as per those regulations.

61. Per ADB SPS, CSISDP subprojects/activities are classified as "Category B" per ADB SPS as these are unlikely to have significant adverse impacts. As such, no category A projects will be considered for funding under this project. It is therefore required that subprojects are subjected to screening, categorization, and preparation of IEEs and EMPs.

62. The Government of Georgia framework does not prescribe due diligence or environmental audit to check existing facilities at subproject site(s) to determine whether they could cause or are causing, environmental risks and impacts. However, ADB's SPS principles require environmental due diligence or audit even in such circumstances. If the subproject does not foresee any major expansion except refurbishment of existing facilities, the due diligence or environmental audit constitutes the environmental assessment for the subproject.

Table 7: Comparative Government and ADB Safeguard Requirements

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
Commensurate environmental	Use a screening process for each	Project screening is done at an early	EIA notification is applicable only to	Implement the ADB SPS

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
screening of impacts and risks	proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	stage of the project. Environmental Assessment Code provides a list of I and II category activities. For the category II project need for EIA is defined based on the scoping procedure by MEPA.	the projects listed in the EIA act.	requirements and tools for screening and categorization, identification of risks and mitigation measures Requirements of the National Environmental Standards are compared with international standards and adapted to the more stringent requirements.
Assess potential impacts and risks to physical, biological, socio-economic and physical cultural resources of the project-affected area	Conduct an environmental assessment for each proposed subproject to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	According to GOG requirements, there are the same requirements for assessing potential impacts and risks to physical, biological, socio-economic and physical cultural resources of the project-affected area.	There is no gap between ADB and GoG legislation.	Subproject selection criteria and environmental assessment process and categorization be implemented with alignment to the SPS.
Examine alternatives for the project's location, design,	Examine alternatives to the project's location, design, technology, and	Alternative assessments are to be carried out for the project location and	There is no gap between ADB and GoG legislation.	N/A

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
technology and potential environmental impacts	components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also, consider the no project alternative.	design and among them zero alternative/no project alternative.		
Preparation of Environmental Management Plan	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	EIA report is required for Annex 1 listed projects. For Annex 2, the project need for EIA is decided based on the screening procedure. The content of the EIA report is structured so to cover requirements indicated in the Environmental Assessment Code. The EMP is a part of the EIA document.	There is no gap between ADB and GoG requirements.	In line with the general guidance, conduct the preparation of the environmental management plan using ADB tools (e.g. REA checklist). The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.
Carrying out Public	Carry out meaningful consultations with	Publication of information in	According to GoG	Adapt the ADB requirements on

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
Consultations and concerns	affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision-makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment.	national and regional mass media. Arrange two public meetings – one at the scoping stage, another not later than the 55th day from submission of the draft EIA report to MEPA. All stakeholders are invited to the meetings. One-to-one meetings and consultations with stakeholders during the EIA process. Consultation not later than 60 days from the date of publication.	requirements conducting public consultations with stakeholders is not required throughout project implementation.	meaningful consultation and documentation carried out with affected people and other concerned stakeholders including civil society and facilitate their informed participation.
Grievance redress mechanism	Establish a grievance redress mechanism to receive and facilitate the resolution of the affected people's concerns and grievances regarding the project's environmental performance.	Implementing Agency to facilitate the resolution of affected people's concerns.	No specific government regulation on addressing grievances.	The component of the Environment Assessment report on the Grievance Redress Mechanism should be addressed in accordance with the ADB requirement.
Disclose a draft and final IEE report	Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s)	The scoping document is available for public review for 45 days before public consultations. The EIA Report is available for public review for 50-55	According to GoG requirements, MEPA is responsible to send an electronic version of the EIA report to local municipalities for	Conduct public disclosure in accordance with ADB requirements such as posting the safeguard documents on its website as well as

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
	understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders. Draft EIA will be published on the ADB website for 120 days before Project approval by the Board.	days before public consultations.	disclosure in GEO language only.	disclosing relevant information in an accessible manner in local communities.
Implementation of monitoring effectiveness	Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	Implementation of the monitoring plan is the responsibility of the Construction Contractor and PIU.	According to GoG legislative, there is no requirement to prepare and submit monitoring reports to the PIU and also there is no requirement to disclose the mentioned reports.	ADB's monitoring and reporting requirements shall be implemented.
Protection of critical habitats and protected flora and fauna	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural			Adapt the SPS requirements for natural, modified and critical habitat

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
	habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.			
Application of pollution prevention and control technologies	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gas emissions, waste generation, and release of	According to GoG legislative, there are the same requirements for the application of pollution prevention and control technologies	There is no gap between ADB and GoG requirements.	ADB requires the adaptation of the more stringent requirements between the international standard and government regulations.

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
	hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.			
Health and Safety	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, minimize, adverse impacts and risks to the health and safety of local communities.			ADB requires the consideration of site-specific hazards such as the presence of asbestos materials.
Conserve physical cultural resources and avoid destroying or damaging them	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of “chance find” procedures that include a pre-approved management and conservation approach for	According to GoG legislative base during the EIA preparation stage, it is required to prepare an archaeological survey report and submit it to the National Agency for Cultural Heritage Preservation of Georgia for obtaining permission.	There is no gap between ADB and GoG requirements.	ADB SPS environmental safeguard policy principles require the conservation of physical cultural resources and avoid destroying or damaging them by using field-based surveys employing qualified and experienced experts during environmental assessment.

ADB SPS Requirement	ADB SPS Policy Principle	Government of Georgia Regulation	Gap	Measures to Address Gap
	materials that may be discovered during project implementation.			

H. Institutional Capacity for Environmental Safeguard Implementation Arrangement

63. MEPA is responsible for the overall strategic planning, guidance, and management of CSISDP, and for ensuring compliance with project conditions, loan covenants, and statutory requirements. PIU is responsible for day-to-day monitoring and ensuring compliance with ADB SPS and government laws, rules, and regulations. PIU is set up for the implementation of the civil works and contract monitoring including overseeing the design, construction supervision and ensuring the technical quality of designs and construction.

64. PIU is also responsible for updating the draft IEE(s) prepared during the loan approval stage based on detailed engineering design, preparing IEEs for subprojects/activities to be identified after ADB loan approval, and providing support and guidance to PIU concerning contractors' performance to ensure compliance with ADB SPS, government regulations, and per provisions in the contract documents on the environment, health and safety.

65. PIU will supervise the PIU's work and will review and advise as required in all aspects of project implementation. PIU will be supported by consultants in all activities during the implementation, including the safeguard activities. After the completion of construction activities, the operation and maintenance will be the responsibility of the PIU and MEPA.

66. In the current institutional set-up, PIU has the capacity for managing environmental safeguard-related functions. PIU was established as part of the World Bank's right side of the Kvemo Samgori Scheme project. The PIU may require capacity development support to meet ADB SPS requirements, undertake contract management, and obtain government clearances/permits. In addition to staffing support, MEPA. PIU will need to have a sustained capacity to manage and monitor environmental safeguards.

III. ANTICIPATED ENVIRONMENTAL IMPACTS

67. An environmental impact is defined as any change to the environment, whether adverse or beneficial; resulting from activities, products or services. To ensure project sustainability, acceptability and to enhance efficiency, it is required that environmental impacts are identified and assessed as part of the planning and design process and that actions are taken to avoid those impacts, and if cannot be avoided, reduced and mitigated to acceptable levels.

68. Based on the environmental assessment of Packages 1 and 2 and based on a broad range of issues listed in the ADB Rapid Environmental Assessment (REA) checklist (Appendix 1) that determine the project's environmental category, Tables 9 and 10 provides a summary of negative potential environmental impacts which may arise during CSISDP implementation and general measures to mitigate those impacts to acceptable levels. These are indicative impacts and will need to be further explored during the detailed engineering design phase of each subproject.

69. No category A type of works (with significant adverse impacts) are anticipated. Subprojects/activities likely to have potentially significant adverse impacts (categorized as A) will not be funded under CSISDP.

70. Currently, CSISDP plans for the main canal, the project will rehabilitate the existing canals and the project areas will replace the existing secondary and tertiary canals (pipes, earth channels and concrete channels) with underground pipes. Extracted sediments will require proper management during the operational phase. During operation, maintenance will occur, e.g. removing debris in tunnels, repairing cracks and removal of vegetation encroaching into any open canals. The impact of this maintenance will be limited. As this is an existing irrigation system, water use on the river should not significantly change, however, care should still be taken over the environmental flow. Improved system operation will comply with the operation and maintenance manual and standard operating procedures that should be developed

71. Potential environmental impacts will be identified during the environmental assessment, this includes direct, indirect, long, and short-term, temporary and cumulative impacts. Initial potential environmental impacts based on preliminary designs are summarized in Table 8. The tables also included general measures to avoid, minimize, and mitigate those impacts to acceptable levels. These are indicative impacts and will need to be further explored during the detailed engineering design phase of each subproject/activity.

72. **Impacts due to design – general risks.** These impacts include impacts arising from design, including technology used, the scale of operation/throughput, waste production, discharge specifications, pollution sources, and ancillary services. Design impacts may vary, and an alternative design may result in minimal or no impacts.

73. The main design aspects of the canal rehabilitation that determine the significance of impacts include the canal’s stability and effective functioning and providing convenient operation and maintenance, impact on landslides, erosion, and river silting. Along the canal’s course, seepage losses inevitably occur. Seepage which travels downwards into the foundation does not threaten the integrity of the canal embankment, but this can affect the canal’s efficiency and ability to make downstream deliveries. Seepage which travels horizontally through a flaw in the embankment or shallow foundation has the potential to lead to canal failure if the right conditions exist or if the seepage is undetected and/or is allowed to worsen over time.

74. **Impacts due to design - risks of asbestos-containing materials (ACM)**. Asbestos is recognized as a cause of various diseases and is considered a health hazard if inhaled. In the existing system of canals, some of the pipes are made out of asbestos cement. The condition of the canals are old and deteriorated conditions. Under the CSISDP, the existing old and leaking network is being replaced with a new network of non-AC pipes. Complete avoidance of ACM may not be possible, and these canals will be decommissioned and may need to be demolished and disposed of. Working with or handling ACM may produce dust, fibres, airborne particles etc., which are very harmful and hazardous to the workers and public around the work sites. During the detailed engineering design phase, it will be decided if the pipes will be left in situ and assessed whether the asbestos is in friable form. Appropriate measures are required to identify hazards, use of proper safety gear and disposal methods is necessary to avoid health impacts on workers and people living close to work sites. An asbestos management plan will be prepared following the ADB Guidance for the areas where the asbestos pipes are present and will be disturbed.

75. **Impacts due to location – general.** Located impacts are associated with site selection and include loss of on-site biophysical array and encroachment either directly or indirectly on adjacent environments. It also includes impacts on people who will lose their livelihood or any other structures by the development of that site. Location of facilities some facilities close to sensitive areas / human habitations may create a nuisance and inconvenience local people by emitting bad odours and high noise.

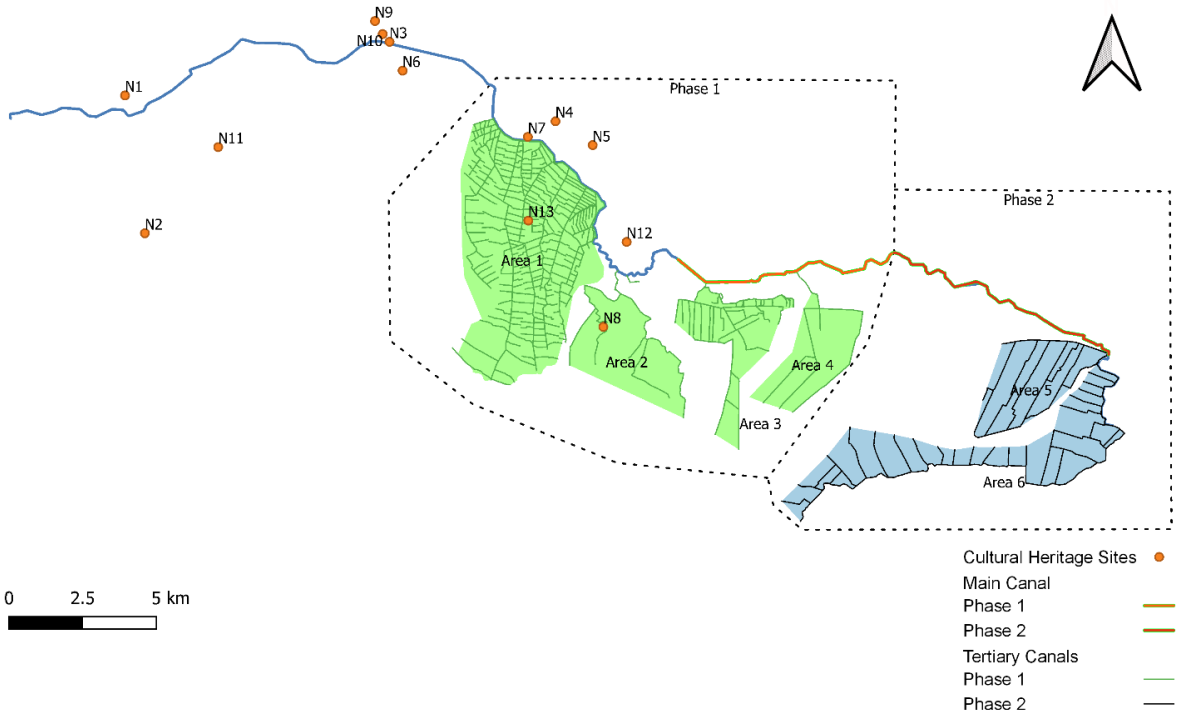
76. **Impacts due to location – Physical Cultural Resources.** ADB SPS defines PCRs as movable or immovable objects, sites, structures, groups of structures and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance.

77. The project area is in the historical zone (an active residential part of Georgia's history), and in the project implementation phase, archaeological sites may be found. This is particularly important for Area 2 which is adjacent to a burial site. The construction contractor must hire a cultural heritage specialist, who will attend to the earthworks, and in case of finding historical artefacts, will act in accordance with the requirements of Georgian legislation. At the stage of preparation for each IEE, it is necessary to study the expected impacts and develop the necessary mitigation measures in each case.

78. According to the initial archaeological survey, there are sites of cultural heritage in Area 1 (Package 2) and Area 2 (Package 3), however, these two sites are not within the net irrigation command areas and the current distribution canals run about 80m from N13 (Nameless Tower) and adjacent to the N8 (burial site). There are other cultural heritage sites nearby the project area that also overlook the site, its therefore important to ensure any permanent landscape impacts are avoided. See Figure 3.

79. If historical artefacts are found in the project implementation phase, the contractor must stop the earthworks and apply to the relevant authority (the National Agency for Cultural Heritage Preservation of Georgia) for appropriate action(s). The construction will be possible to continue only after the National Agency for Cultural Heritage Preservation of Georgia issues a permit to resume the construction.

Figure 3: Location of Cultural Heritage sites[15]



80. **Impacts due to location – Protected Areas.** ADB SPS 2009 does not allow implementing subproject activities in areas of critical habitats[16] or in areas that would lead to significant conversion and degradation of natural[17]/modified[18] habitats. A precautionary approach shall be applied to the management and use of renewable natural resources.

81. The following protected areas are located near the project area:

- Korughi Managed Reserve (belonging to Category IV of The World Conservation Union):
- Iori Managed Reserve (belonging to Category IV of The World Conservation Union); and
- Mariamjvari Natural Reserve (belonging to Category I of The World Conservation Union).

[15] Source: Produced for IEE by TA-6648 GEO Environmental Consultants

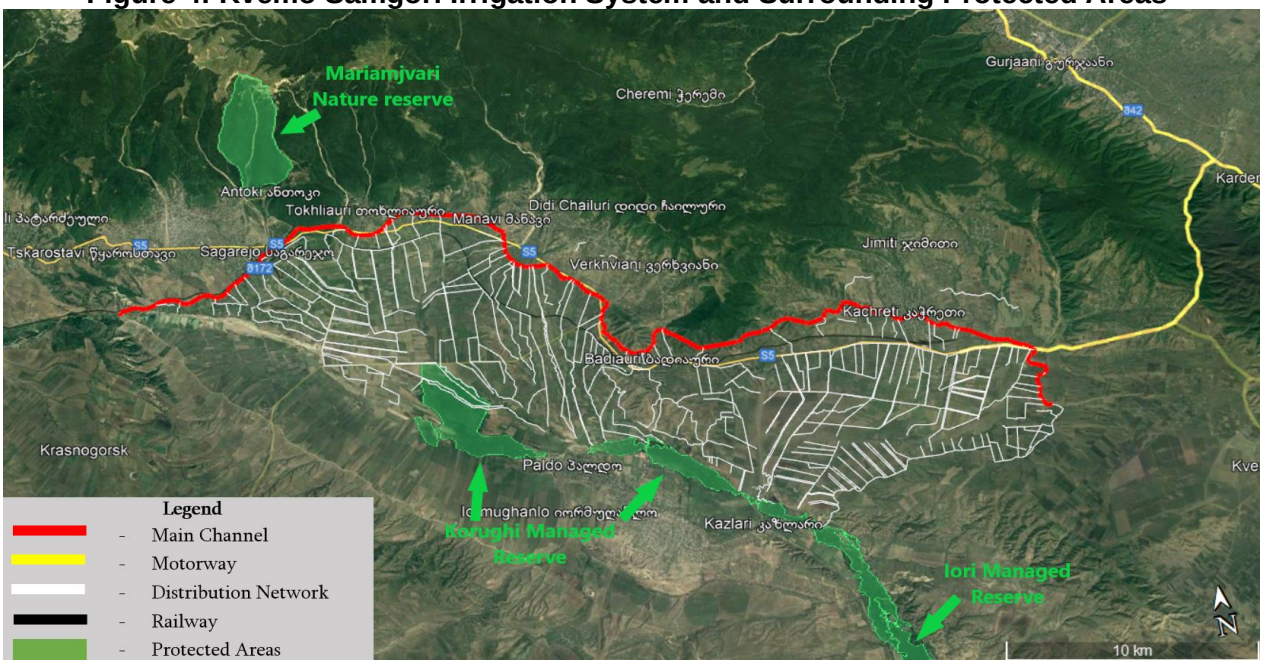
[16] Critical habitat is a subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites.

[17] Natural Habitat is land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions.

[18] Modified habitat is where natural habitat has apparently been altered, often through introduction of alien species of plants and/or animals;

82. Mariamjvari Natural Reserve is 2 km from the project zone. As for Iori and Korughi Managed Reserves, they are separated from the project zone only by the local ground roads. After specifying the methodology and construction schedule of the planned works, it is necessary to identify the types of impacts and develop the mitigation measures that will reduce or mitigate the impacts on the protected areas.

Figure 4: Kvemo Samgori Irrigation System and Surrounding Protected Areas



83. The analysis using the IBAT tool showed the area as likely to be critical habitat. Accordingly, it is necessary to conduct a Biodiversity Assessment (BA) with ADB SPS requirements and IFC's Guidance Note 6 (as updated on 27 June 2019). Critical Habitat Assessment (CHA) must be conducted in accordance with the requirements of IFC Performance Standard 6.

84. The main sensitive receptors found in the direct and indirect impact zones are protected areas, monuments of cultural heritage, and agricultural lands mostly used for viticulture and grain growing. It is necessary to study the impact of the project on agricultural lands to avoid the potential reduction of crop yields. Particular attention should be paid to the issues of harmful substances' emissions and dust propagation in the air.

85. **Cumulative Impact** - On the territory of Lower Samgori Irrigation Channel of the Samgori Irrigation System, the Roads Department of Georgia plans to rehabilitate/build the existing Tbilisi-Sagarejo-Bakurtsikhe roads nearly at the same time. As the project road buffer follows the main channel buffer and crosses it at two points, as per the preliminary schedule, the implementation dates of the two projects coincide, and the cumulative impact is expected in the project area. At the stage of preparation of the environmental impact assessment, the schedule of the Tbilisi-Bakurtsikhe Road rehabilitation project is necessary to evaluate in detail and additional mitigation measures are to be developed within the scope of the two projects.

86. **Cross-boundary impact -** The Lower Samgori irrigation channel of the Samgori irrigation system is of local nature and the activities are not expected to have a cross-boundary impact in

either the construction or operation phase. At the same time, it must be considered that the Iori River, supplying the water to the Samgori irrigation system, is transboundary. The Iori River heads in Georgia, crosses the Georgian-Azerbaijani border through the Kakheti region and flows into the Mingechauri Reservoir (Azerbaijan). The Iori River flows along the southern boundary of the project area, and its two major tributaries: the Lakbe and the Chailuri, cross both, the main and secondary channels of the Samgori irrigation system. Consequently, it will be necessary to develop additional mitigation measures in the construction phase that will prevent river pollution. The types and locations of the mitigation measures will be specified after the development of the preliminary design.

87. **Residual impact -** Following the project implementation, the following types of residual impacts are expected due to the operation of Samgori irrigation systems in the operation phase:

- Cases of illegal connection to the irrigation system for water use are expected. When an individual or group of individuals does not pay for water, as practice shows, they consume much more water than necessary. If the practice of illegal connection is massive, more water resources may be needed to operate the irrigation system than it is specified by the given project.
- There are both, agricultural lands (mainly vineyards) and natural forests near the channels of the irrigation system. Due to the fact that the Kakheti region has historically suffered from water shortages, the trouble-free operation of the irrigation systems may accelerate the process of farming the areas near the channels by the farmers. This may, in turn, lead to cutting down the existing forests to use the lands for agricultural use.
- Increased agricultural lands near the irrigation system will in turn increase the risk of soil contamination with fertilizers and pesticides. Another reason for soil contamination is the lack of awareness of farmers regarding the use of pesticides and fertilizers. As most pesticides are persistent organic pollutants with transportability and accumulation ability, there is a certain risk that after years, the Iori River and its tributaries will be polluted which in turn can have a transboundary effect.

88. **Impacts due to COVID-19 pandemic.** WHO's interim guidance on water sanitation, hygiene and waste management for the COVID-19 virus should be included within the mitigation measures and SSEMP to avoid and manage risks of diseases or illnesses to the workers and the community.

89. **Impacts during construction**. Most impacts of CSISDP will result from construction activities. The impact on flora from the clearing of vegetation in the subproject area will be there. There will be temporary negative impacts, arising mainly from construction dust and noise; hauling of construction material, waste and equipment on local roads (traffic, dust, safety, etc.), mining of construction material, occupation health and safety aspects. During the construction phase of channel rehabilitation works, impacts that arise from the invasive nature of excavation and trenching work may disturb the water body and temporarily affect the neighbouring biodiversity. However as most of the individual elements are relatively small and involve straightforward construction, the potential environmental impacts (i) will be mainly localized, temporary and not greatly significant; (ii) will not cause a direct impact on biodiversity values and (iii) are common impacts of construction, and there are well-developed methods for their mitigation.

90. During canal rehabilitation works, methods to reduce or eliminate seepage include liner repair, liner replacement, embankment reconstruction, grouting, or cutoff wall construction. These methods are preferred as they both improve canal safety and reduce seepage losses. In some circumstances, an extended canal outage to make embankment or liner repairs may not be

feasible. If so, then a filter berm may be constructed in the interim until a more permanent repair can be made. Either approach must be designed by a professional engineer and reviewed by Reclamation. Each of the seepage mitigation measures requires careful planning, analysis, and design. Selecting an appropriate seepage mitigation measure will vary from site to site (even along a given canal system).

91. Cracks in the canal lining need to be assessed to determine if they are stable, or if they are still developing. Many types of crack repair materials are available for both dry and underwater applications. Reclamation materials engineers or product manufacturers can provide guidance on available materials as well as relative durability. When a canal lining is assessed, if vertical offsets or larger cracks are found, overlays may be considered. During this assessment, material properties should be considered to determine bonding capabilities between the original lining system and the available overlay materials. Overlays may be asphalt, concrete, geomembranes, or shotcrete. Cost and durability along with constructability should all be considered.

92. **Impacts due to operation and maintenance**. The main concern is the management and maintenance of the subproject infrastructure, which will require a systematic approach. This needs to be facilitated through effective ownership by water user groups (WUG) operating at an off-farm level for the renovated canal. In addition, the level of fertilizer and pesticide residues could be expected to increase, and if not managed appropriately, can have a possible harmful effect on water quality, public health and ecological balance in soils. These impacts would be mitigated by improving local capacity through training on the appropriate and effective use of fertilizer, growth accelerants which promote a dual production cycle, and pesticides.

93. **Greenhouse gas emissions from the increased command areas.** These emission rates are calculated for the project area and converted into equivalent levels of CO2 using the following formula: *Global warming potential (GWP) = CO2 emissions + CH4 emissions*21 + N2O emissions*310.*

94. **Irrigation Water Demand Increase.** There will be no increase in the water taken from the Iori River. The current rehabilitation works will lead to a reduction in the water loss, and part of Output 3 includes training farmers to support climate-resilient and efficient irrigation. As such the water taken from the Iori will be distributed and used more efficiently; Output 3 also looks into improving the climate efficiency so the system as a whole to manage the future challenges that climate change poses for the Iori River; less snow and glacier melt and changes in precipitation means that the water available to take may be less.

95. The potential impacts, issues, and concerns from assessed sample subprojects and future subprojects using ADB REA Checklists and other checklists developed for CSISDP are presented in Table 9. While general environmental impacts are identified below, these are to be re-assessed during implementation.

