

Supplementary Initial Environmental Examination

April 2026

Georgia: Climate Smart Irrigation Sector Development Program

Kvemo Samgori Left Main Canal Irrigation Scheme:
Main Canal Section 1 - Ch 313+42 to Ch 397+00

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a) ABBREVIATIONS

ADB	–	Asian Development Bank
APA	–	Agency of Protected Areas
BOD	–	Biological Oxygen Demand
CEMP	–	Contractor Environmental Management Plan
COD	–	Chemical Oxygen Demand
CR	–	Critically Endangered
CSISDP	–	Climate Smart Irrigation Sector Development Program
EA	–	Executing Agency
EAC	–	Environmental Assessment Code
EARF	–	Environmental Assessment and Review Framework
EHS	–	Environmental, Health and Safety Guidelines
EIA	–	Environmental Impact Assessment
EIP	–	Environmental Impact Permit
EMP	–	Environmental Management Plan
EMR	–	Environmental Monitoring Report
EN	–	Endangered
GA	–	Georgian Amelioration
GEL	–	Georgian lari
GRCE	–	Grievance Redress Committee
GRM	–	Grievance Redress Mechanism
IA	–	Implementing Agency
IBAT	–	Integrated Biodiversity Assessment Tool
IEE	–	Initial Environmental Examination
IUCN	–	International Union for the Conservation of Nature
LARP	–	Land Acquisition and Resettlement Plan
MEPA	–	Ministry of Environmental Protection and Agriculture
MoF	–	Ministry of Finance
NRM	–	Natural Resources Management
NEA	–	National Environmental Agency
O&M	–	Operation and maintenance
OPs	–	Operational Priorities
PIC	–	Project Implementation Consultants
RCP	–	Representative Concentration Pathways
RLG	–	Red List of Georgia (Aligned with IUCN Criteria)
SDG	–	Sustainable Development Goals

b) WEIGHTS AND MEASURES

°C	–	degrees Celsius
ha	–	hectare, 10,000 m ²
km	–	kilometer
m	–	Meter

c) NOTE

In this report, "\$" refers to US dollars.

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EXECUTIVE SUMMARY

1. This Environmental Examination (IEE) has been prepared for the Climate Smart Irrigation Sector Development Project (Project Number: 54014-001). IEE has been prepared only for Package 1 (Main Canal - Ch 313+42 to Ch 397+00), as this section is planned to be developed as a separate construction package. This package focus on the repair and modernization of the main canal, access roads and bridges and supporting structures and pipelines. For other packages (Main Canal Ch 397+00 to Ch 489+77, as well as Irrigation Areas 1, 2, 3 and 4) IEE will be prepared as a separate documents.

The Project

2. Climate Smart Irrigation Sector Development Program (CSISDP) Project (the project) aims to contribute towards economic growth and food security. The project will support the Government of Georgia through the Ministry of Environmental Protection and Agriculture (MEPA) and Georgian Amelioration (GA) to implement policy, legal, institutional and management reforms in agriculture, in particular irrigation, and modernize selected irrigation schemes through priority repairs to irrigation networks and the introduction of innovative on-farm irrigation and agricultural production technologies.
3. The Ministry of Finance (MoF) will be the executing agency and MEPA will be the implementing agency for the policy component. MEPA will be the executing agency and implementing agency for the investment component. Project implementation will be led by the existing MEPA project implementation unit (PIU).
4. This project is in the ADB's Country Operations Business Plan for Georgia, 2021-2023. It is in line with ADB's Country Partnership Strategy 2024-2028 for Georgia, which will support sovereign and private sector investments, policy reforms, capacity building, and knowledge to help Georgia develop into a green and inclusive regional gateway. In accordance with the strategy, ADB will help develop market-oriented agricultural systems in line with advanced international standards.

Project Impact, Outcome, and Outputs

5. The project is aligned with the following impact: food security in Georgia improved (Irrigation Strategy). The outcome will be sustainable, productive, and resilient agriculture system in eastern Georgia strengthened. The project will have three outputs:
 - i. **Output 1:** Institutional, Governance, Management, and Financial Management Enhanced. This will support 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.
 - ii. **Output 2:** Irrigation Schemes Modernized. The output will support the modernization of the dilapidated, under-utilized Kvemo Samgori left main canal irrigation scheme – package 1 in the Kakheti region in eastern Georgia. Modernizations include repairs to main, secondary and tertiary canals, and on-farm irrigation networks.
 - iii. **Output 3:** Innovative Agriculture Production Systems Demonstrated. This output will support farmers to modernize and improve their irrigation and agricultural production technologies.

Environmental Due Diligence

6. The project is classified as environmental Category B under ADB's SPS (2009), requiring the preparation of an IEE and EMP based on the Rapid Environmental Assessment

Checklist. Actions were taken at an early stage of project preparation, to identify potential direct, indirect, cumulative and induced environmental impacts on and risks to physical, biological, socioeconomic, and physical cultural resources to determine their significance and scope, in consultation with stakeholders, including affected people and concerned NGOs. This included site visits to proposed project areas and interactions with key stakeholders. The project is expected to have potential adverse environmental impacts that are site-specific, mostly reversible, and in most cases, mitigation measures can be designed.

7. As this project is the rehabilitation of existing irrigation systems this project does not fall under the Georgian Environmental Assessment Code 2017 and an EIA is not required. However, environmental and social standards within legislation will be followed and any other required permits will be sorted.
8. In June 2025, significant changes were made to the Code. Among them, the screening, scoping, and EIA procedures were changed. The list of activities subject to screening and EIA was also clarified, including the fact that river bank protection works are no longer subject to the screening procedure. Despite the changes in the case of rehabilitation of the irrigation systems, the development of a screening document is not still required within the scope of the Package 1.

Environmental Impacts and Mitigation:

9. Environmental impact is assessed for different project phases: the pre-construction, construction and operation phases of the Irrigation systems rehabilitation project.
10. This IEE only applies to Package 1: Main Canal Ch 313+42 to Ch 397+00 and does not include Package 2, 3 and 4. The engineering solutions and technological approaches of Package 1 have not changed substantially and are consistent with the information in the 2023 IEE.
11. The existing state of the natural and social environment of the corridor was selected for the planned activity. It should be noted that field surveys conducted in 2025 (May and August) and 2026 (February) indicate that the natural and social environment in the Package 1 corridor is practically the same and no significant changes are observed. No additional (previously unaccounted for) external sources of environmental impact were identified in the Package 1 area during the period 2023-2026.
12. **Biodiversity.** The whole project area covers agricultural land plots with vineyards, orchards, annual and perennial agricultural crop land plots, etc. The project area does not cover natural habitats and is a modified habitat, totally represented by agricultural landscape actively used by the population. The project location is in a degraded landscape that is not critical habitat, however, the area has windbreak areas that are away from the area of construction. There are a few important species that are potentially on-site, such as the Common walnut (*Juglans regia*), Grayish oak (*Quercus pedunculiflora* C.Koch), Georgian weeping Pear (*Pyrus georgica*), Georgian elm (*Ulmus georgica*) and Georgian barberry (*Berberis iberica*).
13. According to field surveys in 2025, the probability of encountering these species specifically in the Package 1 project corridor is very low. In addition, the main canal project does not require a deviation from the existing corridor, which further reduces the likelihood of impact on species subject to special protection.
14. The field studies of 2023 and 2025 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 fauna species may enter the construction area during foraging and breeding periods and may be subject to potential project-related disturbances and impacts.

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15. Due to the large distance between protected areas and the project corridor of Package 1, there are practically no risks of direct or indirect impacts. In this regard, targeted mitigation measures are not required.
 16. 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.
 17. While no significant impact on any critically endangered species is expected during the project construction and implementation, further assessments may be undertaken in the subsequent phase of the IEE and throughout implementation to monitor and avoid unanticipated impacts. Additionally, actions for minimising removal of vegetation, replanting, and minimising disturbance of fauna will be a key part of the mitigation measures. Other mitigation measures for soil and water pollution, noise, vibrations, dust and air emissions will also minimise any impacts.
 18. Cultural Resources. A full cultural study was undertaken by a cultural specialist for a similar project for all the key cultural sites near the project. The findings of his study are also being used for this project. The study included site visits, inspections of the area and an archaeological survey.
 19. There are no visible historical monuments within the Package 1 project's direct and indirect impact zones. Given the nature of the project, the likelihood of late discovery and damage to archaeological sites is also minimal. Overall, the project is not expected to have any impact on historical or archaeological monuments. However, certain mitigation measures are necessary to prevent accidental damage to archaeological sites.
 20. In the event of the detection of foreign (unidentified) objects or layers uncharacteristic for the site during excavation works, immediate cessation of work and appropriate measures shall be taken. Vibration and noise mitigation measures shall also be taken into account.
 21. **Soil quality.** Excavation works have the potential to cause an impact on soil erosion and quality. Good environmental practices when excavating, spoil pile management and backfilling will be applied to mitigate the impact, this includes siting spoil piles in a good drainage area and refilling as soon as possible. Overall, the impact of the main canal rehabilitation soil quality can be assessed as medium. The impact will be temporary and reversible. With the effective implementation of mitigation measures, the magnitude of residual impacts will be negligible. Good maintenance and second containment where necessary and spill prevention equipment and training will be provided.
 22. **Water Quality and Quantity.** There are no large, permanent water bodies within the Package 1 project corridor. This reduces the risk of water pollution. However, improper waste management can lead to long-range transport of pollutants and have long-term impacts on water quality. Excavation activities may result in soil erosion and temporary deterioration of soil quality. To mitigate these impacts, good construction and environmental management practices will be applied, including proper excavation methods, effective spoil management, and timely backfilling. Spoil materials will be stored in designated areas with adequate drainage, and disturbed areas will be restored as soon as practicable.
 23. Overall, the potential impact on soil quality associated with the main canal rehabilitation is assessed as moderate, temporary, and reversible. With the effective implementation of mitigation measures, the residual impact is expected to be negligible.
 24. In addition, appropriate measures will be implemented to prevent contamination, including proper maintenance of machinery, provision of secondary containment where required, and availability of spill prevention equipment and trained personnel
 25. The operation phase will result in increased availability of water in the canal and increased access to irrigation land. This may result in induced risks, including the overuse of water, fertilizers, and pesticides, which could adversely affect water quality in downstream areas.

To address this, it will be important to ensure that sustainable water management practices and the appropriate use of agrochemicals are integrated into Output 3 activities. Where necessary, additional targeted training for farmers should be provided to promote good agricultural practices and minimize potential environmental impacts.

26. **Waste Management.** Construction activities are expected to generate various types of waste, including sediments from canal cleaning, construction debris from canal rehabilitation works, and leftover excavated soil. To manage these effectively, the waste management hierarchy will be applied, prioritizing waste minimization, reuse, and recycling, with any remaining waste disposed of in an environmentally sound manner.
27. All waste materials will be properly segregated, stored in designated areas, and transported by licensed operators to approved disposal sites, in accordance with applicable environmental regulations and good international practice.
28. **Visual and landscape.** This is a historical and agricultural landscape, however, any negative impacts on the visual or landscape will be temporary, and the overall impact will be negligible to positive. Upon restoration of the site to its original condition, landscape impacts will be reduced, as previously degraded areas will be rehabilitated.
29. **Loss of Access and Resettlement.** This project will cause issues over temporary loss of access as well as resettlement issues. During the construction period, it may become necessary to lease land parcels outside the project's expropriation corridor for the installation of residential camps, concrete and crushing plants, temporary access roads, and/or storage of materials. These land parcels will mainly be state-owned; however, in certain cases, leasing of privately-owned plots may also be required. These issues will be managed through the LARP and include consultation and appropriate compensation. Early consultations about this have generally been positive.
30. **Health and Safety.** Occupational health and safety (OHS) measures will be implemented to prevent injury to workers and other site personnel during construction activities. This will include provision of PPE, first aid, emergency response procedures, and worker training, as well as adequate labor facilities such as toilets and drinking water.
31. Upon mobilization, the Contractor will prepare a site-specific Health and Safety Plan, which will be submitted for approval to MEPA prior to the commencement of construction. Occupational health and safety plans need to be in place to prevent injury to workers and anyone on-site from any construction activities. This will cover everything from first aid, PPE and emergency response to training. Appropriate labour facilities, such as toilets and drinking water, are also key to ensuring vital occupational health and safety. Contractor upon mobilization will prepare a site-specific H&S plan and get it approved by MEPA prior to start of construction.
32. During the operational phase, there is a risk of accidental falls into the main canal, which could result in serious injury or loss of life. Appropriate signs, fencing and awareness will be needed to minimise this impact. The upgrading of the bridges and overpasses as part of the Main Canal works is also important to this.
33. **Traffic Management.** During construction, there will be an increased amount of traffic caused by the movement of materials and waste and machinery and equipment. At times works may also require the temporary full or partial closure of roads. Without management of this, it can cause disruption and congestion across the area, disturbance (noise and dust) on fauna and cultural resources and safety issues for the public and workers. Generally, speed limits, planned routes and timeframes, maintenance of vehicles and training will prevent any issues. Contractor upon mobilization will prepare a site-specific Traffic Management Plan and get it approved by MEPA prior to start of construction.
34. **Asbestos.** Some of the existing pipes within Package 1 may contain asbestos-containing materials (ACM). At this stage, the location, extent, and condition of these pipes are not fully known, nor is it confirmed whether they will be disturbed during the proposed works.

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35. In the event that these pipes require removal, a qualified asbestos specialist will be engaged to prepare and implement an Asbestos Management Plan, ensuring that all activities are carried out safely and in accordance with applicable regulations, without posing risks to workers, the public, or the environment.
 36. **Positive Impacts.** Without the project, the irrigation system will continue to deteriorate, resulting in reduced water supply, lower agricultural productivity, and negative impacts on farmers' incomes. With the works, the system will significantly reduce water and lead to a more equitable distribution of water and more land being irrigated for the same amount of water taken from the Iori River. Leading to a greater agricultural output per water used. The project will also enhance system monitoring and management, including the integration of SCADA systems for real-time control, thereby improving operational efficiency and sustainability. Overall, the system is designed to be climate-resilient, which is a key objective of the project.

Implementation Arrangements

37. MEPA, through its PIU is the executing agency responsible for overall guidance, strategic decisions, oversight of the implementation of the project, and financial management and administration, program procedures and guidelines. 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. PIU 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 all measures, and requirements outlined in the EARF and IEEs, and any corrective or preventive actions outlined in the safeguards monitoring reports.
38. The bidding and contract documents shall include specific provisions requiring contractors to comply with all environmental, health and safety, labour and similar provisions to manage impacts and to comply with ADB's SPS and national legislation.

Public Consultation and GRM

39. Engaging with stakeholders is important to the success of the project. Project consultation so far highlights the need for the project and the issues such as the disparity on who is receiving the water. Consultation in regard to the IEE will be undertaken after the draft IEE is disclosed and before the final IEE is submitted, as at this point more information will be able to be provided to the public.
40. The draft IEE and final IEE disclosure is an important part of stakeholder engagement and should be available through the ADB's website, MEPA and GA to be accessible by all interested parties.
41. During implementation, engagement with stakeholders is still required and important to prevent and manage impacts. Consultations around resettlement, loss of access, health and safety, traffic and other issues should be maintained to prevent issues.
42. Another part of this, is the Grievance Redress Mechanism, a system where the public and workers can raise issues to which the construction contractor and project supervision consultants (PIC), with the overview of the PIU, respond to the issue. Below is the GRM process:
 - Stage I: Registration and Initial Assessment.
 - Stage II: Initial Resolution
 - Stage III: Selection of Approach and Strategy

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- Stage IV: Execution of Measures and Documentation

Conclusion

43. As a great part of the existing system is damaged, the irrigation system uses excess water. With the modernization works the irrigation will be able to serve a larger area while not increasing the take from the Iori River. This will lead to socio-economic improvements as well as support GA's management of the system.
44. The background environmental conditions in the Package 1 project corridor have practically not changed during the period 2023-2026. Previously conducted studies, including measurements and laboratory tests, can be considered valid. The project corridor and design have also not changed. During this period, the amendments made to the environmental legislation of Georgia are not related to the Package 1 project. Therefore, the characteristics, area and levels of environmental impacts from the project implementation have practically not changed.
45. During the construction phase, there is the potential for negative environmental impact on biodiversity, cultural resources, noise, vibration, dust, air emissions, water quality, soil quality, waste, visual and landscape, resettlement, health and safety and traffic. These will be managed under the EMP, with limited residual impacts. The project will not have transboundary impacts.
46. During the operation phase, there is a risk that the project will have the following induced impacts, in particular:
 - (i) As the region suffers from a lack of irrigation water, the areas of the agricultural fields may increase following the project implementation, perhaps at the expense of cutting down the existing forests;
 - (ii) The number of processing and transportation companies may increase in the area what will increase the risk of the environmental impact;
 - (iii) As the areas of the agricultural land increase, the use of pesticides and fertilizers in the area will increase as well. In the case of improper use of pesticides and fertilizers, the risk of soil pollution will increase, while in the long term, the risk of Iori river pollution will increase as well.
47. These will be managed under the EMP through the provision of training to farmers on good practices. The IEE / EMP shall be updated based on final designs and alignments and submitted to ADB for approval prior to start of construction

I. INTRODUCTION

A. Purpose of the Report

48. This Initial Environmental Examination (IEE) was prepared for the Climate Smart Irrigation Sector Development Project (Project Number: 54014-001) and for the advanced procurement package of the Main Canal from Ch 313+42 to Ch 397+00. This area has been classified by the ADB as Category B and required the IEE and EMP.
49. Initially, the IEE was prepared in September 2023 for Package 1 (Main Canal - Ch 313+42 to Ch 397+00) of the Kvemo Samgori Left Main Canal Irrigation Scheme, as well as for Package 2 (Area 1 - Irrigation area G 23 to G 33).
50. The IEE has been updated in line with the requirements of the ADB Safeguard Policy Statement (SPS, 2009), which requires that environmental assessment documents be current and relevant to the project design and local environmental conditions. Environmental documents need to be validated and updated if the project is delayed (usually more than 2 years).
51. An updated IEE has been prepared only for Package 1 (Main Canal - Ch 313+42 to Ch 397+00), as this section is planned to be developed as a separate construction lot. This package focus on the repair and modernization of the main canal, access roads and bridges and supporting structures and pipelines. For other Packages (Main Canal Ch 397+00 to Ch 489+77, as well as Irrigation Areas 1, 2, 3 and 4) IEE will be prepared as a separate documents.
52. Cumulative impacts with other Packages, such as construction traffic and waste management, will be addressed in the EMP.

B. The Project

53. Climate Smart Irrigation Sector Development Program (CSISDP) Project (the project) aims to contribute towards economic growth and food security. The project is financed and contracted through a policy based loan and a project loan by the ADB
54. The project will support the Government of Georgia through the Ministry of Environmental Protection and Agriculture (MEPA) and Georgian Amelioration (GA) to implement policy, legal, institutional, management reforms in agriculture, in particular irrigation, and modernize selected irrigation schemes through priority repairs to irrigation networks and the introduction of innovative on-farm irrigation and agricultural production technologies.
55. The project has two lending components: a policy-based loan to promote institutional, governance, management, and financial management reforms in the Georgian irrigation sector; and an investment project to modernize outdated irrigation systems at the Kvemo Samgori left main canal scheme and demonstrate innovative agricultural production through water efficient technologies within the project area.

II. DESCRIPTION OF THE PROJECT

A. Project Rationale

56. Productivity, production and contribution to GDP has declined significantly since the Soviet Union times. The agricultural output provided 8.3% of GDP output with 20% employed in the agricultural sector overall; and outside of urban areas agriculture is one of the main economic activities. This highlights an important issue with the productivity of the sector.
57. This sector is facing a lot of physical difficulties, exasperated by the deteriorating environmental issues, and is not sustainable. Farms face issues over yields from water availability, decreasing farm sizes, increasing fragmentation and market constraints.
58. Effective irrigation and drainage services have declined over the past two decades, mainly due to a lack of new investment and poorly maintained. At the end of the Soviet period, the total irrigated area in Georgia was approximately 386,000 ha (approximately 66% of the total cultivable area). This significantly declined to only 24,000 ha in 2010 – only 7% of the total cultivable area – before Government intervention started to reverse the decline. There is a reliance on ageing irrigation systems and equipment, and a lack of understanding amongst farmers is resulting in poor environmental management, further fuelling environmental issues.
59. On top of this, climate change is and is likely to continue to affect water availability and climate extremes within the region, increasing the pressure on yields. As such annual harvests are variable and on average are decreasing.
60. Food imports exceed exports and with the above factors the agricultural sector is in decline and Georgia is vulnerable in terms of food security.
61. The MEPA and GA are working on reforms, through the 2017 Irrigation Strategy, to develop and manage their irrigation systems. As a result of the rehabilitation projects implemented since 2012, the area of irrigated land has increased 3.5 times and amounts to 165,000 hectares, while drainage is being carried out on 45,000 hectares (Figure 1).

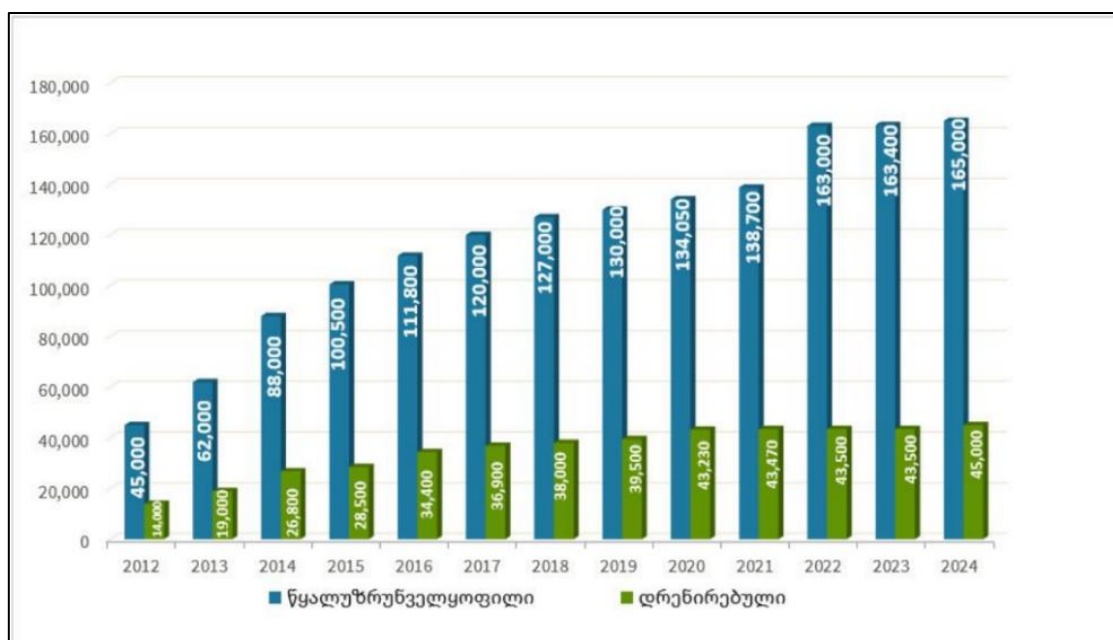


Figure 1. Irrigated and Drained Land Areas in 2012-2025¹

National Statistics Office of Georgia

¹ Ministry of Agriculture of Georgia, "Georgian Amelioration", 2017. *Irrigation Strategy for Georgia 2017-2025*.

Updated Initial Environmental Examination Kvemo Samgori Left Main Canal Irrigation Scheme – Package 1:
Main Canal Ch 313+42 to Ch 397+00

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62. However, further support is needed to address the lack of access to effective and efficient irrigation systems. The government requested the support of ADB.
 63. This project is in the ADB's Country Operations Business Plan for Georgia, 2021-2023. It is in line with ADB's Country Partnership Strategy 2024-2028 for Georgia, which will support sovereign and private sector investments, policy reforms, capacity building, and knowledge to help Georgia develop into a green and inclusive regional gateway. In accordance with the strategy, ADB will help develop market-oriented agricultural systems in line with advanced international standards. Public investment will help build modern climate-resilient irrigation and drainage systems, rehabilitate and modernize the existing systems, and enhance the policy and institutional framework for the sustainable management of water resources and efficient irrigation.
 64. The program is aligned with ADB's Strategy 2030, particularly for operational priorities (OPs) that involve (i) addressing remaining poverty and reducing inequalities (OP1); (ii) accelerating progress in gender equality (OP2); (iii) tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability (OP3); (iv) promoting rural development and food security (OP5); and (v) strengthening governance and institutional capacity (OP6).
 65. The program will contribute to multiple Sustainable Development Goals (SDGs), including (i) addressing poverty (SDG 1); (ii) achieving food security (SDG 2); (iii) supporting gender equality (SDG 5); (iv) promoting integrated water resources management and restoration of ecosystems (SDG 6); and (v) strengthening resilience and adaptive capacity to climate-related and natural hazards (SDG 13).

B. Impact, Outcome and Outputs

66. The project is aligned with the following impact: food security in Georgia improved (Irrigation Strategy). The outcome will be sustainable, productive, and resilient agriculture system in eastern Georgia strengthened. The project will have three outputs. The policy-based loan will support water resources management and irrigation reforms under Output 1. The project loan will support the modernization of irrigation systems under Output 2, and the demonstration of climate- smart irrigation and agricultural production technologies under Output 3.
67. **Output 1:** Institutional, Governance, Management, and Financial Management Enhanced. This will support 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.

¹ Calculated using FAOSTAT data for 1992, which approximates the total growing areas as 581,100 ha.

¹ Calculated using FAOSTAT data for 2010, which approximates the total growing areas as 334,785 ha.

¹ https://transparency.ge/sites/default/files/georgias_agriculture_sector.pdf

¹ National Statistics Office of Georgia

¹ <https://www.ag.ge/En/Statistic/>

68. Irrigation Schemes Modernized. The output will support the modernization of the dilapidated, under-utilized Kvemo Samgori left main canal irrigation scheme – package 1 in the Kakheti region in eastern Georgia. Modernizations include repairs to main, secondary and tertiary canals, and on-farm irrigation networks.
69. **Output 3:** Innovative Agriculture Production Systems Demonstrated. This output will support farmers to modernize and improve their irrigation and agricultural production technologies. The output has two subcomponents: (i) demonstrating and introducing innovative on-farm technologies; and (ii) developing the capacity of farmers, farmers' organizations and water users' organizations. Improved on-farm technologies include
 - (i) introducing water-saving, climate-smart irrigation methods (e.g. drip and sprinkler irrigation), digital technologies, and remote sensing (e.g. for irrigation scheduling);
 - (ii) realizing local water storage and recycling opportunities;
 - (iii) supporting high-value crop production; and
 - (iv) implementing advanced water management and resource monitoring.
70. The updated IEE integrates recent progress under Package 1 and incorporates findings from field surveys conducted in May and August 2025, which confirm the relevance of this update

C. Kvemo Samgori Left Main Canal Irrigation Scheme – Package 1

71. The Kvemo Samgori Irrigation scheme lies in the Kakheti Region of Eastern Georgia (in the municipalities of Sagarejo and Gurjaani) (Figure 2). The Kvemo Samgori Irrigation Area, with the the Climate Smart Irrigation Sector Development Project (CSISDP), focuses on the left or upper bank of this scheme, shaded in red.

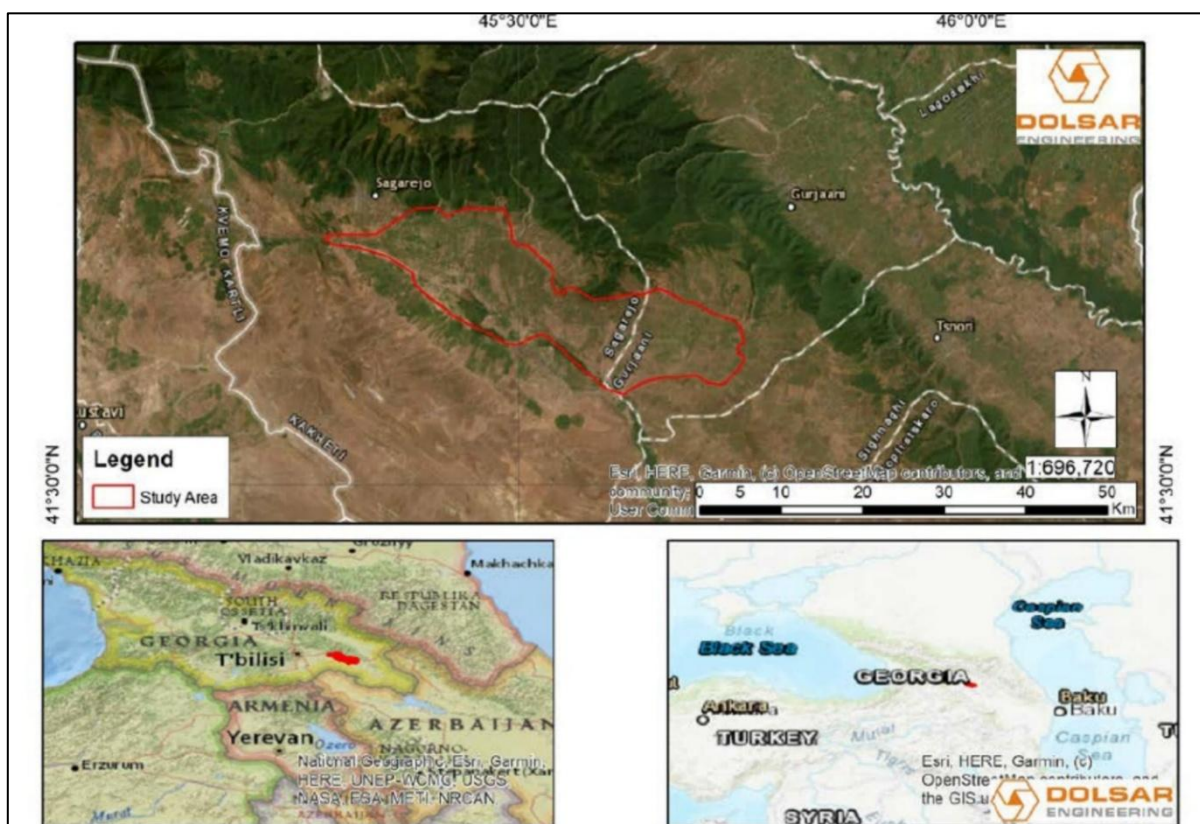


Figure 2. Location of Kvemo-Samgori Irrigation System (Project Area)²

² Project Implementation Consultants Project Implementation Support, Piped Irrigation

72. The Kvemo Samgori Irrigation scheme is part of a larger complex that originates at Sioni Reservoir (Figure 3). From Sioni Reservoir water flows through the Iori River over a distance of about 22,5 km to Paldo Headworks. At this junction, part of the water is abstracted for the Zemo Samgori Irrigation scheme. The remaining amounts flow again through the Iori River over a distance of about 28 km to the Kvemo Samgori Headworks where the flow is divided into the two separate systems of the Left and Right Main Canals (Figure 4). The Iori river continues in the southeast direction towards Azerbaijan (where it is called the Gabirri River) and finally flows into the Mingachevir Reservoir.

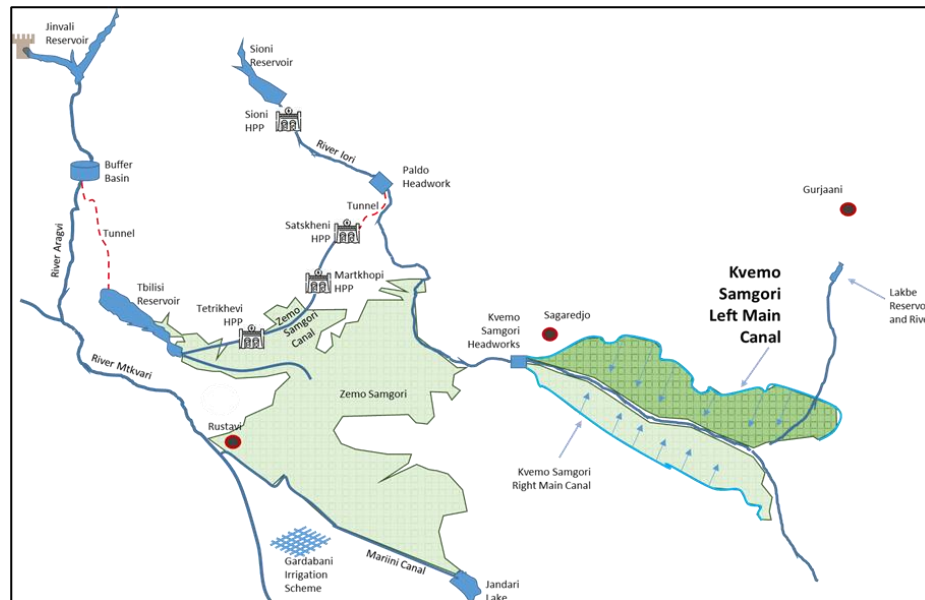


Figure 3. Overview of Kvemo and Zemo Samgori Irrigation Schemes³

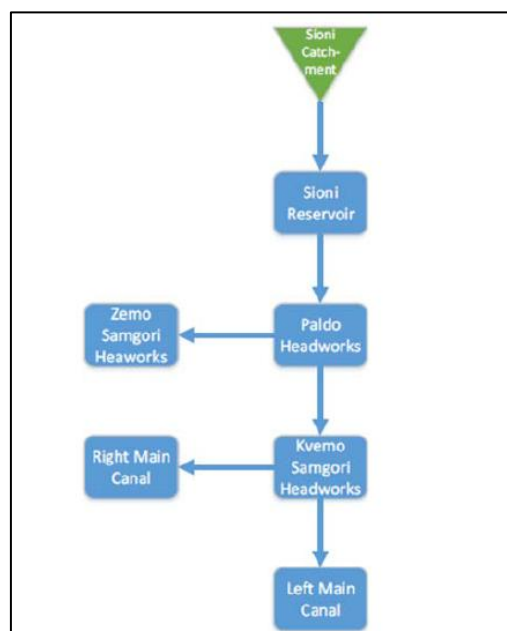


Figure 4. Schematic of Water Flows⁴

73. The current Left Bank scheme was built in 1960. Headworks and diversion weir diverts water into Kvemo Samgori left main canal. Main canal is 48,9 km and discharge

³ Source: TA-6648 GEO consultants, Detailed Design of Output 2.

⁴ Project Implementation Consultants Project Implementation Support, Piped Irrigation Design, Construction Supervision Quarterly Progress Report (15 March 2025 - June 2025)

decreases from 21,7 m³/s to 3 m³/s. 11 inverted syphons, 15 conduit, 12 tunnel, 7 check, 110 offtakes are the main canal structures. The canal ranges between maximum altitude 612 m and minimum altitude 556 m with slope about 0,0011. Kvemo Samgori Left Main Canal Cross Section Capacities are shown in Figure 5.



Figure 5. Kvemo Samgori Left Main Canal Cross Section Capacities⁵

74. The original project (command) area was 14,245 ha, out of which 12,445 ha were formerly irrigated by gravity and the rest was irrigated through pumping stations. The potential irrigatable area of the Kvemo Samgori Left Main Canal was reported by GA as 12,445 ha. As of 2020, the irrigation water supply area, without any intervention, is estimated to be 4,430 ha. In that year, the total area under irrigation contracts signed with GA was 2,227 ha. In 2021, the total area under contracts was 1,987 ha.
75. Additional projects were implemented on the Kvemo Samgori Left Main Canal in 2022-2026. These projects improved water supply to approximately 2,000 hectares of land. These main projects are:⁶
- (i) Sagarejo Municipality - Rehabilitation of the left main canal of the Kvemo Samgori irrigation system secondary canals. Irrigation area - 485 ha. The project was completed in September 2022;
 - (ii) Sagarejo Municipality - Rehabilitation of the left main canal of the Kvemo Samgori irrigation system secondary canals. Irrigation area - 455 ha. The project was completed in September 2022;
 - (iii) Gurjaani Municipality - Rehabilitation of the left main canal of the Kvemo Samgori irrigation system secondary canals. Irrigation area – 1,015 ha. The project was completed in September 2023;
 - (iv) Gurjaani Municipality - Design-construction of measures to regulate water from the Lakbe Reservoir and improve water supply to the left main canal of the Kvemo Samgori irrigation system (pipeline installation). The project was completed in September 2024.
76. These completed interventions, combined with the planned Package 1 rehabilitation works, are expected to further improve the efficiency and reliability of the Kvemo Samgori Left Main Canal and increase the effective irrigated area beyond the current levels, as confirmed by findings from the May and August 2025 field surveys.
77. The irrigation water demand ranged between 0.39 l/s/ha to 0.82 l/s/ha (for the most severe climate change scenario in the year 2099), and the actual water consumption of 2.49 l/s/ha in the system is much higher. This high water use could be attributed to a

⁵ Source: Project Implementation Consultants Project Implementation Support, Piped Irrigation Design, Construction Supervision Design Review of Main Canal (Pk. 313+ 42 – Pk. 397 + 00)

⁶ Source: <https://www.ag.ge/En/Projects>

combination of transmission losses, inefficient irrigation and poor monitoring of discharged amounts, inefficient reservoir releases or the fact that more plots might be connected than the 2,227 ha that is currently under contract.

78. Around 75% of the farmers were connected to the Kvemo Samgori Irrigation system based on the 2020 GA Landowners' Survey; however, supply of water varies between farms with farmers further away from the headworks being more likely to report having no water at all.⁷
79. Field surveys conducted in May and August 2025 also confirm that residents living near the Main Canal are experiencing a significant shortage of irrigation water. Residents independently collect water from nearby streams and then use portable reservoirs for irrigation and other household purposes (Figure 6 **Error! Reference source not found.**). This leads to irrational water use and negatively affects the social conditions of the population.



Figure 6. Use of Water Reservoirs for Irrigation by the Local Population

D. Sytem Elements

80. Available water versus crop demand - the availability of water on an annual basis determines the area that can be connected to the irrigation system. When the available water matches or exceeds the demand from the area connected, the system is designed to meet peak crop demand. if the land area is not limiting but the available water is limiting then the system is designed where the peak demand is calculated as a peak daily percentage of the maximum available volume. In this case, it is assumed that:
 - (i) There is excess available water on an annual basis;
 - (ii) Therefore, the system shall be designed to meet a peak crop demand of 0.75 to 1 l/s/ha; and

⁷ Landowners' survey by the GA in 2020

(iii) The system shall be designed to allow flexibility in the timing of delivery which means that the peak supply is larger than the average crop demand.

81. **Individual flow rate** required by the farmer is determined not by the individual farmer's irrigation system and technique. The size of the farm determines how many hours the system will operate for each irrigation. It is not practical to enable the majority of farmers to irrigate at the same time, but it is essential that they are provided with an individual flow rate large enough that enables efficient on-farm irrigation.
82. For furrow irrigation where there is a section or subsystem of <15 individual connections, the capacity of the system is driven by the individual flow rate, which means that the system is designed as a combination of:
- (i) mainlines that are sized according to the available water/land and associated peak crop; and
 - (ii) groups of spurs that supply 15 individuals (in this case 3 spurs supplying 5 individuals each).
83. **Supply System Elements** - The planned system (Figure 7) will be a combination of three main sub-systems:
- (i) Reservoir with storage releasing to a river to downstream weir offtake (1)
 - (ii) Main canal transferring water (2)
 - (iii) Gravity-pressurized pipeline direct to the farmer (3, 4, 5, 6)

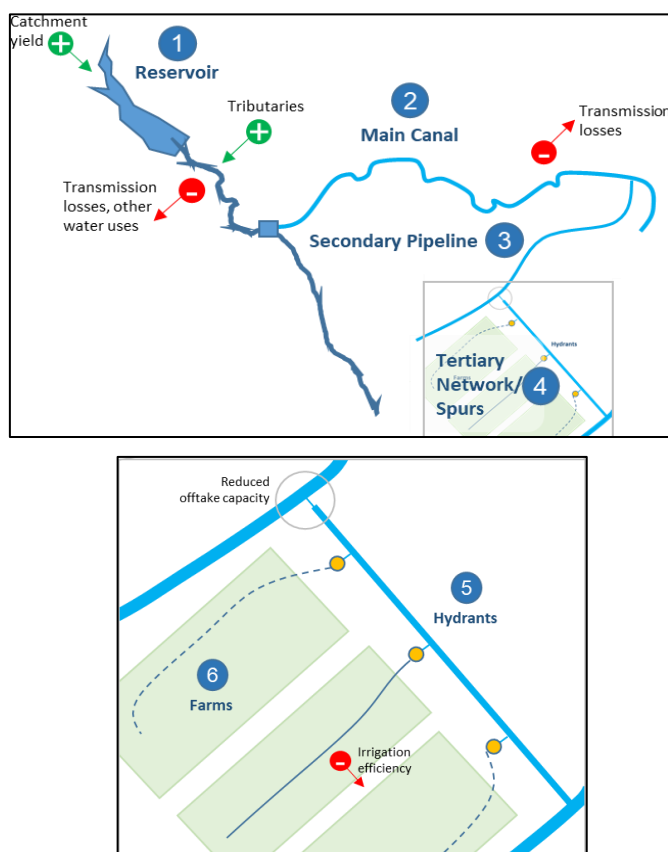


Figure 7. Components of the Irrigation Scheme

84. Harmonizing the three systems is key to the design and operation of this system. The following describes the proposed methods of harmonizing this system taking into account the other irrigation areas and the modernization works to date.
- (i) Different Concept - The design of gravity pipelines for irrigation is very different in concept to a canal-based system.

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- (ii) Different and Varying Operating Conditions - Gravity-fed pressurized pipeline networks have a range of operating options. Unlike canal systems, the maximum flow for the system depends upon delivery pressures respectively head loss permitted.
85. **General Design Principles** will be the basis of the detailed design for the modernization of the Kverno Samgori Left Irrigation scheme:
- (i) Continuous system: there shall be no "breaks" in the supply chain up to the farm connection, i.e. no storage or no separate main canals operated by one group and tertiary systems operated locally
 - (ii) Direct connections: farmers must directly couple a pipe to the system, and the pressure/head is maintained
 - (iii) Almost "water on demand": there is no need for a sophisticated ordering or complicated management system to operate
 - (iv) Equitable distribution: the water is distributed across the whole area giving each area a fair share and limiting waste and over-irrigation by using strategic flow (and consumption) constraints without the need for elaborate management inputs.
 - (v) Interconnecting pipe: creating a true "network" rather than a traditional "tree" supply system to enable the system to be designed with less spare capacity as the network inherently equalizes around the system effectively delivering more efficient and higher flow
86. **Specific Design Principles** for the following main components must be adhered to:
- (i) Reservoir (river and canal offtake):
 - (a) Capacity must be sufficient to secure the overall demand: Reservoir capacity + Catchment yield + Tributaries – Transmission loss (including other uses) to Headworks > Overall system demand.
 - (b) Management of the overall system must commit to certain amounts under defined certain conditions.
 - (ii) Main Canal:
 - (a) Flow capacity > Irrigation Water Demand (Farm Level) + Transmission losses in Secondary and Tertiary Networks.
 - (b) Storage capacity is sufficient to balance demand peaks (operate at a range of depths).
 - (c) Must automatically adjust to demand: the canal must have control structures.
 - (d) Requires measurement throughout the canal and pipe offtakes,
 - (e) Needs SCADA control using operating formulas that enable the system to meet demand without having to have complicated management systems.
 - (f) Uses the concept of "overshot weirs" to ensure sufficient head in the upstream canal sections, incl. gates on top of the overshot weirs to store excess flows to minimize spills.
 - (g) Uses the concept of "undershot offtakes" to pipelines to ensure sufficient flow at all times in the pipes, incl. overflow weirs to enable surplus flows to be discharged back to the river.
 - (h) Includes. overflow weirs to enable surplus flows to be discharged back to the river.
 - (iii) Secondary Pipelines:

- (a) Flow capacity \geq Required System Average Irrigation Water Demand (Farm Level) + Transmission losses Tertiary Network + flexibility for the level of service.
 - (b) Designed for an average peak daily demand between 0.75 to 1 l/s/ha, depending on the desired level of service.
 - (c) Online continuous flow measurement at each offtake from the main canal.
 - (d) Requires flow controls to distribute water across the whole area giving each area a fair share.
 - (e) Needs loops and interconnectivity to increase the ability to balance peaks within the network.
- (iv) Tertiary Network/Spurs:
- (a) Flow rate into each spur is limited, e.g., by reduced diameter in offtake from the secondary canal.
 - (b) Allowed flow rate per spur $\leq 1 - 1,2 \times$ Individual Hydrant Flow.
 - (c) Diameters of intakes of spurs between 80 mm (top of the system) and 40mm (bottom of the system).
 - (d) Area supplied per spur $< 4 - 6$ ha.
 - (e) Ratio of spurs operating at one time is $\sim 35 - 45\%$.
- (v) Hydrants/Supply Nodes:
- (a) Individual Hydrant Flow < 15 l/s.
 - (b) Pressure at node > 2 meters in all system conditions.
 - (c) Average number of plots / supply node $\leq 3 - 4$.
 - (d) Hydrants must be capable to be equipped with individual water meters in the future.
- (vi) Farms:
- (a) Farmers have individual hydrants to directly connect to the system.
 - (b) Farmers have 24/7 access to their connection points.
 - (c) Farmers can choose their irrigation method and apply surface, sprinkler or drip irrigation.
 - (d) Farmers have control over an endpoint with a pipe fitting that is located either at each property boundary or a reasonable distance (< 200 m) from the property.
 - (e) Each connection point should have a valve that the farmer has access to and is secured so that it is protected from damage or unauthorised people interfering.
87. **Pipeline Design Process** - The system shall be designed using hydrodynamic network modelling software.
88. **Metering and SCADA**- Potential locations for water meters should be considered as follows:
- (i) Reservoir at the reservoir offtake.
 - (ii) Canal system at each structure and overflow structure in the canal.
 - (iii) Piped offtakes at the offtake point.
89. There would be SCADA monitoring and real-time measurement enabling the system to be operated automatically. In practice, metering and SCADA can be very expensive and depends upon the method of canal operation and the method of scheduling, ordering or on-demand supply that is adopted. As a minimum, it is recommended that measurement at the first three above is required and SCADA real-time measurement is preferred. SCADA has two elements:
- (i) Canal structure control (if applicable) by depth sensors and monitoring flows.
 - (ii) Monitor water levels, volumes, and pipeline pressures by displaying real-time data but using alarms that report on exceptions.

-
90. Individual metering of each farm connection point is to be considered in the near future once the legal framework for meterized billing of irrigation water is implemented.
91. **Operating Objectives** - There are the following key operating objectives:
- (i) There is sufficient water in the weir pool for diversion to the main canal
 - (ii) Storage and canal offtakes are operated to keep a minimum head above the pipeline offtakes.
 - (iii) A limited number of spurs are operating at one time (assuming furrow irrigation, if in the future more efficient irrigation techniques are more widespread, e.g., sprinkler or drip, every spur can operate).
 - (iv) On average one person per spur operates at a maximum, though in periods of lower demand several may operate at once and/or if they adopt sprinkler or drip with lower (5l/sec) flow rates.
92. The operation of each main sub-system as outlined above (reservoir, canal and pipeline network) can be either
- (i) Scheduled: farmers are told when the water will be available – the old system.
 - (ii) Planned: farmers order water and are told when it will be available.
93. System Operations - The system has three key operations:
- (i) Reservoir operations – releases water according to either a schedule/plan or monitored demand.
 - (ii) Canal operations – divert water according to either a schedule/plan or monitored demand.
94. It is possible that future reservoir operations and canal operations will be combined into one SCADA system with more or less automatic operations and that the farmers' operations be undertaken at a very local spur system informally with some system oversight. The detailed design should consider the potential implications.

E. Modernization Approach and Construction Works

95. The approach to modernization of the selected areas is based on (i) modernization through a network of closed pipes rather than reconstruction of existing infrastructure and facilities, and (ii) providing an improved level of service by allowing farmers to connect directly to the piped network. The three key design elements are:
- (i) The canal system will be controlled by a supervisory control; and data analysis system, which will provide real-time measurement of water flows into the piped system and will enable the system to automatically supply the appropriate volume of water.⁸
 - (ii) The main pipe network will be distributed so that all farms will have reasonable access. The sizing of the pipe network will ensure sufficient capacity (minimum 0,5 litres [l]/second[sec]/ha) to meet peak crop demand.
 - (iii) There will be local hydrants where individual farmers can connect directly to the pipe system and receive a sufficient minimum flow (3-5 l/sec) to enable farmers to choose their irrigation system i.e surface, drip or sprinkler. The sizing of the

⁸ The supervisory control and data analysis system will self-regulate based on the lowest level of the farm outputs depending on the defined level of service, water demand and the limitation of water availability. This will convert the system from a scheduled system to an "on-demand" system. A key benefit will be the reduction of operation and maintenance cost compared to a scheduled system, especially given the high degree of land fragmentation within the area. It will also provide a more equitable distribution of the water to allow greater participation of farmers in irrigation delivery.

hydrants is critical to ensure that farmers can obtain water within a reasonable time frame each day but that the system will not be completely unrestrained as this would require a much bigger pipe network supply.

96. Under modernization works, a variety of development packages are considered:
- (i) Network infrastructure: (a) reinstate existing canals, structures, etc. as originally designed, (b) install closed underground pipelines and hydrants, and (c) install closed underground pipelines and hydrants and water storage facilities to improve irrigation efficiency;
 - (ii) supervisory control and data analysis: (a) flow measurement on main and secondary canals, (b) manual or smart water meters at individual farm outlets, (c) automated gates, and (d) remote sensing, climate data collection;
 - (iii) Solar power for pumping and operation of gates/valves;
 - (iv) storage of water from floods, climate events, and excess canal water. This will also affect drainage systems, and may require increased investment and re-engineering of spillways, culverts and canals, and designing systems to deal with larger peak flows and flood events;
 - (v) farm water storage options support as dams, ponds and tanks; and
 - (vi) other measures, e.g., hail protection.
97. Construction works will be the installation of buried pipes, trenching, laying pipes underground along the existing channels, backfilling and reinstatement, including:
1. excavation of ground III category in a trench with an excavator (bucket 0.25 cubic meters);
 2. manual digging of grounds in a trench;
 3. arrangement of sand bedding around pipe;
 4. backfilling of ground with a bulldozer, transportation at 20 m distance;
 5. loading remaining ground and disposals at 20 kilometres (km) distance;
 6. installation of polyethylene pipes;
 7. installation of electric and manual cast iron valves;
 8. arrangement of prefabricated reinforced concrete wells (with vase and roofing slabs, retaining rings and insulation of external surface) H =1,5 m, D = 2.0 m; and
 9. installation of flow meters.