Table 8: Anticipated Environmental Impacts and Mitigation Measures

Impact field	Impacts	Mitigation Measures
Design Phase		
Environmental Permits: The Law of Georgia on Licenses and Permits [adopted	Environmental Licenses and permits will be required to implement the project. The law defines the list of activities needing licenses or permits, including the so-called “Environmental	• Ensure all permits and licences are obtained before any works

Impact field	Impacts	Mitigation Measures
in 2005]	Decision". Necessary environmental clearances and permits must be obtained and follow the guidelines issued by the authorities.	
Integration of safeguards related aspects into the bidding and contract documents	Include all safeguards related clauses and integrate IEE and EMP into the bidding documents. If bidding documents are not responsive to the safeguards related issues, then the performance of the contractor to meet safeguard compliance is low.	• Incorporation of design considerations into procurement and bidding documents
ACM	Risk of contact with carcinogenic materials	• Minimise and avoid disturbance or removal of asbestos pipes.
Social and Cultural Resources The Law of Georgia on Cultural Heritage [adopted in 2007]	Ground disturbance can uncover and damage archaeological and historical remains. Access to sites of cultural/archaeological importance may be affected during civil construction (especially during canal rehabilitation and pipe-laying type of works). Relevant conclusion of the National Agency for Cultural Heritage Preservation of Georgia	• Avoid locating components in or near physical cultural resources. If cannot be avoided, consult with the Archaeological Survey of Georgia (ASI) (for ASI-protected PCRs) or the State Archaeological Department (for state-protected PCRs) • Do not locate components in the protected areas; avoid locating components within 300 m of ASI protected monuments • In unavoidable cases, conduct heritage impact assessment studies by engaging independent experts, • Obtain prior permission from ASI or the state Department of Archaeology and Museums where necessary; • Develop "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered
Biodiversity	Location may cause habitat disturbance and destruction causing an impact on biodiversity.	• Avoid locating components in or near environmentally sensitive areas. • If there are threatened, endangered, or other protected species within the hydraulic zone of influence of the surface water intake, ensure reduction of impingement and entrainment of fish and shellfish by the installation of technologies such as barrier nets (seasonal or year-round), screens, and aquatic filter barrier systems
Construction work camps, construction equipment, storage areas, and disposal areas	Locations may cause encroachment/impact either directly or indirectly on adjacent environments.	• Develop a camp management plan

Impact field	Impacts	Mitigation Measures
Traffic	Traffic flow will be disrupted if routes for the delivery of construction materials and temporary blockages during construction activities are not planned and coordinated.	• Prepare a traffic management plan and ensure sufficient financial provisions for road restoration
Loss of Property and Physical Relocation	Social conflicts arising from the displacement of communities	• Avoid land acquisition to the maximum extent possible. For potential involuntary resettlement impacts, prepare a Resettlement Plan • Appropriate and timely compensation should be provided in line with ADB SPS and national legislation before any work should take place
Informing stakeholders before starting of the works	Unpreparedness of local communities for construction activities. Congestion and disturbances to services, irrigation and similar could have more of an impact if the community and landowners are unaware. Community health and safety from lack of awareness. This may lead to delays during implementation.	• Ensure all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosures • Set up a GRM for the duration of the project
Construction Phase		
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	• Sourcing of materials through known contractors in compliance with national law.
Air Quality Emissions of harmful substances into the ambient air, propagation of dust, noise and vibration.	Emissions from construction vehicles, equipment, and machinery used for excavation and construction result in dust and an increase in the concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons.	• Use dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles • Use of non-faulty construction techniques and vehicles • Use of water suppression for control of loose materials on paved or unpaved road surfaces. Ensure unpaved surfaces used for the haulage of materials within settlements are dust-free • Use modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions and ensure that these are maintained to manufacturers' specifications at all times. • Prior to the onset of the works, training was provided to workers on pollution prevention mitigation measures • Limit the time vehicles, equipment and machinery are left idle • Proper management of solid materials and taking precautions during the loading and

Impact field	Impacts	Mitigation Measures
		unloading operations. Restriction of such operations in windy weather
Employment Impacts		• Develop an appropriate employment policy that is publicly available. This policy should outline that the employment process is fair, equal and free from discrimination and ensure the overall process is transparent. • Pre-defined employment criteria should be developed to ensure appropriate staff are employed • Staff should be appointed based on knowledge and skill • All contracts should be drafted with: o Details of rights and obligations o Wage and benefits o Working terms and conditions • All non-local workers will be informed about the habits and culture of local people.
Geology and Soil	Strong water flows into open excavations below the water table will occur, causing micro-tunnel collapse. Layers of mixed fill cover the natural ground surface in many places. Contamination from spillage of petroleum products, spent engine oil and oil leaks from construction vehicle maintenance taking place on-site.	• Measures to minimize soil erosion/silt runoff to be incorporated when conducting earthworks • Stripping and storing the topsoil with a high humus content
Drainage and Hydrology	Contamination of surface and underground water	• Ensure drainage is appropriate on-site and that runoff is not increased in and around the project area;
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality.	• Proper management of materials must be maintained including appropriate storage of potentially polluting materials, spill kits, etc. • Take all precautions to prevent entering wastes into streams, watercourses, fisheries ponds or irrigation systems • Place storage areas for fuels and lubricants away from any drainage leading to water bodies • Spill management procedures should be in place to ensure safe and appropriate storage of oil, or oil-containing products e.g. second containment, stored in an area with a solid and impermeable floor and spill kits available • Timely filling of excavated areas
Noise and Vibration	Sensitive receptors may be affected temporarily by increased traffic and related impacts Use of heavy vehicles and equipment may generate high	• Schedule noisy or otherwise invasive activities during periods of the day which will result in the least disturbance • Use of high noise generating equipment shall be stopped during night time.

Impact field	Impacts	Mitigation Measures
	levels of noise. Vibrations resulting from bulk earthworks, micro-tunnelling, and compaction may create significant disturbances to nearby people and businesses. Disturbance from after-hours work.	• In unavoidable cases of night work (due to local rules) provide prior information to the public on work schedule, noisy activities and the need to conduct the works at work. Use the best construction methods to minimize noise to the possible extent. • Vehicle horns should not be used unless it is necessary • All vehicles and equipment to be used in construction shall be fitted with exhaust silencers. • Use silent-type generators (if required) • If it is not practicable to reduce noise levels to or below noise exposure limits, post warning signs in the noise hazard areas. • Identify any buildings at risk from vibration damage and avoid any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly
Biodiversity Flora and Fauna	Reduction/loss of habitats. The borders of the construction corridor and traffic routes are to be identified accurately to avoid excess damage to the vegetation cover. There may be potential for plant species damage during the landscaping and construction works. Species that are Red-Listed plant species in the project construction corridor may potentially be impacted.	• Conduct screening of project influence areas to identify protected areas/sites and conservation status of species • Utilize tools like Integrated Biodiversity Assessment Tool (IBAT), and data from government sources, and international agencies like the World Database of Key Biodiversity Areas website (WPDA), Important Bird Areas (Birdlife International); Ramsar website; IUCN Red list; etc., • Carryout critical habitat assessment (CHA) in case of screening confirms protected areas and/or species with protection status within 10 km of project influence area • Engage a biodiversity expert to conduct an assessment and develop mitigation measures • Engage a local biodiversity expert to verify findings on-site; and • Conduct field-level site visits for the review and updating of the Environmental Management Plan • If species of interest are found on-site, ensure that the findings are recorded and reported to the PIU. No disturbances or works on the site should start/continue until PIU issues clearance to proceed. Measures to restrict poaching or hunting shall be put in place. • If species of interest are present, PIU shall coordinate with the Forest Department for the translocation of the animals.
Ecological resources	Felling of the trees–affects terrestrial ecological balance and affects terrestrial and aquatic	• The boundaries of the works must be set and should minimize the clearing of vegetation

Impact field	Impacts	Mitigation Measures
	fauna/wildlife.	• Protect surrounding vegetation outside the borders of construction against damage • Tree clearing works will be supervised by personnel with appropriate competence (environmental manager or a biodiversity specialist) • If necessary, protect and manage any potential protected species within the construction area in accordance with the Law on the Red List and Red Book of Georgia and ADB SPS (as per the results of the inventory, no Georgian Red-Listed species will be within the impact zone) • If a significant area of vegetation is required to be removed then replanting activities should be undertaken • Any clearing of land of vegetation and other damage to vegetation should be in accordance with the legislation of Georgia
Existing infrastructure and facilities	It is likely to have a temporary disruption of infrastructure and services during the rehabilitation of existing canals and pipe laying of the transmission mains.	• Ensure effective advance communications with the affected residents • Keep disruption to residential water and electric supply to the minimum
Accessibility	Due to the location and nature of the subproject, there will be interference with access Existing public transport facilities and operations will be affected by road closures and detours. There will be disruptions to movements, due to traffic and construction-related noise, visual, and air pollution.	• Ensure effective advance communications with the affected residents • Ensure the process follows the LARP • Traffic Management Plan is implemented.
Traffic	Increased volume of construction vehicles on the roads may lead to increased wear and tear of roads in the vicinity of the subproject site. Road safety concerns due to slow moving construction vehicles. Traffic flow within the vicinity will be affected. The temporary road closure will result in a decrease in overall network performance in terms of queuing delay, and travel times/speeds. The road closure will impact public transport operations and routing.	• Ensure effective advance communications with the affected residents • Follow the traffic management plan • Ensure vehicles used are well maintained. • Limitations of the transport operation and speeds • Implement construction traffic restrictions to reduce construction traffic • On roads during particularly sensitive times at sensitive receptors
Socio-economic income	Impede the access of residents and customers to nearby shops. Shops may lose business temporarily.	• Implement a grievance mechanism for residents to report nuisance and other issues, including 24-hour contact details for a construction site representative.
Occupational	Danger of construction-related	• Prepare a health and safety plan

Impact field	Impacts	Mitigation Measures
Health and Safety	injuries. Open fires in construction camps can result in accidents	• Ensure that all site personnel have a basic level of health and safety training and protective equipment. • Ensure equipment and machinery are properly maintained and are in safe working order • First aid kits that are appropriately stocked, maintained and sufficient to cover the number of workers on site • Ensure appropriate fire prevention measures are in place such as fire extinguishers • Ensure there are procedures in place to detect, manage and prevent the spread of diseases. • Hazards, near misses, accidents and incidents are recorded and reported. • Workers should be aware of the health and safety risks and trained on occupational health and safety including how to use PPE and any safety equipment, hazard report procedures, etc. • Provide barricades, and deploy security personnel to ensure the safe movement of people and also to prevent unnecessary entry and avoid accidental falls into open trenches
COVID-19 and disease prevention and control	Safety of workers and the general public must be ensured. Poor waste management practices and unhygienic conditions at temporary ablution facilities can breed diseases. Standing water due to inadequate water drainage and waste management practices pose a health hazard to providing breeding grounds for disease vectors.	• Worker training on infectious disease and HIV • Follow covid prevention good practices • Ensure appropriate drainage is maintained
Asbestos cement pipes	Health risk in case of their presence in the ROW and/or during the rehabilitation of the existing water supply distribution network	• Avoid any repairs or new connections to/from existing asbestos cement pipes • No Asbestos Cement pipes are to be used • Develop and implement the ACM Management Plan (AMP) that includes the identification of hazards, the use of proper safety gear and disposal methods. • Conduct an awareness program on safety during the construction work • Identify the risk of intervention with existing AC pipes. If there is a significant risk, implement the AMP strictly that includes the identification of hazards, the use of proper safety gear and disposal methods.

Impact field	Impacts	Mitigation Measures
		• Appropriate actions as defined in the Asbestos Management Plan will have to be adhered to • Maintain records of AC pipes as per the AMP
Impact on the visual landscape		• Environmentally sound management of waste • Proper planning and control of nighttime lighting on the working sites to avoid light pollution. • Consideration of the design, and location of temporary structure to limit visual impacts • Perimeter for earthworks must be minimized and defined • Timely restoration of the construction area to a comparable state to the original condition or better;
Workers conduct	Construction workers on site disrupting adjacent land uses by creating noise, generating litter/waste, and possible loitering.	• Conduct worker training • Operate a GRM throughout the project
Community health and safety COVID-19 prevention and control	Community hazards can arise during construction (e.g., open trenches, air quality, noise, falling objects, etc.). Trenching on concrete roads using pneumatic drills will cause noise and air pollution. Traffic accidents and vehicle collisions with pedestrians during material and waste transportation.	• Prepare a community awareness plan. Consult with the local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed. • Ensure that appropriate fencing and warning signs are in place • Timely filling of excavated areas
Construction waste	Trenching will produce additional amounts of waste soil. And also, the accumulation of debris waste materials and stockpiling can cause environmental visual pollution.	• Prioritize the reuse of excess spoils and materials in construction activities. • Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas • Maintaining and implementing the waste management plan; • Ensure that excessive procurement of materials is avoided • Providing storage areas for temporary disposal of waste and equipping them with relevant signs; • Designating properly trained personnel for waste management; • Training staff on waste management practices • Collection and disposal of waste only through licensed contractors.
Work camps COVID-19 prevention and control	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. This may cause conflict with residents and problems with waste	• Environmentally sound and safe collection and disposal of domestic wastewater • Camp Management Plan

Impact field	Impacts	Mitigation Measures
	disposal and disruptions to residents.	
O&M		
Water sustainability	Excessive use of fertilizers and pesticides running off into surface water or groundwater. Inefficient use of water leads to less area irrigated and water loss.	• Conduct water quality monitoring at strategic points in the distribution system • Ensure standard water quality surveillance procedures and protocols with third-party checks
Canal cleaning and repairs	Safety risks due to pipe repairs (workers and public) Waste Disposal	• Limit removal to the young encroaching flora that is damaging or affecting the operations of the irrigation system • Provide sign boards and barricades • Ensure that all site personnel have a basic level of health and safety training and protective equipment. • Appropriate PPE and safety equipment should be used. • Appropriate health and safety procedures should be followed • Equipment and machinery should be appropriately maintained • Care to follow minimize noise, air, dust and water emissions and soil pollution or runoff should be taken • Training to the GA on the potential impacts and management measures should be undertaken during the handover, if required.

96. As subproject locations/sites are screened during the selection process, environmental impacts due to the location are not significant in CSISDP. The environmental assessments of the sample subprojects show that CSISDP is not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Potential impacts are unlikely to affect areas larger than the sites or facilities subject to physical works. These impacts are site-specific and few if any of them are irreversible. Planning principles, subproject selection criteria, and design considerations have been reviewed and incorporated into the site planning and design process wherever possible; thus, environmental impacts as being due to the project design or location were not significant. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. In most cases, mitigation measures can be designed with uncomplicated measures commonly used at construction sites and known to civil works contractors. Once the subprojects are operating, the facilities will operate with routine maintenance, which shall not affect the environment. Improved system operation will comply with the operation and maintenance manual and standard operating procedures to be developed for all the subprojects.

IV. ENVIRONMENTAL ASSESSMENT OF SUBSEQUENT SUBPROJECTS

97. Environmental assessments of the sample subprojects indicate the CSISDP is not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. No Category A projects will be considered for implementation under CSISDP. Potential impacts are unlikely to affect areas larger than the sites or facilities subject to physical works. Subsequent subprojects are expected to be within the same range of scope, scale and setting as with the sample subprojects and producing generally the same impacts at the same or lesser magnitude.

98. Subsequent subprojects shall comply with the discussed selection guidelines (i), Table 2: Exclusion Criteria and (ii) Table 3: Environmental Guidelines for Sub-project Selection.

99. All the projects need to go through the process of environmental assessment and obtain approvals from the government regulatory agencies, to be eligible for funding under the project.

100. As part of the project preparation, an environmental assessment for the active subprojects was conducted based on the preliminary design. The IEE with EMPs were prepared in accordance with the requirements of EARF. The IEEs concluded that the project will have only small-scale, localized impacts on the environment which are readily mitigated. The potential adverse environmental impacts are mainly related to the construction period, which can be minimized by mitigating measures and environmentally sound engineering and construction practices. Therefore, the project has been classified into environmental category B. The future subprojects will seek to replicate the sample subprojects and are thus expected to be category B due to the low-impact nature of such works.

101. The IEEs prepared during loan approval will be updated based on the detailed engineering design stage and will be included in bidding and contract documents with specific provisions requiring contractors to (i) comply with all other conditions required by ADB,[19] and (ii) submit a site-specific environmental management plan (SEMP), including (a) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (b) specific mitigation measures following the approved EMP; (c) monitoring program as per SEMP; and (d) budget for SEMP implementation.

A. Environmental Assessment Process for Subprojects

1. Screening and Categorization

102. As soon as sufficient information on a subproject is available, screening is to be conducted using the ADB's REA checklist and No Mitigation Scenario checklist (Appendix 1) to determine the subproject's environmental category. Requirements as per the government regulations (clearances, approvals, consent etc.,) shall also be identified at this stage, including the requirement for environmental permits/clearances.

103. The following issues and concerns shall be screened for succeeding subprojects/activities (Table 9).

[19] Contractors to comply with (i) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; and (c) elimination of forced labor; and with (ii) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

Table 9: Specific Issues or Concerns for Succeeding Subprojects

Issues and Concerns	Required Actions
Is the subproject site within likely critical habitat?	• Conduct IBAT preliminary screening • If in a likely critical habitat, conduct Biodiversity Assessment and identify mitigation measures and action plans. • Follow suggested mitigation measures.
Are there existing ACM in component locations and irrigation networks?	• Conduct inventory of ACM in the project site • If ACM is to be removed, follow Asbestos Management Plan and implement mitigation measures • If ACM is to be left in situ, ensure documentation and recording as laid out in Asbestos Management Plan • PIU is to report to ADB the extent of ACM for removal and left in situ.
Are there physical cultural resources within or near the subproject sites?	• Conduct heritage impact assessment for the affected physical cultural resources in the subproject site • Implement mitigation measures as recommended

2. Preparation of Environmental Assessment Report

104. **Initial Environmental Examination Study and Report.** For B category projects, an IEE report is required. The outline and content of an IEE Report is given in Appendix 5. The IEEs prepared during the loan approval phase will be used as model documents for future subprojects.

105. During the design, construction, and operation of the project, the executing agency shall apply pollution prevention and control technologies and practices consistent with international good practices, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety guidelines (EHS). These standards contain performance levels and measures that are normally acceptable and applicable to projects. When government regulations differ from these levels and measures, the PIU will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PIU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS. The IEEs shall also reflect meaningful consultation and disclosure process with a provision for a grievance redress mechanism.

106. **Environmental Management Plan**. EMP shall be developed as part of the IEE. The EMP outlines specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements for implementation. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the subproject is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in the EMP. The level of detail and complexity of the EMP and the priority of the identified measures and actions shall be commensurate with the subproject's impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of "no significant harm to third parties," the "polluter pays" principle, the precautionary approach, and adaptive management

107. If some residual impacts are likely to remain significant after mitigation, the EMP will also include appropriate compensatory measures (offset) that aim to ensure that the project does not cause significant net degradation to the environment. Such measures may relate, for instance, to the conservation of habitat and biodiversity, preservation of ambient conditions, and greenhouse

gas emissions. Monetary compensation in lieu of offset is acceptable in exceptional circumstances. If the compensation is used to provide environmental benefits of the same nature and is commensurate with the project's residual impact.

108. All IEEs shall be conducted and EMPs prepared prior to the invitation of the bids for construction contracts. The bid documents shall include the requirement to incorporate the necessary resources to implement the EMP. The EMP will form part of the contract document, and, if required, will need to be further updated during the construction phase of a subproject.

109. IEE shall be updated once (i) detailed design is completed, (ii) when changes in scope, location, alignment, and design are needed or (iii) due to unanticipated environmental impacts occurs.

3. Environmental Audit of Existing Facilities

110. For subprojects involving facilities that already exist or are under construction, an environment audit shall be undertaken, including on-site assessment, to identify past or present concerns related to impacts on the environment. The objective of the compliance audit is to determine whether actions were in accordance with the EARF and to identify and plan appropriate measures to address outstanding compliance issues. Where noncompliance is identified, a corrective action plan will be prepared. The plan will define necessary remedial actions, the budget for such actions, and the time frame for the resolution of non-compliance. The audit report (including a corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of the EARF.

4. Public Consultation, Information Disclosure and Grievance Redress

111. Public consultation and information disclosure are mandatory as part of the environmental assessment process for CSISDP projects. The adequacy of public consultation and disclosure during the environmental assessment process will be one of the criteria used to determine the project's compliance with ADB safeguard policies. Similarly, a grievance redress mechanism (GRM) to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints, and grievances about the social and environmental performance at the project level is to be established and detailed in the IEE Report. GRM should be made operational during the EMP implementation phase. The process of public consultation and information disclosure, which is to be carried through the project preparation and implementation, is presented in detail in the following section V**.**

B. Review of Environmental Assessment Reports

112. IEE including EMPs, prepared/updated by consultants/contractors, will be reviewed and approved by an officer in the PIU. Approval of safeguard documents of the respective subproject is a pre-requisite to initiate the bidding process.

113. The borrower or the executing agency is primarily responsible for identifying, prioritizing, formulating, appraising, approving, and implementing subprojects in accordance with technical, financial, and economic appraisal criteria, including social and environmental criteria, mutually agreed upon between ADB and the borrower/executing agency. PIU will submit all IEEs to ADB for review and disclosure.

114. ADB will review and disclose on its website the final reports (IEEs) of all subprojects.

115. Environmental assessment for subprojects must follow both the ADB SPS and the Government processes. Table 10 discusses the steps in complying with these processes per subproject stage.

Table 10: Environmental Assessment Process for Subprojects

Project Stage	Environmental Assessment and Review Framework Procedure	Government of Georgia Procedure
Subproject identification Feasibility/ preliminary design	Subproject selection criteria (Table 1) Rapid Environmental Assessment Checklist (REA) and the No Mitigation checklists	Categorization according to schedule and general/specific conditions in the government's regulations. Submitting screening for the subproject, as required.
	Categorization (B or C): PIU to review the REA checklists and reconfirm the categorization Preparation of draft IEEs with EMP for Category B and environmental due diligence report for Category C. Information and assessment related to ACM, PCRs and Critical Habitats should be incorporated.	PIU to review the screening decision. Based on decision: - no environmental decision required – no EIA is required - or environmental decision required – EIA required. A scoping report should be prepared at this stage Identify other environmental related regulatory requirements based on the nature and location of the subproject (permit from the government, clearance/approvals from Archeological or Forest Department etc.,)
	For projects involving facilities and/or business activities that already exist or are under construction, undertake an environment and/or social compliance audit, including on-site assessment, to identify past or present concerns related to impacts on the environment, and involuntary resettlement. Where non-compliance is identified, a corrective action plan shall be prepared, and agreed on by ADB and PIU, and implemented accordingly	Check the regulatory compliance of such facilities and, in case of non-compliance, obtain clearances/approvals as required
	Public consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the IEE.	For projects requiring an environmental decision: Public (hearing) consultation is required for all projects requiring an EIA and consist of a public hearing at or near the proposed site before the EIA submitted.
	Disclosure: For category B: Disclosure of the draft IEE; updated IEEs and corrective action plans; and environmental monitoring reports. In addition, environmental information will be in an accessible place and in a form or language understandable to the affected person and other stakeholders. For illiterate people, other suitable	For projects requiring an environmental decision: Disclosure is part of the consultation. Regulatory agency will place the project on their website from screening stage and the scoping and invites responses from stakeholders. Notice to the public should be online, in newspapers and in a public place

Project Stage	Environmental Assessment and Review Framework Procedure	Government of Georgia Procedure
	communication methods will be used.	
	Identify and incorporate environmental mitigation and monitoring measures (including the EMP) into bid/contract documents	For projects requiring an environmental decision: An action plan is required, identifying mitigation measures the adverse effects.
Detailed design	Finalization of draft IEE based on detailed design	For projects requiring an environmental decision: prepare an EIA Report in the prescribed format and submit the application to MEPA
	For projects involving facilities and/or business activities that already exist or are under construction, undertake an environment and/or social compliance audit, including on-site assessment, to identify past or present concerns related to impacts on the environment, and involuntary resettlement. Where non-compliance is identified, a corrective action plan shall be prepared, agreed on by ADB and PIU, and implemented accordingly.	Check the regulatory compliance of such facilities and, in case of non-compliance, obtain clearances/approvals as required
	Public consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the IEE.	For projects requiring an environmental decision: public hearing is undertaken between scoping and EIA submission, the findings from the hearing and comments from disclosure should be incorporated into the report.
	Disclosure: For category B: Disclosure on ADB's website of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. In addition, environmental information will be in an accessible place and in a form or language understandable to the affected person and other stakeholders. For illiterate people, other suitable communication methods will be used.	For projects requiring an environmental decision: Regulatory agency discloses the full EIA report on their website and invites responses from stakeholders. Notice to the public should be online, in newspapers and in a public place
	Mitigation measures specified in the IEE study incorporated in the project design	No specific requirement, however would likely form part of the environmental decision conditions.
	Identify and incorporate environmental mitigation and monitoring measures (including the site-specific EMP and appointment of an EHS supervisor) into bid/contract documents	For projects requiring an environmental decision: An action plan is required, identifying mitigation measures the adverse effects.
Appraisal and Approval	EMP and other environmental covenants (budget, personnel, etc) are incorporated into the legal agreement, loan or project agreement, and project administration memorandum (PAM).	EIA Report is reviewed by an Expert Commission (CC). Applications for other clearances/approvals will be apprised by respective agencies based on submissions and site reconnaissance

Project Stage	Environmental Assessment and Review Framework Procedure	Government of Georgia Procedure
	ADB will review draft final reports of all IEEs	MEPA will issue an environmental decision, stipulating the conditions to be met. Concerned agencies will issue clearances/approvals, stipulating conditions
Contract award	Confirm that all necessary environmental clearances, consents, and no-objection certificates (NOCs) are in place prior to contract award. Implementation of EMP, including monitoring plans based on IEE findings to be incorporated into civil works contracts.	There is no regulatory condition on the contract award, but environmental clearance is to be obtained before any construction work or land preparation (except land acquisition) may commence. All other clearances are also to be obtained before the start of work including land clearance.
Implementation	EA will submit to ADB the following documents for disclosure on ADB's website: (i) Updated IEE (if applicable due to change in scope or detailed design) (ii) corrective action plan prepared during project implementation, if any (iii) semi-annual environmental monitoring reports EA to ensure the effective implementation of the following: (iv) Safeguards induction of Contractors (v) Information disclosure (vi) GRM establishment (vii) EMP monitoring and supervision (viii) Reporting corrective actions.	For projects requiring an environmental decision: Procedures and timeframe for preparing a report during implementation shall be determined by the MEPA. The report should monitor the conditions and mitigation measures, analyses impacts and assess changes. This report should be disclosed. MEPA will initiate necessary action in case of non-compliance.

[a] The plan will define necessary remedial actions, the budget for such actions, and the period for resolution of noncompliance. The audit report (including corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of Safeguard Requirements 1–3.