F. Project Packages

98. According to recent decisions, the project has been split into 4 different packages, which are listed below, in Figure 8.
- (i) **Package 1** - Advanced Procurement. This comprises of the Kverno Samgori Left Main Canal (Ch 313+42 to 397+00) which will focus on the repair and modernisation of the main canal, main canal including repairs to the access roads, removing vegetation and sediment build-up, repairs to inlets and outlets of tunnels and inverted siphon, repairs side and base of the canals and repairs to the tunnel sides. Repairs the bridges and outlets.
 - (ii) **Package 2**. Area 1 to 4 (GA distribution branches G23 to G39). The detailed design has not yet been finalized; therefore, all technical details are not fully defined at this stage. Upon completion of the final design, the full scope of works will be confirmed. However, the anticipated activities include trench excavation, pipe bedding with sand, installation of HDPE pipes, installation of valves at key junctions, backfilling, and installation of flow meters.

(iii) **Package 3.** This covers the repair and modernisation of the main canal, access roads and bridges and supporting structures and pipelines of the Kvemo Samgori Left Main Canal Ch 397+00 to 488+66.7.

99. This IEE focuses on the Package 1 for Main Canal Ch 313+42 to Ch 397+00. For Packages 2 and 3 (Area 1, 2, 3, 4 and Main Canal Ch 397+00 to 488+66.) the IEE reports will be prepared as a separate documents - Supplementary IEE for Area 1, 2, 3 and 4 with EMP per each area, and IEE for Main Canal Section-2 (Ch397 – Ch489).

(iv) **Package 4.** 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.

100. Rehabilitation works on part of the Package 4 have already been carried out by GA with state funding in 2024-2026. Environmental and Social Due Diligence Reports (DDR) will be prepared for this package, and the findings will inform subsequent actions and decision-making. The Environmental Due Diligence Report (EDDR) for this project is being prepared in parallel with the IEE. The EDDR Inception Report was submitted in April 2026. The draft EDDR is scheduled for completion by early May 2026, followed by stakeholder consultations and finalization.

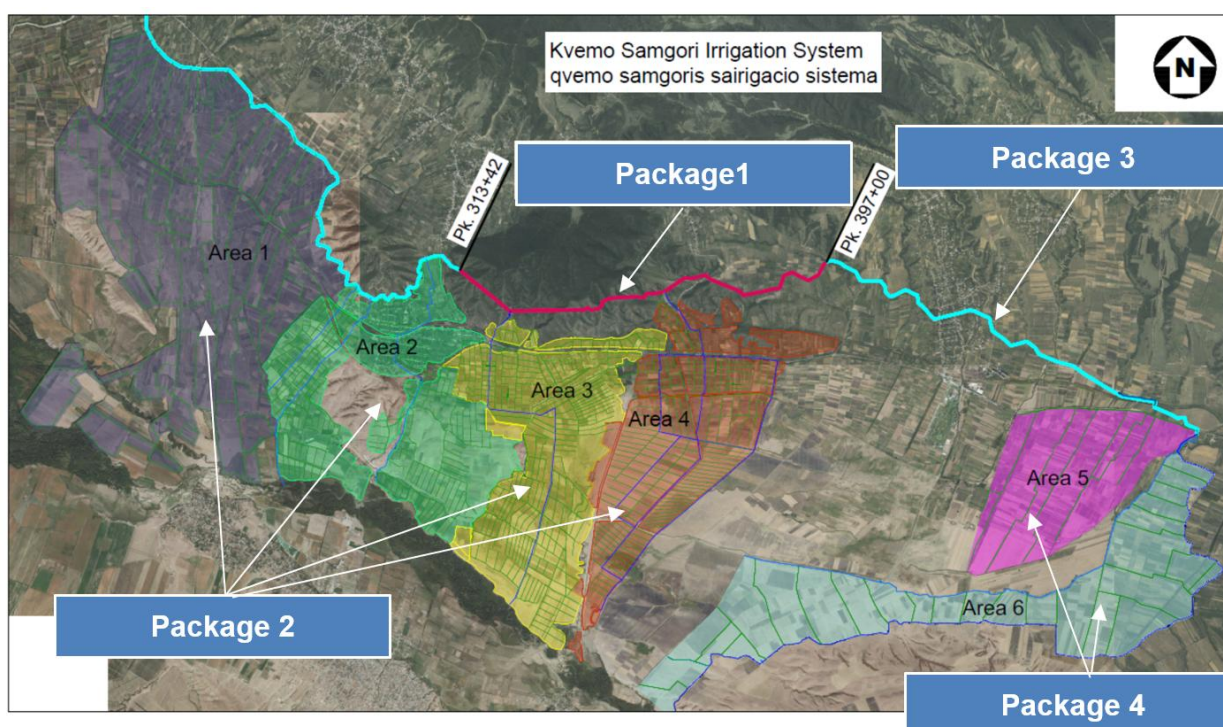


Figure 8. Kvemo Samgori Irrigation System Overview ^{9, 10}

1. Package 1 - Main Canal Ch 313+42 to Ch 397+00:

101. The main open canals are in poor condition with encroached vegetation, blockages due to sediment and other debris build-up, sides of the canal cracking and collapsing and the lining of the tunnel is eroded. This main canal will need to be cleared, cleaned, repaired or replaced, cleaning, repairs of other structural units, improvements to the access road and repairs and improvements of overpasses and bridges.

⁹ Source: Project Implementation Consultants Project Implementation Support, Piped Irrigation Design, Construction Supervision Design Review of Main Canal (Pk. 313+ 42 – Pk. 397 + 00)

¹⁰ (Note: This figure illustrates the full system context for reference; however, the current IEE focuses exclusively on Package 1).

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102. The main canal is 8,358 m (Pk. 313 + 42 ÷ Pk. 397 + 00), comprising of 3,938.7m open trapezoidal canals, 309 m rectangular canal, 9 tunnels (From No3 to No11, with a total length of 3,623), inverted siphons (440.3 m) and a spillway (47 m). The tunnels range in size from 96 to 4,104 m with a width of 3.0 m to 3.3 m and a height of 3.0 to 3.2 m. All tunnels need to be cleared of sediment (see Figures 9 and 10).



Figure 9. Package 1 - Main Canal Features¹¹



Figure 10. Tunnels and Channel Alignment¹²

103. The current condition description of the main canal is given below. The current condition description is based on the site visit parameters (which took place dated on 19-20-21 March, 2025) for the "Project Implementation Consultants Project Implementation Support, Piped Irrigation Design and Construction Supervision".

104. **Tunnel 3 (T3) Pk313+42-Pk325+78 (Kandaura)** - This tunnel, 1,236.85 m long, starts at km 31+342 and ends at km 32+578,85. Tunnel internal section with circular arch and straight walls with 3 m height and 3 m width. Tunnel construction is monolithic concrete and was built with a mining method. At the entrance, the tunnel's bedrock consists of light brown claystone, sandstone, and siltstone alternations. At the exit, alluvial terrace

¹¹ Source: Produced for IEE by TA-6648 GEO Environmental Consultants

¹² Source: Project Implementation Consultants Project Implementation Support, Piped Irrigation Design, Construction Supervision Design Review of Main Canal (Pk. 313+ 42 – Pk. 397 + 00)

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material is observed. The rock is of weak quality. Groundwater seepage is present in the tunnel. Inside the tunnel, near the middle sections, over an approximately 80-100 m stretch, the invert concrete at the base has risen approximately 40-50 cm inward. Furthermore, sedimentary accumulations of gravel blocks and fine materials were in various places of Tunnel 3. In several places, there were small collapses in the arch where soil and the thickness of the arch concrete were approximately 20 cm. No reinforcement was visually visible anywhere along the entire length of the tunnel in cracks and collapsed areas. Before construction, all the water in the tunnel should be pumped outside and also accumulated sediment should be removed.

105. **Tunnel 4 (T4) Pk327+49-Pk330+30 (Badiauri-1)** - Tunnel 4, with a total length of 249,35 m, has bedrock at its entrance and exit consisting of light brown claystone, siltstone, and sandstone alternations, of weak rock quality. Tunnel internal section with circular arch and straight walls. Tunnel construction is with monolithic concrete and tunnel is built along its entire length with a mining method (closed one). After approximately 100 m, cracks 1-4 cm wide and extending for about 50 m are present on both the right and left shoulders. Accumulations of gravel blocks, sand, silt, and clay-like fine sediments are found at the base, along with occasional water pools. The tunnel is full of silt, sand gravel, boulders and other debris. The thickness of the cracks varies from 0.5 cm to 4 cm.
106. **Tunnel 5 (T5) Pk331+20-Pk333+54 (Badiauri-2)** - Tunnel 5, 232,99 m long, has bedrock at its entrance and exit consisting of conglomerate at the top and light brown sandstone, claystone, and siltstone below, of weak rock quality. The tunnel construction is monolithic concrete and the tunnel is built along its entire length with a mining method (closed). The permanent retaining walls of the tunnel at the entrance is accompanied by a horizontal (longitudinal) crack and fissure on both sides. The tunnel is in relatively good condition with no water seepage, though areas with excessive segregation in the concrete casting are present. The tunnel, from the exit portal side, is flooded, silt, sand, gravel, boulders and other types of waste have accumulated.
107. **Tunnel 6 (T6) Pk334+57-Pk338+74 (Badiauri-3)** - Tunnel 6, 414,83 m long, has its entrance and exit covered with thick soil. The underlying bedrock is likely the regionally dominant claystone, sandstone, and siltstone alternation. The tunnel is in good condition but requires cleaning. The tunnel is mainly built by mining (closed cutting) and partly by open cutting at the entrance portal (10 m). Tunnel construction is with monolithic concrete.
108. **Tunnel 7 (T7) Pk339+35-Pk341+11 (Badiauri-4)** - Tunnel 7, with a total length of 186,63 m, has its entrance and exit covered with thick soil, and the probable bedrock is loose gravelly conglomerate. The tunnel is in good condition, requires cleaning, and has no water seepage. The tunnel is mainly built by mining method (closed method) and the entrance and exit portal sections are open method. The tunnel is with monolithic concrete.
109. **Tunnel 8 (T8) Pk343+18-Pk344+93 (Badiauri-5)** - With a length of 186,96 m, Tunnel 8 has loose gravelly alluvial terrace material at its entrance and exit. The tunnel is in good condition, requires cleaning, and has no water seepage.
110. **Tunnel 9 (T9) Pk346+88-Pk347+29 (Badiauri-6)** - Tunnel 9, 95.77 m long, has loose gravelly alluvial terrace material as bedrock at its entrance and exit. Tunnel internal cross section is with circular arch and straight walls. Design height is 3 m and width is 3 m. The tunnel is in very good condition with no water seepage. The tunnel is silted up from the exit portal, with silt, sand, gravel, boulders and other types of debris accumulated.
111. **Tunnel 10 (T10) Pk347+29-Pk352+00 (Shibliani)** - Tunnel 10, 453,08 m long, has alluvial terrace material at its entrance and likely light brown sandstone, claystone, and siltstone alternations at its exit. The tunnel construction is monolithic concrete. The tunnel is built along its entire length with a mining method (closed). Groundwater seepage is observed on the sides. At the exit, a 30-40 cm thick layer of fine clay has accumulated.

Shoulder cracks are present 100-150 m from the entrance, and a water pool exists at the tunnel's end.

112. **Tunnel 11 (T11) Pk. 369+73 - Pk.375+40 (Shibliani)** - Tunnel 11,567 m long, has its entrance and exit covered with thick soil. The underlying bedrock is likely the regionally dominant claystone, sandstone, and siltstone alternation. The tunnel is in good condition but requires cleaning.

113. **Open Canal sections** - In some sections the open Canal is a trapezoidal canal lined with monolithic concrete, while in some sections it is a rectangular canal reinforced with concrete slabs and the bases are made out of monolithic concrete. Within the open canal the concrete is damaged and the lining on the sides has collapsed, the base and sides are defected and there are stones. There are large diameter trees and shrubs on the slopes of open canal sections. The outlets on the canal are severely damaged and a new outlet needs to be installed. The bridges over the canal also are eroded and needs to be restored.

114. Figure 11. shows the current state of the engineering structures on the Main Canal Ch 313+42 to Ch 397+00 as of 2025.



Figure 11. Condition of the Main Canal as of 2025¹³

¹³ Source: Project Implementation Consultants Project Implementation Support, Piped Irrigation Design, Updated Initial Environmental Examination Kverno Samgori Left Main Canal Irrigation Scheme – Package 1: Main Canal Ch 313+42 to Ch 397+00

115. **Main Canal has a detailed design.** The main canal should be cleared of sediment, rubble and encroaching vegetation, after this works include:

- **Rehabilitation/repair of the section of the main canal by arranging the surface of the canal with shotcrete:** washing the surface, anchoring steel mesh, wetting the surface, applying shotcrete and fitting expansion joints with bitumen impregnated planks.
- **Rehabilitation /repair of obsolete section of the main canal:** washing and wetting the surface, placing lean concrete, anchoring with adhesive concrete mortar, wetting the surface, applying shotcrete and fitting expansion joints with bitumen impregnated planks.
- **Rehabilitation/repair of the canal covered with reinforced concrete slabs:** disassembly and disposal of broken and damaged slabs, removal of fall slabs and installation, washing the surfaces, cleaning the gaps and filling with mortar, arrangement of expansion joints and installing reinforced concrete slabs.
- **Rehabilitation /repair of the main canal with cast-in-situ concrete:** removing damaged surface, laying gravel, laying in situ cast concrete on reinforced mesh and fitting expansion joints with bitumen impregnated planks.

116. For the tunnels and gallery:

- Tree cutting and removal of thorny bushes from transition sections, inlet and outlet portals;
- Removal of sediments from transition sections, inlet and outlet portals and tunnels;
- Washing of transition sections, inlet and outlet portals with water jet, drilling of holes in concrete, fastening of anchors with adhesive mortar, arrangement of reinforcement mesh 150.1505.5 and shotcreting with wet-mix shotcrete (thickness 7 cm) with addition of active materials;
- Raising of the transition sections and portals with cast-in-situ concrete if necessary;
- Filling of cavities with cast-in-situ concrete;
- Washing inlet and outlet portals with water jet and plastering with sandy-cement mortar with addition of active materials;
- Pumping of water from the outlet portals of tunnels if necessary;
- Installation of temporary power supply and ventilation in tunnels. Dismantling of power supply and ventilation materials and equipment after completion of underground works;
- As there is no power transmission line across the main canal, power supply should be provided using portable power stations;
- Removal of sedimentary soil and construction waste from the tunnel.

117. The condition of tunnels is still not fully known and therefore a site survey is required. For the **inverted siphon and spillways**, this includes

- Removal of vegetation, sediment, rubble and broken structures
- Repairs with a cast in situ by removing damaged surface, washing surfaces, laying gravel, laying in situ cast concrete on reinforced mesh and fitting expansion joints with bitumen impregnated planks.
- Repairs to the inlets and outlets by cleaning and wetting the surface, anchoring adhesive mortar, placing a reinforced mesh and applying shotcrete.
- Arranging drainage, repairs to the service platform, filling cavities with shotcrete and plastering

118. For the **outlets**:

- Bulkhead:

Construction Supervision Design Review of Main Canal (Pk. 313+ 42 – Pk. 397 + 00) and field surveys conducted by the Environmental Specialist in May-August 2025

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- Cleaning of bulkheads from sedimentary soil;
- Cleaning of bulkheads from thorny bushes and cutting trees;
- Filling of holes in the concrete bulkheads with cast-in-situ concrete;
- Raising of bulkhead walls if necessary;
- Washing of bulkheads and guide wings with water jet;
- Wetting of bulkheads and guide wings and plastering with sandy-cement mortar to a thickness of 2 cm with the addition of active materials;
- Dismantling of the existing damaged deep gate and disposal to the territory of Bezhanbaghi pumping station;
- Installation of new deep gates;
- For 9 outlets out of the trapezoidal canal:
 - Cleaning of the canal from sedimentary soil;
 - Removal of thorns and bushes from the outlet area and tree cutting;
 - Demolition of existing damaged concrete structures;
 - Disassembly of existing pipes;
 - Arrangement of the headwork with cast-in-situ concrete B-20;
 - Excavation of a trench, installation of steel pipes of different diameters in the finished trench with normal anti-corrosion insulation and filling with previously excavated soil;
 - Installation of new deep gates
- For 5 outlets out of rectangle canal:
 - Cleaning of the canal from sedimentary soil;
 - Removal of thorns and bushes from the outlet area and tree cutting;
 - Disassembly of existing pipes;
 - Drilling of holes (d=250 mm) in concrete wall;
 - Installation of steel pipe d=219 mm and filling of the opening with sandy-cement mortar;
 - Excavation of a trench, installation of steel pipe d=219 mm in the finished trench with normal anti-corrosion insulation;
 - Installation of well d=1.0 m (flooring slabs, wall-mounted rings and roofing slabs) with precast concrete ring at the beginning of the outlet;

119. Other activities:

- Repairs to two bridges and one super passages
 - Demolition and disposal of existing damaged nodes;
 - Rehabilitation of existing walls, wings and parapets;
 - Filling of cavities in transition sections and structures with cast-in-situ concrete;
 - Raising of existing walls, wings and parapets with cast-in-situ concrete, if necessary;
 - Drilling of holes in concrete wall;
 - Installation of steel pipe d=219 mm and filling of the opening with sandy-cement mortar;
 - Excavation of a trench, installation of steel pipe d=219mm in the finished trench with normal anti-corrosion insulation;
 - Installation of well with precast concrete ring at the beginning of the outlet;
 - Washing of surfaces, wetting and plastering with sandy-cement mortar;
- Reinforced concrete pipes under main canal:
 - Arrangement of cast in situ concrete walls in front of bulkheads and anchoring of structure
 - Arrangement of new bulkheads
 - Raising inlet and outlet bulkheads
 - Plastering of bulkhead with sandy cement mortar
- Repairs to access roads
- Restoration of curbs and plastering surfaces.

120. **Operation.** The main task of the technical operation of the irrigation system is the management of a efficiency of the irrigation system, individual junctions and equipment, efficient functioning and taking measures to prevent damage; ensuring of water supply, transportation and rational distribution among water users; and upgrading and improving technical equipment of the irrigation system. According to the technical operation rules of amelioration systems, the maintenance, maintenance and operation of the main canals include:

- Cleaning from sediment, sedimentary soil and plants;
- Carry out ongoing repairs of damaged sections of paved canals and filtration areas to ensure the stability of the canal;
- Maintenance of water regulating nodes and gates arranged on the canal and carrying out ongoing operational repairs;
- Preventive measures - minor and ongoing repairs.

2. Temporary facilities for Package 1 - Main Canal Ch 313+42 to Ch 397+00

121. At present, the locations and parameters of the temporary facilities for Package 1 have not been determined. The facilities will be selected and agreed upon by the construction contractor. However, in 2025, recommended locations for temporary facilities were identified and proposed through studies conducted by the Environmental Protection Group. These recommendations are presented below.

a) Camps:

122. The selection of camp locations and the determination of their composition is the responsibility of the construction contractor.

123. The contractor shall submit detailed information on the camps to the Client for approval prior to the commencement of construction. The selection of camp locations must be based on the following criteria:

- Proximity to construction sites, minimizing the need to use public roads (including bridge crossings);
- Availability of utilities (water, electricity, existing roads, etc.);
- Favorable natural conditions (flat terrain, limited vegetation, minimal soil cover);
- Sufficient distance from sensitive receptors (residential houses, protected areas, etc.) to minimize the potential impacts of noise, emissions, and vibrations;
- Land ownership and land category – minimal impact on privately owned land and state forest fund territories. If agricultural land is selected, the land use status must be changed in advance, in compliance with the requirements of Georgian legislation.

124. Based on these criteria, several alternative locations were selected by the Environmental and Social Team, which may be used by the construction contractor in the future.

125. The list of these alternatives is provided in Table 1. General views of the potential camp areas are shown below on Figure 12. and their locations are shown on Figure 13.



Camp 1



Camp 2



Camp 3



Camp 4

Figure 12. General Views of the Potential Camp Areas

Table 1. Description of Alternative Locations of Camps

Alt. #	Coordinates		Cadastral Code	Category	Ownership	Approx. Area, ha	Positive Aspects	Negative Aspect
	X	Y						
Camp 1	546941	4611863	55.06.52.036.013	Agricultural	State	0,5	<ul style="list-style-type: none"> • Distance from populated areas; • Adequate condition of access roads; • Good availability of electricity and water supply; • Sparse vegetation cover; • Thin or minimal fertile soil layer; • Sufficient area size. 	<ul style="list-style-type: none"> • Proximity to forested areas; • The site is located near the starting point of the channel, close to the tunnel entrance. Therefore, it will serve the initial section of the tunnel, while other construction sites are located at a considerable distance from this area.
Camp 2	548040	4611041	55.06.52.020.007	Agricultural	State	0,3	<ul style="list-style-type: none"> • Distance from 	<ul style="list-style-type: none"> • Access road passes through

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Alt. #	Coordinates		Cadastral Code	Category	Ownership	Approx. Area, ha	Positive Aspects	Negative Aspect
	X	Y						
							<ul style="list-style-type: none"> populated zones; • Direct access to the main road, avoiding residential areas; • Favorable location relative to construction sites, enabling the camp to serve the first two tunnels and the open trapezoidal channel between them; • Low density of vegetation cover; • Scarcity of fertile soil layer; • Adequate area size. 	<ul style="list-style-type: none"> difficult terrain; • Limited availability of electricity and water supply; • Proximity to forest area, increasing the likelihood of disturbing local fauna.
Camp 3	551175	4611458	55.01.51.000.219	Agricultural	State	2 ha and more	<ul style="list-style-type: none"> • Distance from populated areas; • Direct connection to the main road, bypassing residential zones; • Convenient location relative to construction sites, allowing the camp to serve the entire open channel section; • Low density of vegetation cover; • Scarcity of fertile soil layer; • Sufficient area. 	<ul style="list-style-type: none"> • Presence of privately owned agricultural plots in adjacent areas; • The territory is likely used as pastureland.
Camp 4	554207	4611867	51.19.51.000.002	Agricultural	State - Gurjaani Municipality	2 ha and more	<ul style="list-style-type: none"> • Distance from populated areas; 	<ul style="list-style-type: none"> • Presence of privately owned agricultural plots in

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Alt. #	Coordinates		Cadastral Code	Category	Ownership	Approx. Area, ha	Positive Aspects	Negative Aspect
	X	Y						
							<ul style="list-style-type: none"> • Direct connection to the main road, bypassing residential areas; • Low density of vegetation cover; • Scarcity of fertile soil layer; • Sufficient area; • Good availability of electricity and water supply. 	<ul style="list-style-type: none"> • adjacent areas; • The territory is located at the end point of the canal and will therefore serve the canal's final section. Other construction sites are located at a considerable distance from this location; • eThe territory is likely used as pastureland.

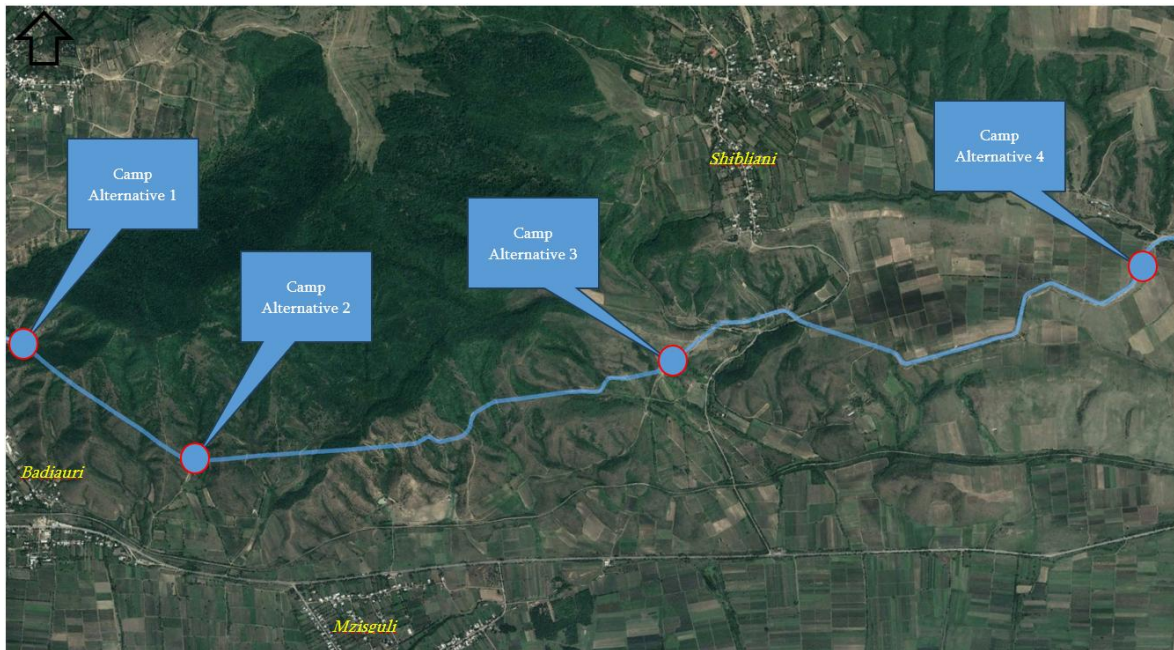


Figure 13. General Views of the Potential Camp Areas

b) Quarries

126. The project region is quite rich in inert materials (sand and gravel) suitable for construction resources. There are dozens of licensed quarries operating in the region. The majority of these are located in the Iori River basin. Construction materials are also extracted from the ravine beds on the Gombori Ridge. Therefore, the main construction materials needed for the highway construction will not require long-distance transportation (the approximate transportation distance will not exceed 20–30 km). Extraction of inert materials must be carried out in accordance with the license conditions.