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

116. ADB SPS requires meaningful consultation with affected people that:

- Begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;
- Provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people;
- Is undertaken in an atmosphere free of intimidation or coercion;
- Is gender-inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups;
- Enables the incorporation of all relevant views of affected people and other stakeholders into decision-making, such as project design, mitigation measures, the sharing of development benefits and opportunities and implementation issues.

117. Meaningful stakeholder consultation and participation are part of the project preparation and implementation strategy. A consultation and participation program will be implemented with the assistance of consultants. By addressing stakeholder needs, there is greater awareness of the benefits and "ownership" of the project among stakeholders, which in turn contributes to sustainability. The consultation process during the project preparation has solicited inputs from a wide range of stakeholders, including government officials, NGOs, residents of the three towns, marginalized/vulnerable beneficiary groups, and project-affected persons (APs).

118. Consultation, participation, and disclosure will ensure that information is provided and feedback on the proposed subproject design is sought early (within three months of the IEE preparation), right from the subproject preparation phase, so that the views/preferences of stakeholders including potential beneficiaries and affected people can be adequately considered, and continue at each stage of the subproject preparation, processing, and implementation.

119. APs will be consulted at various stages in the project cycle to ensure: (i) incorporation of their views/concerns on compensation/resettlement assistance and environmental impacts and mitigation measures; (ii) inclusion of vulnerable groups in project benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and APs in the project process.

120. Relevant information about any major changes to the project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

121. A variety of approaches can be adopted. At a minimum, stakeholders will be consulted regarding the scope of the environmental and social impact studies before work commences, and they will be informed of the likely impacts of the project and proposed mitigation once the draft EIA/IEE and resettlement plan reports are prepared. The reports will record the views of stakeholders and indicate how these have been taken into account in project development. Consultations will be held with a special focus on vulnerable groups.

122. The key stakeholders to be consulted during project preparation, EMP implementation and project implementation include:

- project beneficiaries;
- elected representatives, community leaders, and representatives of community-based organizations.
- local NGOs;
- Georgian Amelioration (GA)
- local government and relevant government agency representatives, including local authorities, Mayors, and Municipalities responsible for land acquisition, protection, and conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments.
- Sensitive receptors and stakeholders within 100 meters from canal rehabilitation and construction components.
- Stakeholders in PCRs;
- Stakeholders in areas with biodiversity concerns;
- Stakeholders in areas with ACM;
- GA PIU and consultants; and
- ADB and the Government of Georgia

123. A variety of approaches can be adopted, and stakeholders should be consulted throughout the project implementation. At a minimum, the following consultation activities (Table 11) should be conducted. This is indicative and project agencies can also adopt more effective methods and approaches, which are locally appropriate. Consultations shall be conducted in an atmosphere which is conducive to the development of the subprojects and beneficial to the affected persons and other stakeholders. The implementing agency will ensure that the consultations are free of cohesion and intimidation, gender-inclusive, and tailored to the needs of disadvantaged and vulnerable groups.

Table 11: Public Consultation Activities

Project Stage	Consultation Activities	Remarks
Subproject preparation	Local-level consultations through sample questionnaire surveys on service levels, needs and priorities for project preparation	At the start of the project
	Focus group discussions with people residing/working near the project sites	During the visits to project sites
	A subproject level consultation workshop with all key stakeholders (Community Development block-wise or district-wise, as appropriate)	Once the draft IEE report is prepared
	Consultations with affected persons: affected persons shall be consulted to ensure: • incorporate their views/concerns on compensation/resettlement assistance • inclusion of vulnerable groups in project benefits; • identify assistance required by affected persons during rehabilitation, if any; and • Avoid potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and affected persons in the project process	At various stages, especially during, the preparation and implementation of the resettlement plan

Project Stage	Consultation Activities	Remarks
Subproject Implementation	Focus group discussions with the people residing/working near the project sites	During the EMP monitoring at work sites
	Informal discussions with the construction workers and construction supervision staff (contractor, consultants and PIU)	During the EMP monitoring at work sites
	Informal discussions with commuters and the general public along the roads where works are implemented	During the EMP monitoring at work sites

B. Information Disclosure

124. Project-related information shall be disclosed through public consultation and by making relevant documents available in public locations. PIU shall provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to the affected persons and other stakeholders. For illiterate people, other suitable communication methods will be used.

125. At a minimum, the following documents shall be made available at the offices of project agencies - PIU for public reference, and shall also be uploaded on respective websites.

- Summary of project and draft IEE (in Georgian and English)
- Draft IEE Report (in English)
- Final IEE Report (in English)
- Updated/amended IEE (in English)
- Corrective action plan prepared during project implementation (English)
- Semi-annual Environmental Monitoring Reports (English)

126. A concise summary of the project and draft IEE report (in Georgian), providing all necessary details of proposals, implementation arrangements, subproject locations, likely issues and mitigation and monitoring measures and grievance redress mechanism, shall be made available to the stakeholders at consultation meetings. This should also provide contact information for the project agency. This summary shall also be displayed on the notice boards of PIU, PIU and other public places. During project implementation, relevant information about any major changes to the project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

127. The following documents will be submitted to ADB for disclosure on the ADB website. PIU will send a written endorsement to ADB for disclosing these documents:

- For category B projects[20]
  - final IEE;
  - a new or updated IEE and corrective action plan prepared during project implementation, if any; and
  - environmental monitoring reports
- For category C projects, Environmental Due Diligence Report.

[20] Category A subprojects will not be considered for funding under CSISDP. In case, during the implementation, if a potential category A subproject is identified and approved by ADB, the following documents will be submitted to ADB for disclosure: (a) draft EIA, at least 120 days before the ADB approval, (b) final EIA, (c). a new or updated EIA and corrective action plan prepared during project implementation, if any; and (d) environmental monitoring reports.

128. PIU will send a written endorsement to ADB for disclosing these documents on ADB's website. PIU will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

C. Grievance Redress Mechanism

129. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of AP's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. A grievance redress mechanism (GRM) constitutes a formalized system of accepting, assessing and resolving/ addressing community feedback or complaints. It provides predictable, transparent, and credible processes to all parties, resulting in outcomes that are relatively low-cost, fair, and effective. GRMs build on trust as an integral component and facilitate corrective action and pre-emptive engagement. They also set out a timeframe for the resolution of complaints. The GRM should be established and operated in compliance with Georgian legislation and ADB's Safeguard Policy Statement (SPS) 2009 requirements.

130. ADB's SPS requires the borrower/client to establish a GRM to receive and facilitate the resolution of complaints related to the project. As per SPS 2009, the borrower/client is required to establish a mechanism to receive and facilitate the resolution of affected persons' concerns and grievances related to project impacts, paying particular attention to the impacts on vulnerable groups. The GRM should be scaled to the risks and adverse impacts of the project. It should address affected persons' concerns and complaints promptly, using an understandable and transparent process that is gender-responsive, culturally appropriate, and readily accessible to the affected persons at no cost and without retribution. The mechanism should not impede access to the country's judicial or administrative remedies. The borrower/client is required to inform the project affected persons about the GRM.

131. At the national level, the Administrative Code of Georgia is the primary legislation defining the rules and procedures for grievance review and resolution. According to this law, the administrative body receiving officially lodged claims is obliged to review the claims, engage the claimant in the grievance review and resolution process, and make the final decision in the resolution of the claim/ complaint. Clause 181 defines the content and the grievance submission forms. In particular, the grievance package should include:

- Name of the administrative body to whom the complaints are addressed.
- Name, address and contact details of the claimant.
- Name of the administrative body, whose decisions or administrative acts are the subject of the complaint.
- Name of the administrative act or decision, which is subject to complain
- Content of the claim.
- The context and facts, based on which the complaint is substantiated; and
- List of attachments.

132. Clauses 194 and 198 define the rules and procedures ensuring the participation of the claimants in the grievance review process. According to clause 202, the decision issued by the Administrative Body in relation to the reviewed claim has the status of an individual administrative

legal act. The standard period given for the issuance of the decision in relation to the grievance is one month.

1. GRM, Grievance Redress Committee and Grievance Focal Persons

133. The GRM consists of project-specific systems established at the municipal level and a regular system established at the PIU. The grievance redress committee (GRCE) will be established at the municipal level as a project-specific instrument, functional for the whole period of the project implementation. The grievance redress commission (GRC) is formed as an informal structure within the PIU to ensure grievance review, resolution, and record.

134. A GRCE will be formed to administer project-specific grievances, exercise the grievance redress mechanism and handle grievances at Stage 1 of the GRM. The GRCE is the first-instance body to be established at the community level in each affected Municipality (village/community authority). The PIU through the environmental and social safeguards specialist of the design and supervision firm shall coordinate the GRCE formation. He/she will then be responsible for the coordination of GRC activities and organizing meetings (convener). In addition, GRCE shall comprise village Rtsmunebuli or his/her representative, representatives of appointed persons (APs), women APs and appropriate local NGOs to allow the voices of the affected communities to be heard and ensure a participatory decision-making process.

135. The GM is formed by the order of the head of PIU as a permanently functional structure, engaging personnel of the Implementing Agency (IA), in this case, the Ministry of Environmental Protection and Agriculture (MEPA), from all departments, having regard to environmental safeguard and LAR issues and complaint resolution. MEPA representative, PIU top management representative, PIU monitoring, evaluation and reporting specialist, layer and engineer, PR and communication specialist of a social marketing firm, which will be contracted by PIU, and other relevant persons. The GRM is involved in Stage 2 of the grievance resolution process. The order shall also state that, if necessary, representatives of local authorities, NGOs, auditors, APs and any other persons or entities can be included in the Commission as its members. (ii) GRCEs will be established at the community level with PIU order and following composition: Environmental and social safeguards specialist of architectural design and supervision firm, Gamgebeli – concerned Gamgeoba (village level), representatives of civil works contractor, NGO representative, APs representative, acting as grievance focal person (GFPs).

136. GRCEs will be established at the community level with PIU order and following composition: Environmental and social safeguards specialist of design and supervision firm, Gamgebeli – concerned Gamgeoba (village level), representatives of civil works contractor, NGO representative, APs representative, acting as grievance focal person (GFPs).

137. The environmental and social safeguards specialist of the design and supervision firm is coordinating the work of the Committee and at the same time, s/he is nominated as a contact person for collecting the grievances and handling the grievance log. The local authorities at the municipal level, contractors, as well as APs (through informal meetings) are informed about the contact person and his contact details are available in the offices of all mentioned stakeholders.

138. The design and supervision firm will assist the project affected communities/villages identify local representatives to act as GFPs. The GFPs will be responsible for (i) acting as community representatives in formal meetings between the project team and the local community s/he represents; (ii) communicating the community members' grievances and concerns to the contractor during project implementation.

139. A pre-mobilization public consultation meeting will be convened by the PIU and will be attended by the GFPs, representatives of the contractor(s) and other interested parties (e.g., district level representatives, NGOs, etc. The objectives of the meeting will be as follows:

- Introduction of key personnel of each stakeholder including roles and responsibilities.
- Presentation of project information of immediate concern to the communities by the contractor (timing and location of specific construction activities, design issues, access constraints etc.) This will include a summary of the EMP, its purpose and implementation arrangements.
- Establishment and clarification of the GRM to be implemented during project implementation including proactive public relations activities proposed by the project team ensures that communities are continually advised of project progress and associated constraints throughout the project implementation period; and
- Elicit and address the immediate concerns of the community based on the information provided above.

140. In the operational stage, complaints will be resolved at GRCE level.

2. Project Grievance Redressed Process

141. During the actual operationalization of the GRM, the process and communication flows will be centered on the GRM coordinator. The GRM coordinator will take initiative to be observant of any issue and will try to obtain information, which will be used in the subsequent GRM process stages. Under normal processing through the GRM, complaints undergo four major procedural stages as follows:

142. Stage **I: Registration and Initial Assessment**. This is the entry point of complaint wherein the complainant can tell his or her side of the issue and be assured that his grievance will be seriously and expeditiously dealt with. The following are the tasks in this stage:

- Receive Grievance: This task will entail listening intently to the source of the complaint, filling out the complaint form and registering the complaint in a GRM registry book, and assigning a GRM reference number. The complainant or representative shall affix a signature and provide contact particulars on the complaint form. Important information shall be entered in the complaint form, which can be supplemented by additional documents.
- Obtain Comprehensive Information: The GRM coordinator will mobilize some staff to obtain as much information as possible from the location where the complaint originated, the impact area and the outlying areas. Field information will be gathered using necessary survey methodologies, equipment and devices. Interviews shall be conducted directly from the field to have an actual appreciation of the nature of the complaint and to obtain other versions of the issue. It would be necessary to talk and discuss with as many people as possible who have direct and indirect knowledge of the problem. Photographs and videos shall be obtained, which can be used later in the analysis of the problem. Secondary backup information shall also be acquired to determine background information and cross-reference it with other sources of information.
- Screen and Assess: After gathering all the available and obtainable information, the GRM coordinator with the support of the staff shall analyze the complaint and determine the admissible information. The team will render an opinion on whether the complaint is

project related or not and provide justifications for such an opinion. The findings shall be communicated to the complainant upon which, in case of disagreement, supplementary information may have to be provided by the complainant.

143. Stage **II: Initial Resolution.** Based on the opinions of the screening and upon presentation of additional documentary evidence by the complainant, the GRM coordinator will direct the complaint to one of the following options:

- Refer to appropriate authorities: If the issue is not relevant to the project, the GRM coordinator will refer the issue to the appropriate competent office and explain to the complainant the reasons. S/he will advise the complainant on what to do and provide contact particulars to that appropriate office if available. Primarily, these can be the MEPA, local authorities or the local court in the district or region that has jurisdiction on the issue. Also, if available and possible s/he can refer the complainant to some people who can be of good help (e.g., NGOs). After these steps, the matter will be considered closed and a resolution acceptance form will be issued for the acceptance and signature of the complainant. Relevant information regarding the resolved complaint shall be gathered and a cross entry shall be entered in the GRM registry book.
- Resolve within the project: If the complaint is found to be project related, the contractor/s will be given a directive to resolve the matter. It would be necessary to have a meeting with the contractor/s' project manager regarding the issue. The meeting will entail the determination of the most preferred options, which will be part of the next stage of the GRM process.
- Reject the complaint with a clear explanation: When in the opinion of the committee complaint is not project related, it is rejected and such decision will be communicated to the complainant, after which the matter will be considered closed and all relevant information shall form part of the archived information.

144. **Stage III: Selection of Approach and Strategy**. At this stage, the complaint will be accepted and agreed on the proper approach and strategy for its resolution. Depending on the gravity of the situation and the complaint the GRM has the following options:

- Contractor/s recommend solution: In this approach, as in most cases, the contractor shall decide on the technical solution to the issue and implement the measure/s. This seems straightforward especially if this is within the scope and obligations of the contract. Some contractual issues may arise pertaining to cost and payment considerations, but this can be decided by the contractor. After a due decision is made on the division of scope and responsibility, the GRM coordinator will oversee the implementation of the resolution or measures and report to the PIU. The progress of the execution of works is documented with periodic reporting to PIU. The complainant is also apprised of the progress of the work for the better attainment of results and improved effectiveness of the measures.
- Complainant joint solution: In some cases, the cooperation and collaborative effort of the complainant are necessary to provide some avenues to facilitate the devising of a solution. It is a good strategy to involve the complainant in the problem-solving process as it can generate cooperation.
- Third-party arbitration: In complicated matters where the complainant is reluctant to work directly with the contractor, the complaint can be elevated to arbitration. This may not be an easy approach as the project will have to organize and set up an arbitrating party, perceived as impartial, to execute the process. Nevertheless, this can still be pursued if both the contractor and the complainant agree to use this approach.

- Local conflict resolution: These may be through the local courts, the council of elders in the village, the appointed head of the local municipality, etc. Issues may be discussed through these avenues, and with the participation of the contractor, consensus can be arrived at for the benefit of those affected directly and indirectly.

145. **Stage IV: Execution of Measures and Documentation.** At this stage, the agreed solution or measures are implemented by the contractor under the supervision of the architectural design and supervision firm and tracked by the GRM coordinator for documentary purposes.

- Execute solution: The execution of the solution will entail the engagement of the contractor and his staff. Designs or schemes will be agreed upon and are to be checked by the staff as part of their facilitation tasks. Equipment and materials will be employed, and work will be performed by the contractor and supervised by the design and supervision firm.
- Document the progress: The GRM coordinator will undertake full documentation of the work, and shall also include designs and schemes, costing, and photographs of the work (before, during and after), which will form part of the progress reporting and documentation archive of the GRM.

146. At this stage, the complainant may either be satisfied or not satisfied, and the issue persists. The following pathways ensue in each of the cases: If the issue is deemed to be resolved satisfactorily, the grievance is considered ‘Resolved’ and two more tasks are to be accomplished:

- Completing the documentation: The GRM coordinator will complete all documentation and ask the complainant to sign the resolution acceptance form that s/he was satisfied with the measures implemented.
- Recording acceptance: In the end, the GRM coordinator will put an entry in the GRM registry book that the grievance is resolved.

147. In case the issue is not resolved, the complaint and grievance will follow another pathway entailing the following sub-tasks and then revert to Stage III to repeat the process:

- Review the complaint: The GRM coordinator will initiate a review and if necessary, request the group for a larger review. The purpose of this is to determine other underlying issues that led to the non-resolution of the complaint.
- Assign appropriate staff: It may be necessary to appoint appropriate staff to assist in the process or even obtain outside assistance from some governmental offices. The GRM coordinator will seek out other staff who can contribute to the resolution of the issue.
- Formulate approach/ strategy options: The GRM should also determine if the approach itself was the cause of the non-resolution of the issue. In this instance, the contractor may need to revisit the initial approach and further refine it or even change it entirely if required. During this internal sub-process, the GRM coordinator should be proactive in documenting every step, which will form part of the documentation and progress monitoring of the GRM process.

148. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

D. ADB Accountability Mechanism

149. ADB Accountability Mechanism can be considered as a last resort. The ADB's Accountability Mechanism provides a venue for people adversely affected by ADB-assisted projects to seek solutions to problems and report alleged noncompliance with ADB's operational policies and procedures. It is however a last resort mechanism and affected people are expected to exhaust grievance handling mechanisms mentioned in this brochure and the ADB operations department concerned (ADB Georgian Resident Mission, contact information below) before lodging a complaint with the ADB's Accountability Mechanism.

150. GRM Contact Information (Project Officer and Contact Details):

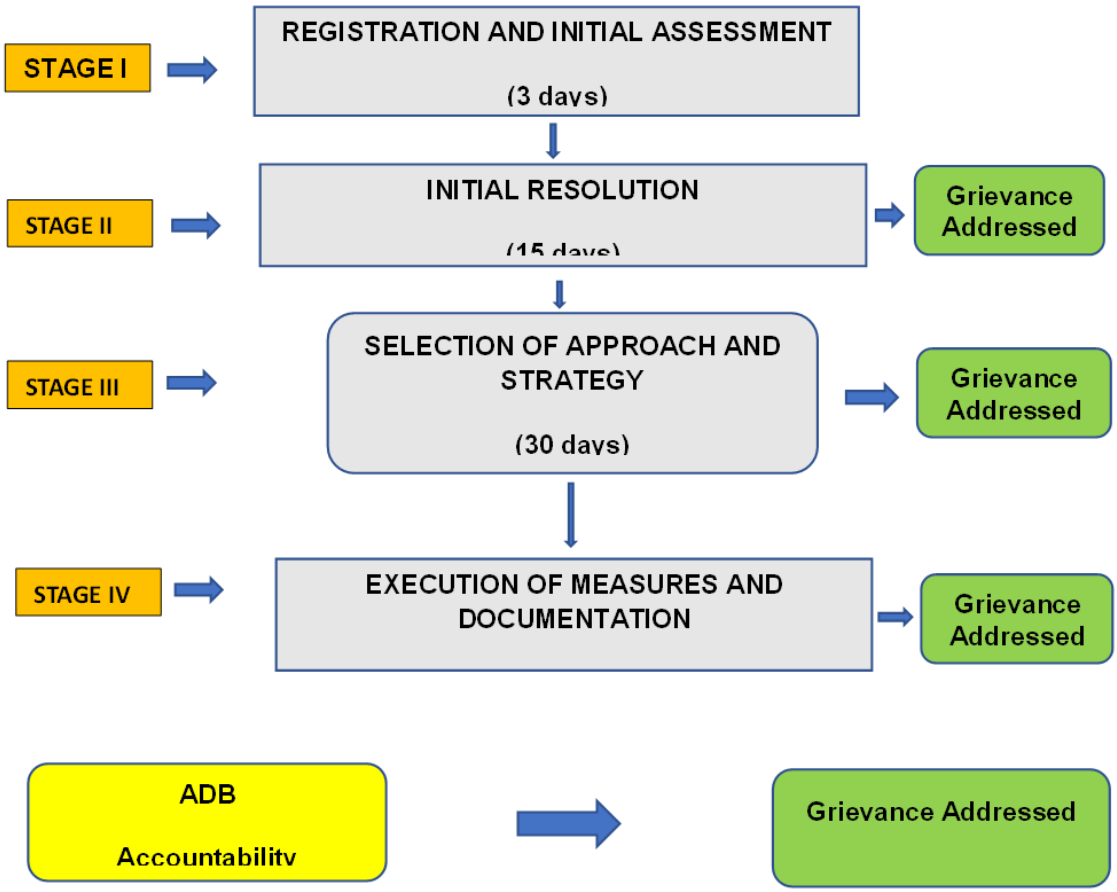
Complaint Receiving Officer (CRO), Accountability Mechanism
Asian Development Bank,
ADB Headquarter, 6 ADB Avenue, Mandaluyong City 1550, Metro Manila, Philippines
Tel: (+632) 632 4444 local 70309
Fax: (+632) 636 2086
Mail: amcro@adb.org

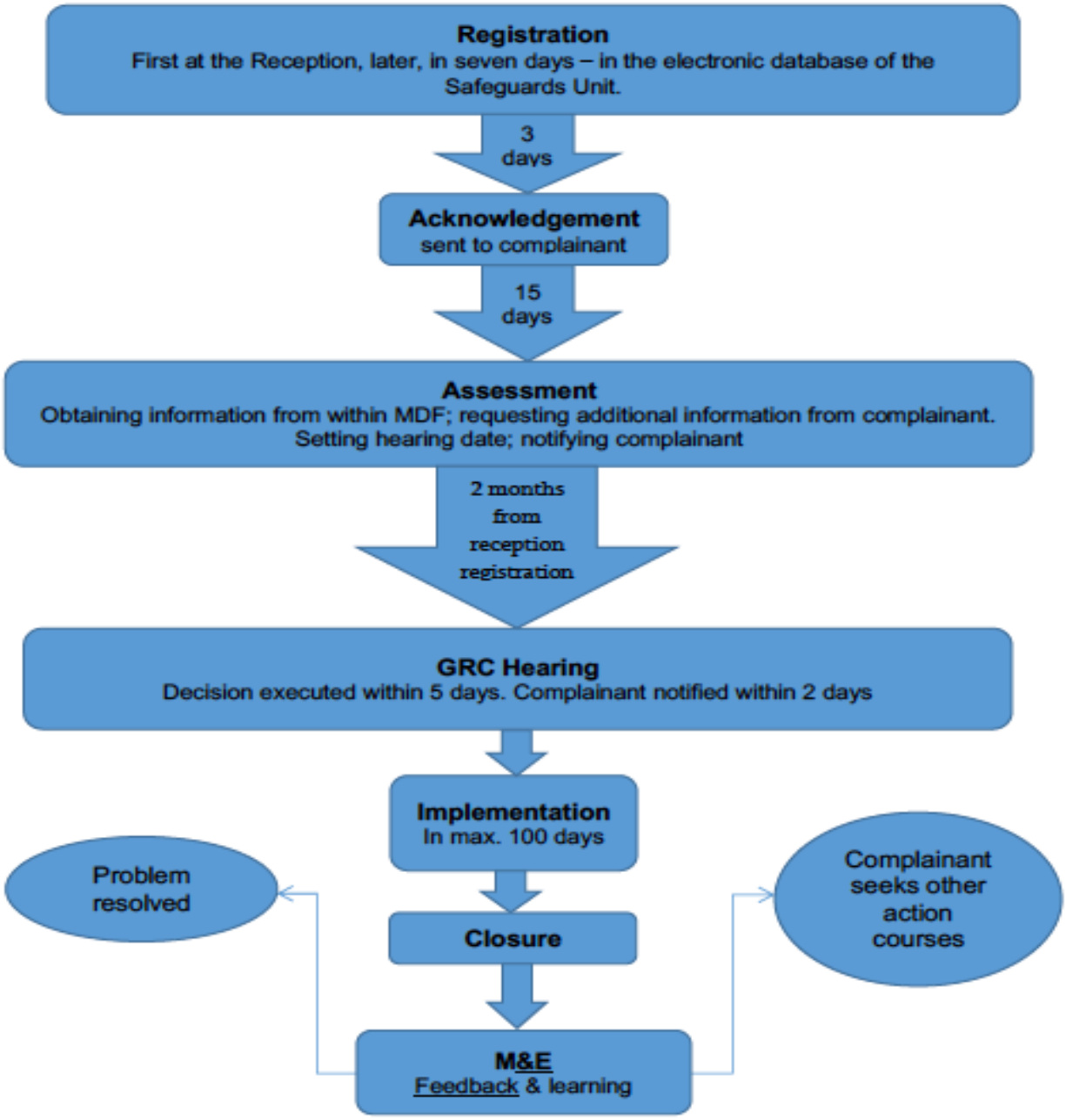
151. Record**-keeping.** The PIU will both keep records of grievances received, including contact details of the complainant, the date the complaint was received, the nature of the grievance, agreed corrective actions and the date these were affected and the final outcome. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PIU office, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

152. Periodic **review and documentation of lessons learned.** The PIU Project Officer (Environment) will periodically review the functioning of the GRM in each town and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

153. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/information dissemination) will be borne by the concerned PIU at the town level while costs related to escalated grievances will be met by the PIU. Cost estimates for grievance redress are included in resettlement cost estimates.