127. On Figure 14 the sand and gravel deposits and outcrops near the project area are shown, as well as the active crushing and screening plants.

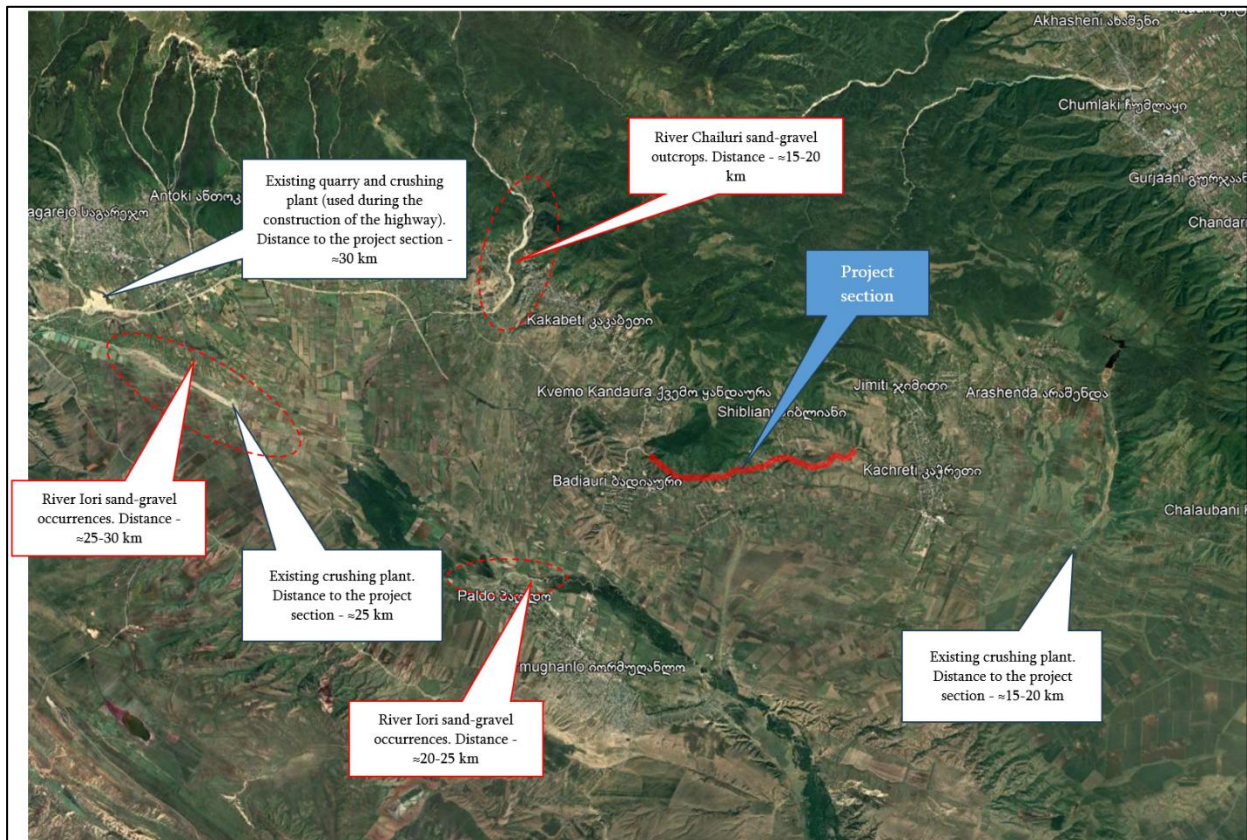


Figure 14. Gravel Deposits and Outcrops near the Project Area

c) Concrete batching and crushing plants

128. For the installation of the concrete plant, the 1st, 3rd, and 4th alternative construction camps can be used. According to national legislation requirements, it is recommended that no residential houses or other sensitive facilities be located within a 500-meter radius of the concrete plants. This recommendation will be met in all three camp locations. Water supply for the concrete plant will be possible from nearby small ravines and village water supply networks. An alternative option is to invite subcontractor companies; however, in this case, environmental risks may be associated with the long-distance transportation of concrete mixtures.

129. Regarding crushing plants, there is a strict recommendation to place the crushers close to the quarries or to invite subcontractor companies already operating in the region. Setting up a crushing plant near the project corridor is associated with environmental risks, specifically: a large number of transport operations, water supply problems, and difficulties related to the management of used wash water. All plants must comply with Georgian EAC 2017 screening procedures for mineral processing.

130. Additional information regarding the environmental requirements for the installation and operation of concrete plants and crushing plants is provided in the corresponding paragraph.

d) Waste disposal areas

131. During the execution of excavation works, excess soil (waste code: 17 05 06) will be generated. It should be noted that the project section is of a short length, with a large part consisting of closed tunnels and culverts. Therefore, the volume of generated excess soil will not be significant. It is also worth noting that some local areas of the project corridor are affected by erosion processes, and certain sections of the service road valley require restoration. Part of the excess soil can be used for stabilizing erosion-affected areas and restoring road valleys. This circumstance further reduces the volume of excess soil generated.
132. Adjacent to the project channel corridor (especially on the Gurjaani side), there are fairly extensive areas where permanent storage sites for excess soil can be arranged. The storage sites should be located on non-agricultural land plots owned by the state. Due to the small volume of excess soil, the area required for storage sites will not be large, and finding such areas will not pose difficulties. The issue of arranging storage sites (including the corresponding project) must be coordinated with local authorities and other interested agencies. It is also possible to negotiate with local authorities regarding the use of excess soil for the restoration of other damaged (eroded) areas near the project corridor.
133. During the demolition of concrete lining works in the channel, a considerable volume of concrete waste (waste code: (17 09 04) will be generated. In accordance with the Waste Management Code 2025 hierarchy principle, the Contractor is required to consider the possibility of reusing this type of waste (e.g., specifically for internal project needs as sub-base material for temporary access roads). Any such re-use must be approved in writing by the PIC in advance to ensure that it is not grossly dispersed and meets engineering/environmental standards. The location of the generation of the waste, the type and quantity of the waste, the pre-treatment procedure, the location and conditions of its use are required for written approval. However, it is worth noting that the Package 1 rehabilitation project does not envisage significant rehabilitation of access roads (there is no need for this) or the provision of facilities that would allow for the re-use of large quantities of this type of waste. There are also no specialized recycling facilities for this type of waste in the region. Based on the above, landfilling of this type of waste still remains the main option. In Sagarejo, there is a solid waste landfill operated by LLC "Solid Waste Management Company." The approximate transportation distance to the landfill is 35–40 km. This approach balances the legal hierarchy with the technical and logistical constraints of the project area.
134. Vegetation Waste (20 02 01). Following the hierarchy, reuse as mulch for site restoration or distribution to local communities as firewood (coordinated with local municipalities) will be prioritized. Landfilling will only be considered as a last resort. The transfer of this type of waste to landfill must also be confirmed by the PIC, in writing form.
135. Mixed municipal waste (waste code: 20 03 01) generated at construction camps and sites will also be transported to the municipal waste landfill in Sagarejo municipality.
136. Additional information regarding environmental requirements for waste management processes is provided in the corresponding paragraph.

G. Hydraulic Connectivity and Safeguard Boundary Clarification

137. The Project under this IEE covers the rehabilitation of the Main Canal section from Ch 313+42 to Ch 397+00 (Package 1). Hydraulically, this canal section is part of a continuous conveyance system extending further downstream toward Areas 5 and 6, including the G41 and G42 offtakes.

138. It is acknowledged that the downstream canal section (Ch 397+00 to Ch 488+66.7) hydraulically connects Package 1 with Areas 5 and 6. However, the following clarifications are essential from an environmental safeguards perspective:

1. Nature of Intervention

Package 1 consists exclusively of rehabilitation works within the existing canal prism. The works do not:

- increase design discharge capacity,
- alter abstraction volumes from the source,
- introduce new diversion structures,
- modify operational flow regime, or
- expand the command area.

2. No Change in Downstream Flow Regime

The rehabilitation improves structural integrity and reduces seepage losses but does not result in increased water abstraction or additional water delivery to downstream Areas 5 and 6. Operational parameters remain governed by the existing system design and water allocation framework.

3. Safeguard Segmentation Avoidance

The downstream section (Ch 397+00 to Ch 488+66.7), which directly interfaces with Areas 5 and 6, will be subject to a separate IEE in accordance with ADB SPS (2009). That assessment will:

- evaluate site-specific environmental conditions,
- address any interface risks,
- assess potential cumulative impacts at the hydraulic transition point,
- review legacy conditions associated with Areas 5 and 6 (in coordination with the EDDR process).

4. Environmental Pathway Assessment

Since Package 1 does not involve any increase in capacity or changes to the water flow regime, it does not create any new or increased downstream environmental impacts. Therefore, under ADB SPS requirements, Areas 5 and 6 are not considered “associated facilities” of Package 1, but part of the wider irrigation system, which will be subject to separate and phased safeguards assessments.

5. Future Interface Review

The hydraulic interface between Package 1 and the downstream section will be re-assessed during preparation of the subsequent IEE to ensure continuity of environmental risk management.

Clarification Note:

139. During the public consultation held on March 6, 2026, stakeholders and PIC technical and safeguards representatives discussed the potential for expanding the irrigation command area (For details see Public Consultation Minutes – Appendix 10 and Section 8.2.4). As clarified after the public consultation, the public meeting attendees requested an increase in the irrigation area of the canal (Ch 313+42 to Ch 397+00) by approximately 200 hectares, which is a significant change.

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140. While the project acknowledges the high social demand for such expansion, the current Safeguard Boundary for Package 1 is strictly defined by the existing hydraulic capacity and the physical footprint of the canal section (Ch 313+42 to Ch 397+00).
141. Any inclusion of additional lands at this stage would constitute a Major Change in Scope under ADB SPS (2009), requiring:
- (i) New baseline environmental studies (soil, biodiversity, and hydrology) for the added areas;
 - (ii) A revised water balance model to ensure no negative impact on downstream users' water rights;
 - (iii) Re-categorization of the project if cumulative impacts exceed Category B thresholds.
142. In addition to ADB SPS (2009) requirements, such an expansion must strictly comply with the 'Environmental Assessment Code' of Georgia. Specifically:
- (i) National Regulatory Screening: According to the Code, an expansion of an irrigation project of this scale falls under Annex II activities, which legally requires a Screening Procedure by the NEA.
 - (ii) EIA Requirement: Depending on the screening results, the project may be mandated to undergo a full Environmental Impact Assessment (EIA) procedure, including new public hearings and a statutory review period.
 - (iii) Technical & Baseline Requirements: Compliance would require new baseline studies (soil, biodiversity, and hydrology) for the added areas and a revised water balance model to ensure no negative impact on downstream water rights.
143. Proceeding with an unassessed expansion would violate both ADB safeguards and national environmental legislation. Therefore, to avoid legal non-compliance and project delays, any expansion will be treated as a **separate future phase or a technical addendum**, subject to independent due diligence and national permitting.
144. The best solution would be to continue consultations with high involvement of GA and local authorities, according to which the most acceptable option can be identified - for example, the arrangement of wells independent of the canal we are considering and the provision of irrigation water to these additional plots. The technical study and justification of this alternative can be carried out independently of the given project. This requires separate feasibility studies and environmental permits.

III. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. Overview

145. The project is classified as environmental Category B under ADB's SPS (2009), requiring the preparation of an IEE and EMP. The current project, and IEE, have been prepared to these requirements.
146. During the period 2023-2026, no relevant changes were made to the environmental legislation of Georgia that would be relevant to this project and that could give rise to additional obligations.
147. As in 2023, according to the 2026 legislation, as this project is the rehabilitation of existing irrigation systems this project does not fall under the Georgian Environmental Assessment Code 2017 and an EIA is not required. However, environmental and social standards within legislation will be followed and any other required permits will be sorted.

B. Georgian Policies and Administrative Framework

1. Environmental Policy and Legal Framework

148. The Constitution of Georgia 1995 (Last amended 29.06.2020) is the overarching legal document establishing the basic rights of people to live in a healthy environment and the obligation to protect it. According to the constitution, everyone has the right to live in a healthy environment and enjoy the natural environment and public space. Everyone has the right to receive full information about the state of the environment in a timely manner. Everyone has the right to care for the protection of the environment. The right to participate in the adoption of decisions related to the environment shall be ensured by law (Article 29, Part 1). Environmental protection and the rational use of natural resources shall be ensured by law, taking into account the interests of current and future generations (Article 29, Part 2).
149. Also, the Constitution of Georgia states that the legislation of Georgia shall correspond to universally recognized principles and rules of international law. An international treaty or 4. agreement of Georgia unless it contradicts the Constitution of Georgia, the Constitutional Agreement, shall take precedence over domestic normative acts.
150. Georgia has a comprehensive legal framework for the environment. The environmental legislation is managed through the Law on Environmental Protection 1996 (Last amended 12.06.2025). The Law defines the principles and norms of legal relations, rights and obligations and responsibilities, awareness raising, education and scientific research in the field of environment and climate change.

2. Administrative Framework

151. **Ministry of Environmental Protection and Agriculture (MEPA)** is an institution of executive authority established under the Constitution of Georgia and the Law of Georgia "On the Structure, Powers and Procedures of the Government of Georgia", which exercises the powers granted to it by the legislation of Georgia to ensure the state governance and state policy in the entrusted field. The Ministry represents the state, while performing its tasks.
152. The Ministry is accountable to the Government of Georgia and performs the tasks provided for by law or assigned by the Government of Georgia and the Prime Minister of Georgia on the basis of law. The sphere of governance of the Ministry includes the management, overseeing, and promoting development in the fields of environmental protection, agricultural and rural development. The Ministry of Environmental Protection and Agriculture follows to fulfill the obligations assumed by the existing Association and

other international agreements between Georgia and the European Union. The Structural Subdivisions of the Central Apparatus of the MEPA are:

- (i) Department of Food Policy
- (ii) Department of Environment and Climate Change
- (iii) Department of Agriculture and Rural Development Policy
- (iv) Department of Biodiversity Policy
- (v) Department of Forest Policy
- (vi) Department of Land Reclamation and Land Management Policy
- (vii) Department of Waste and Chemical Substances Management Policy
- (viii) Department of Mineral Resources Policy
- (ix) Department of Strategic Coordination and Analytics
- (x) Department of Law; k) Department of International Relations and Euro-Integration
- (xi) Department of Strategic Communication
- (xii) Department of Administration
- (xiii) Department of Finance
- (xiv) Department of Internal Audit
- (xv) Department of Human Resources Management
- (xvi) Department of Information Technologies
- (xvii) Protocol Service.

153. MEPA also has several agencies under them. Key agencies for the project include:

- (i) Georgian Amelioration – is responsible for the management and rehabilitation of the irrigation systems
- (ii) Agency of Protected Areas – manage reserves, national parks, natural monuments, protected landscapes, world heritage sites and wetland sites of international importance.
- (iii) Agency of Wildlife
- (iv) National Environmental Agency – issues and disseminates information on environmental conditions including pollution, hydro-meteorological, geodynamic processes and conducting Environmental Assessment.

154. The National Environment Agency (NEA) is a legal entity of public law within the system of the Ministry of Environmental Protection and Agriculture of Georgia, which was established as an agency on September 1, 2008. The agency is an organization which is independent from state administration authorities, which operates independently under state control. The Agency is guided by the Constitution of Georgia, international treaties of Georgia, decrees of the President of Georgia, resolutions and directives of the Government of Georgia, orders of the Minister of Environmental Protection and Agriculture of Georgia, its Statutes, other legislative and by-law normative acts and individual administrative-legal acts of the head of the Agency.

155. One of the main goals of NEA is to establish systems for monitoring ongoing meteorological, hydrological, geological processes and environmental (ambient air, surface and underground waters, sea, soil) quality status on the territory of Georgia and ensure their proper functioning. The NEA also aims to discuss and agree on a draft plan of measures to remedy significant environmental damage. The functions of the NEA Environmental Assessment Department include, in accordance with the procedure established by Georgian legislation, the implementation of the screening procedure and

the preparation of the screening decision; the implementation of scoping and EIA procedures.

156. Ministry of Culture, Sports and Youth - responsible for protecting Georgia's cultural heritage supervision as well as sports and youth development. If construction is to be carried out in historic sites or zones of cultural heritage, consent of the Ministry of Culture, Monument Protection and Sport is also required for issuing a construction permit.
157. Ministry of Economy and Sustainable Development – responsible for planning and construction to ensure sustainable and safe construction works, sets technical standards of construction works and energy efficiency building. The key agency under this ministry is the Technical and Construction Supervision Agency who are responsible for issuing construction permits. LEPL National Agency for Mineral Resources is there for issuing licenses for mineral resources.

3. Georgian Environmental Impact Assessment Rules and Procedures

158. **Environmental Assessment Code (EAC) 2017 (Last amended 26.06.2025).** The Code establishes a legal basis for regulating issues related to projects and strategic documents, the implementation of which may have a significant impact on the environment, human life and health. It regulates the procedures related to environmental impact assessment, strategic environmental assessment, public participation in decision-making, transboundary environmental impact assessment; defines the rights and obligations of the developer, the planning authority, the public and the competent authorities in the course of decision-making envisaged by this Code; describes procedures of issuing Environmental Decision; exemption rules. The law includes two annexes. Annex I list activities subject to EIA, and Annex II - lists activities/projects that require screening procedure. Screening is the responsibility of NEA. According to the document, the main stages of environmental impact assessment include:
 - (i) Screening.
 - (ii) Scoping procedure.
 - (iii) Preparation of the EIA Report by the developer or the consultant.
 - (iv) Ensuring public participation.
 - (v) Examination of the information presented in the EIA Report and any supplementary information provided by the developer to the NEA as well as assessment of the information received through the public participation and consultation processes.
 - (vi) Expertise procedure.
 - (vii) Implementation of transboundary environmental impact assessment procedure (weather appropriate).
 - (viii) Issuance of Environmental Decisions or the decision on refusal to implement the project by the NEA.
159. In June 2025, significant changes were made to the Code. Among them, the screening, scoping, and EIA procedures were changed. The list of activities subject to screening and EIA was also clarified, including the fact that river bank protection works are no longer subject to the screening procedure.
160. Despite the changes in the case of rehabilitation of the irrigation systems, the development of a screening document is not still required within the scope of the Package 1. However, according to the requirements of the Code, a screening procedure is still required for activities such as mineral processing (including the operation of sand and gravel crushing plants) and the construction and operation of wastewater treatment plants. These issues should be considered by the construction contractor: The contractor

will be strictly required to source sand, gravel, and stone only from legally licensed suppliers/quarries that have valid Environmental Decisions and approved Emission permits. Before any material is sourced, the contractor must submit copies of the supplier's licenses and environmental permits to the PIC for verification.

161. If the construction contractor decides to use a facility subject to the EIA procedure (for example, sand and gravel crushing plants), the contractor is required to prepare the Maximum Permissible Discharge (MPD) norms for wastewater discharge and agree this document with the NEA (According to Resolution No 414 (31/12/2013) on approval of the technical regulations on the calculation of the maximum permissible discharge of polluting substances into surface water bodies). If such facilities are not arranged or such facilities are not subject to EIA based on screening, then the construction contractor must agree with the NEA on water intake and discharge. In this case, the requirements of Resolution No. 425 (31/12/2013) on the approval of the technical regulations for the protection of surface water of Georgia from pollution should be taken into account. The contractor must produce quarterly reports on the quantities of water consumed and discharged. This ensures legal compliance with EAC and prevents violations of water quality standards.
162. **Law of Georgia on Licenses and Permits 2005 (Last amended 13.05.2025).** The Law regulates activities that may result in an increased hazard to human life or health, involves interests of importance to the State or public, or are connected to the consumption of State resources. The Law defines the full list of activities that require licenses and

4. Relevant Laws of Georgia

163. **Law of Georgia on Water Resources Management (Last amended 26.06.2025)** covers the sustainable use and protect of water and to prevent contamination, pollution and depletion of water. This law regulates the intake and discharge of water as well as setting out the procedures for water standards and maximum permissible rates of emissions. It also sets out the river water protection zone to protect the river from pollution, littering, fouling and depletion. For rivers such as Iori, the protected area is 50 m from the edge of the riverbed. For small rivers that cross the main channel, the protected area is 10 m from the edge of the riverbed. This should be taken into account when planning the location of construction camps, including potentially polluting temporary facilities.
164. **Law on regulation and engineering protection of the sea and river banks 2002 (Last amended 20.10.2023).** This law is to protect the stability of coastal zones, waterways and rivers and to prevent erosion.
165. **Waste Management Code 2015 (Last amended 26.06.2025)** covers the implementation of measures to implement the waste management hierarchy (prevent, reuse, recycle and recover) as well as to ensure safe disposal to protect the environment and human health. The waste is responsible for the storage, collection, transportation, disposal or recovery, recording and reporting of waste to prevent pollution and risks to human health. If more than 2 tons of hazardous waste is produced in a year, a separate collection system and appropriate training for all staff handling the waste are required and an appropriate environmental manager should ensure safe management.
166. The Construction Contractor must hire a duly qualified environmental manager who will be obliged to develop Waste Management Plan and submit it to MEPA for approval. The Construction contractor is obliged to control the process of managing the originated waste through the final disposal of the waste. waste management plan is updated every 3 years or in case of changes in the type and quantity of waste generated and significant changes in the waste management process.

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167. **Law of Georgia on Protection of Ambient Air 1999 (Last amended 02.07.2025)** regulates the protection of atmospheric air from harmful anthropogenic influences (including hazardous, radiation, microorganisms and biological matter, noise, vibration, electromagnetic fields and other impacts) to ensure a safe environment for human health and the natural environment. It outlines the procedures for the maximum permitted limits for hazardous substances into the air.
168. **Law of Georgia on Cultural Heritage 2007 (Last amended 12.12.2024)** covers the protection of cultural resources. It outlines the chance find procedures, requiring the construction to pause until appropriate investigation and mitigation measures are taken and to protect known cultural resources.
169. **Law of Georgia on Soil Protection 1994 (Last amended 02.11.2021)**. The Law sets the maximum permissible concentrations of hazardous matter in soil and restricts the use of fertile soil for non-agricultural purposes, the execution of any activity without prior striping and preservation of topsoil, open quarry processing without subsequent re-cultivation of the site, terracing without a preliminary survey of the area and approved design, agricultural activities that could lead to overgrazing, woodcutting, damage of soil protection facilities, and any activity that could deteriorate soil quality (e.g. unauthorized chemicals, etc.). The law sets a general basis for the protection of soil from erosion, contamination, sedimentation, sanitization, secondary swamping, etc., regulation of the open extraction of natural resources and construction materials, and impacts from human economic activity.
170. **Law on Wildlife 1996 (Last amended 29.06.2023)**. The law mandates the MEPA to regulate wildlife use and protection overall territory of the country, including existing protected areas. The law empowers the MEPA to issue hunting permits and licenses, declare hunting areas, control poaching, etc. It is one of the main goals of the Environmental Protection Law to support the preservation of biodiversity of the country, the preservation of rare, endemic and endangered species, the protection of the marine environment, and the maintenance of the ecological balance (Art. 3.1 (d)). The Law contains regulations on both wild animals and plants which are threatened by extinction and those which are not. Two main legal acts regulate species protection in Georgia. This law also determines activities in protected areas by the corresponding structural units. Potential poaching by the workers should be controlled also during construction works.
171. **Law on Red List and Red Book of Georgia 2003 (Last amended 02/07/2025)** The Law establishes the legal basis for the preparation and approval of the Red List and Red Data Book to provide these instruments for the protection and restoration of threatened species of flora and fauna.
172. **Forest Code of Georgia 2020 (Last amended 30.11.2023)**. This aims to conserve the biodiversity of Georgia's forests and preserve the natural and cultural environment of the forest. The protected forest; is an area of forest forming species that are within 100m from road edge headworks or riverbanks, on eroded land, etc. and should be managed in line with the law on the system of protected areas and the protected area management plan.
173. **Law on the system of the protected areas 1996 (Last amended 26.04.2022)**. Aims to protect and restore the biodiversity of Georgia by establishing an area for protecting and restoring significant national heritage. There are different types of protected areas – state reserves, national parks, natural monuments, managed reserves etc. Each of the protected areas requires management plans outlining the boundaries, management and monitoring of the area.
174. **Law on Environmental Liability 2021 (Last amended 26.06.2025)**. This law introduces the polluters pays principle, regulating the prevention of significant environmental damage, mitigation (prevention) of damage, damage assessment and remedial measures. This includes criteria for determining significant harm.

175. **Law on Public Health 2007 (Last amended 13.12.2024).** The law defines the rights and obligations of the population and legal entities in the field of public health. To establish an environment safe to public health, the Ministry sets the qualitative mandatory standards for the environment safe for human health (atmospheric air, water, soil, noise, vibration, electromagnetic radiation), including maximum permissible concentrations and rates of harmful impact. It's an obligation to prevent activities which cause infectious and non-infectious diseases spreading, to protect the sanitary and epidemiological standards, and to inform the public health department about all emergencies caused by the violation of the sanitary norms. The observance of the standards is controlled by appropriate state structures. The responsibility for the internal and external audits rests with a certified, independent laboratory.
176. **Acoustic Noise Limits for Rooms/Premises in Residential Houses and Public Establishments Regulation 2017.** This sets the maximum permissible noise limits.
177. **Organic Law on Agricultural Land Ownership 2019.** The law ensures improved agricultural land structure through rational resource use, avoiding fragmentation of land and avoiding unsustainable use. Defines land acquisition of state-owned agricultural land, and land ownership issues related to preventing land alienation.
178. **Civil Code of Georgia 1997 (Last amended 26.06.2025).** This code regulates the contrail relation, rights and responsibilities of persons, differential between movable and immovable property and acquisition of property.
179. **Law on Determination of the Designated Purpose of Land and on Sustainable Management of Agricultural Land 2019.** The law ensures the rational use and protection of land through determining and monitoring agricultural land and compensation for changing the use of land from agricultural to non-agricultural and state acquisition of agricultural land.
180. **Law on Rules for Expropriation of Property for Social Needs 1999 (Last amended 13.06.2023).** This law outlines the requirements and procedure for expropriation for social needs, including the preconditions and requirements for fair compensation.
181. **Organic Law of Georgia on Labor Safety 2019 (Last amended 26.06.2025).** The Law defines basic requirements and preventive measures in terms of workplace safety for employers. The Law applies to jobs considered to be of 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.
182. **Law on State Property 2010 (Last amended 13.12.2024).** This law covers state property management and transfer for use. The Ministry of Economy and Sustainable Development are responsible for the property.
183. **Labour Code of Georgia 2010 (Last amended 16.04.2025).** The code regulates employment relations. Employers are obliged to comply with the requirements and clauses of the document to ensure that the rights of employees are protected.
184. Other relevant decrees, resolutions and orders are listed below.

Table 2. Georgian Decrees

Environmental Decrees
Decree No. 303 'On approving the Red List of Georgia', 2006
Order No. 297 'On Approval of Norms of Quality of Environment'
Resolution No 383 (27/07/2018) on approval of European ambient air quality standards (EU directives 2008/50/EC, 2004/107/EC)
Resolution No 383 (27/07/2021) on the approval of the regulation on forest protection, restoration and maintenance

Resolution No 145 (29/03/2016) on the approval of the technical regulation on special requirements for the collection and treatment of hazardous waste
Resolution No 190 (20/02/2014) on approving the Red List of Georgia
Resolution No 424 (31/12/2013) on removal, storage, use and recultivation of fertile soil
Resolution No 423 (31/12/2013) on approval of technical regulations for the protection of fisheries and fish stocks
Resolution No 414 (31/12/2013) on approval of the technical regulations on the calculation of the maximum permissible discharge of polluting substances into surface water bodies
Resolution No 425 (31/12/2013) on the approval of the technical regulations for the protection of surface water of Georgia from pollution
Resolution No 413 (31/12/2013) on the approval of the technical regulations for the self-monitoring and reporting of the release of harmful substances from stationary sources of pollution
Resolution No 146 (25/03/2022) on the approval of the rules for the restoration, cultivation, maintenance, protection and supervision of the windbreak strip
Resolution No 414 (23/06/2014) on the approval of the procedure for demarcation of the borders of the protected areas
Resolution No 398 (15/08/2017) on acoustic noise norms in the premises and areas of residential homes and public / public institutional buildings
Resolution No 143 (31/03/2016) regarding the approval of the technical regulation - "Waste Transportation Rules"
Resolution No 144 (26/03/2016) about the rules and conditions for registration of waste collection, transportation, preliminary treatment and temporary storage
Ordinance No 386 (01/07/2020) on the Approval of the Procedure and Conditions for Payment and Exemption from Payment of Compensation for Changing the Designated Purpose of a Plot of Agricultural Land, as well as for Changing the Category of a Plot of Agricultural Land

Table 3. Gap Analysis between ADB Safeguard Requirements and National Environmental Legislation

Aspect	Asian Development Bank	National Regulations	Harmonized Framework
Environmental Policy and Regulations	ADB SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas: Environmental safeguards, Involuntary resettlement safeguards, and Indigenous people safeguards	Environmental assessment and permitting procedure in Georgia are set out in the following laws and regulations: #Law of Georgia on Licenses and Permits 2005 (Last amended 1.04.2026). # Environmental Assessment Code (EAC) 2017 (Last amended 16.08.2021) .	
Screening	ADB carries out project screening and categorization at the earliest stage of project preparation when sufficient information is available for this purpose using rapid environmental assessment (REA) checklist. Categories A, B, C, FI	Project is the rehabilitation of existing irrigation systems. This project does not fall under the Georgian Environmental Assessment Cod 2017 and an EIA is not required.	The project is classified as Category B (ADB classification)

Aspect	Asian Development Bank	National Regulations	Harmonized Framework
Scoping	Avoid, minimize, mitigate and/or offset any adverse impacts and enhance positive impacts through environmental planning and management	The environmental assessment will consider: (i) compliance of the proposed project with the environmental requirements, (ii) level of risk related to project implementation and efficiency of developed measures to mitigate identified impacts.	The environmental and social standards within Georgian Legislation, Decrees and Rules will be followed and any other required permits will be sorted. Law on Environmental Protection 1996 (Last amended 02.03.2021): The Law defines the principles and norms of legal relations, rights and obligations and responsibilities, awareness raising, education and scientific research in the field of environment and climate change.
	Executing Agency considers potential impacts (direct, indirect and cumulative) and risks on physical, biological, resettlement, socio-economic (including health and safety), and physical cultural resources	Environmental assessment considers the project's potential impacts on physical, biological, socio-economic, and cultural resources, including cumulative impacts.	The required permits and approvals will consider natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous people, and physical cultural resources).
Alternatives	Examination of financially and technically feasible alternatives to the project location, design, technology and components, their potential environmental and social impacts Consider "without project" scenario.	Project Alternatives not required.	Assessment of alternatives will include alignment and "without project" project scenario.

Aspect	Asian Development Bank	National Regulations	Harmonized Framework
Environmental Assessment Report	Guidelines and Table of Contents are provided for environmental assessment report in ADB SPS: (i) Executive Summary, (ii) Policy, Legal and Administrative Framework, (iii) Description of the project, (iv) Description of the Environment, (v) Anticipated Environmental Impacts and Mitigation Measures, (vi) Analysis of Alternatives, (vii) Information disclosure, Consultations, and Participation, (viii) Grievance Redress Mechanism, (ix) Environmental Management Plan, and (x) Conclusion and Recommendation. EMP will include proposed mitigation measures, monitoring and reporting requirements, institutional arrangements, schedules, cost estimates and performance indicators.		The IEE and EMP reports will follow the table of contents proposed in ADB SPS. Following the requirements of ADB SPS, MEPA 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, MEPA shall achieve whichever is more stringent.
Public Consultations	Carry out meaningful consultations with affected people and facilitate their informed participation Ensuring women's participation in consultation. Involving stakeholders, project- affected people and concerned NGOs early in the project preparation and ensure that their views and concerns are made known and understood by decision makers and considered. The consultation process and its results are to be documented and reflected in the environmental assessment report.	Public meetings are mandatory for the Projects requiring EIA.	Consultations will be carried out with stakeholders, affected people, NGOs in accordance with COVID-19 restrictions. Questions and concerns raised during preliminary consultations held during preparation stage have been considered. All questions and concerns raised during stakeholder consultations have been considered in IEE. Also, a signed list of participants and photos from meetings are attached to this IEE.

Aspect	Asian Development Bank	National Regulations	Harmonized Framework
Public Disclosure	IEE will be disclosed on the websites of ADB. The borrower needs to provide relevant environmental information in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.	National environmental legislation does not require disclosure of IEE.	The summary of the final IEE, EMP and GRM will be translated into Georgian language, documents will be posted on MEPA / GA website.
Monitoring and Reporting	The borrow/client must monitor and measure the progress of implementation of the EMP and prepare periodic monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions if any	The Construction Contractor shall hire a duly qualified environmental staff who will develop Waste Management Plan and submit it to MEPA for approval. The report on waste generation will have to be submitted by the Implementing Agency to concerned authorities as per the Waste Management Code 2015 (Last amended 15.07.2020)	Environmental Monitoring Plan (EMoP) has been developed under this IEE to monitor implementation of EMP requirements. The IEE also includes requirements on preparation of semi-annual Environmental Monitoring Reports and their submission to ADB for further disclosure on ADB and MEPA / GA websites.
Grievance Redress Mechanism	The GRM must be established to receive and facilitate resolution of affected peoples' concerns and grievances about the project/s environmental performance.	No GRM requirements applicable to the Project.	The GRM for this Project will be developed in accordance with ADB and national requirements.

C. International Agreements

185. Georgia is part of multiple international treaties and regional Multilateral Environmental Agreements (MEAs), including 18 conventions. The international conventions ratified are below:

Table 4. Key International Conventions Ratified

Agreement	Date Ratified
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1975	1996
Paris Convention on protection of the Archaeological Heritage, 1982	1992
UN Convention on Biological Diversity 1993	1994
UN Framework Convention on Climate Change 1994	1994
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1992	1995
Vienna Convention for the Protection of the Ozone Layer, 1985	1996
Montreal Protocol on Substances that Deplete the Ozone Layer, 1987 (and its London, Copenhagen, Montreal and Beijing Amendments 2000 and 2011)	1996
European Cultural Convention, 1954	1997
Kyoto Protocol to UNFCCC, 1997	1999
UN Convention to Combat Desertification 1996	1999
Convention on the Conservation of Migratory Species of Wild Animals (also called the Bonn Convention), 1983	2000
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), 1998	2000
European Convention on the Protection of the Archaeological Heritage, 1985	2000
Convention for the Protection of the Architectural Heritage of Europe, 1985	2000
Agreement on The Conservation of African-Eurasian Migratory Waterbirds, 1995	2001
Agreement on The Conservation of Populations of European Bats, 1991	2002
Ministerial Conference on the Protection of Forests in Europe (known as Forest Europe), 1990	2003
International Plant Protection Convention (1997 Revised Text), 1997	2007
Stockholm Convention on Persistent Organic Pollutants, 2001	2007
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998	2007
UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003	2008
International Convention for The Protection of New Varieties of Plants, 1961	2008
Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 1997	2009
Convention on the Conservation of European Wildlife and Natural Habitats (Bern), 2008	2010
European Landscape Convention, 2000	2011
Council of Europe Framework Convention on the Value of Cultural Heritage for Society (Faro Convention), 2005	2011
2030 Agenda for Sustainable Development, 2015	2015
Paris Agreement 2016	2017

Regional Cooperation

186. **Ecoregion Conservation Plan for the Caucasus**¹⁴ Georgia has worked with its neighbouring countries to create an “Ecoregion Conservation Plan for the Caucasus” (2006, updated 2012), which aligns with the Aichi biodiversity goals. This identifies regional hotspots and regional corridors to be prioritized for conservation and 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.

D. ADB Safeguards Policy Statement (2009)

187. ADB’s SPS (2009) purpose is to avoid, minimise, or mitigate environmental and social impacts and is covered by three operational policies: (i) environmental safeguards; (ii) involuntary resettlement safeguards; and (iii) indigenous peoples safeguards. The objectives of ADB’s safeguards are to:

- Avoid adverse impacts of projects on the environment and affected people, where possible;
- Minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and,
- Help borrowers/clients strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

188. At an early stage, projects are screened and categorised based on the significance of potential project impacts and risks and determine the level of assessment required:

- **Category A.** Likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented; impacts may affect an area larger than the sites or facilities subject to physical works. An Environmental Impact Assessment is required.
- **Category B.** Proposed project’s environmental impacts are less adverse and fewer in number than those of category A projects; impacts are site-specific, few if any of them are irreversible, and impacts can be readily addressed through mitigation measures. An Initial Environmental Examination is required.
- **Category C.** Proposed project is likely to have minimal or no adverse environmental impacts.

189. The SPS also promotes the use of international standards, including the World Bank Group’s EHS Guidelines. EHS guidelines relevant to the project include environment protection, water conservation, hazardous materials, waste management, noise control, sanitation, and community and occupational health and safety. Where EHS standards are higher than national standards, efforts are made for ADB-funded projects to target the EHS standards.

190. Under the SPS, this project proponent is Category B based on the Rapid Environmental Assessment Checklist, see Annex 1. As a Category B project an Initial Environmental Examination, establishing the baseline and identification of all potential impacts are required. As part of this, an Environmental Management Plan and Grievance Redress Mechanism will also be required.

¹⁴ https://wwfeu.awsassets.panda.org/downloads/ecp_2020_part_1_1.pdf?1388891/Ecoregion-Conservation-Plan-for-the-Caucasus

Updated Initial Environmental Examination Kverno Samgori Left Main Canal Irrigation Scheme – Package 1: Main Canal Ch 313+42 to Ch 397+00

E. Environmental and Social Requirements under ADB ESF 2024

191. ADB's new Environmental and Social Framework (ESF, 2024, effective January 2026; current projects under SPS 2009) establishes a broader and more detailed system for environmental and social management. The ESF consists of the following five core elements:

- A vision for sustainable development
- Environmental and Social Policy for ADB
- Ten mandatory Environmental and Social Standards (ESS1–ESS10)
- Specific requirements for various financing modalities
- A list of prohibited investment activities

192. The 10 ESSs include:

- ESS1 – Environmental and social impact management
- ESS2 – Labor and working conditions
- ESS3 – Resource efficiency and pollution prevention
- ESS4 – Health, safety, and security
- ESS5 – Land acquisition and resettlement
- ESS6 – Biodiversity and natural resource protection
- ESS7 – Indigenous Peoples protection
- ESS8 – Cultural heritage
- ESS9 – Climate-related risks
- ESS10 – Stakeholder engagement and information disclosure.

F. Environmental Regulations and Standards

193. The project will need to follow World Bank's Environment, Health and Safety Guidelines (EHS Guidelines)¹⁵ as environmental and social standards that are in line with good international practice (as required under the ADB SPS) and ensure we comply with national law. Limits from Georgian legislation and the EHS Guidelines are summarized below:

1. Ambient Air Quality Standard

194. Maximum permissible concentrations for air-borne pollutants are set by the Law of Georgia on Protection of Ambient Air 1999. These sets standards are set to limit hazardous emissions. Annual maximum capacity is defined for each hazardous substance and is calculated so that for each stationary source of emission cumulative emission from all registered sources of discharge does not exceed the relevant maximum permitted value. The polluter is responsible for monitoring the emissions and managing the polluting processes to ensure compliance with the law.

195. Following Resolution No 383 (27.07.2018) on approval of European ambient air quality standards (EU directives 2008/50/EC, 2004/107/EC), Georgian legislation also complies with the EU Air Quality Directive limits.

Table 5. Ambient Air Quality Standards

Ambient Air Quality Standards

	Reference Limit ($\mu\text{g}/\text{m}^3$)	Project
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¹⁵ <https://documents1.worldbank.org/curated/en/157871484635724258/pdf/112110-WP-Final-General-EHS-Guidelines.pdf>

Updated Initial Environmental Examination Kverno Samgori Left Main Canal Irrigation Scheme – Package 1: Main Canal Ch 313+42 to Ch 397+00

Parameter	Average Period	National	EHS Guidelines Limits	Limits (µg/m ³)
Carbon Monoxide (CO)	8 hours	10		10
Ozone	8 hours	120	100	100
PM10	24 hours	50	50	50
	1 year	40	20	20
PM2.5	24 hours		25	25
	1 year	25	10	10
Nitrogen Dioxide (NO ₂)	1 hour	200	200	200
	1 year	40	40	40
Sulphur Dioxide (SO ₂)	10 minutes		500	500
	1 hour	350		350
	24 hours	125	20	20

2. Surface Water Quality Standards

196. Surface Water Quality Standards are required under the Law of Georgia on Water Resources Management 2023. For discharge to water, permits are needed with Maximum Permissible Discharge Documents calculating the volumes of the discharge and impact on the environment. The standards are set by Order No 297 'On Approval of Norms of Quality of Environment.'

Table 6. Applicable Standards for Surface Water Quality

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

197. The maximum permissible concentration of micronutrients for agricultural water supply as per Order No 297 'On Approval of Norms of Quality of Environment' are as follows:

Table 7. Maximum Permissible Concentration of Micronutrients for Agricultural Water Supply

Parameter	Maximum Permissible Concentration (mg/l)
Arsenic	0.05
Barium	0.1
Beryllium	0.0002
Bismuth	0.1

Boron	0.5
Bromine	0.1
Cadmium	0.001
Chromium	0.5
Cobalt	0.1
Copper	1.0
Fluoride	1.5
Lead	0.03
Lithium	0.3
Molybdenum	0.25
Nickle	0.1
Selenium	0.01
Silver	0.0005
Strontium	7.0
Tin	0.1
Tungsten	0.05
Vanadium	0.1
Zinc	1.0

3. Groundwater Quality Standards

198. There is no Georgian legislation with regard to the quality and standards for groundwater. Instead, the quality of groundwater is regulated by norms set for potable water.

Table 8. Potable Water Criteria Index

	Measuring Unit	Standard Not more than:
Common Characteristics		
Hydrogen index	PH	6-9
Permanganate oxidation	mg O ₂ /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

4. Noise

199. Noise standards are set according to the Acoustic Noise Limits for Rooms/Premises in Residential Houses and Public Establishments Regulation 2017 and are included in Table 9.
200. For EHS Guidelines, the noise impacts should not exceed the levels presented in Table 10 and Table 11, nor result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.
201. Generally, the noise level limit is represented by the background or ambient noise levels that would be present in the absence of the facility. It is also important to note that when identifying background noise levels, highly intrusive noises such as passing trains should not be excluded.

Table 9. Georgian Standards for Noise Levels (Allowable Limits Indoors, not at the Building Facade)

Purpose/ use of area and premises	Allowable Limits (A-Weighted Decibels (dBA))		
	Day (8am to 7pm)	Evening (7pm to 11pm)	Night (11pm to 8am)
Educational facilities and library halls	35	35	35
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 services and children’s facilities (<6 story buildings)	50	45	40
Areas bordering houses residential, medical establishments, social service, and children’s facilities (>6 story buildings)	55	50	45
The areas bordering hotels, trade, service, sport, and public organizations	60	55	50

Note: 1. in case noise generated by indoor or outdoor sources is an impulse or tonal, the limit must be 5dBA less 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 10. Applicable Noise Level Guidelines Per WB EHS Guideline

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

Table 11. Applicable Work Environment Noise Limits Per WB 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

5. Vibration

202. Vibration standards for human health are set out in Residential Houses, Hospitals and Rest Houses, Sanitary Norms 2001 (Table 13). The EHS Guidelines do not set limits on vibration themselves instead refer to ACGIH for safety limits on vibration, Table 14. The American Association of State Highway and Transportation Officials provides maximum vibration levels for preventing damage to buildings, Table 12.

Table 12. Georgian General Admissible Vibration Values

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. 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 13. ACGIH Hand-Arm Vibrations Threshold Limit Values

Total Daily Exposure Duration	Values	
	m/s ²	g ^c
Between 4 and 8 hours	4	0.40
Between 2 and 4 hours	6	0.61
Between 1 and 2 hours	8	0.8
Under 1 hour	12	1.22

Table 14. American Association of State Highway and Transportation Officials (AASHTO) Maximum Vibration Levels for Preventing Damage

Type of Situation	Limit (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

6. Soil Quality

203. To prevent the contamination of soils, the anthropogenic releases of hazardous materials, as well as those naturally occurring, must be monitored and limited by the following set standards in Table 15 to align with the **Law of Georgia on Public Health (adopted in 2007)**. These admissible concentrations must be kept in line to prevent further contamination into groundwater, surface water, and surrounding locations, limiting the potential risks to human and ecological health. The Law on Soil Protection, adopted in 1994, also sets out the policy requirements for maintaining fertile soils and preventing deterioration, including the use and action taken on the soil.

Table 15. Maximum Admissible Concentrations of Various Substances and Elements in Soils

Parameter	Unit	Limit
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
Benzoyl	mg/kg	0.3
Toluene	mg/kg	0.3
Compound Xylene (ortho, meta, para)	mg/kg	0.3
Benzopyrene	mg/kg	0.02
Isopropylbenzol	mg/kg	0.5
Atrazine	mg/kg	0.5
Linden	mg/kg	0.1
DDT (and its metabolite)	mg/kg	0.1

G. Permits Potentially Required

204. Necessary regulatory clearances and approvals need to be obtained prior to the commencement of works. PIU, with the support of project consultants and contractors, are responsible for obtaining the clearances/permits and ensuring the provisions are incorporated in the subproject design, costs, and implementation. Table 16 shows the list of clearances or permissions required for the subprojects. This list is indicative.

Table 16. Different Permits Required under Georgian National Legislation

Construction Activity	Clearance Required	Implementation	Supervision
Land for Project Activity	Allotment and approval for specific land use in the pre-construction stage	Implementing Agency	Executing Agency
Construction in heritage areas	Relevant conclusion of the National Agency for Cultural Heritage Preservation of Georgia	Implementing Agency	Executing Agency
Tree Cutting	Relevant conclusion of the National Forestry Agency under the MEPA.	Implementing Agency/ Construction contractor	Executing Agency

Hot mix plants, crushers, batching plants	Relevant conclusion of the NEA	Construction contractor	Implementing Agency
Storage, handling, and transport of hazardous materials	Relevant conclusion of the NEA	Construction contractor	Implementing Agency
Technical Report on the Inventory of Stationary Sources of Harmful Substances Emission into the Atmospheric Air	Relevant conclusion of the NEA	Construction contractor	Implementing Agency
Water Intake Permit — Use of Water for Technical Purposes	Obtaining a permit from the LEPL "National Environmental Agency" or the local water supply company	Construction contractor	Implementing Agency
Sand mining, quarries and borrow areas	LEPL The National Agency of Mineral Resources	Implementing Agency	Implementing Agency
Waste Management Plan (possibly Asbestos-Containing Waste Management Plan) Agreement	Agreement with the Waste and Chemicals Management Department of the MEPA	Construction contractor	Implementing Agency
Certificate of the Absence of Animal Burial Sites within the Area of Earthworks	Obtaining a certificate from LEPL "National Food Agency,"	Construction contractor	Implementing Agency
Temporary traffic diversion during construction	Relevant conclusion from the Ministry of Internal Affairs of Georgia (Patrol Police Department)	Implementing Agency	Implementing Agency
Establishment of construction camps	Relevant conclusion of the MEPA	Implementing Agency	Executing Agency
Disposal of Construction waste and demolition debris	Relevant conclusion of the MEPA	Implementing Agency	Executing Agency

IV. BASELINE ENVIRONMENT AND SOCIO-ECONOMIC DATA

A. Physical Setting

1. Climate

205. The climate in the plains of East Georgia is a dry subtropical climate, and in the mountainous areas, it is alpine. The plains of eastern Georgia are shielded from the western, sub-tropical influence of the Black Sea by mountains that provide a more continental climate.
206. In the period 2023-2026, there is no new and reliable information on the climatic conditions of the main canal location area. During this period, no projects were implemented in this area that could have had an impact on climatic conditions (for example, commissioning of large reservoirs, etc.). Therefore, the information presented in the IEE prepared in 2023 was considered valid and is presented below.
207. Precipitation is presented in Figure 15. Sagarejo precipitation as annual totals from 1960 to 2020, with a suggested estimated annual decline from 800 to 700 mm over the period. This is about a 12 % reduction over 60 years or 2% per decade. In the Kvemo Kartli region, south of Tbilisi, by more than 5% per decade.
208. **Temperature** trends for three stations in Eastern Georgia are presented in Figure 16. The mean monthly (maxima and minima) temperature trends across the period from 1960 to 2020 for January and July respectively. The trends are slightly upward for minimum temperatures, though this is a non-significant regression of temperature over years. For winter months the CV % (stdev/ mean) are very high for minima and shows significant variance in minimum temperatures over months.
209. **Wind** has shown little change over the years with the averages being 130km/day; with July, August and October typically lower and December to February typically experiencing higher winds. The majority of the winds are north western and northern winds in Sagarejo Municipality and western and south-western in Gurjaani Municipality.
210. **Humidity** averages at 71%, lowest in July at 63% and highest at 79% in November. This has been consistent over the years.
211. **The total ice area loss** between 1911–1960 was 8,1% or 49.9 km², while the number of glaciers increased from 515 to 786. Between 1960–2014, the glacier area decreased by 36.9%, from 563.7 km² to 355.8 km² 278 and glacier numbers from 786 to 637.