Figure 5: Grievance Redress Process




Registration
First at the Reception, later, in seven days – in the electronic database of the Safeguards Unit.
3 days
Acknowledgement
sent to complainant
15 days
Assessment
Obtaining information from within MDF; requesting additional information from complainant. Setting hearing date; notifying complainant
2 months from reception registration
GRC Hearing
Decision executed within 5 days. Complainant notified within 2 days
Implementation
In max. 100 days
Problem resolved
Closure
Complainant seeks other action courses
M&E
Feedback & learning

VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

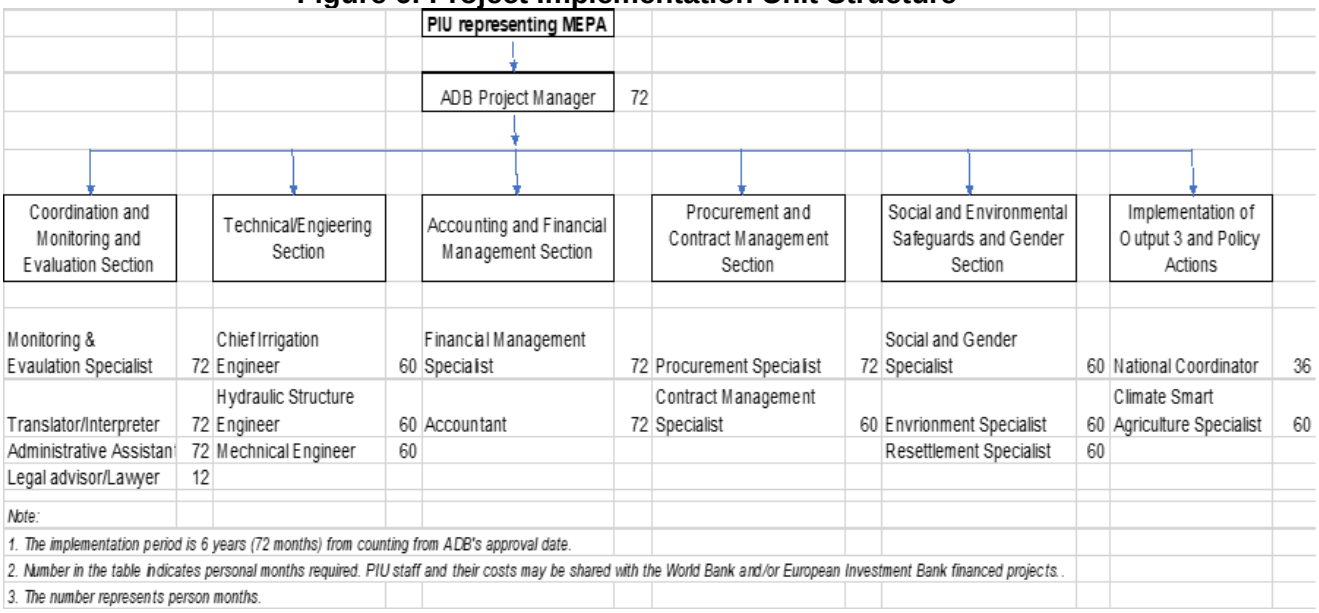
154. **MEPA is the executing agency** responsible for overall guidance, strategic decisions, oversight of the implementation of the project, and financial management and administration. **The MEPA PIU is the implementation agency** and will be responsible for the day-to-day implementation and needs to have sufficient capacity to manage and monitor environmental safeguards. The PIU will be responsible for overall compliance with ADB's safeguard requirements and national environmental regulations and will ensure that the preparation, design, construction, implementation, operation and decommissioning of the projects and all project facilities comply with all applicable national laws and regulations relating to the environment, health and safety, environmental safeguards, and requirements outlined in the EARF and IEEs, and any corrective or preventive actions outlined in the safeguards monitoring reports.

155. The PIU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all environmental, health and safety, labour, social, gender, resettlement and similar provisions to manage impacts and to comply with ADB's SPS and national legislation. The PIU should ensure there is an appropriate budget for environmental safeguards implementation.

Table 12: Project Implementation Unit Staff

Staff Position	Person-Months
Project Director (intermittent)	n/a
CSISDP Project Manager	72
Financial Management Specialist	72
Accountant	72
Procurement Specialist	72
Contract Management Specialist	60
Administrative Assistant	72
Monitoring and Evaluation Specialist	72
Climate Smart Agriculture Specialist	60
Hydraulic Structure Engineer	60
Chief Irrigation Engineer	60
Mechanical Engineer	60
Resettlement Specialist	60
Environment Specialist	60
Social and Gender Specialist	60
Legal Specialist/Lawyer (intermittent, assumed at 2 months per year)	12
National Policy Coordinator	36
Translator/Interpreter	72

Figure 6: Project Implementation Unit Structure



A. Safeguard Implementation Arrangement

156. **PIU**. The MEPA PIU is overseen by a Project Director with the CSISDP ADB Project Manager managing the project on a day-to-day basis. The PIU will be responsible for overall compliance with ADB's safeguard requirements and national environmental regulations and will ensure that the preparation, design, construction, and implementation of the projects and all project facilities comply with all applicable national laws and regulations relating to the environment, health and safety, environmental safeguards, and all measures, and requirements outlined in the EARF and IEEs, and any corrective or preventive actions outlined in the safeguards monitoring reports.

157. The PIU will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all environmental, health and safety, labour, social, gender, resettlement and similar provisions to manage impacts and to comply with ADB's SPS and national legislation. The PIU should ensure there is an appropriate budget for environmental safeguards implementation. The PIU will receive support from the Environmental Specialist of the PIC Team in the implementation of environmental related tasks at the field level.

158. The PIU will be responsible for the implementation of the Environmental management plan. PIU will undertake internal monitoring and supervision and record observations throughout the project period to ensure that the safeguards and mitigation measures are provided as intended. They will be responsible for (i) conducting briefings to contractors on safeguards requirements including GRM (ii) implementing and monitoring safeguards compliance activities, public relations activities, gender mainstreaming activities, and community participation activities; (iii) coordinating with district administration, PIC for land acquisition and resettlement aspects and addressing any problems and/or delays; (iv) monitoring physical progress on EMP implementation; and (v) organizing monthly meetings with the PIC safeguard support staffs to review the progress. The PIU will be supported by the PIC and by the Construction Contractors' Environmental Specialists.

159. The PIU already has an Environment Specialist. The PIU Environment Specialist will receive support from Environmental Specialists of the PIC Team in the implementation of environmental and social related tasks at the PIU level.

160. **PIC.** The PIC shall manage preparation/vetting design documents, tendering of contracts, implementation of resettlement, environmental management and gender action plans; setting and managing project performance monitoring systems, planning and managing implementation of training and capacity building as well as institutional strengthening activities besides preparing reports as per ADB requirements. They will support the PIU in the supervision of the construction works, on behalf of the PIU, reviewing the SSEMP, ensuring the correct implementation of the SSEMP, EMP and GRM, monitoring the environmental impacts and parameters, supporting the corrective actions and reporting process. They will report back to the PIU on any issues.

161. They will also lead any training that is required, during the pre-construction phase, during construction and at handover.

162. They will support the PIU handover to the GA and ensure that the GA understands the environmental requirements for the operation and maintenance phase.

163. The PIC requires an environmental specialist for the development and review of the safeguarding documents, throughout construction to support the PIU in supervision and support training. Additionally, a pool of experts would be required for intermittent support, as needed, to ensure requirements of ADB SPS 2009 are effectively complied with during project implementation.

- Biodiversity Specialist – Intermittent
- Waste Specialist – Intermittent
- Cultural Specialist – Intermittent and short-term (during works within 100m of the Nameless Tower, or to support during chance finds).
- Asbestos Specialist – Intermittent and short-term (during any works involving asbestos)

164. **Design** Contractor**.** The design contractor will produce or update the IEE and EMP as part of the detailed design phase and submit them to PIU and ADB. They shall employ an appropriate environmental specialist to ensure that the IEE is up to ADB standards and national requirements.

165. Construction **Contractor** The contractor will be required to provide the resources to comply with the contract provisions on environment, health and safety, the IEE, and applicable permits/clearances. The contractor shall appoint an Environment, Health and Safety (EHS) engineer who will be responsible on a day-to-day basis for (i) ensuring implementation of EMP, (ii) coordinating with the PIU environment staff; (iii) community liaison[21], consultations with interested/affected parties, and grievance redress; and (iv) documentation and reporting. The requirement of the EHS Supervisor will be included in the bid documents.

166. The Contractor will be required to submit to PIU for review and approval, a site-specific environmental management plan (SSEMP) including (i) proposed sites or locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes; (ii) pre-works conditions of all sites and public assets/roads/utilities that

[21] Reasonable size social outreach team (SOT) to be appointed by contractor to facilitate community liaison, consultations and R&R implementation (including resolution of grievances). Requirement of SOT will be included in bid document.

will be used for the execution of works; (iii) specific mitigation measures following the approved EMP; (iv) monitoring program per SSEMP; (v) budget for SEMP implementation. No works can commence prior to the approval of SSEMP.

167. A copy of the EMP or approved SSEMP will be kept on-site during the construction period at all times. Non-compliance with, or any deviation from, the conditions set out in the EMP or SSEMP constitutes a failure in compliance and will require corrective actions. The EARF and the IEEs specify responsibilities in EMP implementation during the design, construction and O&M phases.

168. **GA**. The GA will be responsible for the operation of the irrigation system. They gave the responsibility to review the design documentation and provide recommendations. After project completion, GA will take over the responsibility for the operation and maintenance of the system. Including ensuring any repairs and any works follow good environmental practices and national legislation and supporting the sustainable use of the irrigation system. Figure 7 and Table 13 summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Figure 7: Institutional Arrangement for Environmental Safeguards

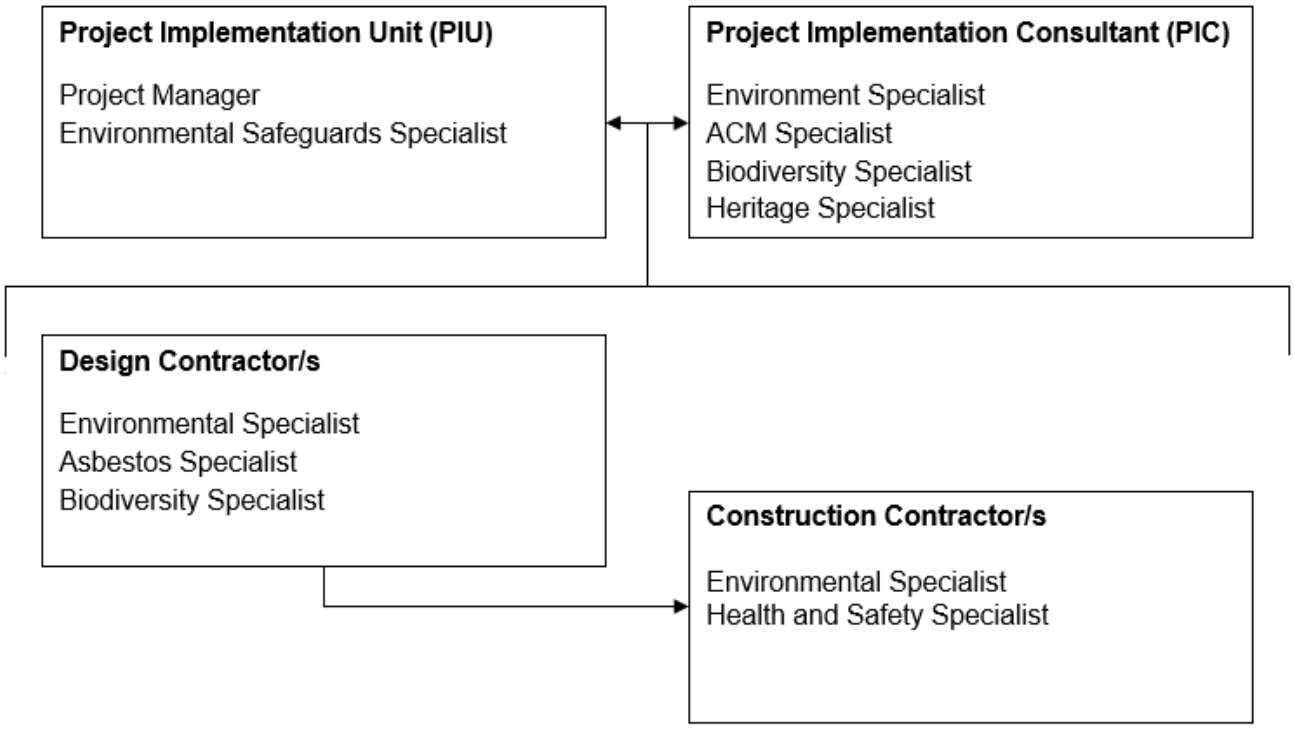


Table 13: Institutional Roles and Responsibilities for Environmental Safeguards Implementation

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
PIU (Environmental Officer),	• Review REA checklists and assign categorization based on ADB SPS 2009 • Review and approve EIA/IEE • Submit EIA/IEE to ADB for approval • Ensure approved IEEs are disclosed on PIU websites and summary posted in public areas accessible and understandable by local people. • Ensure environmental management plans (EMPs) are included in the bid documents and contracts • Ensure the cost of EMP implementation is provided. • Obtain all necessary clearances, permits, consents, NOCs, etc. Ensure compliance with the provisions and conditions. • Ensure the GRM is set up • Take necessary action for obtaining rights of way;	• Oversee implementation of EMPs, • Monitor and ensure compliance with EMPs as well as any other environmental provisions and conditions. • EMP implementation regarding sites for disposal of wastes, camps, storage areas, quarry sites, etc. • Ensure compliance with all government rules and regulations regarding the site and environmental clearances as well as any other environmental requirements • Review monthly monitoring report • Prepare and submit to ADB semi-annual monitoring reports • If necessary prepare Corrective Action Plan and ensure implementation of corrective actions to ensure no environmental impacts; • Review and submit Corrective Action Plans to ADB • Coordinate with national and state-level government agencies • Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner • Conduct continuous public consultation and awareness • Conducting environmental monitoring, as specified in the EMP.	• Issuance of clearance for contractor's post-construction activities as specified in the EMP.
GA	• Review and endorse feasibility and design documentation prepared by the PIU and provide comments and recommendations for revisions as required	• Assist the PIU in the assessment of any design adjustments proposed by the construction supervising company or contractor company.	• Upon completion of modernization works and after handing over the modernized facilities to the GA, confirm the obligation

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	within a reasonable timeframe.	• As required and within its authority, manage relations with Kvemo Samgori water users and land users.	for the maintenance of those facilities. • Ensure following repairs and works follow good international practices and national legislation. • Compliance monitoring to review the environmental performance of project components, if required and as specified in EMP
PIC-Environmental Safeguard Specialist	• Assist in the review of the contractors' implementation plans to ensure compliance with the IEE. • Organize an orientation workshop for PIU involved in the project implementation on (a) ADB SPS, (b) Government of Georgia national, state, and local environmental laws and regulations, (c) core labour standards, (d) OH&S, (e) EMP implementation especially spoil management, working in congested areas, public relations and ongoing consultations, grievance redress, etc. • Organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during implementation.	• Oversee the day-to-day implementation of EMPs by contractors, including compliance with all government rules and regulations; • Monitor EMP implementation • Recommend corrective action measures for non-compliance by contractors • Assist in the review of monitoring reports submitted by contractors • Assist in the preparation of monthly monitoring reports • Assist in addressing any grievances brought about through the Grievance Redress Mechanism in a timely manner • Organize capacity building programs on environmental safeguards	• Assist in the inspection and verification of contractor's post-construction activities.

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	• Assist PIU, to document and develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE. • Assist in addressing any concern related to IEE and EMP.		
Design Contractor	• Conduct initial environmental assessment for the proposed project using REA checklists and submit to PIU/PIU • Prepare EIA/IEE based on categorization and submit to PIU/PIU for approval • Ensure provisions and conditions are incorporated in the IEE and detailed design documents. • Assist in ensuring IEE is included in bid documents and contract agreements. • Assist in determining the adequacy of cost for EMP implementation. • Assist in summarizing IEE and translating to a language understood by local people • Conduct continuous public consultation and awareness		
Contractors (EHS Engineer/Staff)	• Prepare EHS plans and submit them to PIU • Ensure EMP implementation cost is included in the methodology. • Undergo EMP implementation training by PIC prior to the start of works • Provide EMP implementation training to all workers prior to deployment to worksites	• Implement EMP. • Implement corrective actions if necessary. • Prepare and submit monitoring reports to PIC/PIU • Comply with all applicable legislation • Brief all workers about the requirements of the EMP • Provide environmental training to all workers; • Ensure any sub-contractors/ suppliers who	• Ensure EMP post-construction requirements are satisfactorily complied to • Request certification from PIU

Responsible Agency	Responsibility		
	Pre-Construction Stage	**Construction Stage**	**Post-Construction**
	• Seek approval for campsites and sources of materials. • Ensure a copy of IEE and EMP is available at worksites and posted at visible places at all times. • Assist PIU in obtaining all necessary clearances, permits, consents, NOCs, etc.	are utilized within the context of the contract comply with all requirements of the EMP. The Contractor will be held responsible for non-compliance on their behalf; • Bear the costs of any damages/ compensation resulting from non-adherence to the EMP or written site instructions; • Ensure that PIU/PIC are timely informed of any foreseeable activities related to EMP implementation. • Conduct continuous public consultation and awareness;	

B. Institutional Capacity and Development

169. Executing and implementing agencies need to have a sustained capacity to manage and monitor environmental safeguards. Although specialist consultants' support will be available to PIU, it is necessary to mainstream safeguards in day-to-day work. Therefore, PIU requires capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in the preparation of IEE, implementation of mitigation measures, and subsequent monitoring. Training and awareness workshops are included in the project with the primary focus of enabling the PIU staff to understand impact assessments and carry out environmental monitoring and implement EMPs. After participating in such activities, the participants will be able to review environmental assessments, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender documents and carry out necessary checks and balances during project implementation.

170. The detailed cost and specific modules will be customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the environment specialist of PIC.

171. The detailed cost and specific modules will be customized for the available skill set after assessing the capabilities of the target participants and the requirements of the project by the ESS of PIC.

172. Modules would be as follows: (i) sensitization; (ii) introduction to the environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of

the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project, along with the frequency of sessions, is presented in Table 18.

Table 14: Capacity Building Program on EMP Implementation

Sl. No.	Description	Target Participants and Venue	Cost and Source of Funds
1	Introduction and Sensitization to Environmental Issues (1 day) - ADB Safeguards Policy Statement - EARF of CSISDP -Government of Georgia and Georgian Amelioration applicable safeguard laws, regulations and policies including but not limited to core labour standards, OH&S, etc. -Incorporation of EMP into the project design and contracts -Monitoring, reporting and corrective action planning	All staff and consultants involved in the project At PIU	PIU cost
4	EMP implementation (2 days) -Roles and responsibilities -OH&S planning and implementation -Wastes management (water, hazardous, solid, excess construction materials, spoils, etc.) -Working in congested areas, - Public relations - Consultations - Grievance redress -Monitoring and corrective action planning -Reporting and disclosure -Post-construction planning	All staff and consultants involved in the subproject All contractors prior to the award of the contract At PIU	PIU cost
5	Plans and Protocols (1 day) -Construction site standard operating procedures (SOP) - AC pipe protocol - Site-specific EMP -Traffic management plan -Spoils management plan -Waste management plan - Chance find the protocol - O&M plans - Post-construction plan	All staff and consultants involved in the project All contractors prior to the award of the contract or during the mobilization stage. At PIU	PIU cost Contractors' cost as compliance with the contract provisions on EMP implementation
6	- Experiences and best practices sharing - Experiences in EMP implementation - Issues and challenges - Best practices followed	All staff and consultants involved in the project All contractors All NGOs At PIU	PIU Cost
7	Contractors' Orientation to Workers on EMP implementation (OH&S, core labour laws, spoils management, etc.)	All workers (including manual labourers) of the contractor prior to dispatch to the work site	Contractors' cost as compliance with the contract provisions on EMP implementation

C. Staffing and Budget

173. Costs required for implementing the EARF will cover the following activities:

(i) conducting environmental assessments of new subprojects, preparing and submitting reports, and public consultation and disclosure;
(ii) application for government regulatory consents, approvals; and
(iii) implementation of EMP and long-term surveys.

174. For budgeting purposes, it is assumed that all new subprojects will be classified by ADB as category B (requiring IEE). Some subprojects may require a simpler environmental review, but this is discounted for budgeting purposes.

175. Preparation of IEE requires an experienced environmental specialist for conducting the following activities: (i) a site visit to assess environmental conditions and potential impacts of the scheme; (ii) liaison with municipalities and others to obtain any environmental/social data that might be available locally (e.g. population figures, designated sites, etc.); (iii) consultation with the local community to inform them about the scheme and identify their views and concerns; (iv) assessment of impacts and development of mitigation; and (v) desk study and report preparation.

176. The infrastructure involved in each scheme is generally straightforward and will take 2 years to build. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by the PIC environment safeguard specialist, assisted by the PIU project officer (environment). The PIC environment safeguard specialist will prepare EIAs, IEEs, or environmental reviews for new subprojects. The budget, therefore, includes the full cost of the environmental specialist.

177. The cost of mitigation measures and surveys during construction will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors.

178. The operation phase mitigation measures are of good operating practices, which will be the responsibility of the municipalities. All monitoring during the operation and maintenance phase will be conducted by government regulatory agencies as per their mandate therefore, there are no additional costs. The indicative costs of EARF implementation are shown in Table 12. An implementation period of 48 months is considered for preparing the following costs.

Table 15: Indicative Cost of Environmental Assessment and Review Framework Implementation

Component	Description	Number	Cost Per Unit (USD)	Cost (USD)	Source of Funds
A. Consultants Costs					
PIC environmental safeguards specialist – International and National 1 no each	Responsible for environmental safeguards of the project	International – 6 National – 18 person months (spread over the entire project	Included	Budgeted	Remuneration and budget for travel covered in the PIC contract

		implementation period)			
PIC Construction supervision – environmental specialist and health and safety specialist	Responsible for all elements of environmental safeguards:	Environmental specialist 28 person months Health and safety specilaist 6 person months (spread over the entire project implementation period)	Included	Budgeted	
PIC Biodiversity expert	Responsible for: (i) screening and conduct of biodiversity assessment (ii) training and capacity building tasks, (iii) monitoring and reporting	6 person months (spread over the entire project implementation period) implementation period)	Included	Budgeted	Remuneration and budget for travel covered in the PIC contract
B. Administrative Costs					
Legislation, permits, and agreements	License fee for forest permission etc.	All subprojects	Lump sum	XXX	Included in the overall project cost
C. Environmental Monitoring Costs					
Environmental monitoring	During construction	All subprojects	Lump sum	XXX	Contractor's cost (included in project cost)
Other Costs					
Public consultations and information disclosure	Information disclosure and consultations during pre-construction and construction phase, including public awareness campaign through the media	As per requirement	Lump sum	Budgeted	PIU costs – part of incremental administration
Capacity development in environmental safeguards	Awareness and training programs - venue and other arrangements	Training workshops for all program agencies	Lump sum	Budgeted	PIU costs - part of incremental administration
GRM implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)	Part of administration cost of PIU	Lump sum	Budgeted	PIU cost - part of incremental administration

Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period	Lump sum	Contractor's liability	As per the insurance requirement	Contractor's insurance

VII. MONITORING AND REPORTING

179. PIU will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts. In addition to recording information on the work and deviation of work components from the original scope, PIU, PIU, and PIC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

180. Prior to the commencement of the work, the DBO contractor will submit a compliance report to PIU ensuring that all identified pre-construction environmental impact mitigation measures as detailed in the EMP will be undertaken. PIU with the assistance of the PO (environmental safeguard) and ESS of the PIC Consultant will review the report and thereafter PIU will allow the commencement of works.

181. During construction, results from internal monitoring by the DBO contractor will be reflected in their monthly EMP implementation reports submitted to the PIU and environmental specialist of PIC. They will review and advise contractors for corrective actions if necessary. A monthly report summarizing compliance and corrective measures taken will be prepared by PIU with the assistance of the environmental specialist of PIC and submitted to PIU.

182. A quarterly report shall be prepared by PIC and PIU and submitted to PIU for review and further actions. The quarterly report shall include the Quarterly Progress Report checklist (refer to Appendix 12) to ensure completeness of safeguards requirements.

183. Based on monthly and quarterly reports and measurements, PIC will draft a six-monthly report and submit to PIU for their review and further submission to ADB. Once concurrence from the ADB is received the report will be disclosed on the project website.

184. ADB will review project performance against the MEPA and GOG commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

- conduct periodic site visits for projects with adverse environmental or social impacts;
- conduct supervision missions with detailed review by ADB's safeguard Specialists /officers or consultants for projects with significant adverse social or environmental impacts;
- review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and agreed with ADB;
- work with EAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to reestablish compliance as appropriate; and
- prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

185. ADB's monitoring and supervision activities are carried out on an ongoing basis until a Project Completion Report (PCR) is issued. ADB issues a PCR within 1-2 years after the project is physically completed and in operation.

APPENDIX 1: RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST

(SAMPLE FOR A SUBPROJECT)

Rapid Environmental Assessment (REA) Checklist

Country/Project Title:	**Georgia, TA-6648 GEO: Climate Smart Irrigation Sector**
Investment Title:	Modernization of the Kvemo Samgori Left Main Canal
Sector Division:	**Irrigation**
Date:	**12.04.2022**

Screening Questions	Yes	No	Remarks
A. Investment Siting Is the Investment area adjacent to or within any of the following environmentally sensitive areas?	**Yes**		The project area, which is divided into 6 areas in view of biodiversity, is in a sensitive area (according to the information received from the Integrated Biodiversity Assessment Tool (IBAT)). The first area is separated from Iori Managed Reserve only by a local ground road. The second area is also separated from Korughi Managed Reserve by a local ground road.
▪ Protected area	**Yes**		As mentioned, the project area does not intersect with the protected area. Iori and Korughi Protected Areas are located 10-15 meters from the project area. At this stage, no preliminary design has been developed for the second section, and the scale of the rehabilitation works or the methods and schedule of the necessary works are not known either. Consequently, at the given stage the level of expected impact on the protected area is not specified. According to the preliminary design, several secondary pipes will be installed underground in the vicinity of the protected areas.
▪ Wetland		**No**	
▪ Mangrove		**No**	
▪ Estuarine		**No**	
▪ Buffer zone of protected area	**Yes**		A 1.7-km-long southern portion of the first section of the project area follows Iori Managed Reserve. These areas are divided by a local ground road. Iori Managed Reserve (belonging to Category IV of The World Conservation Union). It is located quite close to the secondary channels.

Screening Questions	Yes	No	Remarks
▪ Special area for protecting biodiversity	**Yes**		As per the information taken from the Integrated Biodiversity Assessment Tool (IBAT), the project area is in a sensitive zone in view of biodiversity.
B. Potential Environmental Impacts Will the Investment cause…			
▪ Loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?	**Yes**		After the design changes, no cultural heritage sites are included in the project area. It should be noted that the project area, especially its first and second sections, is located in a region rich in cultural heritage resources. Consequently, there is a possibility of the presence of artefacts in the ground during the installation phase of the secondary irrigation pipes.
▪ Conflicts in water supply rights and related social conflicts?		**No**	The project plans the modernization of the existing irrigation system.
▪ Impediments to movements of people and animals?		**No**	Mainly the existing irrigation systems will be rehabilitated within the scope of the project. This will not cause impediments to the movements of people and animals. As for the additional secondary channels envisaged under the project, as per the preliminary information, they will be installed under the ground with pipes.
▪ Potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		**No**	
▪ Insufficient drainage leading to salinity intrusion?		**No**	
▪ Over pumping of groundwater, leading to salinization and ground subsidence?		**No**	In the operation phase, the project will use only surface waters for irrigation purposes.
▪ Impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		**No**	
▪ Dislocation or involuntary resettlement of people?		**No**	
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples, or other vulnerable groups?		**No**	
▪ Potential social conflicts arising from land tenure and land use issues?		**No**	
▪ Soil erosion before compaction and lining of canals?		**No**	

Screening Questions	Yes	No	Remarks
▪ Noise from construction equipment?		**No**	As per the preliminary design, it is not expected to use a large number of techniques on one construction site. Consequently, the noise level will be within the set standard of 250-300m from the construction sites. The rehabilitation areas are mainly located on agricultural lands. The irrigation systems in the populated areas are laid under the ground.
▪ Dust during construction?	**Yes**		The access roads to both, the main and the secondary channels are covered with a ground layer. Consequently, dust generation is expected during the movement of the equipment in the construction phase.
▪ Waterlogging and soil salinization due to inadequate drainage and farm management?		**No**	
▪ Leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?		**No**	
▪ Reduction of downstream water supply during peak seasons?		**No**	
▪ Soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?	**yes**		A certain amount of ground in the project area is used as agricultural land. There are also forest massifs in the project area. As the Kakheti region has historically suffered from a water deficit, following the rehabilitation and modernization of the irrigation channels, the number of agricultural lands in the project area may increase at the expense of the forest massifs. This will also contribute to the increase in the use of pesticides and fertilizers which may result in soil contamination.
▪ Soil erosion (furrow, surface)?		**No**	
▪ Scouring of canals?	**Yes**		
▪ Clogging of canals by sediments?	**Yes**		There are several construction material (sand/gravel) mining enterprises in the upper part of the headworks of the Samgori irrigation system in the riverbed of the Iori River. Following the operation of these plants, the amount of suspended particles in the water of the Iori River increases drastically. Consequently, blocking of the irrigation system with sediment is expected.
▪ Clogging of canals by weeds?		**No**	
▪ Seawater intrusion into downstream freshwater systems?		**No**	
▪ Introduction of increase in incidence of waterborne or water related diseases?		**No**	

Screening Questions	Yes	No	Remarks
▪ Dangers to a safe and healthy working environment due to physical, chemical, and biological hazards during construction and operation?	**Yes**		As per the design, at the given stage it is known that the project envisages dismantling 160-m-long (First area) asbestos-containing pipelines. After the preliminary design is developed, the number of asbestos-containing materials may be found greater.
▪ Large population influx during construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		**No**	
▪ Social conflicts if workers from other regions or countries are hired?		**No**	
▪ Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel, and other chemicals during construction and operation?		**No**	
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the investment (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout construction, operation, and decommissioning?		**No**	

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector:

Subsector:

Division/Department:

Screening Questions		Score	Remarks[22]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms,landslides? Would the project design (e.g., the clearance for bridges)		

[22] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

	need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?		

Materials and Maintenance	Would weather, current and likely future climate conditions (e.g., prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g., construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g., annual power production) of project output(s) (e.g., hydro-power generation facilities) throughout their design lifetime?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding allresponses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high-risk project.

Result of Initial Screening (Low, Medium, High):

Other Comments:

Prepared by:

APPENDIX 2: SAMPLE BIODIVERSITY REPORT

1. Introduction

This document presents the preconstruction biodiversity study report of the Samgori irrigation system project area. An inventory of flora and fauna representatives was provided and the habitats in the project area and the threats to them were assessed during the study period. The document describes the degree of impact on the representatives of flora and fauna biodiversity in the case of the construction works. The Biodiversity Study was conducted in June 2022.

2. Brief Description of the Project Area

The project area in question is located in Sagarejo Municipality, near villages Manavi, Didi Chailuri and Badiauri, with its southern border, partially bordering the nationally protected area “The Korughi Managed Reserve”. The whole project area covers agricultural land plots with vineyards, orchards, annual and perennial agricultural cropland plots, etc. The project area does not cover natural habitats and is represented by an agricultural landscape actively used by the population. All these factors make fauna representatives keep away from the area.

3. Study Methods

3.1 Flora:

Prior to the fieldworks in the project area, literary sources were studied, and the results were used to develop the lists of flora representatives common in the vicinity of the project area. The Latin names of the plant species mentioned in the text were taken from the second edition of "Georgian Flora" (Volumes I-XIV 1987-1996; N. Ketskhoveli, A. Kharadze, R. Gagnidze); as well as the Nomenclature List of Plants (2005, R. Gagnidze) and the Botanical Dictionary (1991, Makashvili). The obtained information was thoroughly verified during the field study, thus revealing the flora representatives common in and around the project area. The same sources were used to identify the species and their taxonomically valid scientific names.

A field study was accomplished within the project area. The study mainly used a route method aiming at studying the background state of the plant species growing in the project area and the botanical survey of the area.

The main objective of the floristic survey was to identify the plant species, sensitive habitats and communities within the construction corridor that will be under the impact.

The floristic survey consisted of two components: 1) collection of detailed data about the generic diversity of the habitats common in the project corridors, and 2) field sampling of the plants growing in the corridors to obtain accurate information about the floristic diversity.

3.2 Fauna:

Prior to the fieldworks in the project area, literary sources were studied, and the results were used to develop the lists of flora representatives common in the vicinity of the project area (Muskhelishvili and Chkhikvadze, 2000; Bukhnikashvili & Kandaurov 2001; Arabuli, 2002; Kvavadze & Pataridze, 2002: Kankaviladze, 2002; 2002; Darchiashvili et al., 2004; Didmanidze, 2004; Arabuli et al., 2007; Kvavadze et al., 2008; Murvanidze et al., 2008; Pokryszko et al., 2011; Kutibidze, 1966). The obtained information was thoroughly verified during the field study, thus

revealing the fauna representatives common in and around the project area. The same sources were used to identify the species and their taxonomically valid scientific names.

The study mainly used the route method. The given project corridor was divided into transects and all the encountering species were visually fixed and identified along the routes planned in advance. Signs of animal life were also identified, such as traces, excrements, holes/burrows, feathers, fur, etc. During the study, we used binoculars with 10X50 magnification, and we used the following field guides during the fieldworks: Mammals of Europe (Macdonald and Barrett 2001) და Birds of Europe (Svensson et al. 2010).

3.3 Study of Fish Fauna

Although there are no rivers, lakes, or artificial fish farms immediately in the project area, ichthyofauna study was still conducted. It should be noted that the Rivers Iori and Chailuri will be adjacent to the project corridor. The natural water discharge of the Chailuri River is little in summer and often, it completely dries up, and its bed is filled with water only following abundant rainfalls. As for the river Iori, fishing was done immediately in it and the facts of fishing were also registered during the study, following which the fishermen were interviewed. During the field survey, the caught fish samples were photographed and returned to the river.

4. The Project and Adjacent Areas and Their Biodiversity

The given Report describes the following protected areas:

- National Protected Area.
    - Korughi Managed Reserve (IUCN Category IV)
- Protected Areas of International Importance
    - Emerald Network Site of Bern Convention, Mariamjvari (Site Code: GE0000020)
    - Important Ornitological Area (International Bird Area (IBA)SPA 5 David Gareji).

Protected areas across the world, including Georgia, play an important role in biodiversity conservation. In order to preserve biodiversity, it is important for a country to discharge its international obligations: Convention on Biological Diversity, the Convention on Migratory Species (CMS), the European Convention on Wildlife and Natural Habitats, so-called "Bern Convention". The Program of Work on Protected Areas (PoWPA), as well as one of the main instruments for the implementation of the Bern Convention, the Emerald Network, which is based on the Association Agreement signed between the EU and Georgia, are directly related to the biodiversity convention of the protected areas. This agreement also obliges Georgia to establish "Important Bird Areas", with their major part located in the existing or planned protected areas.

4.1 Mariamjvari Strict Nature Reserve

The administration of Mariamjvari Strict Nature Reserve includes: Mariamjvari Reserve (1022.5 ha), Korughi Managed Reserve (1716 ha) and Iori Nature Reserve (2126.8 ha).

Mariamjvari Strict Nature Reserve is a unique object of conservation and study of the forms of Caucasian/hook pine (*Pinus sosnowsky nakia*) common in the Caucasus. The pines in the Reserve area are located on the southern slopes of Tsiv-Gombori Ridge, where they show favorable renewal trends on rocky and stony soils and are recognized as the means reinforcing rock talus.

The pine forests on the site have always attracted the attention of scientists with their biological diversity and morphology of forming various forms.

Mariamjvari Reserve was designated with the aim to protect and preserve the pristine landscapes of Sosnovsky pine, which is the Caucasian relics and the rare hearth of the formation of this timber species, having no analogue not only in Georgia, but also abroad.

The main objectives of the Korughi and Iori Nature Reserves are the protection, maintenance and reproduction of the flora and fauna of unique floodplain forests (Korughi) and Tugai-type forests (Iori).

4.1.1 Plants

Mariamjvari Strict Nature Reserve is a part of East Georgia vegetation region. The western border of this region runs approximately along Tbilisi meridian and coincides with the eastern border of Eastern spruce propagation. To the south, the region is bordered by Bezobdali, Shaghdaghi and Morovadaghi Ridges, more precisely by the Tertera river Valley, where the eastern border of the beech forest runs across the Lesser Caucasus.

The northern boundary of this region runs across Tsiv-Gombori Ridge and the Gareja Mountains. To the east, the region extends to the confluence of the Alazani and Iori Rivers with the River Mtkvari (V. Gulisashvili, 1974). The territory of the Reserve is provisionally divided into three zones based on vertical zoning:

- The lowest forest zone is at an altitude of 800-1000 m asl. This zone is represented by oak-hornbeam, brushwood and pine groves.
- The middle forest zone is at an altitude of 1000-1500 m asl. Oak-hornbeam and pine groves commonly grown within this zone;
- The upper zone spreads at an altitude of 1500-1800 m asl, with mainly beech forests, and pine forests growing in the areas of rock talus.

There is no sharp expression of the vertical belt of forests in the territory of the reserve. The main species of woody plants - pine extends from 800 meters to 1800 meters asl in the upper zone of the belt up to 1100-1800 meters (mainly primary groves), as well as in the lower, moderately warm zone of the belt up to 800-1000 meters. In many cases, pine forests are spread mainly in areas where conglomerates have been washed away by water, plateaus and huge outcrops have emerged

In the Mariamjvari State Reserve in the southern part of the Tsiv-Gombori Ridge, S. Kurdiani (1910) distinguished four forms of Sosnowski (hook) pines: Pyramidal (Pinus sosnowskyi Nakai var. Pyramidalis Kurd.); Compact (Pinus sosnowskyi Nakai var. Compacta Kurd.); Oval (Pinus sosnowskyi Nakai var. Ovalus Kurd.); and Umbrella (Pinus sosnowskyi Nakai var. Umbraculifera Kurd.). It is noteworthy that all pines develop similarly until 8-10 years and only after this age, they grow differently taking different forms, which proves that the polymorphism of this pine is not inherent and it is caused by air, soil, temperature, humidity, light and other environmental factors (S. Kurdiani, 1910).

In Mariamjvari Reserve, in terms of arid and semi-arid habitats (ecotopes), there are 9 main types of pine and oak-pine forests identified (Z. Tiginashvili 2006).

The III-Bonitet pine forests grow at 900-1400 m asl and are presented by the following forest types: Pine forest with fescue (Pinetum festucosum); Pine forest with verbena (Pinetum cytisusum); Pine forest with juniper undergrowth (Pinetum juniperosum).

The IV-Bonitet pine trees are found at 850-1500 m asl, which are distinguished by the variety and abundance of indicative grass cover or undergrowth of forest types. The same bonitet presents pure pine forests, as well as oak-pine and pine-oak subformations, with the following types: Pine forest with poosum (Pinetum poosum); Pine forest with soft rush (P. Caricosum); gramineous herb pine forest (P. gromineto-mixtoherbosum); gramineous herb pine and oak forest (Quercetum mixtoherbosum-Pineto-Quercetum mixtoherbosum); oak-pine forest with fescue (Querceto-Pinetum festucosum).

The V-Bonitet oak-pine and pine forests grow at 900-1400 m asl. Due to the low soil productivity, poor grass cover and scarce undergrowth, only two types of forest were identified in this forest: oak-pine forest with oriental hornbeam undergrowth (Querceto-Pinetum carpinuletum) and dry pine forest (Pinetum siccum).

Thus, the types of Mariamjvari pine forests are diversified in terms of dry and arid habitat. They differ from each other with grove composition, frequency, undergrowth, grass cover, soil productivity (bonitet) and other taxonomic indices. Consequently, the typological characteristics of the forest ecosystems of the given ecotopes are as follows: climatic (light, heat, dependence on moisture, etc.), edaphic (soil depth, moisture, fertility, etc.), orographic (relief, slope exposure, slope gradient, altitude, above sea level, etc.) and other factors evidence the biological diversity of the pine forest types in the area.

4.2 National Protected Areas. Korughi Managed Reserve (IUCN Category IV)

The southern section of the project area borders the Protected Area of National Importance, the Korughi Reserve. The purpose of the Reserve was to protect and preserve the floodplain forest survived on the banks of the Iori River. The forests of Korughi Managed Reserve are located along the river as narrow strips on both sides of the Iori, on its first and second terraces. It borders the project area. According to the local conditions, the main forest-forming species are elongated oak, aspen (abele, black poplar), field elm, willow, and secondary forest-forming species: wild pear, shamrock and cherry plum. Noteworthy bushes are: hawthorn, blackthorn, oleaster, Christ's thorn, sea-buckthorn, barberry, European privet, Warty Spindle Tree, Gaiter-tree, Salt cedar, Dog-rose and others. These forests are also characterized by twining plants: greenbrier, traveller's joy, etc., which together with blackberries form impassable thickets, offering favorable conditions for fauna representatives to find shelters and/or propagate.

In lower wetlands, common reed, reed and Cusick's **sedge** are common, while in high dry areas, bottle-brush, Wood bluegrass, wheat-grass, wheat-grass, Saxifraga juniperifolia, etc. are common, also forming a refuge for ornithofauna representatives.

The forests of the Reserve have a function of soil protection and river flow regulation, especially during floods. They reduce erosive processes, moderate the distribution of ambient precipitations and thus contribute to the stability of groundwater yields and river water regimes. The following types of forest groups are found in the Korughi Reserve:

I. Oak forests. This group is dominated by Grayish oak, with 0.4 or higher density. The grown individuals are of medium or low density. Oak and elm grown trees are most common. The undergrowth has shrubs such as: red and black hawthorn, cornelian cherry, gaiter-tree, warty

spindle tree, seaberry, blackberry, etc. with low or medium density. Twining plants are also widespread. These groves are the best shelter for animals and birds.

II. **Mixed floodplain forests.** This group includes groves dominated by poplar, black alder, willow and elm, with mainly oak and aspen shoots and grown individuals, which are quite strong and can be viewed as reliable. Undergrowth: hawthorn, cornelian cherry, gaiter-tree, warty spindle tree, wild privet, blackthorn, oleaster and blackberry. The most common plants are cat briar, traveller's joy and ivy. There is tall herbaceous cover in the black alder and willow groves: Cusick's **sedge** and common reed.

III. **Open stands.** This group includes groves with 0.4 or less density. They are dominated by crayish oak, elm, poplar, and willow. Growing plants are poorly developed and grow as few individuals in the area. In the undergrowth, there are: red and black hawthorn, oleaster, and dog-rose. Twining plants are: cat briar, traveller's joy and ivy. The grass cover is well developed and is presented by gramineous plants, with tall herbs, such as common reed grass in some cases.

IV. Bushes. The following species dominate: oleaster, hawthorn, dog-rose, blackberry, and Christ's thorn. Gramineous plants და common reed grass of grassy plants are common here. This type forms a favorable habitat and shelter for hares, redlegs, and black francolins.

The Reserve has the following types of forests:

- Oak forest with grass.
- Oak forest with wheat grass.
- Oak-elm forest with grass.
- White poplar forest with gaiter-trees.
- White poplar forest with carex bushes.
- White poplar forest with false brome grass.

The grass cover is presented by fescue, Wood bluegrass brome grass, and common reed grass, and beard-grass at forest edges. The wheat grass is made up of carex bushes, brome grass and wood bluegrass.

List of plants and trees common in Korughi and Iori Managed Reserve

Ordinal #	Plant's English Name	Plant's Latin Name
1.	Grayish oak	Quercus pedunciflora
2.	Georgian oak	Querqus iberika
3.	White poplar	Populus alba
4.	Black poplar	Populus nigra
5.	Abele	Populus hibrida
6.	Field elm	Ulmus minori
7.	Wych elm	Ulmus scabra
8.	Black mulberry	Molus nigra
9.	Basket willow	Salix viminalis
10.	White willow	Salix alba
11.	Goat willow	Salix carpea
12.	Russian olive	Eleagnus angustifolia
13.	Common pear	Pirus caucasica
14.	Oriental hornbeam	Carpinus orientalis

15.	Wild pistachio tree (only in Iori Managed Reserve)	Pistacea mutika
16.	Stinking juniper (only in Iori Managed Reserve)	Juniperus foetidisimma
17.	Greek juniper (only in Iori Managed Reserve)	Juniperus excelza
18.	Persian juniper (only in Iori Managed Reserve)	Juniperus polikarpus
19.	Caucasian nettle tree	Celtis caucasica
20.	Eastern crabapple	Malus irientalis
21.	Tree of heaven	Ailantus altissima
22.	weeping Pear (only in Iori Managed Reserve)	Pirus salicifolia
23.	Damson	Prunus frutikoza
24.	Mandarin Chinese	Cygoia oblonga
25.	Seaberry	Hipophae ramnoides
26.	Blackthorn	Prunus spinoza
27.	Georgian Barberry	Berberis vulgaris
28.	Black hawthorn	Crataegus pentagina
29.	Red hawthorn	Crataegus cirfostila
30.	Common fig	Ficus cariea
31.	Pomegranate	Punika granatun
32.	Hubei grape	Vitis silvestris
33.	Honeysuckle	Lonicera iberika
34.	Meadowsweets	Spirala granata
35.	Blackberry	Pubus caucasicus
36.	Nitre bush	Nitraria schoberi
37.	Spannish broom	Ycnista sachokia
38.	Caucasian Astragal	Astragalus caucasicus
39.	Christ's thorn	Paliurus spina kristi
40.	Silkvine	Periploca gracea
41.	Cat briar	Smilax excelza
42.	Cherry plum	Prunus divaricata
43.	Medlar	Mespilus germanika
44.	meadowsweets	Spiraca crenata
45.	Dog-rose	Rosa canina
46.	Gaiter-tree	Thelicrania australis
47.	Buckthorn	Rhamnus pallasii
48.	Salt cedar	Tamaris ramosissima
49.	Warty Spindle Tree	Euonimus verrucosa
50.	Wild privet	Ligustrum vulgare
51.	Cornelian cherry	Cornus mas
52.	Caucasian honeysuckle	Lonicera caucasica Pall.

Red-Listed Species commonly growing in Mariamjvari State Reserve (Mariamjvari Reserve, Korughi and Iori Managed Reserves)

Georgian Name	Latin Name	Georgian Red List Status	IUCN Red List Status
Plants			
English Yew	*Taxus baccata*	Small fragmental area	VU
Caucasian oak	*Querqus macranthera*	Small fragmental area	VU

Grayish oak	*Quercus pedunculiflora*	Small fragmental area	VU
Caucasian wingnut	*Pterocarya pterocarpa*	Small fragmental area	VU
Wild pistachio tree	*Pistacia mutica*	Small fragmental area	VU
Common walnut	*Juglans regia*	Small fragmental area	VU

List of Endemic Timber Species of Caucasus commonly growing in Mariamjvari State Reserve (Mariamjvari Reserve, Korughi and Iori Managed Reserves)

Species		მარიამჯვრის ნაკრძალი	**Korughi Managed Reserve**	იორის აღკვეთილი
In Georgian	**In Latin**			
Georgian Barberry	*Berberis iberica*	**+**	**+**	**+**
Black alder	*Alnus barbata*	**+**	**+**	**+**
Transcaucasian birch	*Betula medwdiewii*	**+**	**-**	**-**
Nut	*Corylus avellana*	**+**	**+**	**-**
hawthorn	*Crataegus caucasuc*	**+**	**+**	**+**
Common pear	*Pyrus caucasica*	**+**	**-**	**-**
weeping Pear	*Pyrus salicifolia*	**-**	**+**	**+**

4. 3 National Park Fauna

The National Park also has rich fauna. The following mammals are noteworthy: wolf (*Canis lupus)*, Jackal (*Canis aureus)*, *Red fox (Vulpes vulpes)*, jungle cat (*Felis chaus),* Eurasian lynx (*Lynx lynx*), hare (*Lepus europeus)*, European badger (*Meles meles)*, otter (*Lutra lutra*), wild boar (*Sus scrofa*), etc.
The following small mammals are noteworthy: small forest mouse (*Sylvamus uralensis*), steppe field mouse (*Sylvaemus fulvipectus*), Caucasus field mouse (*Sylvaemus ponticus*), House mouse (*Mus musculus*), ველის Mouse (*Mus macedonicus*), black rat (*Rattus rattus*).

The following birds are common in the area: Eastern imperial eagle - *Aquila heliaca*, Eurasian sparrowhawk - *Accipiter nisus,* Black-billed Magpie (*PMUa PMUa*), hawk (*Falco peregrinus)*, ring-dove (Columba palumbus), European Turtle-dove (*Streptopelia turtur)*, Eurasian skylark (*Alauda arvensis)*, etc.

The following reptiles are amphibians should be noted: dice snake (Natrix tesselata), grass snake (*Natrix natrix)*, smooth snake (*Coronella austriaca)*, Dagestan blunt-nosed viper (*Vipera lebetina obtusa)*, Spur-thighed tortoise (*Testudo graeca)*, European green toad (*Bufo viridis)*, marsh frog (*Pelophylax ridibundus*), etc.

Fish fauna in the area: Wels catfish (*Silurus glanis)*, Luciobarbus mursa (*Luciobarbus mursa*,) common barbel (*Barbus barbus)*, Danube bleak (*Chalcalburnus chalcoides)*, Bulatmai barbel (*Barbus capito)*, gudgeon (*Gobio gobio*), etc.

According to the National Biodiversity Strategy and Action Plan (NBSAP), protected areas should be at least 12% of the country what means that by 2030, the natural habitat degradation, biodiversity loss and endangered species will be reduced.

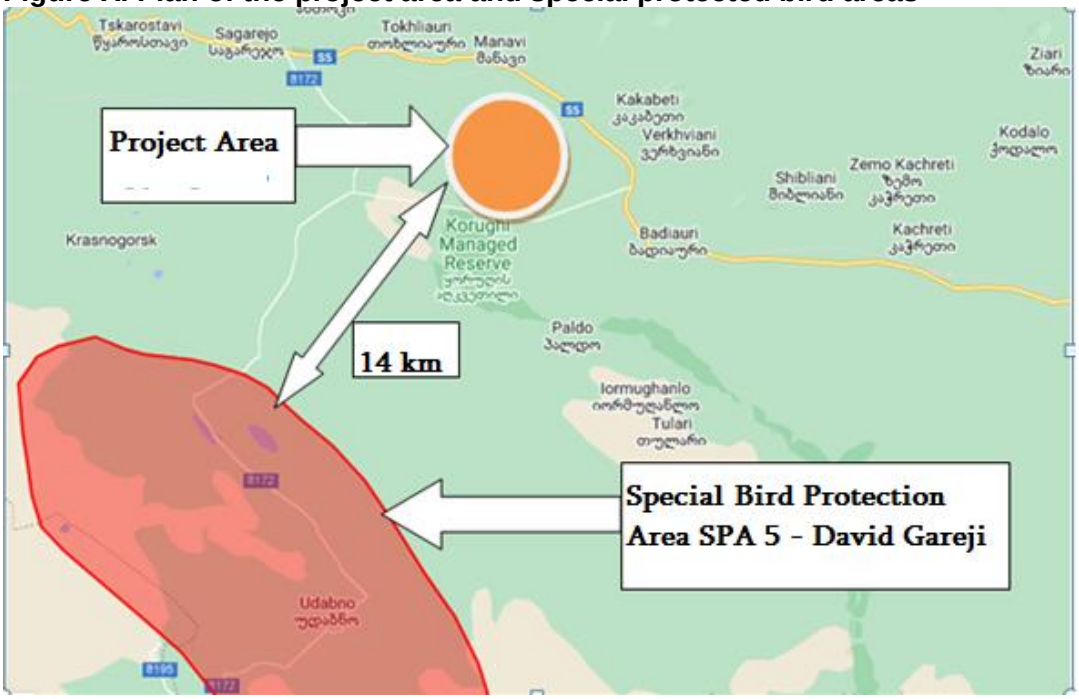
The total area of Korughi Managed Reserve is located among agricultural land plots, and the project area is an agricultural landscape as well. Consequently, the biodiversity of the project

corridor is considered as the diversity adjacent to the protected area. However, the project implementation does not exclude indirect indirect impacts on the biodiversity of the protected area. Optimally developed mitigation measures may reduce this risk what will also have an impact on the biodiversity of the National Park and its surrounding area.