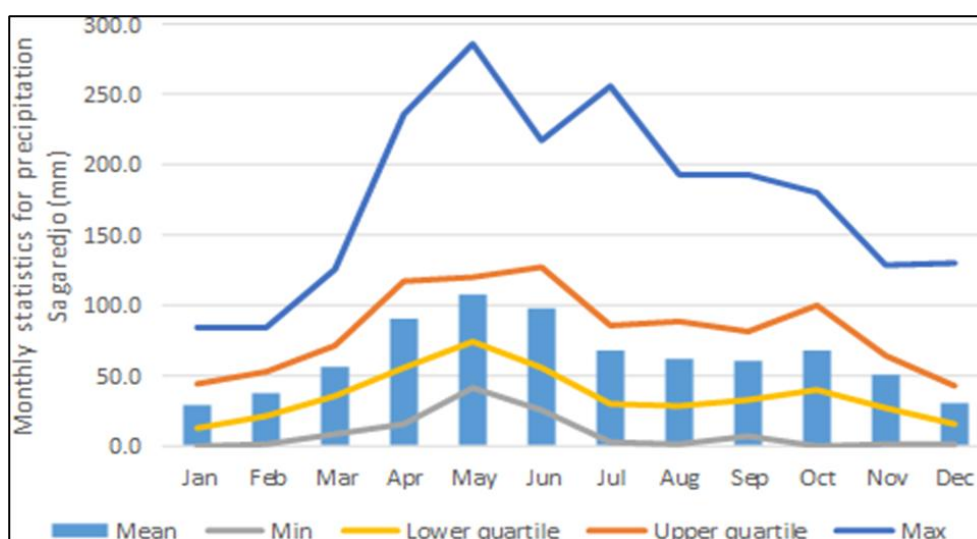


Figure 15. Statistics of Monthly Mean Precipitation Data for Sagarejo from 1960 to 2020

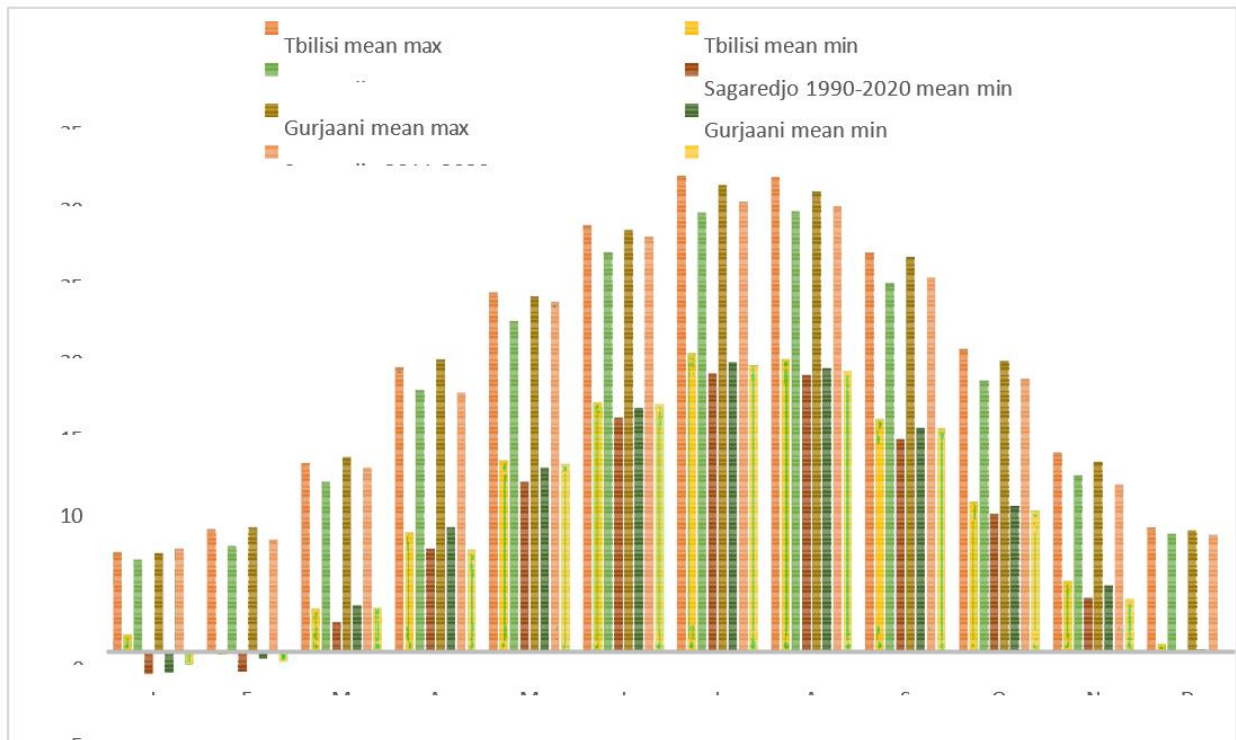


Figure 16. Mean Monthly Temperature Trends for Three Stations in Eastern Georgia and Over Different Reporting Periods for Tbilisi, Sagaredjo and Gurjaani.¹⁶

212. Natural Disasters. The WB Think Hazard identified the following disaster risks for Sagarejo Municipality in Georgia based on historical trends, shown in Table 17.

213. Figure 17.¹⁷ The historical trend shows that in the Sagarejo area, the main natural disasters are likely to be (in order of likelihood): wildfires, extreme heat events, river floods, earthquakes and landslides. The first two are likely to be exacerbated by rising temperatures from climate change. The frequency of hailstorms, frosts and strong winds has been increasing in Georgia, affecting the Kakheti and Adjara regions among others.

Table 17. Probability of Possible Natural Disasters in Georgia.¹⁸

Type of hazard or disaster	Geoportal of Natural Hazards and Risks - Package 1	ThinkHazard Risk rating	Probability of occurrence
River floods	None	Medium	>20% in 10 years
Earthquakes	Medium	Medium	>10% in 5 years
Landslides and Mudflow	1 - 16: Medium 17<: Low	Medium	NA
Wildfires	1 - 16: Medium 17<: High	High	50%
Extreme heat events		Medium	>25% in 5 years

¹⁶ Source: TA-6648 GEO consultants

¹⁷ WB Think Hazard! is developed and maintained by the Global Facility for Disaster Reduction and Recovery (GFDRR Labs) <http://thinkhazard.org/>

¹⁸ Source: <https://thinkhazard.org/en/>

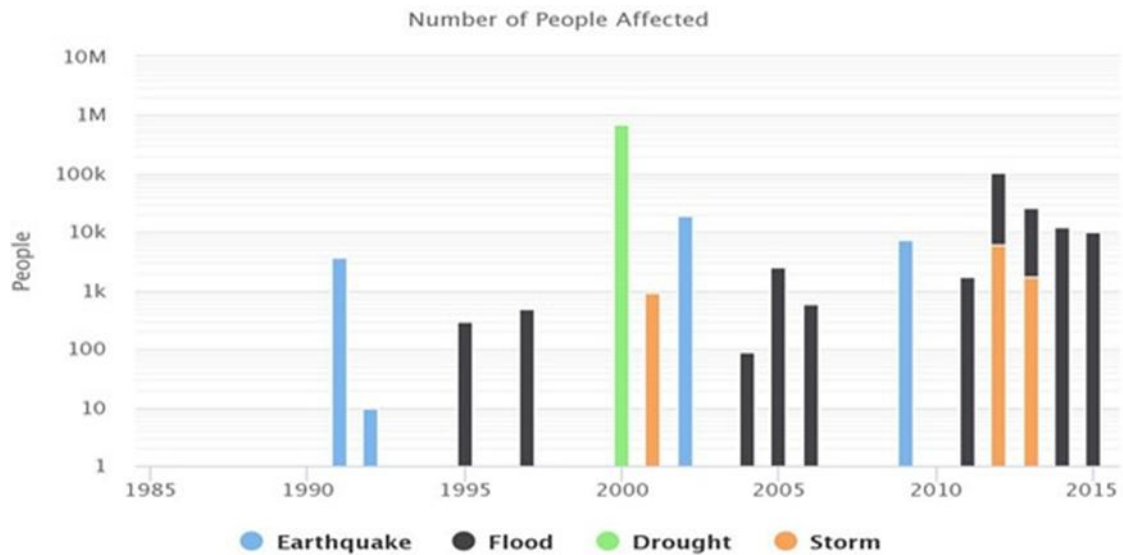


Figure 17. Main natural disasters

a) Climate Change

214. **Temperature:** Under the RCP (Representative Concentration Pathways) 2.6 and 4.5, the changes will be manageable. Temperatures under RCP 6.0 and above predict a substantial projected increase from 2080 onwards. Changes in maximum temperature are projected to increase by almost 10 degrees C under RCP 8.6 by 2099. Under the various RCP scenarios, mean monthly variations are from < 1 to 2 degrees C up to 2039, increasing in the range from <2 to 6 degrees C by 2099, with RCP 8.5 consistently giving the largest increases. Average daily maximum show significant increases from the historical average under all RCP models, with RCP 8.5 showing slightly higher median values and greater variability. The number of hot days (>35 degrees C) is from 6,2 to 6.5 for all RCP scenarios out to 2039, but this increases to 9 to 41 days for RCP 2.6 and RCP 8.5 by 2099

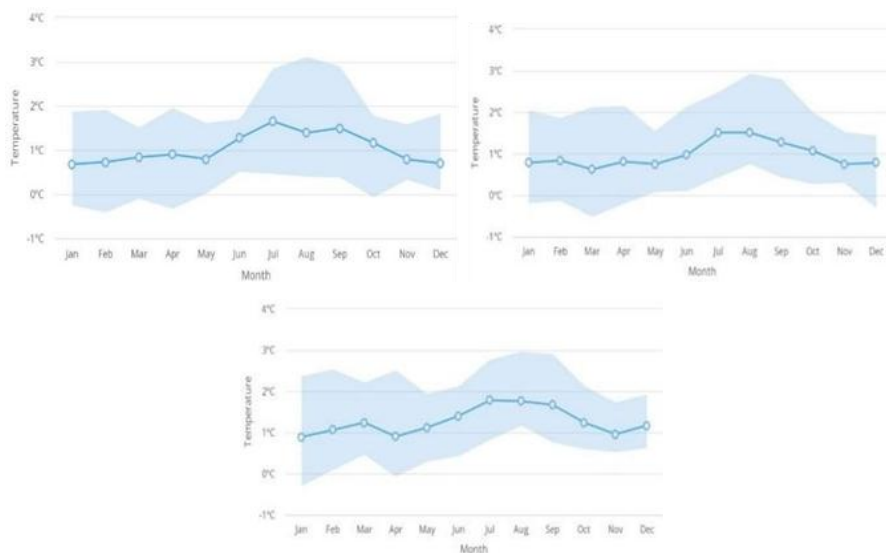


Figure 18. Projected Change in Temperature near Sagarejo between 2020 to 2039, Left To Right RCP2.6, RCP6 and RCP 8,5

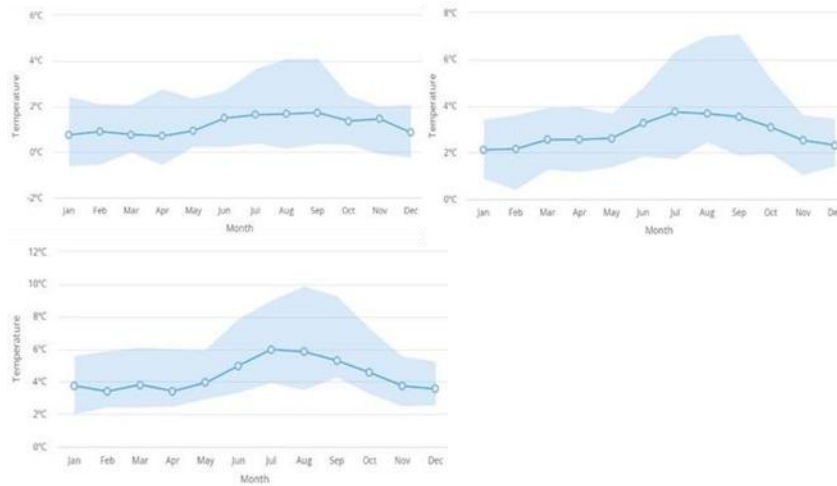


Figure 19. Projected Change in Temperature near Sagarejo between 2060 to 2079, Left To Right RCP2.6, RCP6 and RCP 8.5

215. **Precipitation** projected changes near Sagrejo are minor across all years and RCP models, except for RCP 8.5 after 2050, with reductions in median monthly rainfall in summer months. Some reports project up to 20% reductions.



Figure 20. Projected Change in Monthly Precipitation near Sagarejo between 2020 to 2039, Left To Right RCP2.6, RCP6 and RCP 8.5

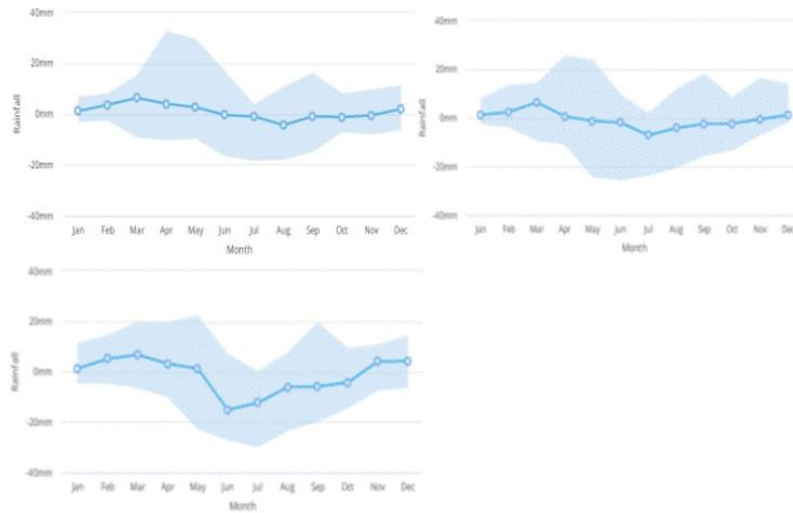


Figure 21. Projected Change in Monthly Precipitation near Sagarejo between 2060 to 2079, Left To Right RCP2.6, RCP6 and RCP 8.5

216. **Wind speed and duration.** This is poorly studied within the region and historically more of a problem in places such as Dedoplistskaro and Akhmeta. The impact of climate change on wind speed and duration of winds beyond 1 meter / second has not been projected.

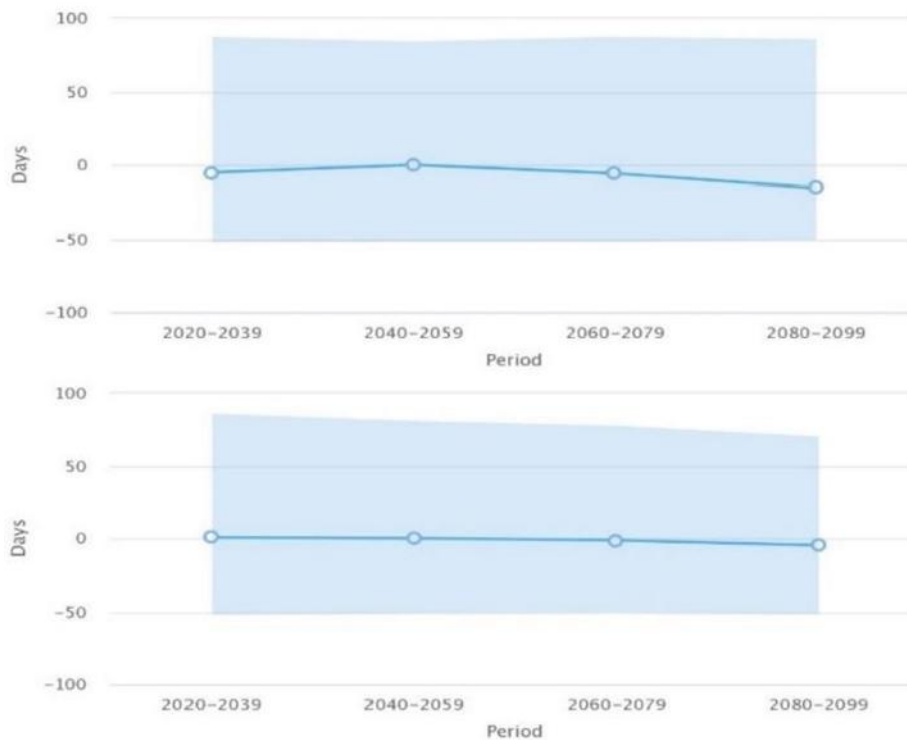


Figure 22. Projected changes in wind speed (days less than 1m/s) RCP 2.6 (Left) and RCP 8.5 (Right)

217. **Hail**, low-level moisture and convective instability will increase, raising hailstorm likelihood and enabling the formation of larger hailstones; thus, the projection is for increased hail severity in Georgia.

-
218. **Impact on Water Resources.** Beyond 2040 water supply and availability are expected to worsen, and water demand is expected to increase. Glacier meltdown until 2160 will yield abundant waters and may present problems in terms of erosion and floods in irrigation infrastructure, waterways and drainage outlets.
219. **Impact on Agriculture.** Food security is threatened by ongoing, declining productivity, low levels of investment in farms, lack of modernization of climate-resilient farming systems, and threats from climate change. There is an increase in growing season, evapotranspiration (which increases the water need of crops), climate and geohazards increase causing damage, increase droughts, and flooding.

2. Geology and topography

220. In general, Iori Plateau (also called Gare Kakheti) is built mainly with slightly folded Cenozoic sandstones, conglomerates, clays and limestones. Tectonically, the Plateau is a system of ejected folds, developed based on Neogene formations and only its north-western corner, bordered by the Tbilisi basin and Ujarma-Sartichala section of the Iori Valley, is built with Paleogene deposits. Extensive syncline depressions, such as Didi Shiraki, Naomari, etc., are filled with Quaternary continental sediments: clays and rocks.
221. The overall area is located on a plain-hilly Iori Plateau (also known as Gare Kakheti Plateau); a wavy, slightly dissected relief and dry continental climate with resultant hydrological, soil and geographical and geobotanic conditions. The given territory is distinguished from other parts of Georgia by lack of water, scarce vegetation and vast badlands lacking soil cover.
222. The Gombori Ridge divides the watershed of the Iori and Alazani Rivers. Its length is 107 km. The highest peak is Tsivi (1991 m above sea level). The territory is mainly formed by Cretaceous and tertiary sedimentary strata.
223. The eastern part of the Sagarejo municipality, where the Main Canal Ch 313+42 to Ch 397+00 implementation is planned, is predominantly characterized by low and medium relief with slopes ranging from 10° to 35° and absolute elevations between 570 and 600 meters. This part of the Gombori ridge is mainly composed of Cretaceous and Neogene sedimentary rocks. Forests have developed on the adjacent slopes, which help maintain soil stability and inhibit the development of large-scale landslides.
224. According to the seismic zoning scheme of the territory of Georgia, the project corridor belongs to Zone 8, with a seismic intensity coefficient A averaging 0.17.
225. The study area is located within the Kartli-Kakheti artesian basin of the Intermountain Depression Hydrogeological District of Georgia. The upper Jurassic brecciated limestones, which are exposed in a small part of the area, exhibit relatively good potential water permeability.
226. The Package 1 corridor itself is mostly represented by hilly terrain. According to field visual surveys, no significant signs of hazardous geodynamic processes have been observed directly within the project corridor. Only some sections adjacent to the canal exhibit small-scale local erosion processes (Figure 23). Additionally, some slopes near the canal are quite steep and free of vegetation. Therefore, during earthworks and machinery operations, minor activation of small-scale gravitational processes is possible.
227. There is a medium risk of landslides within the area of Package 1 according to ThinkHazard and Geoportal of Natural Hazards and Risks. Tunnel 1 was built after a landslide in the nearby Kandaura Village. However, there has been no landslide or mudslide along the main canal in the last 30 years.



Figure 23. Small-Scale Local Erosion Processes

228. The soil cover is quite diversified 1965. All soils have good soil water storage capacity, and the alluvial soils are highly porous as indicated by infiltration data. The major soil types are listed below (listed in order from largest area to smallest):

- Cinnamonic calcareous soils (Calcic Cambisols)
- Black calcareous soils (Calcic Vertisols)
- Grey Cinnamonic soils (Ermic Cambisols)
- Meadow black alkalised and halomorphic
- Alluvial calcareous (Calcaric fluvisols)
- Black vertisols

229. The main problem with soils is weathering and pollution with different substances. The reason for this is improper use of organic and inorganic fertilizers, destruction of field protection and wind-breaking belts and faulty operation of irrigation systems on the one hand and wind and water erosion on the other hand. Soil fertility is mostly finite, and within Georgia, there is an issue with degraded soils.

230. Within the Package 1 corridor, brown soils are widely distributed in areas of intensive agriculture. On the mountain tops and lower slopes of the Gombori Ridge, forest brown soils are present. In certain areas, particularly pastures, carbonate-rich soils with high skeletal content are observed.

231. Across within the Package 1 corridor, including along the parallel operational road, the fertile soil layer is limited in thickness. There is a high content of deluvial material (stones and gravel). The areas proposed for construction camps and spoil disposal sites are comparatively more valuable, where during the mobilization phase, greater attention must be paid to the removal and preservation of the topsoil layer.

3. Water resources

232. The Package 1 corridor crosses only small, seasonal ravines, most of which almost completely dry out during summer. There are no large rivers near the Package 1 area.

¹⁹ [Soil Map of Georgia: Georgian Academy of Sciences 1999.](#)

The rivers Chailuri and Lakbe flow to the east and west of Package 1 and cross other sections of the main channel. The river Iori flows to the south and is not crossed in the project area (Figure 24 Error! Reference source not found.).

233. Surface water regime is characterized by spring (April, May) and autumn floods, and low water availability during summer and winter. Generally, rivers in the region experience periodic flood events; however, the ravines intersecting the project canal are not distinguished by such characteristics.

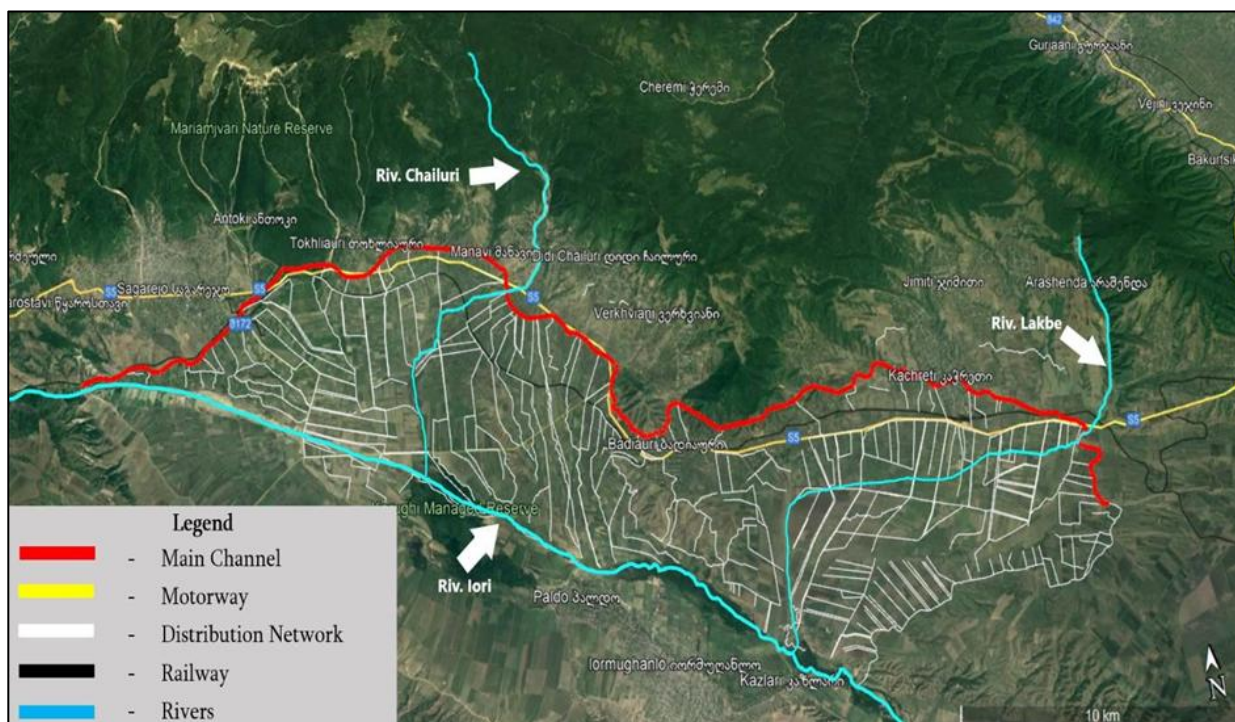


Figure 24. River Network in the Kvemo Samgori Area²⁰

234. **Groundwater.** The Iori River Basin is one of the richest underground water resource basins in Georgia. According to the information of the NEA in 2023, the groundwater debit remained at a stable level in the wells being monitored and the temperature, chemical composition, total mineralization, and microbiological indicators of monitored groundwater have changed insignificantly and were mostly within the permissible level.