4.4 Special Protected Bird Areas in Georgia

According to Clause 5.5.1 of the 2018-2030 Strategy and Action Plan of the Parliament of Georgian Committee of Environment and Natural Resources, the country is working towards establishing “Important Bird Areas” (IBAs) what will be a great contribution to the conservation of the natural habitats and species.

Figure X. Plan of the project area and special protected bird areas



The project area does not include special bird protected areas. However, the candidate site for a special bird protection area SPA 5 David Gareji is located within the boundaries of the Municipality, which is about 14 km away from the project area. The common endangered species in the project area are: saker falcon (Falco cherrug), Eastern imperial eagle (Aquila heliaca), griffon vulture (Gyps fulvus), Egyptian vulture (Neophron percnopterus) and Ruddy shelduck (Tadorna ferruginea). Saker falcon is on the Red List of Georgia as Critically Endangered (CR). Other species are classified on the Red List as vulnerable (VU). Saker falcon and Egyptian vulture are on the IUCN Red List of Threatened Species (EN), while Eastern imperial eagle is enlisted as Vulnerable (VU).

4.5 “Emerald Network“

The main purpose of creating the Emerald Network was to preserve and protect habitats that are important for the conservation of many species. The habitats of the Emerald Network are particularly rich in species protected by the Bern Convention. Such areas are given the status of

Areas of Special Conservation Interest (ASCI) and they are united in so-called "Emerald Network".

The project area does not directly border the Emerald Network site. However, Emerald Network site Mariamjvari - GE0000020 is in the territory of the municipality.

This Emerald Network site has two types of habitats protected by the Bern Convention: G1.6 Fagus woodland, and G1.A1 Quercus - Fraxinus - Carpinus betulus woodland on eutrophic and mesotrophic soils.

G1.6 Fagus woodland
The forests dominated by *Fagus sylvatica* in Western and central Europe and dominated by *Fagus orientalis* and other beech species in Southeastern Europe and the Pontus region. The formation includes mixed beech-fir or beech-fir-spruce forests.

G1.A1 *Quercus - Fraxinus - Carpinus betulus* woodland on eutrophic and mesotrophic soils
Atlantic, medio-European and eastern European forests dominated by Quercus robur or Quercus petraea, on eutrophic or mesotrophic soils, with usually ample and species-rich herb and shrub layers.

Species common for the Emerald Site habitats (as per Standard Data Sheet):

Group*	Code	Scientific Name	English Name
I	1060	*Lycaena dispar*	Large copper
I	1087	*Rosalia alpina*	Rosalia longicorn
I	1088	*Cerambyx cerdo*	Great capricorn beetle
A	1171	*Triturus karelinii*	Southern crested newt
R	1219	*Testudo graeca*	Spur-thighed tortoise
M	1303	*Rhinolophus hipposideros*	Lesser horseshoe bat
M	1304	*Rhinolophus ferrumequinum*	Greater horseshoe bat
M	1307	*Myotis blythii*	Lesser mouse-eared bat
M	1308	*Barbastella barbastellus*	Western barbastelle
M	1321	*Myotis emarginatus*	Geoffroy’s bat
M	1352	*Canis lupus*	Wolf
M	1354	*Ursus arctos*	Brown bear
B	A079	*AegyPIU monachus*	Cinereous vulture
B	A379	*Emberiza hortulana*	Ortolan
B	A320	*Ficedula parva*	Red-breasted flycatcher
B	A078	*Gyps fulvus*	Griffon vulture
B	A339	*Lanius minor*	Lesser grey shrike
M	1361	*Lynx lynx*	Eurasian lynx
I	1930	*Agriades glandon aquilo*	Arctic blue
B	A072	*Pernis apivorus*	European honey buzzard
B	A073	*Milvus migrans*	Black kite
B	A246	*Lullula arborea*	Woodlark
B	A077	*Neophron percnopterus*	Egyptian vulture
B	A089	*Aquila pomarina*	Lesser spotted eagle
B	A092	*Hieraaetus pennatus*	Booted eagle
B	A103	*Falco peregrinus*	Peregrine falcon

B	A215	*Bubo bubo*	Eurasian eagle-owl
B	A307	*Sylvia nisoria*	Barred warbler
B	A338	*Lanius collurio*	Red-backed shrike

***Group:** B = Bird, I = Invertibrate, M = Mammal, P =Plant, R = reptile, A = Amphibian, F = Fish.

4.6 Fauna Species Common in the Project Area to Protect by the Bern Convention

***Testudo graeca* (Spur-thighed tortoise).** This species has been given the protected status as having a small fragmented area. The project area is its distribution area. During the field study, more than one individual of spur-thighed tortoise were seen.

The project implementation will not have a high negative impact on the turtle population, as they mainly live near the windbreaks where no channel is planned to lay under the project.

5. Flora

5.1 Present State

The main goal of the floristic study in the given area was to determine the generic plant composition in the project area, identify sensitive habitats, determine the possible impact on plant diversity in the construction and operation phases, and develop relevant mitigation measures. Particular attention is given to the species protected by the legislation of Georgia and international covenants (Red-Listed species and other species with conservation status).

The project area mainly presents an agricultural landscape. With its sensitivity, the area was divided into 4 main sections and it is given in the map.

1. Along this section of the **study area** (X 539872 Y 4614731; X 540378 Y 4614326; X 540994 Y 4613926; X 541439 Y 4613664; X 541999 Y 4613553; X 542588 Y 44613450; X 542944 Y 4613169; X 543266 Y 4612833; X 543547 Y 4612614; X 543846 Y 4612106), there is a degraded roadside landsaping and private land plots. The private land plots are presented by vineyards, orchards, annual and perrenial agricultural crops, etc. The project area does not cover natural habitats and is totally represented by agricultural landscape actively used by the population.

The plants along the degraded roadside landscape is presented by: black mulberry (*Morus nigra);* white mulberry (*Morus alba);* field maple (*Acer campestre);* Caucasian Maple (*Acer laetum);* white willow (*Salix alba);* acacia (*Acacia dealbata);* common walnut (*Juglans regia);* cherry plum *(Prunus divaricata);* Siberian Apricot (*Prunus armeniaca);* fig (*Ficus carica);* apricot (*Prunus armeniaca);* oleaster *(Elaeagnus angustifolia);* black hawthorn (*Crataegus pentagyna);* green broom (*Genista fasselata);* Christ's thorn (*Paliurus spinachrist);* blackthorn (*Prunus spinosa);* honey locust (*Gleditsia triacanthos);* dog-rose *(Rosa canina);* Persian buckthorn (*Rhamnus pallasii);* cornelian cherry (*Cornus mas);* gaiter-tree (*Swida iberica);* wild privet (*Ligustrum vulgare);* oleaster (*Elaeagnus angustifolia)* , etc.

Along the given section of the project area, the following Red-Listed species may be under the impact: common walnut (*Juglans regia).*

2. Along this section of the **study area** (X 539996 Y 4609479; X 540262 Y 4609285; X 540559 Y 4609285; X 540820 Y 4608905; X 541170 Y 4608684; X 541243 Y 4608565; X 541406 Y 4608376; X 541553 Y 4608290; X 541786 Y 4608166; X 541885 Y 4608189; X 542201 Y 4607992), there are degraded floodplain forest vegetation fragments and private land plots. The private land plots are presented by vineyards, orchards, annual and perrenial agricultural crops, etc.

The plants within the degraded floodplain forest vegetation fragments are as follows: Siberian Apricot (*Prunus armeniaca);* fig (*Ficus carica);* common walnut (*Juglans regia);* cherry plum *(Prunus divaricata);* silver-leaf poplar (*Populus alba);* black poplar (*Populus nigra);* abele *(Populus hibrida);* red hawthorn (*Crataegus sanguinea);* black hawthorn (*Crataegus pentagyna);* coat willow (*Salix caprea);* white willow (*Salix alba);* box elder (*Acer negundo);* elb *(Ulmus foliacea),* black alder (*Alnus barbata)* field maple (*Acer campestre);* blackthorn (*Prunus spinosa);* cornelian cherry (*Cornus mas);* gaiter-tree (*Swida iberica);* wild privet (*Ligustrum vulgare);* oleaster (*Elaeagnus angustifolia).* Black alder and willow groves have tall herbs: soft rush *(Carex sp.)* and common reed grass (*Phragmits communis).*

Along the given section, the following Red-Listed species may be under the impact: common walnut (*Juglans regia)*, Grayish oak *Quercus pedunculiflora C.Koch*

3. Along this section of the **study area** (**X** 542683 **Y** 4612675; **X** 542907 **Y** 4612768; **X** 543093 **Y** 4612805; **X** 543140 **Y** 4612775; **X** 542987 **Y** 4612319; **X** 542894 **Y** 4611981), there is degraded roadside landscaping and private land plots. The private land plots are presented by vineyards, orchards, annual and perrenial agricultural crops, etc.

The plants within the degraded roadside landscaping are as follows: honey locust (*Gleditsia triacanthos);* acacia (*Acacia dealbata);* black mulberry (*Morus nigra);* white mulberry (*Morus alba);* field maple (*Acer campestre);* box elder (*Acer negundo);* elm *(Ulmus foliacea).* Siberian Apricot (*Prunus armeniaca);* fig (*Ficus carica);* common walnut (*Juglans regia);* apricot (*Prunus armeniaca);* cherry plum *(Prunus divaricata);* black poplar (*Populus nigra);* abele *(Populus hibrida);* oleaster *(Elaeagnus angustifolia);* goat willow (*Salix caprea);* white willow (*Salix alba);* blackthorn (*Prunus spinosa);* red hawthorn (*Crataegus sanguinea);* black hawthorn (*Crataegus pentagyna);* dog-rose *(Rosa canina).*

Along the given section of the project area, the following Red-Listed species may be under the impact: common walnut (*Juglans regia).*

4. Along this section of the **study area** (**X** 5539684 **Y** 4608630; **X** 5540033 **Y** 4608274; **X** 540338 **Y** 4608018; **X** 540622 **Y** 4607815; **X** 540984 **Y** 4607751), there are degraded floodplain forest vegetation fragments and private land plots. The private land plots are presented by vineyards, orchards, annual and perrenial agricultural crops, etc.

The plants within the degraded floodplain forest vegetation fragments are as follows: cherry plum *(Prunus divaricata);* silver-leaf poplar (*Populus alba);* black poplar (*Populus nigra);* Abele *(Populus hibrida);* red hawthorn (*Crataegus sanguinea);* black hawthorn (*Crataegus pentagyna);* Goat willow (*Salix caprea);* white willow (*Salix alba);* common walnut (*Juglans regia);* box elder (*Acer negundo);* თელა *(Ulmus foliacea),* Black alder (*Alnus barbata)* field maple(*Acer campestre);* Blackthorn (*Prunus spinosa);* Cornelian cherry (*Cornus mas);* Siberian Apricot (*Prunus armeniaca);* fig (*Ficus carica);* gaiter-tree (*Swida iberica);* wild privet (*Ligustrum vulgare);* oleaster (*Elaeagnus angustifolia).* In the black alder and willow groves, there is tall herbaceous cover developed: Cusick's sedge *(Carex sp.)* and common reed (*Phragmits communis.).*

Along the given section of the project area, the following Red-Listed species may be under the impact: common walnut (*Juglans regia)*, Grayish oak *Quercus pedunculiflora C.Koch;* endemic species: Georgian weeping Pear (*Pyrus georgica*); Georgian elm (*Ulmus georgica*); Georgian barberry (*Berberis iberica)*

A. 6. Fauna

6.1 Present State

The main purpose of the fauna study in this area was to determine the generic composition of animals on the study site, to identify sensitive areas for the habitant animals, to determine possible impacts on animal diversity in the construction and operation phases, and to develop mitigation measures. Particular attention is paid to the species protected by the legislation of Georgia and international covenants (the Red-Listed species and other species with conservation status).

6.2 Mammals

Although the project area is an agricultural landscape and the impact on mammals is very high, there are many species of mammals found in the project area. Large mammals use this area for migration and finding food, although they cannot use it for long-term habitation. The generic composition of the mammals common in the project area is mainly represented by species tyPMUal to steppes and floodplain. The following species of small mammals are found in the project area: hamster (*Cricetus cricetus*), levant mole (*Talpa levantis*), mouse (Apodemus mystacinus), Robert's snow vole (Chionimys roberti), house mouse (*Apodemus mystacinus*), Robert's snow vole (*Chionimys roberti),* house mouse (*Mus musculus)*, brown rat (*Rattus norvegicus),* Southern white-breasted hedgehog (*Erinaceus concolor*), etc. The impact on small mammals by farmers is great because the various pesticides they use destroys harmful *rodents.*

Of large mammals, only jackal (*Canis aureus*) excrements was found during the field study. However, during survey, the local farmers confirmed the presence of Jackal, fox and rarely wolf in the area.

Wild boar may be identified in the project area, especially in its southern part, as this section borders the Korughi Managed Reserve floodplain forest where the wild boar lives.

During the study, hare (*Lepus europeus*) was seen in the project area. The existence of otter is not confirmed in the project area, as there is no aquatic ecosystem suitable for its existence: river, lake, reservoir, fish farm, etc. However, near the project area, where the River Iori flows smoothly, there is a favorable habitat for otters.

Iori River (potential otter habitat) adjacent to the project area

During the survey, the vital signs of 8 mammal species were found in the project area

№	English Name	Latin Name	IUCN	RLG	Identified during the study
1	Levant Mole	*Talpa levantis*	LC		+
2	Mouse	*Apodemus mystacinus*	LC		+
3	Major's Pine Vole	*Terricola majori*			+

4	Robert's snow vole	*Chionimys roberti*	LC		+
5	House mouse	*Mus musculus*	LC		+
6	Brown rat	*Rattus norvegicus*	LC		+
7	Jackal	*Canis aureus*	LC		+
8	Southern white-breasted hedgehog	*Erinaceus concolor*	LC		+

Mammals common in and around the project area according to the literary data

№	English Name	Latin Name	IUCN	RLG	Literary Data
1	Levant Mole	*Talpa levantis*	LC		√
2	Caucasian mole	*Talpa caucasica*	LC		√
3	Caucasian Pygmy Shrew	*Sorex raddei*	LC		√
4	Caucasian Pygmy Shrew	*Sorex volnuchini*	LC		√
5	Red squirrel	*Sciurus vulagaris*	LC		√
6	Caucasian squirrel	*Sciurus anomalus*	LC	VU	√
7	European edible dormouse	*Glis glis*	LC		√
8	Forest mouse	*Apodemus sylvaticus*	LC		√
9	Small forest mouse	*Apodemus uralensis*	LC		√
10	Mouse	*Apodemus mystacinus*	LC		√
11	Jungle cat	*Felis chaus*			√
12	Major's Pine Vole	*Terricola majori*			√
13	Robert's snow vole	*Chionimys roberti*	LC		√
14	Daghestan pine vole	*Terricola daghestanicus*	LC		√
15	European water vole	*Arvicola terrestris*	LC		√
16	Steppe field mouse	*Sylvaemus fulvipectus*	LC		√
17	House mouse	*Mus musculus*	LC		√
18	Black rat	*Rattus rattus*	LC		√
19	Brown rat	*Rattus norvegicus*	LC		√
20	Güldenstädt's shrew	*Crocidura gueldenstaedtii*	LC		√
21	Transcaucasian water shrew	*Neomys teres*	LC		√
22	Sorex satunini Caucasian Shrew	*Sorex satunini*	LC		√
23	least weasel	*Mustela nivalis*	LC		√
24	Otter	*Lutra lutra*	NT	VU	√
25	European Pine Marten	*Martes martes*	LC		√
26	beech marten	*Martes foina*	LC		√
27	Fox	*Red fox (Vulpes vulpes)*	LC		√
28	Wolf	*Canis lupus*	LC		√
29	Jackal	*Canis aureus*	LC		
30	Bear	*Ursus arctos*	LC	EN	√
31	Wildcat	*Felis sylvestris*	LC		√
32	Eurasian lynx	*Lynx lynx*	LC	CR	√
33	Roe deer	*Capreolus capreolus*	LC		√
34	Deer	*Cervus elaphus*	LC	CR	√
35	Chamois	*RuPMUapra ruPMUapra*	LC	EN	√
36	Wild boar	*Sus scrofa*	LC		√

37	Forest dormouse	*Dryomys nitedula*	LC		√
38	Southern white-breasted hedgehog	*Erinaceus concolor*	LC		√
39	Hare	*Lepus europeus*	LC		√
40	European badger	*Meles meles*	LC		√
41	greater horseshoe bat	*Rhinolophus ferrumequinum*	LC		√
42	lesser horseshoe bat	*Rhynolophus hipposideros*	LC		√
43	Mediterranean horseshoe bat	*Rhynolophus euryale*	NT	VU	√
44	lesser mouse-eared bat	*Myotis blythii*	LC		√
45	Brandt's bat	*Myotis brandtii*	LC		√
46	Natterer's bat	*Myotis nattereri*	LC		√
47	Whiskered bat	*Myotis mystacinus*	LC		√
48	Western barbastelle	*Barbastella barbastellus*	NT	VU	√
49	Brown long-eared bat	*Plecotus auritus*	LC		√

6.2 Bats

According to the literature, 14 bat species are common in and around the project area. Bat surveys were accomplished along the entire perimeter of the project road. All habitats (old abandoned buildings, old fortresses, hollow trees) were visually fixed, as they are a potential habitat for bats.

There are many large-diameter Common walnuts growing in the project area; there are Honey locusts and poplars growing in the windbreaks, but the study did not reveal any hollows in these trees. If it is necessary to cut any large-diameter trees in the construction phase, the presence of hollows should be visually inspected in details not to damage any bats present in them.

6.3 Birds

The project area is a steppe-type agricultural landscape, with diversified ornithofauna in and around it. Consequently, there are no large birds of prey or birds associated with the aquatic environment in the project area. The project area is mainly inhabited by the following bird species: Passerines, Eurasian hoopoes, Columbidae, Chionidae, and other members of the family.

As per the available literary sources, there are 136 bird species described in the study area and its surroundings.

The **birds** were mainly studied with the methods of visual observation and sound description. Along the transect along the project road, all encountered species were visually fixed and identified. Binoculars with 10X50 magnification were used during the study. The survey was carried out during the day.

List of birds observed in the study area during the field study

№	English Name	Latin Name	Migration seasons	IUCN	RLG	Bern Conv	Literary Data	Seen during the study

1	Eurasian sparrowhawk	Accipiter nisus	YR-R	LC		√	√	+
2	Atlas Long-legged Buzzard	Buteo rufinus	YR-R, M	LC	VU	√	√	+
3	Common kestrel	Falco tinnunculus	M	LC		√	√	+
4	Common wood pigeon	Columba palumbus	M	LC			√	+
5	Turtle Dove	Streptopelia turtur	BB,M	VU			√	+
6	Common cucko o	Cuculus canorus	BB	LC		√	√	+
7	Tawny owl	Strix aluco	M	LC			√	+
8	Little owl	Athene noctua	YR-R	LC			√	+
9	Eurasian hoopoe	Upupa epops	M	LC		√	√	+
10	Bee-eater	Merops apiaster	BB, M	LC			√	+
11	Common Swift	Apus apus	BB	LC			√	+
12	Eurasian Skylark	Alauda arvensis	M	LC			√	+
13	Barn Swallow	Hirundo rustica	BB,M	LC		√	√	+
14	Common house martin	Delichon urbicum	YR-V	LC		√	√	+
15	White Wagtail	Motacilla alba	YR-R	LC		√	√	+
16	Yellow Wagtail	Motacilla flava	BB,M	LC		√	√	+
17	Common Blackbird	Turdus merula	YR-R	LC		√	√	+
18	Mistle Thrush	Turdus viscivorus	M	LC		√	√	+
19	Common starling	Sturnus vulgaris	YR-R, M	LC			√	+
20	European Robin	Erithacus rubecula	BB	LC		√	√	+
21	Great tit	Parus major	YR-R	LC		√	√	+
22	Common chaffinch	Fringilla coelebs	YR-R	LC			√	+
23	Eurasian Sparrow	Passer montanus	M	LC			√	+
24	House sparrow	Passer domesticus	YR-R	LC			√	+
25	Eurasian jay	Garrulus glandarius	YR-R	LC			√	+
26	Carrion crow	Corvus corone	YR-R	LC			√	+

27	Eurasian sparrowhawk	PMUa PMUa	YR-R	LC			√	+
28	Eurasian golden oriole	Oriolus oriolus		LC			√	+

A nest of the Eurasian Penduline Tit (*Remiz pendulinus)* **Eurasian hoopoe (***Upupa epops)*
Carrion crow (C*orvus corone)* Common ringed plover (*Charadrius hiaticula*)
Eurasian sparrowhawk (*PMUa PMUa)* Turtle Dove *Streptopelia turtur*

It should be noted that the project area is located at about 14-15 km from the Special Protected Bird Area (SPA 5 - David Gareji). Therefore, during the bird migration, much more species may occur in the area.

6.4 Reptiles and Amphibians

According to the field study results and literary data, 7 species of **reptiles** and 4 species of **amphibians** are found in the project area. The route method was mainly used during the study. During the study, 3 species of amphibians and 5 species of reptiles were seen.

According to the field study results and literary data, 7 species of **reptiles** and 4 species of **amphibians** are found in the project area. The route method was mainly used during the study. During the study, 3 species of amphibians and 5 species of reptiles were observed on the transect along the planned corridor. Of the reptiles, spur-thighed tortoise (Testudo graeca), which is protected by the Red List of Georgia and has VU status was observed. This species was observed during the study. The surroundings of the project area is the area of distribution of spur-thighed tortoise.

Table X. Reptiles and amphibians observed during the field study in and around the project area

№	English Name	Latin Name	IUCN	RL G	Literary Data	Seen during the study
1	Slow worm	Angius fragilis	NE	LC	√	+
2	Caucasus emerald lizard	Lacerta strigata	LC	NE	√	+
3	European Grass Snake	Natrix natrix	LC	LC	√	+
4	Smooth snake	Coronella austriaca	LC	LC	√	+
5	Spur-thighed tortoise	Testudo graeca	VU	VU	√	+
6	Eurasian Marsh Frog	Pelophylax ridibundus	LC		√	+
7	European Tree Frog	Hyla arborea	LC		√	+
8	Green toad	Bufo viridis	LC		√	+

6.5 Fish Fauna

There are no reservoirs immediately in the project area where fish can be found. River Iori is near the project area. Consequently, the representatives of ichthyofauna common in the Iori River basin may be found near the project area.

During the study, Kura loach (*Oxynoemacheilus brandtii*) was caught in the Iori River. Besides, according to the results of the survey with local fishermen, the following fish species are common in the Iori River near the project area: Luciobarbus mursa *(Luciobarbus mursa)*, Kura chub (*Squalius agdamicus)*, Khramulya (*Capoeta capoeta)*, South caucasian gudgeon (*Romanogobio macropterus)*, Bulatmai barbel (*Luciobarbus capito).*

Fish fauna common near the project area and in the Iori River

№	English Name	Latin Name	IUCN	RLG
1	Barbel	*Barbus cyri*	NE	NE
2	South Caspian sprilin	*Alburnoides eichwaldii*	LC	NE
3	Kura bleak	*Alburnus filippii*	LC	NE
4	Kura loach	*Oxynoemacheilus brandtii*	LC	NE
5	Kura chub	*Squalius agdamicus*	NE	NE
6	Seven khramulya	*Capoeta capoeta*	LC	NE
7	Kura goby	*Ponticola cyrius*	LC	NE
8	Caucasian Spined Loach	*Cobitis saniae*	NE	NE

6.6 Sensitive habitats

Although the project area is an agricultural landscape, so-called sensitive habitats have been still identified during the study. Such habitats are mainly presented by windbreaks, which include poplar, honey locust, ash, black Locust, aspen, etc. Such windbreaks are a nesting habitat for various bords. So, the impact on windbreaks should be minimum during the works.

Windbreak zone in the project area	Nest of a Black-billed Magpie in the windbreak zone
A nest of the Eurasian Penduline Tit in the windbreak zone	Nest of a Black-billed Magpie in the windbreak

7. Impact on Flora

7.1 Construction Phase

During the design construction phase, a significant impact on the vegetation cover is expected, in particular, it will be necessary to clear the construction site off the vegetation cover. Therefore, in such a case, it is recommended to minimize the impact on biodiversity and when it is impossible to avoid environmental damage, the damage shall be compensated according to the compensation program with its goal to restore the equivalents to the lost habitats.

The compensation plan of restoration and cultivation must be developed by considering the existing surroundings. The supply of the genetic material needed for the restoration and cultivation program (seeds, cuttings, young plants) must be of a local origin to the extent possible. (The buildings and premises are needed to store the seeds and the seedlings must be grown in the greenhouses and planted in the restoration areas). The restoration and cultivation program must have long-term outcomes. Restoration, cultivation and further management of the territories must be done gradually, as they are isolated.

Such measures are necessary after the construction works are over, when the areas to restore are still at the project disposal.

Permanent monitoring is necessary to evaluate the success of the activities and identify the need for corrective measures.

The landscape restoration is necessary with the original plant species, in accordance with their original content and rule of distribution.

The trees and shrubs of high conservation value will be marked and, where possible, preserved or re-planted.

The following Red-Listed species may be under the impact of the project area or impact zone: Common walnut (*Juglans regia)*, Grayish oak *Quercus pedunculiflora C.Koch;* endemic species: Georgian weeping Pear (*Pyrus georgica*); Georgian elm (*Ulmus georgica*); Georgian barberry (*Berberis iberica).* Consequently, attention must be paid to them both, in the construction and operation phases.

The southern section of the project area borders the Korughi Managed Reserve of National Importance. Hence, the impact on it should be brought to minimum.

7.2 Operation phase

No direct impact on flora in the operation phase is expected. Indirect impact may be associated with the dust and exhaust caused by the traffic or impact of the polluted surface runoff. One of the main risks in the operation phase is the use of pesticides in irrigation waters in agriculture what will have a negative impact.

8. Impact on Fauna Diversity

8.1 Impact on Fish Fauna in the Construction

There are no rivers, lakes, artificial fish farms or other objects with standing water in them in the project area. Therefore, the implementation of the project will not have a direcr long-term impact on ichthyofauna.

The mechanical impact on ichthyofauna will be temporary, during the construction of small irrigation channels to discharge so-called unused waters back to the river.

The project does not envisage a change in the riverbed what would change the fish habitat.

In the construction phase, there is a certain risk of getting various waste or harmful substances into the water what will be harmful not only to the representatives of ichthyofauna, but also to all species living in the water.

8.1.1 Operation phase

One of the main risks in the operation phase is the agricultural use of pesticides in irrigation waters discharged into the river what will have a negative impact on all living organisms in the river.

8.2 Impact on Fauna. Construction Phase

Zoological studies accomplished in the project corridor showed that the generic composition of the animals living in the project area is rather poor. Virtually, there is no natural habitat in the project corridor. Therefore, damage to animal shelters will not be of a large scale. However, certain animal species when searching for food, as well as during breeding, may enter the construction area and be under various impacts. Due to the fact that the project area is an agricultural landscape, the likelihood of the presence of habitats for large mammals there is minimal, as the impact of disturbing factors is very high (machines, special equipment, farmers' active movement across the area). Naturally, the given species prefer quieter sites with a minimum human impact. However, their presence in the project area in the construction or operation phase is not excluded.

In addition, due to the peculiarities of the area, the presence of such large carnivorous birds, as griffon vulture, Bearded Vulture-Eagle, Egyptian vulture and cinereous vulture, is also minimal.

As mentioned above, the Iori River is located near the project area, which is a potential otter habitat. This section was thoroughly visualized during the study to detect the signs of otter (burrow, traces, excrements, etc.). However, none of them were observed. Although no signs of otter presence were identified during the study, its occurrence near the project area cannot be excluded. There are no construction works planned immediately on the river. Therefore, even in the presence of otter, the disturbing factors will be minimal and temporary.

In the construction phase, damage can be inflicted to species that are present during their breeding season, or constantly being directly in the construction corridor, in shelters (ponds, stone piles, shrubs, etc.) (birds, amphibians, reptiles or small mammals).

Considering the above-mentioned and the specifics of the planned activities, the negative impacts on the animal species common in the construction area can be as follows:

- Habitat loss/fragmentation is expected (for instance in the shrubs growing in the windbreaks or on the adjacent plots as a result of cutting down trees and shrubs, etc.). The main receptors will be small mammals, birds, and reptiles;
- As a result of cutting down the trees and during the earthworks, the nesting sites of certain species may be destroyed. The main receptors can be birds.
- Inconvenience due to the increased traffic, presence of people and lighting may increase.
- Noise and vibration, as well as emissions of dust and other harmful substances into the ambient air will increase in the construction phase. Almost all species living in the corridor will be affected.
- Trenches made during the earthworks will pose certain risk to small mammals, as they may fall into the trenches, injuring themselves or dying. More sensitive to such impacts are amphibians, reptiles, and small mammals (moles, forest mouse, water shrews, etc.).

Overall, the impact on fauna in the construction phase can be assessed as low. With proper mitigation measures and permanent monitoring, it is possible to further reduce the impact on terrestrial animals.

8.2.1 Operation phase

The main source of negative impacts during the construction works will be an increased traffic of special equipment. Although the animals living in the project corridor are accustomed to intense

equipment operation, the proect oeprations will still cause additional inconvenience for them. Some animals may get injured or even die because of vehicle movement.

The shelters for reptiles and birds will be more or less destroyed. Therefore, the mitigation measures should be mainly aimed at reducing such risks.

9. Mitigation measures

It is planned to supervise the efficiency of the mitigation measures what means as follows:

- Visual control of the construction site in order to identify the Georgian Red-Listed species.
- Carrying out observations to identify the impact on species.
- Monitoring their condition and, if necessary, developing relevant conclusions and recommendations.

These activities shall be carried out both, on the working sites and in the surrounding areas. The study will envisage regular visual inspections of the area and, if necessary, its additional studies.

9.1 Mitigation Measures (Flora)

The mitigation measures for the impacts on the vegetation cover and the habitat unity are as follows:

- The borders of the construction corridor and traffic routes are to be identified accurately in order to avoid excess damage to the vegetation cover.
- Prior to the onset of the construction works, instructing the personnel about the protection of the vegetation cover.
- In order to protect the vegetation cover against damage, the Construction Contractor must observe the borders of the construction sites and the corridor. After the construction works are over, the area must be cleared and the removed topsoil must be returned to the site. This will be followed by a more or less restoration of the vegetation cover.
- The landscape restoration is to be done with the original plant species, in accordance with their original content and rule of distribution.
- The trees and bushes with hg conservation value will be marked and preserved or replanted where possible.
- For the temporarily lost habitats, the plan for the vegetation cover restoration and management must be developed on its own, as this kind of impact can be mitigated.
- If the environmental damage is inevitable, the damage will be compensated according to the forest compensation program.
- The plant species damaged during the construction works must be used in landscaping.
- As for cutting down the Red-Listed plant species in the project construction corridor, the measures to maintain them are necessary, and in lieu of the damaged trees, compensation plantings shall be provided.
- Removal of the protected species from the environment must be done in line with the requirements of sub-clause f), clause 1, Article 24 of the “Georgian law on the Red List and Red Book”, in agreement with the Ministry of Environment and Agriculture of Georgia.
- The vegetation cover must be monitored.

9.2 Additional Mitigation Measures for Fauna in the Construction and Operation Phases

The trees on certain sites of the project area will be cut down, and the trees used by the birds or bats as shelters may be among them. All trees to cut down on the sites should be thoroughly visualized before the construction starts, and any identified animal shelters should be notified in writing to the Ministry of Environmental Protection and Agriculture of Georgia, with further actions to take in accordance with the Georgian Law on the Red List and the Red Book of Georgia and the Law of Georgia on Wildlife. In particular, any further actions (except in exceptional cases), which may reduce the population of endangered species, deteriorate their habitat and living conditions, are prohibited.

The following mitigation measures must be paid particular attention in the construction and operation phases:

- The duration of the works causing animal disturbance and frightening should be as minimal as possible.
- It is prohibited to dump or spill the waste in an uncontrollable manner during the construction works to avoid the environment pollution.
- None of the breeding areas should be damaged without proper study and permission of relevant experts (the studies have evidenced a higher probability of small nests of so-called garden birds and small mammal shelters within the impact zone). The working crews should be instructed against killing fauna representatives. Rather, they must be allowed to escape from the area during the works. In extreme cases, their disturbance should be limited to giving the animals a corridor to escape.

APPENDIX 3: SAMPLE CULTURAL HERITAGE SURVEY REPORT

Introduction

Generally, archeological monuments are the only source to study much of the history of human development. Archeology plays a significant role in the historical study of epochs with developed scripts. The results of archaeological excavations supplement and clarify the data given in the written sources. Among other things, archaeologists have discovered ancient written monuments as well.

Archaeology reconstructs the cultural and social-economic status of ancient societies based on the data of the material sources, as at every stage of historical development of the human society, material culture and everyday life are consistently linked to their social and economic life.

Archaeologists use artifacts and features to learn how people lived in specific times and places. Archaeologists want to know what these people's daily lives were like, how they were governed, how they interacted with each other, and what they believed and valued.
Sometimes, artifacts and features provide the only clues about an ancient community or civilization. Prehistoric civilizations did not leave behind written records, so we cannot read about them.

Most cultures with writing systems leave written records that archaeologists consult and study. Some of the most valuable written records are everyday items, such as shopping lists and tax forms.

Survey Methodology

A professional archaeological survey involves several distinct steps. First, before going into the field, the archaeologist reviews existing information, site records from the general area, historical documents, and summaries of archaeological research about the kinds of sites that were previously found. Other sources of information include ethnographic accounts of tribes, land records, and aerial photographs. Topographic maps may help archaeologists identify specific landforms or locales in the project area that should be closely inspected. Other tasks include activities such as securing the landowners permission and contacting the concerned tribes and other parties or knowledgeable researchers who have an interest in the project.

Based upon the literature and records review, the archaeologist develops a research design that details what he or she is expecting to look for, what actual methods he or she will employ to conduct the search and how he or she will record what they find.

The second step is the actual survey. This requires the archaeologist to physically inspect the project area according to a developed survey methodology. Most commonly, the archaeologist walks over the entire project area in evenly spaced transects. Depending upon the vegetative cover and soils, the archaeologist may systematically dig auger or shovel probes into the soil to search for artifacts or evidence of human activity. If an archaeological site is found, the archaeologist will obtain specific kinds of information in order to record the site. The site form includes basic location and descriptive information about the archaeological site.

This report summarizes the archaeologist's research and field efforts, details his or her findings and offers specific recommendations for further steps.

Information about the study area

Sagarejo Municipality is located in the foothills of the south-western slope of Gombori Ridge, on the bank of the Tvaltkhevi River, on Tbilisi-Gurjaani Road, 700 m asl, 58 km from Tbilisi by rail and 48 km by road.

Sagarejo Municipality is bordered by Gurjaani Municipality from the east, Gardabani Municipality from the west, and Tianeti and Telavi Municipalities from the north. The southern boundary of Sagarejo Municipality borders the Republic of Azerbaijan.

Name Sagarejo derives from the common name of the estate of Davitgareja Monastery – Sagarejo (literally, 'For Gareja").

According to archeological data, the traces of human life in the territory of the city of Sagarejo date back to II BC.

Sagarejo is the municipality in Kakheti region in East Georgia. From the first half of the VI century, some villages of Gare Kakheti were feudal estates of Gareji, the largest monastic center. Over time, Gare Kakheti was called Sagarejo, or Gareji country, and the historical sources from the XV c. refer to it by this name.

As per the written sources, the earlier name of the city of Sagarejo was "Tvali", sometimes called as "Tvalni", "Tval-Sagarejo" or "Sagarejo".

"Tvali", as the name of the village, is used in historical documents since the XIX century. Name "Tvalni" (plural of "Tvali") means that there were some villages in the area, as evidenced by many materials' cultural monuments inter alia. However, there are no visible borders between these villages today. Name "Sagarejo" originated in the mid-XV century. At first, this name was used to denote the villages and estates owned by Gareja Monasteries.

Sagarejo was an important strategic and economic center throughout the Middle Ages and afterwards. The transit trade road from Tbilisi to Kakheti ran across Sagarejo. One branch of road "Tskvari Gza" on the back also ran across Sagarejo, by which the Pshavi, Ertso-Tianeti and Tushi people used to take sheep from Shirak to summer pastures.

At the beginning of the XX century, 800 or 900 families lived in Sagarejo, with the majority of Georgians and 70 Armenian families. There was a regular traffic between Tbilisi and Sagarejo. The village streets were winding making a dense network. There was a market, a medical school, a two - class school and a private parish school in the region. The people were engaged in field crop cultivation and viticulture.

Sagarejo Municipality has two grape micro-zones, with the grape varieties of a special origin: Khashmi Saperavi and Manavis Mtsvane. Village Manavi is famous for its Churchkhela. Village Udabno is famous for Sulguni with special taste properties, and Gombori village is famous with its dairy products (Dambalkhacho).

Archeological sites

The project area is a constituent part of the currently operating main road in Kakheti region. It starts from Village Manavi, continues until the end the village Mzisguli.

The buffer zone of the project area was an active residential part of Georgia's history from almost palaeolithic until the 19th century. So, it is natural that the existence of a number of historic and

archaeological objects has been confirmed and may be confirmed in the future. Stationary archaeological works have not been performed in the Kakheti area interesting for us, except for a rare exception. In this area until the present the most known monuments have been discovered by accidental findings, some of which are followed by recovering the archaeological works or by surface surveys, that's why the boundaries of spreading of each archaeological site are unspecified that makes difficult the protection of such places.

According to the visual study of this buffer zone performed by Archaeologists and considering the accidental findings or archaeological works performed by the research organizations of various states on this territory from the second half of the 20th century the historical and archaeological report of the buffer zone is as follows:

- An archaeological object - settlement on the hill "Kustapa" of the Late Bronze and Early Iron Age is in the study area, to the south at a distance of 2 km from Sagarejo, on the left bank of the river Tvaltkheva which was found in 1955 during investigation. The monument was found accidentally when erecting a high-voltage tower. The site of a former settlement is located on the high hill with a flattened crest, which is surrounded by a terrace;
- Another important archeological center was discovered in site "Lapriani", south of Sagarejo, where te archaeologists found a stone mortar-and-grinder and stone inventory. These items are made of black porous stone and date back to the V-IV BC. These farming items should belong to the Iori-Alazani Farming Cultural Age;
- On the territory of the village of Manavi, we know archaeological objects - early medieval burial grounds of Kazarashvilis plot accidentally found during land works in 2016;
- The site of former settlement in Avazasgori, which is damaged. The slopes of the hill are intensely washed away. The monument was studied by(Kakheti Archeological Expedition (headed by K. Pitskhelauri). Fragments of stone hand grinders and pottery were found in the settlement;
- The site of former settlement in Sabadurisgori was studied by KAE (Kakheti Archeological Expedition). The settlement is located on a high, conical hill, which has a flattened crest and is surrounded by a wide terrace. Insert of a silica hammer and fragments of clay pottery decorated with furrowed concentric strips made of the mix of clay and coarse sand and burned to gray-brownish color were collected in the excavated ground;
- A former Church of John the Baptist is an archaeological and architectural monument in Turi site, on the right side of Tbilisi-Gurjaani Road. There were remains of two buildings on the east and west axes survived. As the local people wished it, it was decided to build a new church on the site of the old building in the east, and in 2011, clean-up works were carried out to identify the remnants of the old church. No church remnants were found during the excavations. A small part of quite a big building was found, with its outer rectangle of the plan showing three rooms. Cobblestones of equal sizes put in regular, evenly spaced rows were used as a building material. The fireplaces were entirely made of brick. The walls contain some fragments of bricks. By considering the excavated material, the building is presumably dated by the late Middle Ages;
- On the territory of the village of Chailuri to the south of the road in the buffer zone, there is the Chailuri Fortress which is the defensive and residential fortress of the 17th century. The Chailure Fortress, named as Niakhura Fortress in the sources, is a rectangular structure with circular and rectangular towers in the corners. The fortress was built on the rickshaw stone. The entrance is one - from the south. In the upper part of the wall, there are treadmill and tracks. The towers have several floors. The first floor is blind, while the second and the third floors are residential. The towers are ended by a combat balcony. Haircuts and narrow lights are on the walls of the towers. The ruins of various buildings

are in the yard. The Niakhura Fortress is one of the most important examples of the late medieval Georgian defensive system where in addition to the housing of the inhabitants of the local nobleman the population was sheltered during the enemy invasion. The castle has a status of the cultural heritage immovable monument (Order of the Minister of Culture and Monument Protection of Georgia No.3/133 dated from 30/03/2006);

- Gorasamarkhi (burial place) in village Badiauri. This archeological site is located south of the village and is dated by the Late Bronze Age. The accidentally discovered burial ground was studied by Kakheti Archeological Expedition (headed by K. Pitskhelauri). A bronze shield and two-pronged pitchforks were found in the tomb, which are considered to have been brought from the tomb to the territory of Kakheti.

Thus, several archaeological and historically active regions were found as a result of the scientific researchers, investigation or accidental findings of past years and our superficial study. Archaeological layers are not confirmed at this stage in other places of the buffer zone of the studied area. In the case of discovery of archaeological object during the works, according to the article 10 of the Law of Georgia "On Cultural Heritage," the works should be terminated and the National Agency for Cultural Heritage Preservation of Georgia should be informed about this.

Monuments of cultural heritage

Gare Kakheti is rich in archeological monuments. There are numerous sites of ancient settlements found in Sagarejo, its surrounding areas and villages, while the discovered archeological materials confirm that Sagarejo was an ancient settlement with over 5000-year-long history, and people have lived on both banks of the River Tvaltkhevi, in Perdoubani, Kostape and in the environs of the river mouth since times immemorial.

Sagarejo Municipality has such important historical monuments as: Davit Gareja Monastic Complex, Ujarma Fortified city, Ninotsminda Nunnery, Khashmi Trinity Church, Katsreti Monastery, and Manavi, Chailuri, Khashmi and Patardzeuli Fortresses. These monuments date back to the V-XVIII cc.

There are following monuments of cultural heritage around the project area:

- Village Manavi on a rocky mountain slope is located near Sagarejo. There are ruins of an old castle and conical towers seen on the mountain top. The fortress was presumably built in the unification era of Georgia, i.e. on the turn of the XII century. "Manavi Fortress stood as an unshakeable tower and guard over tormented Georgia, taking upon itself numerous enemy attacks; a lot of Georgian blood was shed in Manavi Fortress";
- Manavi Church of the Virgin Mary: the Church of the Nativity of the Virgin Mary in Manavi is one of the latest specimens of old Georgian domed churches of Kakheti Region, Sagarejo Municipality, 15 km east of village Manavi, on a mountain slope and is built in a Kuppelhalle style. The Church of the Mother of God in Manavi was built by Ekvtime, the head of the Davit Gareji Monastery of John the Baptist, where Archimandrite Ekvtime served from 1774 to 1798. The Manavi Church was built during the same period (1794) is. The Church was restored in 2008;
- Meligori Tower: the Tower has a square plan. From outside, in all four corners of the Tower, there are rounded lugs, gradually narrowing upwards. The Tower is built entirely with cobblestones and lime mortar. The Tower apparently had three floors. Its upper floor should have been open, finished with battlements. The floor cover was wooden. There is an obelisk near the Tower erected by the Tsarist Russian government in 1901, on the

occasion of the 100th anniversary of its victory in the Niakhura (Kakabeti) battle. The Russian inscription on the obelisk is currently missing;

- Chailuri (Niakhura) Castle: Chailuri is located on Tbilisi - Gurjaani Road. The distance from the city of Sagarejo to village Didi Chailuri is 17 km, and it is 60 km from Tbilisi, 500 m left of the central highway. It is separated from Patara Chailuri by the Chailuri River. There is Tsivgombori Mountain north of it, the Iori River, vineyards and arable lands to the south, and Niakhura to the southeast, on the outskirts of the village. On the territory of the village of Chailuri to the south of the road in the buffer zone, there is the Chailuri Fortress which is the defensive and residential fortress of the 17th century. The Chailure Fortress, named as Niakhura Fortress in the sources, is a rectangular structure with circular and rectangular towers in the corners. The fortress was built on the rickshaw stone. The entrance is one - from the south. In the upper part of the wall, there are treadmill and tracks. The towers have several floors. The first floor is blind, while the second and the third floors are residential. The towers are ended by a combat balcony. Haircuts and narrow lights are on the walls of the towers. The ruins of various buildings are in the yard. The Nikhura Fortress is one of the most important examples of the late medieval Georgian defensive system where in addition to the housing of the inhabitants of the local nobleman the population was sheltered during the enemy invasion. The castle has a status of the cultural heritage immovable monument (Order of the Minister of Culture and Monument Protection of Georgia No.3/133 dated from 30/03/2006);
- Fortress: the monument is badly damaged, with only its east and north walls survived. Other walls are ruined to the ground. The Fortress is built of cobblestones and lime mortar. Its walls are finished with plaster. The outer walls have some fragments of bricks. The floors are wooden;
- Teleti St. George Church; an architectural monument north of village Badiauri, in the environs of the site of ancient village Taraki, about 1 km in the forest. It is dated by the Late Middle Ages. It is a hall church.

Cultural traditions and feasts

Cultural traditions and holidays provide an insight into the cultural values of the people in the study area. Some of them represent ancient values and are important to consider when planning an archaeological survey. The characteristics of cultural traditions and holidays may have a positive impact on an archaeological study. Below we give the traditions and common festivals in the study area:

„Garejoba“

In the 1970-80s, public holiday “Garejoba” was very popular in Sagarejo, held annually in village Udabno of Sagarejo Municipality, at Chichkhaturi Tower near the Davit-Gareji Monastic Complex. The holiday has been celebrated only once since 1988, in 1997. 21 years later, in May 2018, the holiday was restored in the same place and in the same format as on May 16, 1976.

„Berikaoba“

Traditional old Georgian holiday “Berikaoba” is celebrated in village Didi Chailuri, Sagarejo Municipality. The men (Berikas) participate in the ritual of pagan times dressed in sheepskin, wearing different animal masks and clothes decorated with pieces of colored fabric. They walk in the village shaking the whips in their hands and whoo-whooping. The people get prepared for this day in a special manner: the families are welcoming the Berikas with gifts. Berikaoba is held every spring in Didi Chailuri, at the beginning of Lent, and is called the feast of fertility and the revival of nature.

„Goglaoba“

An evening dedicated to the memory of Gogla is held in village Patardzeuli. Local and invited guests read Gogla's poems, and a concert with the participation of local performers is held.

„Vajaoba"
An evening dedicated to the memory of Vazha-Pshavela is held in village Kochbaani.

Location of the discovered monuments

Below we give the summary table showing the geographical coordinates of each monument described in the report.

Table 1: Geographical coordinates of the observed monuments

Monument number	Purpose of Monument	Name of Monument	Coordinates of Monument (WGS/UTM/Zone 38)	
			X	Y
N1	Archaeological	settlement on the hill "Kustapa"	528252	4617385
N2	Archaeological	„Lapriani"	528946	4612729
N3	Archaeological	early medieval burial grounds	537238	4619209
N4	Archaeological	"Avazasgori" settlement	542911	4616506
N5	Archaeological	"Sabadurisgori" settlement	544131	4615699
N6	Archaeological	Former Church "Natlismtsemeli"	537736	4618236
N7	Archaeological	"Chailuri" ("Niakhura") Fortress	541944	4615987
N8	Archaeological	"Gorasamarkhi"	544490	4609541
N9	cultural	Manavi Castle	536754	4619879
N10	cultural	Manavi St. Virgin church	537013	4619478
N11	cultural	Meligor Tower	531412	4615628
N12	cultural	"Chailuri" ("Niakhura") Fortress	541944	4615987
N13	cultural	Castle - Tower	541950	4613344
N14	cultural	Teleti Church of St. George	545284	4612430
N15	Managed Reserve	„Korugi Managed Reserve"	---	

As the study results show, there are 1 archeological monument and 2 monuments of cultural heritage in the selected rehabilitation area, namely:

- N8 - "Gorasamarkhi" - Archaeological Site;
- N12 - "Chailuri" ("Niakhura") Fortress - cultural Site;
- N13 - Castle - Tower - cultural Site.

Other monuments are some distance away from the project area. Most of the observed monuments are located near villages Manavi and Kakabeti.

Figure 1 below shows the location of the archaeological and cultural monuments in the study area. The following Figures show PMUtures of the monuments. The numbers of monuments are the same as the numbers given in Table 1.

APPENDIX 4: ENVIRONMENTAL STANDARDS FOR AIR, WATER, NOISE AND VIBRATION NORMS

Table A: Ambient Air Quality Standards

Parameter	Averaging Period	Limit (µg/m³)			Applicable to Project
		Maximum Permissible Concentration (MPC) for Air Quality	IFC Guideline Value	EU Ambient Air Quality Guidelines	
Nitrogen Dioxide (NO_2)	30 minutes	200	-	-	200 **µg/m³**
	1 Hour	200 µg /m³	200	200	200 **µg/m³**
	24 Hours	40	-	-	
	1 Year	40 µg /m³	40	40	
Sulphur Dioxide (SO_2)	10 minutes	-	500	-	
	30 minutes	500	-	-	500
	1 Hour	-350 µg /m³	-	350	-350 µg /m³
	24 Hours	125 µg /m³	20	125	
Carbon Monoxide (CO)	30 minutes	5,000	-	-	5,000
	24 Hours	3,000	-	-	
	8 hours	10 mg/m³	-	-	10 mg/m³
Total Suspended Particulates (TSP) / Dust	24 Hours	150	-	-	
	30 minutes	500	-	-	500
PM10	1 year	40 µg /m³	20	40	20
	24 hours	50 µg /m³	50	50	50
PM2.5	1 year	25 µg /m³	10	25	10
	24 hours		25	-	25
Ozone	8-hour daily maximum	120 µg /m³	100	120	

Note: World Health Organization (WHO) Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile. Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Table B: Georgian Standards for Noise Levels (Allowable Limits Indoors, Not at the Building Façade)

Purpose/use of area and premises	Allowable limits (A-Weighted Decibels (dBA))		
	L_{day}		23:00 – 08:00 L_{night}, Night
	08:00 - 19:00, Day	Evening 19:00-23:00	
Educational facilities and library halls	35	35	35

Purpose/use of area and premises	Allowable limits (A-Weighted Decibels (dBA))		
	L_{day}		23:00 – 08:00 L_{night}, Night
	08:00 - 19:00, Day	Evening 19:00-23:00	
Medical facilities/chambers of medical institutions	40	40	40
Living quarters and dormitories	35	30	30
Hospital chambers	35	30	30
Hotel/motel rooms	40	35	35
Trading halls and reception facilities	55	55	55
Restaurant, bar, cafe halls	50	50	50
Theatre/concert halls and sacred premises	30	30	30
Sport halls and pools	55	55	55
Small offices (≤100m^3) – working rooms and premises without office equipment	40	40	40
Small offices (≤100m^3) – working rooms and premises without office equipment	40	40	40
Conference halls /meeting rooms	35	35	35
Areas bordering with houses residential, medical establishments, social service and children's facilities (<6 story buildings)	50	45	40
Areas bordering with houses residential, medical establishments, social service, and children's facilities (>6 story buildings)	55	50	45
The areas bordering with hotels, trade, service, sport, and public organizations	60	55	50

Note: 1. in case noise generated by indoor or outdoor sources is impulse or tonal, the limit must be 5dBA les than indicated in the table. 4. Acoustic noise limits given above are set for routine operation conditions of the 'space', i.e. windows and door are closed (exception – built-in ventilation canals), ventilation, air conditioning, lighting (in case available) are on; functional (baseline) noise (such as music, speech) not considered.
Note 2. Technical Regulation does not apply to the construction and repairs during the day.