4. Land use

235. The total area of Sagarejo Municipality is 155,369 ha²¹, with 94,371 ha of agricultural lands and 42,065 ha of forests. Arable land covers 29,386 hectares, perennial crops cover 5,275 hectares, 1,407 hectares of mowing land, 42,065 hectares of forest, 56,884 hectares of pastureland and 1,430 hectares of land underlying dwellings.
236. From the Landowner's survey, the majority crop in the Kvemo Samgori Irrigation scheme is grapes, with 60% of landowners growing grapes, followed by cereals at 38% and fruit trees at 7%. However, cereal is the most grown crop by area with 44% followed by vine which is grown on 35% of the sampled area. Within the project area, agricultural land is becoming fragmented and small, with an average of 2.17ha per plot. Landowners were not full-time farmers, around 60% reported that they have other sources of income than farming.

²⁰ Source: Produced for IEE by TA-6648 GEO Environmental Consultants

²¹ National Statistics Office of Georgia

B. Social and Economic

237. From an administrative standpoint, the Package 1 area is mainly located in the Sagarejo Municipality. Only a small part of the project area (the final section) extends into the Gurjaani Municipality (Figure 25). The administrative center of Sagarejo Municipality is the city of Sagarejo. Gurjaani Municipality is the geographical center of Kakheti.

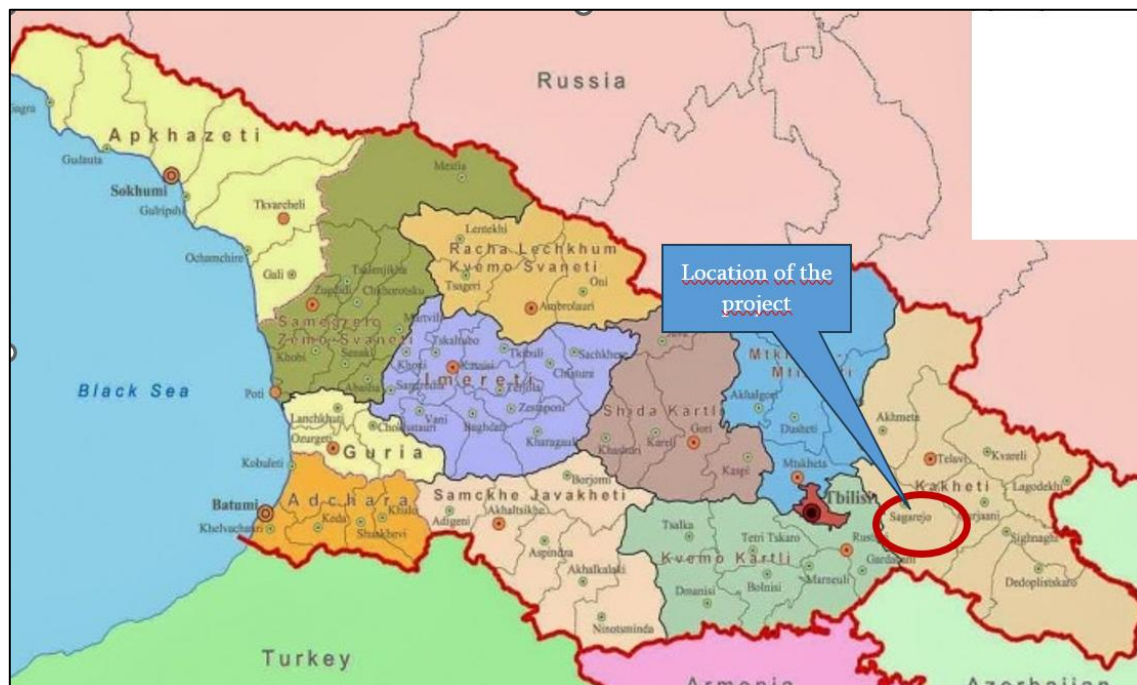


Figure 25. Project Location on the Administrative Map of Georgia

238. There are 4 settlements near the Package 1 area:

- Badiauri village, Sagarejo Municipality
- Shibliani village, Sagarejo Municipality
- Mzsiguli village, Sagarejo Municipality
- Kachreti village, Gurjaani Municipality

239. The majority of the population are ethnic Georgians; however, Azerbaijanis also reside there. Compared to other settlements in the region, the migration rate in these villages is not high.

1. Demographics

The population of Sagarejo and Gurjaani municipalities in 2020-2025 is shown below:

Table 18. The Population Sagarejo and Gurjaani Municipalities in 2020-2025,

Municipality	2020	2021	2022	2023	2024	2025
Kakheti region	310,100	309,600	304,900	306,200	299,900	298,500
Sagarejo Municipality	52,200	52,300	52,000	52,200	51,500	51,500

Gurjaani Municipality	52,100	51,800	51,000	50,800	49,900	49,500
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For the settlement nearby Sagarejo the populations are as follows (based on the 2014 census):

- C. Sagarejo – 10,871
- Vill. Badiauri – 1,286
- Vill. Shibliani – 456
- Vill. Mzsiguli – 578
- Vill. Kachreti – 1,958

240. In 2020-2025, the population in both municipalities decreased by 1.0-1.5%. The majority of the population lives within rural areas, with a low than average population density (27.2 people per km²), and there is a small increase in the number of people living in urban areas.

2. Economy

241. The economy within the area is predominantly agricultural, tourism, services and trade and a large proportion of production is in agricultural products with grain crops (12%) and viticulture (15%).

242. Employment within the region is 51,3.3% (about 72% employees). Labour Indices are included in Table 19.

Table 19. Labour Indices²²

Index	Kakheti				
	2020	2021	2022	2023	2024
Total: 15+ population	247.0	243,2	239,4	236,7	237,6
Labour force (active population)	122.2	127,2	128,2	133,7	135,9
Employed	109.5	116,1	116,7	117,6	121,9
Hired	57.1	56,5	59,6	65,3	72,4
Self-employed	52.4	59,6	57,0	52,3	49,6
Doubtful	0.0	0,0	0,0	0,0	0,0
Unemployed	12.7	11,1	11,5	16,0	13,9
Population beyond the labour force	124.8	116,0	111,2	103,1	101,7
Unemployment rate, per cent	10.4%	8,7	9,0	12,0	10,2
Level of the labour force participation (activity), per cent	49.5%	52,3	53,5	56,5	57,2
Employment rate, percent	44.3%	47,7	48,7	49,7	51,3

3. Infrastructure

243. Roads and Transport: The S5 route, also named as Tbilisi-Bakurtsikhe and Kakheti Highway84, runs to the north of the project following and crossing the main canal (outside the boundaries of package 1). This serves as one of two main routes that connect Georgia and Azerbaijan. This road is in the process of being upgraded, with Sagarejo to Bakurtsikhe being funded by the Government of Georgia and Sagarejo to Badiauri being funded by the World Bank.

244. Local infrastructure includes secondary village roads (with bridges) and low-voltage power transmission lines (see Figure 26 and Figure 27). The access road running parallel

²² National Statistics Office of Georgia

to the Main canal is used by the local population and livestock for movement. No other significant infrastructure facilities—such as industrial sites, schools, or similar institutions—are present in the vicinity of the project corridor.

245. There is a train line which runs through the project area, connecting to Sagarejo and a number of the other villages within or nearby the project area. This line runs from Tbilisi to Sagarejo, after Sagarejo the line branches with one line running to Dedoplistskaro and another to Gurjaani and the line between Telavi and Tsnori.
246. Water and Energy: Most of Georgia has 100% access to electricity, 97.3% access to drinking water supply (66.4% access to managed water supply) and 85.8% access to sanitation facilities. In urban areas, access to these services is higher than compared to rural areas.



Figure 26. The Intersection of the Canal and the Motor Road Leading to the Village of Mzsiguli



Figure 27. Low Voltage Power Lines Located near the Main Canal

4. Landowners Survey

247. Generally findings of consultation undertaken as part of this project, but not specific to the environmental assessment activities found:

- Most landowners were not full-time farmers, with 60% reporting having other income sources
- A high amount of fragmentations
- 55% reported that their land had access to irrigation
- 69% are contracted to the GA (84% of the total area), however, 14% of the area is without irrigation
- 88% of the land is cultivated per plot. Irrigation there is a slight downward trend from around 61% irrigation of the area in 2018 and 2019 to 58% in 2020
- The amount of area a landowner irrigated differs significantly between the sectors: where in sector 1 (closest to headworks) around 68% to 71% of the areas were irrigated, in sector 3 (farthest from headworks only 33% to 34% were irrigated. Not irrigated areas are most common in sector 3 (37%).
- The majority crop in the irrigation scheme is Grapes (60% of landowners), followed by cereals at 38% and fruit trees at 7%. However, cereal is the most grown crop by area with 44% followed by vine which is grown on 35% of the sampled area.
- About 75% of the vine is sold and 52% of the cereal is sold and about 40% use the cereal for livestock.
- Livestock ownership is 28%, and only a small amount of landowners are exclusively livestock farmers.
- Over 71% are using surface irrigation
- Over 70% of the water used for irrigation is taken from canals, less than 1% is from ponds or rivers and one respondent used a private well.
- 67% to 69% of the required water was delivered, this varies between 100% to 0%.
- For uncultivated land, the main reason was a lack of water supply (60%), other sources of income (24%) and lack of equipment and high input costs (both 7%).
- Farmers reported that they lost 16.9% of their income due to inadequate water supply
- The majority of landowners saying that they would invest in new irrigation equipment would choose drip irrigation (80%).
- The majority of landowners (over 59%) would be willing to pay more for water if the supply would become more reliable.
- The early stages of the resettlement activities found that the local population were generally positive about the project

5. Agricultural Activities

248. The absolute majority of the local population is engaged in agriculture. Vineyards are particularly developed in the area. However, continuously cultivated lands are scarcely present directly adjacent to the rehabilitation canal. The vineyards are mainly located to the south, near the secondary distribution channels, at relatively lower elevations.

249. The population is also involved in animal husbandry. The forest-free areas near the project canal are used as pastures (Figure 28). Additionally, in some locations, small-scale watering facilities for livestock have been arranged (Figure 29), which are filled from local streams.



Figure 28. Areas Used for Pasture near the Main Canal



Figure 29. Cattle Watering Point Located near the Main Canal

C. Cultural Resources

250. Sagarejo Municipality is an area with high historical activities, with traces of life within the region dating back to 2 BC. During the 500s, some of the area was part of the David Gareji monastery estates, after which the city Sagarejo was named after. Sagarejo is of strategic importance and an economic centre throughout the Middle Ages and afterwards, as a transit trade road from Tbilisi and Kakheti and a Tskvari-Gza road used for taking sheep to pasture in summer.

251. There is no information about the existence of historical or cultural heritage monuments in the corridor of Package 1. There is no information about the discovery of new archaeological monuments within the project area in the recent period (including 2023-

2026). Therefore, the historical-archaeological research conducted in the past is valid and is presented below.

252. The cultural and archaeological are shown in Figure 30 and described below.

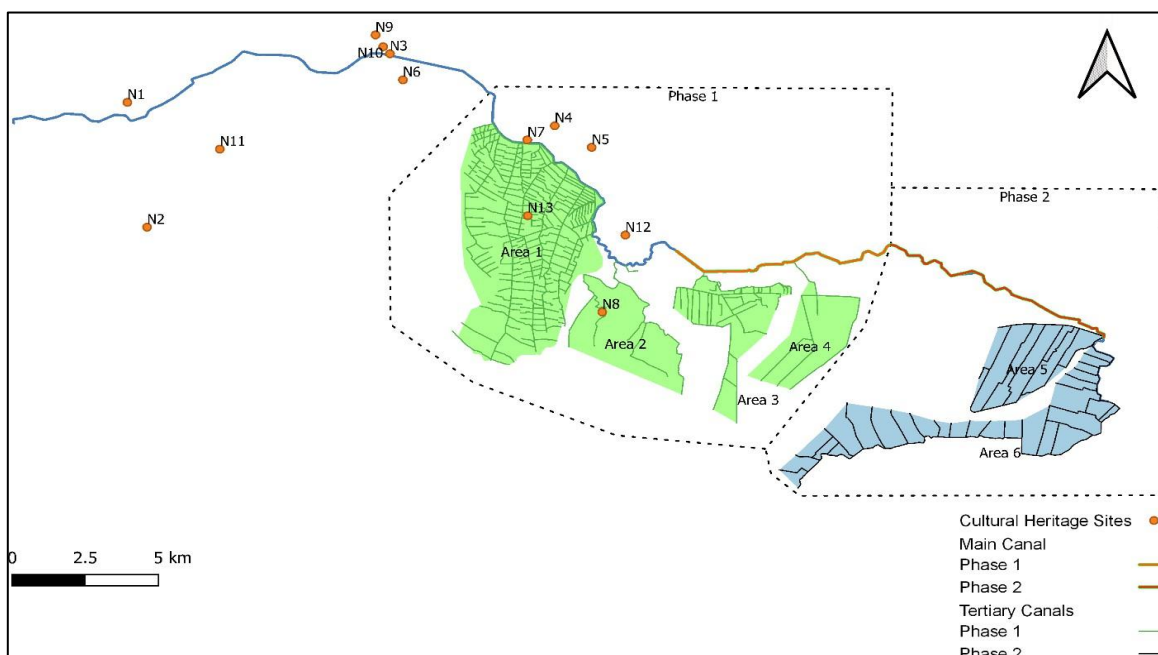


Figure 30. Location of Cultural Heritage Sites²³

253. **N1 – Kustapa Settlement** – the settlement on the hill “Kustapa” is to the south of Sagarejo and on the left bank of the river Tvaltkheva and is of Late Bronze and Early Iron Age. This was accidentally found in 1955 when erecting a high-voltage tower. The site of a former settlement is located on a high hill with a flattened crest, which is surrounded by a terrace;
254. **N2 – Lapriani Settlement** – South of Sagarejo, stone mortar-and-grinder and stone inventory made from black porous stone and dating back to 5-6 BC were found. These belonged to the Iori-Alazani Farming Cultural Age.
255. **N3 – Medieval Burial Grounds** – early medieval burial grounds of Kazarashvilis plot accidentally found during land works in 2016;
256. **N4 – Avazasgori Settlement** – former settlement in Avazasgori, which is damaged. The slopes of the hill are intensely washed away. The monument was studied by (Kakheti Archaeological Expedition). Fragments of stone hand grinders and pottery were found in the settlement;
257. **N5 – Sabadurisgori Settlement** – former settlement in Sabadurisgori was studied by KAE (Kakheti Archaeological 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 grey-brownish colour were collected in the excavated ground;
258. **N6 – Natlismtsemeli Church** – 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 two buildings on the east and west axis survived. 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

²³ Source: Produced for IEE by TA-6648 GEO Environmental Consultants

during the excavations. By considering the excavated material, the building is presumably dated to the late Middle Ages;

259. **N7 – Chailuri (Niakhura) Fortress** – Chailuri Fortress is the defensive and residential fortress of the 17th century. The Chailuri Fortress, named Niakhura Fortress in the sources, is one of the most important examples of the late medieval Georgian defensive system where in addition to housing the inhabitants of the local nobleman the population was sheltered during the enemy invasion. The castle has the status of a cultural heritage immovable monument (Order of the Minister of Culture and Monument Protection of Georgia No.3/133 dated from 30.03.2006), see Figure 31
260. **N8 – Gorasamarkhi Burial Place** – This archaeological site is located south of the village Badiauri and is dated from the Late Bronze Age. The accidentally discovered burial ground was studied by Kakheti Archaeological Expedition. A bronze shield and two-pronged pitchforks were found in the tomb. See Figure 32.
261. **N9 - Manavi Castle** – Overlooking the Iori Plateau and project area, the ruins of an old castle and conical towers are seen on the mountain top. The fortress is believed to have been built in the unification era of Georgia, i.e. at the turn of the 7th Century.
262. **N10 – Manavi St. Virgin Church** – the domed church, 15 km east of village Manavi, is built in a Kuppelhalle style 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). The Church was restored in 2008;
263. **N11 – Meligor Tower** - the Tower has a square plan with round lugs in all corners. The Tower is built entirely with cobblestones and lime mortar and likely had three floors. Its upper floor should have been open, finished with battlements. 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 missing;
264. **N12 – Teleti Church of St. George** – 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 from the Late Middle Ages (see Figure 34).
265. **N13 – Nameless Tower** – called local Nameless Tower (no official name found), the monument is badly damaged, with only its east and north walls surviving. Other walls are ruined to the ground. The Castle/Tower is built of cobblestones and lime mortar. Its walls are finished with plaster. The outer walls have some fragments of bricks, see Figure 33;



Figure 31. “Chailuri” (“Niakhura”) Fortress²⁴



Figure 32. Gorasamarkhi²⁵

²⁴ <https://georgiantravelguide.com/en/chailuris-niakhuras-tsikhe>

²⁵ Source: TA-6648 GEO consultants



Figure 33. Nameless Tower²⁶



Figure 34. Teleti Church of St. George²⁷

266. There are key cultural traditions held within the region, Garejoba is a popular public holiday in Sagarejo held on periodically on 16th May at Chichkhaturi Tower, Berikaoba is an old tradition held in the village of Didi Chailuri in early spring each year, Goglaoba held in the village of Patardzeuli dedicated to Gogla and Vajaoba held in the village of Kochbaani dedicated to the memory of Vazha-Pshavela.

267. All of the above listed cultural heritage sites are located a long distance from the Package 1 project corridor.

²⁶ Source: TA-6648 GEO consultants

²⁷ Source: TA-6648 GEO consultants

D. Environmental Quality

1. Air Quality and Noise

268. The considered section of the main irrigation canal (package 1) passes away from populated settlements and industrial zones.
269. As can be seen from the results of previous measurements, the daytime noise level at five measurement locations is lower than the permissible noise level established by Georgian legislation. Exceedance of the noise level is recorded only at one point (location N6), which is located in the village of Kachreti and is very far from the project corridor of Package 1.
270. During the measurement period, the noise level exceeded the night noise norm established by the legislation of Georgia at points N4, N5 and N6. Noise excess at points N4 and N5 is negligible, ranging from 0.5 to 0.7 dBA. These points are also far away from the project corridor of Package 1.
271. The vibration results observed during the study are lower than the reference values of DIN 4150-3. The higher level recorded by the vibration device is 0.41 mm/s. In all other cases, the vibration level is significantly lower.
272. As can be seen from the obtained data, the concentration of harmful substances in the atmospheric air, except for solid dust particles, is low compared to the standards established by the legislation of Georgia and the WHO. Excess concentrations are observed only with PM2.5, with the greatest excess which is 32 ($\mu\text{g}/\text{m}^3$). This data was obtained at a great distance from the project corridor of Package 1.

Table 20. Result of Measurements Noise dBA

Standard		Standard Value	Measurement Results											
			N1 Loc.		N2 Loc.		N3 Loc.		N4 Loc.		N5 Loc.		N6 Loc.	
			Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Norm of Georgian legislation (Adjacent to Residential house)	Day	55												
	Night	45	50.1	36.8	54.5	44.4	46.3	40.1	52.2	45.5	53.7	45.7	57.2	49.5

Parameter	Standard		Standard Value	Measurement Results
Vibration mm/sc	DIN 4150-3 Standard		5	0.41
Solid particles ($\mu\text{g}/\text{m}^3$)	Standard	PM10	50	48
		PM2.5	25	32
Nitrogen dioxide ($\mu\text{g}/\text{m}^3$)	Standard		200	159
Ground - level ozone ($\mu\text{g}/\text{m}^3$)	Standard		120	24
Volatile organic compounds ($\mu\text{g}/\text{m}^3$)	Standard		1000	115
Carbon monoxide (mg/m ³)	Standard		10	1.47

a) Validation of measurement data relevance in 2026

273. As of 2025-2026, there are no significant facilities (factories, highways, railways, etc.) near the corridor that could cause emissions of harmful substances into the atmosphere, noise, or vibrations. Only the middle section of the corridor should be noted, where it intersects a local road (connecting to the village of Shibliani), coordinates: X – 551944; Y – 4611703. Traffic intensity on this road is very low and, accordingly, it is characterized by low noise and emission levels.
274. In 2026, background noise levels were measured at 3 points along the main canal corridor (see Figure 35). The measurements were carried out during daylight hours, at the following coordinates:
- Point 1. - X - 550134; Y - 4611223
 - Point 2. - X - 551891; Y - 4611683
 - Point 3. - X - 554273; Y - 4611852.
275. According to the measurement results, background noise levels at all three points varied within the range of 35-50 dBA. These data are even lower than the measurement data taken in 2023. The reason for this is that the measurements were performed during the inactive season of agricultural activities and also the main canal corridor is further away from anthropogenic areas than other irrigation areas.



Figure 35. Process of measuring background noise levels in the project corridor, 2026

276. The noise measurement results can be considered as indirect evidence that anthropogenic activity has not increased in the project areas. Accordingly, the background levels of ambient air quality and vibration are also identical to the data of 2023.
277. Overall, the ambient air quality and background noise conditions can be assessed positively, and the risks of cumulative impacts resulting from the planned works are very low.

2. Water Quality

278. The project corridor of Package 1 does not cross any large water bodies. The project corridor passes through fairly high elevations and there are no significant sources of water pollution in its vicinity.
279. There are two water quality monitoring stations along the Iori River, at Sartichala Sasadilo, which are upstream of the project. This makes it hard to establish the water quality baseline. It is known that there is a high level of suspended sediments in the Iori River from quarry activities upstream. Instrumental measurements of the concentration

of suspended particles in the lori River were accomplished. The mentioned quarries started working at 7:00 am, and instrumental measurements were carried out both, at 6:00 am and 10:00 pm.

280. As the detailed measurements showed, as the aforementioned quarries and processing plants start working, the amount of suspended particles in the River increases almost 5 or 6 times. The amount of suspended particles in water samples taken at 6 am was about 15 NTU (Nephelometric Turbidity Units), while after the mentioned plants started working, the amount of suspended particles in the water was 75 NTU on average.
281. The relationship between NTU and suspended solids is as follows: 1 mg/l (ppm) is equivalent to 3 NTU. Accordingly, every litre of water taken from the river lori contains 23 mg of suspended particles. Accordingly, 9m³ of water taken from the lori River every second contains 0,2 kg of suspended particles which means that a minimum of 1,700-1,800 kg of suspended particles gets into the irrigation system every day making about 30m³ a month across the whole irrigation system.
282. Based on a 2020 study of water characteristics of the lori river (samples taken upstream of the project area) biological oxygen demand, nitrates, phosphates, chlorides, lead zinc, and copper did not exceed the maximum allowable concentrations. The main source of nutrient runoff is agriculture, sewage and stormwater.
283. There is a high than the allowable value of manganese at Sartichala and there are heavy metals present within the river but in permissible forms.

a) Water quality verification as of 2026

284. Regarding water quality monitoring, it should be noted that the target section of the Kvemo Samgori Left Main Canal (Ch 313+42 to Ch 397+00) is currently non-functional and completely dry. It should also be noted that additional site inspections were conducted during the 2025 and 2026 non-irrigation seasons. As there are no other natural surface water bodies (rivers or streams) within the project's immediate area of influence, the collection of water samples for baseline analysis was technically unfeasible at this stage.
285. However, to provide a proxy baseline context, NEA (National Environmental Agency) laboratory monitoring data for 2025 was utilized for three representative locations on the lori River (Paldo, Sartichala, and Sasadilo). As shown in the table below, Ammonium Nitrogen levels during the irrigation season (July) tend to exceed the maximum permissible concentrations (MPC of 0.4 mg/l). This indicates significant upstream anthropogenic impact, primarily driven by agricultural runoff and livestock activities.

Table 21. Water quality of the lori River according to NEA data²⁸

Location	Ammonium nitrogen – NH ₄ , Mg/l		Maximum permissible concentration
	April	July	
lori - Paldo	0.208	0.395	0,4
lori - Sartichala	0.227	0.447	0,4
lori - Sasadilo	0.370	0.338	0,4

286. The exceedance of Ammonium Nitrogen at the Sartichala and Paldo stations serves as a critical indicator that the source water for the canal is already subject to nutrient loading before entering the project section.
287. NEA monitoring data for the lori River has been integrated as a proxy baseline, indicating existing elevated Ammonium levels in the source water due to agricultural runoff. To ensure full compliance, the following protocols have been added to the EMP (Monitoring

²⁸ Source : <https://nea.gov.ge/Ge/Services/19>

Plan): Pre-construction: The Contractor will conduct a 'first-flush' water quality analysis as soon as water is let into the canal but before major earthworks begin. Water quality analysis (Physical-chemical parameters) will be conducted once the canal is operational to establish the long-term baseline for the rehabilitated system and ensure that the project's activities (e.g., concrete lining) have not negatively impacted the water chemistry.

288. It should be noted once again that there are no significant sources of surface water pollution in the vicinity of the Main Canal (Ch 313+42 to Ch 397+00) corridor. This situation remains unchanged In the period 2023-2026. It may be said that sources of pollution exist away from the area of Package 1.