Table C: Applicable Noise Level Guidelines Per IFC EHS Guideline

Receptor	One-hour L_{aeq} (dBA)	
	Daytime 07.00-22.00	Night-time 22.00 – 07.00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

Table D: Applicable Work Environment Noise Limits Per IFC EHS Guidelines

Type of Work, workplace	IFC General EHS Guidelines
Heavy Industry (no demand for oral communication)	85 Equivalent level Laeq,8h
Light industry (decreasing demand for oral communication)	50-65 Equivalent level Laeq,8h

Table E: Georgian General Admissible Vibration Values in Residential Houses, Hospitals and Rest Houses, Sanitary Norms 2001

Average Geometric Frequencies of Octave Zones (Hz)	Allowable Values X0, Y0, Z0			
	Vibro-acceleration		Vibro-speed	
	m/sec^2	dB	$m/sec\ 10^{-4}$	dB
2	4.0	72	3.2	76
4	4.5	73	1.8	71
8	5.6	75	1.1	67
16	11.0	81	1.1	67
31.5	22.0	87	1.1	67
63	45.0	93	1.1	67
Corrected and equivalent corrected values and their levels	4.0	72	1.1	67

Note: It is allowable to exceed vibration normative values during daytime by 5 dB during daytime. In this table of inconstant vibrations, a correction for the allowable level values is 10dB, while the absolute values are multiplied by 0.32. The allowable levels of vibration for hospitals and rest houses must be reduced by 3dB. Note that no standards for building damage exist.

Table F: American Association of State Highway and Transportation Officials (AASHTO) Maximum Vibration Levels for Preventing Damage

Type of Situation	Limiting Velocity (in/sec)
Historic sites or other critical locations	0.1
Residential buildings, plastered walls	0.2-0.3
Residential buildings in good repair with gypsum board walls	0.4-0.5
Engineered structures, without plaster	1.0-1.5

Table G: Maximum Admissible Concentrations of Various Substances and Elements in Soils

Component	Unit	Level
Arsenic	mg/kg	2-10
Copper	mg/kg	3
Mercury	mg/kg	2.1
Nickel	mg/kg	4
Lead	mg/kg	32
Zinc	mg/kg	23
Compound Hydrocarbons	mg/kg	0.1
Phenol (Compound)	mg/kg	-
Cyanide	mg/kg	-
Sulphate	mg/kg	-
Chloride	mg/kg	-
Ammonium Nitrogen	mg/kg	-
Evaporable Organic Compounds		
Benzoyl	mg/kg	0.3
Toluene	mg/kg	0.3
Ethylbenzene	mg/kg	-
Compound Xylene (ortho, meta, para)	mg/kg	0.3
semi-Evaporable Compounds		
Benzopyrene	mg/kg	0.02
Isopropylen-benzol	mg/kg	0.5
Pesticides		
Atrazine	mg/kg	0.5
Linden	mg/kg	0.1

Component	Unit	Level
DDT (and its metabolite)	mg/kg	0.1

Table H: Potable Water Criteria

Index	Measuring unit	Standard not more than:
Common characteristics		
Hydrogen index	PH	6-9
Permanganate oxidation	mg O2 /L	3,0
Nonorganic substance		
Barium (Ba 2+)	mg/L	0.7
Boron (B, total)	mg/L	0.5
Arsenic (As, total)	mg/L	0.01
Quicksilver (Hg, nonorganic),	mg/L	0.006
Cadmium (Cd, total)	mg/L	0.003
Mangan (Mn, total)	mg/L	0.4
Molybdenum (Mo, total)	mg/L	0.07
Nickel (Ni, total)	mg/L	0.07
Nitrate (short impact by NO^{-3})	mg/L	50
Nitrite (long impact by NO^{-2})	mg/L	0.2
Selenium (Se, total)	mg/L	0.01
Copper (Cu, total)	mg/L	2.0
Lead (Pb, total)	mg/L	0.01
Fluorine (F)	mg/L	0.7
Chromium (Cr6+)	mg/L	0.05
Antimony (Sb)	mg/L	0.02
Cyanide (CN-	mg/L	0.07
Organic substance		
Total content of pesticides	mg/L	0.05

Note: Georgian legislation does not regulate quality standards for groundwater. Quality of groundwater is regulated by norms set for potable water.

Table I: Applicable Standards for Surface Water Quality

Parameter	Maximum Permissible concentration	Source
pH	6.5-8.5	National
Diluted Oxygen, mg/l	4-6	National
BOD5, mg/l	30	IFC
COD, mg/l	125	IFC
Total Nitrogen, N, mg/l	10	IFC
Total Phosphate, mg/l	2	IFC
Chlorides, mg/l	350	National
Oil Products, mg/l	0.3	National
Zinc (Zn^{2+})	1g/kg	National
Lead (Pb total)	23.0	National
Chrome (Cr^{6+})	32.0	National
Cadmium (Cd, total)	6.0	National
Total Suspended Solids, mg/l	50	IFC

Note: certain parameters are not specified in the national standards for these IFC Guidelines are being used.

Table J: Water Quality Requirements by Water Use Category

	Water use category			
	Household water use	Domestic water use	Fisheries	
			Highest and first	Second
	Increase not higher that listed below is allowed			
Suspended solids	0.25 mg/l	0.75 mg/l	0.25mg/l	0.75 mg/l
	For rivers with natural content of suspended solids 30mg/l, around 5% increase is allowed			
	If wastewater contains suspended particles with deposition rate above 0.2mm/sec discharge in water reservoirs is not allowed. Discharge of effluents containing suspended particles with deposition rate above 0.4mm/sec is prohibited.			
Floating matter	Patches and films of oil, petroleum products, fats must not be detectable			
Colour	Must not be visible in water column		Water must not have unusual colour	
	20 cm	10 cm	-	
Odour, taste	Water must not have odour and taste of higher than 1-unit intensity		Water must not result in unusual odour and taste in fish	
	After chlorination of other treatment	Without treatment	-	
Temperature	After discharge of wastewater, temperature in water reservoir must not exceed by more than 5 percent compared to the natural value		For water bodies, representing an habitat for cold water fish such as *Acipenseridae, Coregonidae*, maximum allowable temperatures in summer and winter are 20°C and 5°C respectively, while for other water bodies - 28°C (in summer), 8°C (in winter).	
pH	Must be in 6.5 - 8.5 interval			
Water mineralisation	<1000mg/l, Incl. chlorides – 350mg/l; sulphates - 500mg/l	To comply with requirement given in section related to taste (see above)	In accordance with taxation	
Dissolved oxygen	Must not be lower than			
	4 mg/l	4 mg/l	6 mg/l	6 mg/l
Biological oxygen demand	At 20°C must not exceed			
	3 mg/l	6 mg/l	3 mg/l	6 mg/l
Chemical oxygen demand	Must not exceed			
	15 mg/l	30 mg/l	-	-
Chemical substances	Must not exceed maximum permissible limits			
Pathogens	Must be free for pathogens, including viable helminth eggs, tenia oncosperes and viable cysts of pathogen organisms			
Toxicity	-	-	At the point of discharge and control section of the river toxic impact must not be observed.	

Table K: Indicative Values for Treated Sanitary Sewage Discharges

Pollutant	Unit	Standards			Applicable to project
		GEO	WB	EU	
pH	pH	6-9	6-9		6-9
Biochemical oxygen demand (BOD)	mg/l	35	30	25	30
Chemical Oxygen Demand (COD)	mg/l	125	125	125	125
Total Phosphorus	mg/l	2	2	2	2
Total Nitrogen	mg/l	15	10	15	10

Pollutant	Unit	Standards			Applicable to project
		GEO	WB	EU	
Total Suspended Solids	mg/l	60	50	35	35
Coliform bacteria	[1]MPN[b]/100ml		400[a]		400[a]

APPENDIX 5: OUTLINE OF AN ADB ENVIRONMENTAL ASSESSMENT REPORT

An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

Executive Summary
This section describes concisely the critical facts, significant findings, and recommended actions.

Policy, Legal, and Administrative Framework
This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

Description of the Project
This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

Description of the Environment (Baseline Data)
This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

Anticipated Environmental Impacts and Mitigation Measures
This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [Appendix 2, para. 6 of ADB SPS]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifiesmitigation measures and any residual negative impacts that cannot be mitigated; exploresopportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

Analysis of Alternatives
This section examines alternatives to the proposed project site, technology, design, and operation including the no project alternative in terms of their potential environmental suitability under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

Information Disclosure, Consultation, and Participation

This section:

- describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;
- summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concernsof vulnerable groups, including women, the poor, and Indigenous Peoples; and
- describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

- Mitigation:
    - identifies and summarizes anticipated significant adverse environmental impacts and risks;
    - describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (forinstance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and
    - provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.
- Monitoring:
    - describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and
    - describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.
- Implementation arrangements:
    - specifies the implementation schedule showing phasing and coordination with overall project implementation;
    - describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmentalmanagement

capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and
    - estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.
- Performance indicators:
    - describes the desired outcomes as measurable eventsto the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

APPENDIX 6: OUTLINE OF DUE DILIGENCE REPORT

Executive Summary
I. Introduction
  A. Background
  B. Objective of the Subproject
  C. Categorization and Justification for DDR
II. Subproject Description
  A. Present Status
  B. Need for the Subproject
  C. Components of the Subproject
II. Potential Impacts and Mitigation Measures
III. Contractor Requirement for Environmental Management
IV. Grievance Redress Mechanism
VI. Conclusion and Recommendations

Appendices
REA Checklist
Location Map
Site Layout — showing proposed infrastructure, boundaries, and if any existing facilities/trees/etc.
Site Photographs

APPENDIX 7: RECORDS OF PUBLIC CONSULTATION

The following table is the suggested format for recording the minutes of the public consultations conducted for the project.

Date and Venue of Public Consultation	Number of attendees	Issues /concerns raised during the public consultation	Response of the EA/IA on how to address the issues and concerns

Attachments:
Attendance sheets
Photo documentation

APPENDIX 8: SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

This template must be included as an Appendix in the IEE that will be prepared for the project. It can be adapted to the specific project as necessary.

Introduction

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number	Roles
1. PIU				
2. PIU				
3. Consultants				

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/ List of Works	Contract Status (specify if under bidding or contract awarded)	Status of Implementation (Preliminary Design/ Detailed Design/On-going Construction/ Completed/ O&M)[1]	If On-going Construction	
				%Physical Progress	Expected Completion Date

[1] If on-going construction, include %physical progress and expected date of completion

Compliance status with National/State/Local statutory environmental requirements[2]

Package No.	Subproject Name	Statutory Environmental Requirements[3]	Status of Compliance[4]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[5]

Compliance Status With Environmental Loan Covenants

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

Compliance Status With The Environmental Management Plan (Refer To EMP Tables In Approved IEE/s)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise IEE Documentation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP)	Remarks
	Not yet due (detailed design not	Submitted to ADB (Provide	Disclosed on project website	Final IEE provided to Contractor/s		

[2] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as Appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.
[3] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)
[4] Specify if obtained, submitted and awaiting approval, application not yet submitted
[5] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

	yet completed)	Date of Submission)	(Provide Link)	(Yes/No)	approved by Project Director? (Yes/No)	

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.

Package-wise Contractor/s' Nodal Persons for Environmental Safeguards

Package Name	Contractor	Nodal Person	Email Address	Contact Number

- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Summary of Environmental Monitoring Activities (for the Reporting Period)[6]

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

[6] Attach Laboratory Results and Sampling Map/Locations

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

Approach And Methodology For Environmental Monitoring Of The Project

- Briefly describe the approach and methodology used for environmental monitoring of each sub-project.

Monitoring Of Environmental Impacts On Project Surroundings (Ambient Air, Water Quality And Noise Levels)

- Discuss the general condition of surroundings at the project site, with consideration of the following, whichever are applicable:
    - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
    - Identify if muddy water is escaping site boundaries or if muddy tracks are seen on adjacent roads.
    - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these are intact following heavy rain;
    - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area in the Appendix.
    - Confirm spill kits on site and site procedure for handling emergencies.
    - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
    - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
    - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
    - Provide information on barricades, signages, and on-site boards. Provide photographs in the Appendix.
    - Indicate if there are any activities being under taken out of working hours and how that is being managed.

- Briefly discuss the basis for environmental parameters monitoring.
- Indicate type of environmental parameters to be monitored and identify the location.
- Indicate the method of monitoring and equipment used.

- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements.

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

Grievance Redress Mechanism

- Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as Appendix Notification of the GRM (town-wise if applicable).

Complaints Received during the Reporting Period

- Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

Summary Of Key Issues And Remedial Actions

- Summary of follow up time-bound actions to be taken within a set timeframe.

Appendixes

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors

APPENDIX 9: CHANCE FIND PROTOCOL

Introduction

Project town being a heritage town, there are possibility of any chance finds (artefacts) recovery during excavations. Contractors working at heritage towns must take additional care not to destroy or damage historic features during excavations. There may be many buried historic features in heritage towns such as – idols, toys, wells, ancient drains, remains of buildings, other walls, grain pits, etc. Every care must be made not to destroy these during excavations.

Excavator drivers need to be instructed to be aware of hitting buried features and that they must be investigated before continuing work. When features are encountered during mechanical excavation, work should stop and the PIU/Consultants engineers must be informed immediately so that they can be inspected at the first opportunity.

When historic features such as walls, brick constructions and other features are encountered during excavation the excavation must be stopped immediately and the PIU/Consultants must be informed immediately.

1.1 Contractors' instruction: As soon as contractor recovers any chance find during any excavation works for pipe laying, they should immediately inform PIU/Consultant present in town about the chance find recovery. Immediately stop the excavation activity near point of recovery. After PIU/consultants engineers come at site, contractor should follow cleaning and photography in supervision of PIU/Consultant engineers.

Cleaning

When a feature/chance find is discovered it must be defined by careful cleaning. Roots must be removed and dirt must be carefully cleaned away. The section or trench base should also be cleaned back for a little distance around the feature.

Record photography

When the feature is clean good photography should be taken – vertical and face-on shots and a few general shots of the feature, also showing its position in relation to surrounding features, buildings, etc. The photographed should be catalogued (date, location, direction of shot)

Drawn record

When features/chance finds are revealed a drawn record should also be made.

a. General location record – measuring its position and orientation within the protected site / in relation to surrounding structures

b. Record drawings – detail drawings made in plan and section/profile. The extent (edges) of the feature should be drawn and the level of the existing ground surface and the top and base of the feature should be recorded. These levels should be marked on the drawings. The drawings should include detail of the construction of the feature. Perspective sketches could also be made if necessary. Explanatory notes can also be put on the drawings.

Reporting finds

When finds are made these should be reported to PIU/Consultants. Photographs and record drawings should be sent.

Discovery of historic objects

When clearance and excavation takes place artifacts and historic objects are sometimes found. These should be recovered and kept in a safe place. The place of discovery should be recorded and each find given a number and tag tied to the find with the same number on it. A list of the finds should be kept (with the find No. And place of discovery and date of discovery recorded).

PIU/Consultants responsibility- PIU/Consultants should inform in written to the State Archaeological Department at the earliest with photographs and request to Archaeology Department to visit the site and hand over the chance finds to them.

APPENDIX 10: SAMPLE GRIEVANCE REGISTRATION FORM

Complainant Information

Name	
Address	
Gender	
Type	e.g. Affected Persons
Contact Details:	
Telephone	
Email	
Preferred method of response	

Complaint Details

Mode of receiving grievance	(e.g. telephone)
Date of Issue	
Location of issue	
Type of Problem	
Land Acquisition and resettlement	
Disruption to land access	
Disruption to Irrigation Water	
Construction Issues	
Other	
Description of Issue	
Description of Factors Causing Issues	
Past Action/s Taken by Complainant (if any)	
Person/Agency Responsible for the Issue	

MEAP		PIC	
PIU		Construction Contractor	
Affected Persons		GA	
ADB		Other (Specify)	

Focal Person Information

Name	
Position	
Organisation	
Type	e.g. Affected Persons
Contact Details:	

Telephone	
Email	
Preferred method of response	

Actions Taken

Action	Description	Name of Action Officer	Date
1			
2			
3			

Final Resolution

Completed By	
Signature	
Date	

APPENDIX 11: SAMPLE CONSTRUCTION SITE CHECKLIST FOR EMP MONITORING

Project Name: CSISDP **Name of the Subproject:** **Contractor:**	**Yes (√) No (x)**
Monitoring Details: _____	
EHS supervisor appointed by contractor and available on site	
Construction site management plan (spoils, safety, material, schedule, equipment etc.,) prepared	
Traffic management plan prepared	
Dust is under control	
Excavated soil properly placed within minimum space	
Construction area is confined; no traffic/pedestrian entry observed	
Surplus soil/debris/waste is disposed without delay	
Construction material (sand/gravel/aggregate) brought to site as and when required only	
Tarpaulins used to cover sand and other loose material when transported by vehicles	
After unloading, wheels and undercarriage of vehicles cleaned prior to leaving the site	
No Asbestos Cement pipes disturbed/removed during excavation	
No chance finds encountered during excavation	
Work is planned in consultation with traffic police	
Work is not being conducted during heavy traffic	
Work at a stretch is completed within a day (excavation, pipe laying and backfilling)	
Pipe trenches are not kept open unduly	
Road is not completely closed; work is conducted on edge; at least one line is kept open	
Road is closed; alternative route provided and public is informed, information board provided	
Pedestrian access to houses is not blocked due to pipe laying	
Spaces left in between trenches for access	
Wooden planks/metal sheets provided across trench for pedestrian	
No public/unauthorized entry observed in work site	
Children safety measures (barricades, security) in place at work sites in residential areas	
Prior public information provided about the work, schedule and disturbances	
Caution/warning board provided on site	
Guards with red flag provided during work at busy roads	
Workers using appropriate PPE (boots, gloves, helmets, ear muffs etc.)	
Workers conducting or near heavy noise work is provided with ear muffs	
Contractor is following standard and safe construction practices	
Deep excavation is conducted with land slip/protection measures	
First aid facilities are available on site and workers informed	
Drinking water provided at the site	
Toilet facility provided at the site	
Separate toilet facility is provided for women workers	
Workers camps are maintained cleanly	
Adequate toilet and bath facilities provided	

Project Name: CSISDP **Name of the Subproject:** **Contractor:**	**Yes (√) No (x)**
Monitoring Details: _____	
Contractor employed local workers as far as possible	
Workers camp set up with the permission of PIU	
Adequate housing provided	
Sufficient water provided for drinking/washing/bath	
No noisy work is conducted in the nights	
Local people informed of noisy work	
No blasting activity conducted	
Pneumatic drills or other equipment creating vibration is not used near old/risky buildings	

APPENDIX 12: QUARTERLY PROGRESS REPORT CHECKLIST

Environment Safeguards QPR checklist[1]

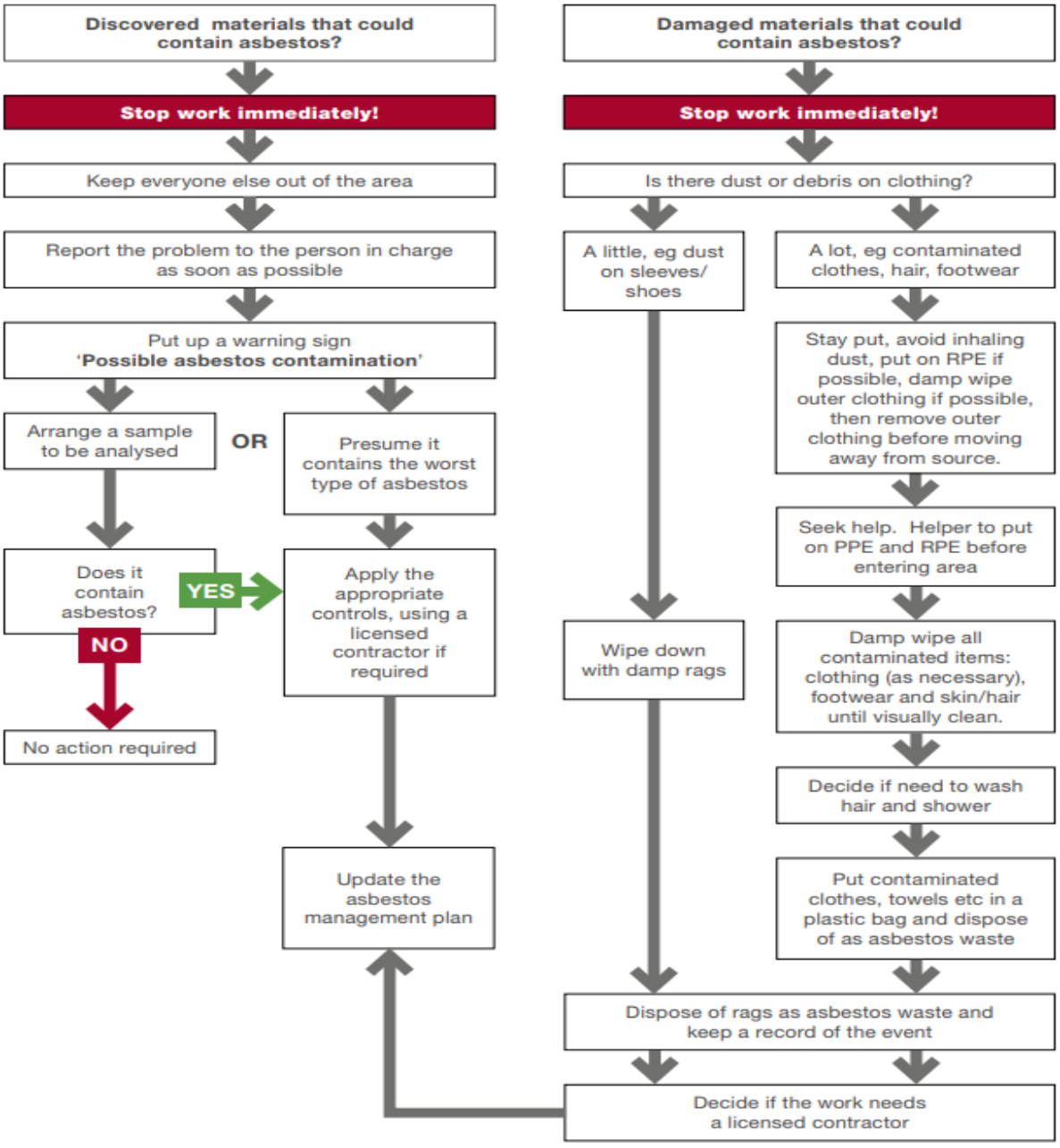
Activity	Yes / No	Remarks (If Answer Is **No**)
A. For subproject packages under bidding		
1. IEEs cleared by ADB?		
2. IEEs/EMPs included in the bidding documents?		
3. Are there changes in the scope of work of the cleared IEEs?		
4. Core labor standards and environment, health and safety (EHS) incorporated in Section 8 of the bid documents?		
5. BOQ line item includes EMP requirements?		
6. IEE disclosed in form and language understood by stakeholders and affected persons (APs)?		
For subproject packages with contracts awarded (no works yet)		
1. All statutory clearances/permits obtained?		
2. Each contractor appointed EHS and/or safety officer?		
3. Baseline regarding condition of roads, agricultural land and other infrastructure prior to start of transportation of materials and construction has been recorded?		
4. Contractor has established tie-ups with local hospitals/clinics for emergencies onsite?		
5. For DBO packages, detailed design completed and updated IEE submitted to ADB?		
6. For civil works packages, site-specific EMP submitted to ADB?		
For subproject packages with contracts awarded and works on-going		
1. Contractors have appointed EHS and/or safety officer onsite per subproject package?		
2. Site-specific EMP posted onsite?		
3. Contractors' records of accidents / incidents submitted to PIU on a monthly basis?		
4. Contractors provided PIU with a notification/incident report of any accident(s) within 24 hours of its occurrence?		
5. Reports of complaints/grievances reported monthly to PIU?		

[1] This checklist should provide the Project's **general** compliance to environment safeguards during the reporting period. The indicators are aligned with project loan agreement, PAM, IEEs and ADB's Sustainable Development Safeguards Division Safeguards project performance rating. The detailed environmental safeguards compliance status should be provided in the semi-annual environmental monitoring report.

6. Records of information disclosure/consultations submitted by PIU to PIU monthly?		
7. Records of site inspection by PIU submitted to PIU monthly?		

APPENDIX 13: SUGGESTED ASBESTOS MANAGEMENT PLAN

1. Background
2. Project Description
3. Regulatory Framework, Standards and Protocols
4. Existing/Baseline Conditions
5. Risk Assessment:
6. Roles and Responsibilities
7. Permissible Levels
8. ACM Removal Protocol
9. ACM Handling Protocols
10. ACM Storage Protocols
11. ACM Stabilization and Treatment
12. List of Approved ACM Handlers and Disposal Facilities
13. Health and Safety Protocols
14. Training
15. Emergency Response Plan & Chance Find Protocol
16. Reporting and Monitoring


Discovered materials that could contain asbestos?
Stop work immediately!
Keep everyone else out of the area
Report the problem to the person in charge as soon as possible
Put up a warning sign 'Possible asbestos contamination'
Arrange a sample to be analysed
OR
Presume it contains the worst type of asbestos
Does it contain asbestos?
YES
NO
Apply the appropriate controls, using a licensed contractor if required
No action required
Update the asbestos management plan
Damaged materials that could contain asbestos?
Stop work immediately!
Is there dust or debris on clothing?
A little, eg dust on sleeves/ shoes
A lot, eg contaminated clothes, hair, footwear
Stay put, avoid inhaling dust, put on RPE if possible, damp wipe outer clothing if possible, then remove outer clothing before moving away from source.
Seek help. Helper to put on PPE and RPE before entering area
Wipe down with damp rags
Damp wipe all contaminated items: clothing (as necessary), footwear and skin/hair until visually clean.
Decide if need to wash hair and shower
Put contaminated clothes, towels etc in a plastic bag and dispose of as asbestos waste
Dispose of rags as asbestos waste and keep a record of the event
Decide if the work needs a licensed contractor