3. Waste

289. The removal of household waste from the villages adjacent to the project canal is managed by the relevant municipal service of Sagarejo Municipality. Within the project corridor itself, there is no significant accumulation of solid waste. Only in certain localized areas are small amounts of concrete debris present (see Figure 36).
290. During the excavation and demolition works to be carried out within the project corridor, the likelihood of encountering asbestos-containing waste or other hazardous wastes is low. However, during digging, the possibility of encountering old asbestos-containing pipes and generating a small amount of such waste cannot be excluded.



Figure 36. Small Quantities of Concrete Debris Adjacent to the Project Corridor, 2025

291. The environmental baseline data for air quality, noise, water parameters and waste presented in this report were collected in 2023. A recent site reconnaissance and environmental audit conducted in 2025 and in early 2026 confirmed that there have been no significant changes in the land use, industrial activity, or infrastructure development within the project's area of influence since the last monitoring cycle. The project corridor remains an uninhabited, predominantly agricultural area with no new stationary or mobile sources of Consequently, the 2023 baseline data is considered representative of the current ambient environmental conditions.

E. Biological Environment

1. Protected areas

a) Protected Areas under National Legislation

292. There are no protected areas near the main irrigation canal corridor of Package 1. The closest protected areas include:

- **Mariamjvari State Reserve** – corresponds to the International Union for Conservation of Nature (IUCN) Protected Area Category I – Strict Nature Reserve. It is located on the southern slopes of the Tsiv-Gombori Ridge, northeast of the town of Sagarejo. Its total area is 1,022.5 hectares. The establishment of Mariamjvari Reserve was based on the protection and preservation of the pristine landscapes of the Caucasian relic – Sosnovsky pine. The direct distance from the Package 1 corridor to the reserve is 19 km or more.
- **Tsiv-Gombori Managed Reserve**, with a total area of 5,009 hectares, is situated on the watershed ridge between the Iori and Alazani Rivers within the Caucasus mountain system. Its highest peak is Tsivi (1,991 m above sea level). The Tsiv-Gombori Reserve covers the southeastern part of the Tsiv-Gombori Ridge and is characterized by medium and low mountain terrain with relatively moderate relief. It was created to protect Georgia's unique deciduous and coniferous forests in the area. The direct distance from the Package 1 corridor to the reserve is 19 km or more.
- **Khorugi Managed Reserve**, covering 1,716 hectares, is located within the territories of Sagarejo and Gurjaani municipalities. The reserve area lies within the Iori River valley and forms a narrow, irregular strip. The main purpose of the reserve is to protect and maintain the unique floodplain forests of Qorugi, as well as its flora and fauna. The direct distance from the Package 1 corridor to the reserve is 4.4 km or more.

293. The spatial relationship between the project corridor and the nearby protected areas is shown in Figure 37.

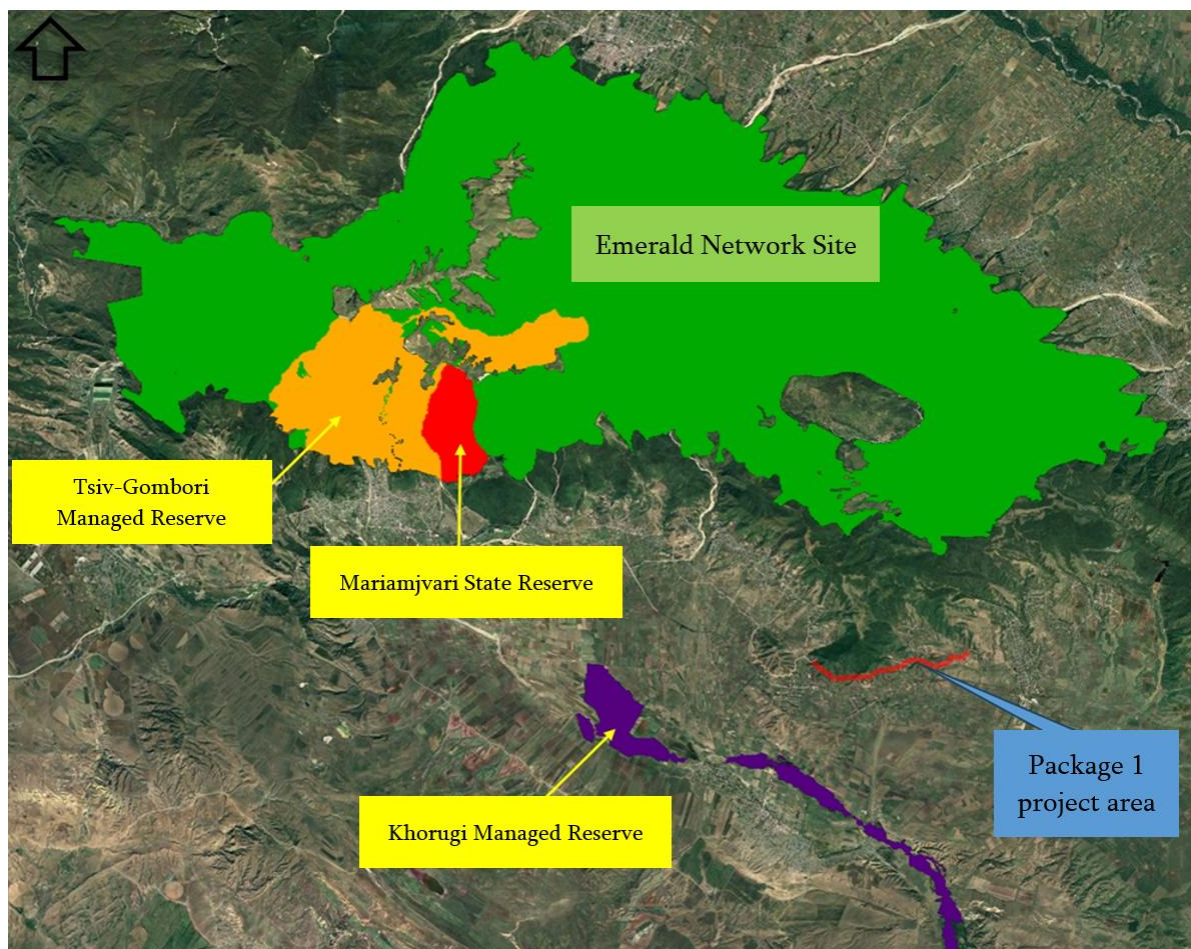


Figure 37. The Spatial Relationship between the Project Corridor and the nearby Protected Areas

b) Emerald Network Sites

294. The Mariamjvari State Reserve and Tsiv-Gombori Managed Reserve are significant Emerald Network sites protected under the Bern Convention:

- **Emerald Network Site “Mariamjvari”:**
 Registration Code: GE0000020
 Area: 1,022.5536 ha
 Biogeographical Region: Alpine (100%)
- **Emerald Network Site “Gombori”:**
 Registration Code: GE0000027
 Area: 55,436.20313 ha
 Biogeographical Region: Alpine (100%)

295. Within the Emerald Network territories, several habitat types are designated according to Resolution #4 of the “Standard Data Form,” including important habitats such as Pine Forests (G1.6) and Oak-Hornbeam Forests (G1.A1). Similar habitat types are not present within the Package 1 project corridor.

c) Special Protected Bird Areas in Georgia

296. 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 the 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 the Eastern imperial eagle is enlisted as Vulnerable (VU).

2. Project Area

a) Flora and vegetation

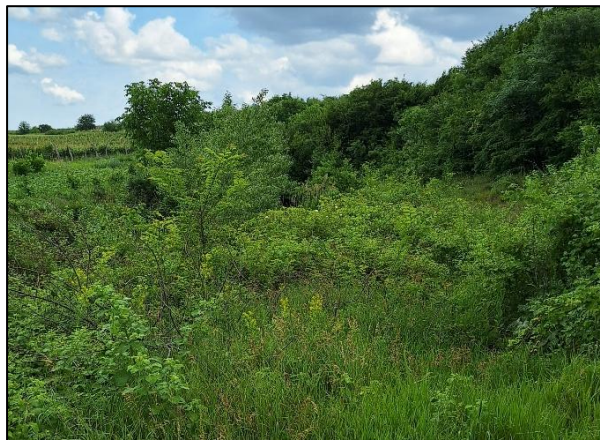
297. The information on the floristic components presented in the Package 1 project corridor is based on field visits conducted in May and August 2025 and literature sources. However, key findings presented in the 2023 IEE are also taken into account.
298. In the project corridor of Package 1, natural vegetation has been significantly altered due to agricultural activities (grazing, land cultivation) and the influence of the existing canal. Certain parts of the surrounding area are covered with vineyards and cornfields. In the uncultivated places used for farming, including within the canal easement corridor and the operational road, naturally occurring hybrid poplar trees (*Populus hybrida*) and low-value forest elements such as *Ulmus campestris*, *Morus alba*, *Malus communis*, *Pyrus communis*, *Crataegus kyrtostyla*, *Prunus divaricata*, *Prunus spinosa*, and *Paliurus spinachristi* are widespread. Such plant communities typically develop on previously cleared forests and represent their remnants or derivatives.
299. The areas in front of the Gombori Ridge are covered with shrubs such as *Cotoneaster*, *Rhamnus*, *Daphne*, and *Clematis*. In relatively more humid places, especially at river and stream crossings, fragments of floodplain forests are present, although they are heavily degraded.
300. Among the plant species listed in the Red List of Georgia, the region—including the slopes of the Gombori Ridge—hosts small fragments and isolated individuals of 12 woody species: *Taxus baccata*, *Quercus macranthera*, *Quercus pedunculiflora*, *Pterocarya pterocarpa*, *Pistacia mutica*, *Juglans regia*, *Ulmus minor*, *Nitraria schoberi*, *Prunus microcarpa*, *Juniperus foetidissima*, *Juniperus excelsa*, and *Juniperus polycarpus*.
301. Among endemic species, 7 species occur here: *Berberis iberica*, *Alnus glutinosa*, *Corylus avellana*, *Crataegus caucasica*, *Pyrus caucasica*, *Pyrus salicifolia*, and *Quercus macranthera*.
302. During the research conducted within the canal easement corridor, no Red List or endemic species were recorded. However, additional studies (taxation) should be carried out at the pre-construction stage, with the main goal being the identification of species requiring special protection.
303. Overall, it can be stated that the project corridor contains low-value habitats — a mosaic of agricultural fields and forest fragments. The anthropogenic impact on habitats and vegetation cover is quite significant.
304. General views of the habitats and plant species distributed within the project corridor are presented below (Figures 38).



Robinia pseudoacacia, Ulmus glabra, and Swida australis in the canal corridor



Low productivity shrub and herbaceous plants in the canal corridor



Shrubby and herbaceous plants in the corridor of the canal and the service road- *Salix alba* *Rubus* sp., *Carpinus caucasica*



Cultivated species in the areas adjacent to the second half of the project corridor

Figure 38. Views of the Vegetation Cover Presented in the Package 1 Project Corridor

305. Although the project area is an agricultural landscape, so-called sensitive habitats have still been identified during the past studies. According to the IEE prepared in 2023, such habitats are mainly presented by windbreaks, which include poplar, honey locust, ash, black Locust, aspen, etc. Such windbreaks are nesting habitats for various birds. Based on the site-specific assessment and the project design for Package 1 (Ch 313+42 to Ch 397+00), no windbreak trees are located within the direct physical footprint of the canal rehabilitation works. These habitats are present south of the canal corridor, within the irrigated areas.

b) Terrestrial fauna

Mammals

306. The generic composition of the mammals common in the project area is mainly represented by species typical to steppes and floodplains. 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*), field 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 destroy harmful rodents.

307. Within the Package 1 project corridor, anthropogenic influence is quite high due to agricultural activities, secondary roads crossing the channel, and other factors. Consequently, the likelihood of encountering large and medium-sized mammals in the corridor is very low. The presence of permanent habitats for large mammals in the project corridor is practically excluded. However, medium-sized mammals such as the European pine marten (*Martes martes*), fox (*Vulpes vulpes*), and European hare (*Lepus europeus*) may occasionally enter the project area while searching for food. Agricultural fields are inhabited by species like the mouse (*Apodemus mystacinus*) and the common vole (*Microtus arvalis*). Of large mammals, only jackal (*Canis aureus*) excrements were found during the past field study. However, during the survey, the local farmers confirmed the presence of jackals, foxes and rarely wolves in the area.

308. During the field survey, diversity of bats was not observed extensively. However, near the second section of the channel, there are old buildings (see Figures 39), which may serve as concentration sites for regionally distributed bat species such as the Mediterranean horseshoe bat (*Rhinolophus euryale*), Western barbastelle (*Barbastella barbastellus*), and common bent-wing bat (*Miniopterus schreibersii*). It should be noted that these buildings are located at a considerable distance from the channel corridor.



Figure 39. Probable Concentration Areas of Bats

309. No species found during site visits were protected or vulnerable under IUCN or RLG classification, however, in literature the following are potentially present:

- Caucasian squirrel (*Sciurus anomalus*) – listed as Vulnerable under RLG
- Otter (*Lutra lutra*) – Near Threatened under IUCN and Vulnerable under RLG
- Brown Bear (*Ursus arctos*) – Endangered under RLG
- Eurasian lynx (*Lynx lynx*) – Critically Endangered under RLG
- Deer (*Cervus elaphus*) – Critically Endangered under RLG
- Chamois (*Rupicapra rupicapra*) – Endangered under RLG
- Mediterranean horseshoe bat (*Rhinolophus euryale*) – Near Threatened under IUCN and Vulnerable under RLG
- Western barbastelle (*Barbastella barbastellus*) – Near Threatened under IUCN and Vulnerable under RLG

Birds

310. The 2025 field survey recorded that the areas surrounding the Package 1 corridor are characterized by a number of small bird species typical for forest zones. Among those recorded were: Great tit (*Parus major*), European goldfinch (*Carduelis carduelis*), Eurasian jay (*Garrulus glandarius*), Eurasian magpie (*Pica pica*), and Brambling (*Fringilla montifringilla*). Near the village of Shibiani, synanthropic species such as Western house martin (*Delichon urbicum*), Eurasian tree sparrow (*Passer montanus*), and Hooded crow

(*Corvus cornix*) were observed. Below are photos of some bird species recorded within the project corridor.

311. It is also noteworthy that in the middle and final sections of the surveyed canal corridor, the raptor species Eurasian goshawk (*Accipiter gentilis*) was recorded, which presumably enters the vicinity of the project area in search of food. The project corridor does not intersect important bird areas (IBAs) or migratory sites (Figures 40).



Eurasian chaffinch *Fringilla coelebs*



Eurasian magpie *Pica pica*



Group of Swallows (*Delichon urbicum*)



Eurasian goshawk (*Accipiter gentilis*)

Figure 40. Bird Species Recorded during the 2025 Field Surveys

c) Aquatic biodiversity

312. During the past studies, Kura loach (*Oxynoemacheilus brandtii*) was caught in the Iori River. 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*).

313. The Package 1 project corridor does not intersect any significant surface water bodies. The canal will only cross small streams that typically dry up during the summer. These streams are very poor in terms of ichthyofauna, and it can be said that no significant

species are present within them. Near the project corridor, there are small ponds (Figures 41) that may serve as shelters for low-value amphibian species common in the region.



Figure 41. Potential Shelter Areas for Amphibians and Water-Dependent Reptiles

V. METHODS, APPROACHES AND EVALUATION CRITERIA USED TO ASSESS THE ENVIRONMENTAL IMPACT

314. The principal goal of the evaluation of the environmental impact is to identify the type and significance of the impact of the planned activity on the physical, biological and social environment. This must become the basis for developing relevant mitigation measures. To achieve this, it is necessary to identify the criteria so that results are comparable through calculations and other methods. The comparison difference (quantitative change) allows for identifying the value of the expected impact (scale, limits of propagation).
315. Following the requirements of the legislation of Georgia and the characteristics of the planned activities, the following types of environmental impact were considered:
- (i) Impact on the physical environment – the probability of atmospheric air quality deterioration, noise and vibration propagation, risks of changing the qualitative state of water and soil environment (including during the disposal of hazardous materials and construction waste), violation of the stability of the geological state, and visual-landscape impact (including due to improper storage of materials and waste).
 - (ii) Impact on the biological environment – the generic and quantitative decrease of flora and tree-and-vegetation cover, disturbance of the animal world, deterioration of their habitats and probability of immediate impact.
 - (iii) Changes in socio-economic conditions of the affected area, both positive and negative, including:
 - impacts on livelihoods, particularly for farmers and households dependent on irrigation systems, including potential disruptions to agricultural production, income sources, and seasonal activities;
 - impacts on land use patterns, including temporary or permanent changes in the use of agricultural land, construction areas, and access routes;
 - impacts on access to land, water resources, and local infrastructure, including irrigation canals, roads, and community-used areas;
 - potential impacts on vulnerable groups, including low-income households, women-headed households, elderly persons, and those with limited access to land and productive assets, who may be disproportionately affected by project-related changes
 - temporary disturbances to economic activities and local mobility during construction, including restrictions on access and increased movement of construction vehicles.
 - (iv) Occupational and community health and safety risks – including:
 - risks to workers associated with construction activities, such as operation of heavy machinery, excavation works, working in confined spaces (e.g., canal sections), and exposure to hazardous materials (fuel, oil, chemicals);
 - risks related to inadequate use of personal protective equipment (PPE), lack of safety training, and site-specific hazards during construction;
 - risks to nearby communities, including increased traffic and movement of construction vehicles, potential for traffic accidents, and temporary disruption of local mobility;
 - safety risks associated with open canal sections and construction sites, including the likelihood of falling into canals, especially for children and livestock;

- risks related to improper waste generation and management, including construction waste and hazardous materials, which may affect community health and local environmental conditions;
- potential impacts on community health due to noise, dust, and temporary changes in access to local infrastructure and services.

(v) Possible negative impact on historical and archaeological monuments.

316. The evaluation criteria for each of the above-listed impacts were identified by an individual approach, e.g:

- (i) The emissions and noise propagation in the atmospheric air were calculated based on the relevant methodical and normative documents. The expected changes in the design points were identified as the most unfavourable conditions. During the calculations, the background state in the pr area was taken into account. The gained results were compared to the normative documents effective in Georgia.
- (ii) The value of the impact on the qualitative state of the water and soil environment was evaluated by considering the distance from the surface waters and the specificity of the technical procedures used during the construction process. The removals of rehabilitation works were also taken into account in the impact assessment process. The types and quantities of materials used and potentially generated waste are one of the determinants of the magnitude of such impacts.
- (iii) The methods of visual-landscape assessment are based on the landscape value and existing situation of the active site.
- (iv) In evaluating the impact on the geological environment, the existing engineering-geological conditions and analysis of the measures necessary for the construction works are important.
- (v) The approach used in evaluating the impact on the biological environment envisages the comparison of the background state and forecasted change resulting from the project implementation.
- (vi) In evaluating the impact on the social-economic environment, attention was paid to various aspects, with the positive impact being the most important. In addition, particular attention was paid to livelihoods, especially for farmers and households dependent on irrigation systems, and to the potential impacts on agricultural activities and income sources. The assessment also considered land use patterns and possible changes in access to land, water resources, and local infrastructure. Furthermore, special consideration was given to vulnerable groups, including low-income households, women, elderly persons, and those with limited access to productive assets, in order to assess their level of exposure to potential project impacts. Available baseline data, field observations, and stakeholder consultations were taken into account in the evaluation process. Temporary and long-term impacts related to construction and operation phases, including potential disruptions to access, mobility, and local economic activities, were also considered in the overall assessment.
- (vii) Occupational and community health and safety risks assessment is based on the analysis of the types and volumes of work to be carried out. It is significant here that rehabilitation of tunnels is planned on several sections of the canal, which is given special attention. The proximity of settlements/public buildings and the analysis of the intensity of use of the areas adjacent to the project areas are also important in assessing the risks. In addition, potential risks to workers related to construction activities, including the use of heavy machinery, excavation work, and confined-space conditions, as well as risks associated with exposure to hazardous materials (fuel, oil, chemicals), are taken into account. Furthermore,

risks to nearby communities, including increased traffic, construction-related accidents, temporary disruptions to access and mobility, and the likelihood of falling into open canal sections, are considered. Risks related to construction waste generation and management are also considered in the overall assessment.

- (viii) The method to evaluate the negative impact on historical and archaeological monuments envisages the identification of the probability of their damage or destruction by considering the specifics of their location.

317. All kinds of impacts were classified with a 3-point system, in particular:

- a. Significant (high) impact – impacts that cannot be effectively mitigated, causing a high level of residual impacts and a high probability of dissatisfaction amongst the population.
- b. Moderate impact – impacts that can be effectively mitigated and the impact brought to an admissible level.
- c. Insignificant (low) impact – impacts effects lead to a limited quantitative or qualitative change in the environment and do not cause public dissatisfaction.

318. It should be noted that some kinds of impact are not expected and there is no need for mitigation measures.

319. To assess the values of some of the impacts, it is also important to assess the duration of impact and evaluate how swiftly a natural object can be restored either to its original state or a state nearly similar to the original one, after the sources of impact are eliminated.

VI. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Introduction

320. The environmental impact is assessed for different project phases: the pre-construction, construction and operation phases of the Irrigation systems rehabilitation project.
321. Initial screening and identification of potential impacts were conducted using ADB's rapid environmental assessment (REA) checklist (Annex 1). The study team visited the proposed project sites and nearby areas to identify the potential impacts (both positive and negative), met stakeholders and conducted meetings, brainstorming sessions, field examinations, and data gathering.
322. The succeeding paragraphs provide the potential negative impacts for pre-construction, construction, and operation and maintenance phases. Avoidance and mitigation measures are also discussed to ensure potential negative impacts are insignificant, site-specific and can be managed using established internationally accepted practices. In particular, the following aspects were taken into account:
- (i) Project specifics, engineering solutions and technological approaches used during the construction and operation processes. It should be noted that this IEE only applies to Package 1: Main Canal Ch 313+42 to Ch 397+00 and does not include other Packages. The engineering solutions and technological approaches of Package 1 have not changed substantially and are consistent with the information in the 2023 IEE.
 - (ii) The current state of the natural and socio-economic environment within the project corridor was established as the baseline for assessing the planned activities.. It should be noted that field surveys conducted in May and August 2025 indicate that the natural and social environment in the Package 1 corridor is practically the same and no significant changes are observed. No additional (previously un accounted for) external sources of environmental impact were identified in the Package 1 area during the period 2023-2026.
 - (iii) Criteria for assessing the anticipated impacts on each environmental receptor were defined in advance.

B. Pre-Construction Impacts

323. Location, Engineering and Design Issues. The project is not located in any eco-sensitive areas. There is no major bottleneck along the existing alignment. As a result, minimal acquisition of any land is required. Impact on private and community structure is not there. The project design has considered all major preconstruction impacts and taken avoidance measures at an early stage of planning to have minimal impact due to location.
324. The rehabilitation of existing canal will require the need to cut vegetation / trees along the project alignment. This will inevitably have some impact and this matter is discussed in the following sections. However, the trees to be cut within the main canal of Package 1 generally do not extend beyond the alienation line and the impact on additional areas is minimal. As part of the engineering design, the following principles are implemented during detailed design, or the appropriate adjustments shall be made on site during the construction phase.
- (i) **Alignment:** The canal rehabilitation works will follow the fixed alignment. This significantly reduces the risks of direct and indirect impacts on surrounding areas.
 - (ii) **Water bodies:** rehabilitation works shall be planned to ensure that the water bodies do not get impacted during construction.

- (iii) **Tree Cutting:** Planning to ensure that the tree cutting is restricted to a minimum.
- (iv) **Construction material Sourcing:** Quarrying is not required, and construction material will be sourced from existing licensed suppliers.
- (v) **Dust and air pollution:** Spoil and Waste disposal sites and temporary construction material and equipment storage areas shall be sited away from habited areas;
- (vi) **Noise and Vibration:** While the habitat near the main canal project site is minimal, time regulation for construction near sensitive receptors in the distribution network areas shall be maintained.
- (vii) **Construction Camp and Waste Disposal:** No such facility shall be sited near any water bodies, forest area, and settlements; and
- (viii) **Natural Hazards:** The project area is not located in a high seismic zone or high- risk zone from natural hazards perspective.

325. Various impacts associated with the pre-construction phase are summarized in the table below.

Table 22. Type of Potential Impacts at Pre-Construction

S.No.	Environmental Issue	Measures to be taken
1	Distribution line Alignment	Final alignment should be determined to minimize land acquisition and the impact on people, biodiversity and to avoid unfavorable geological condition and cultural relics.
2	Spoil / sediment disposal	Designated areas / low lying areas shall be identified in advance to ensure that the sediment disposal is adequately carried out.
3	Dust and air pollution	Dust and air pollution shall be avoided. Waste disposal sites and construction material storage sites should be identified – keeping in mind environmental issues such as dust generation and noise pollution.
4	Cultural heritage	Any archaeological sites/remains identified along the alignment should be intimated to Archeological authorities prior to construction.

326. From an environmental perspective, it is important that the location selection for construction camp(s), borrow pits (if needed), and other temporary infrastructure is carried out with maximum compliance to appropriate criteria, specifically:

- (i) Construction camps, related contractor's facilities, will be established and be in environmentally sound and socially safe areas. These should be located at least 500m away from settlements;
- (ii) Proximity to construction sites, minimizing the need to use public roads (including bridges);
- (iii) Availability of utilities (water, electricity, existing roads, etc.);
- (iv) Satisfactory natural conditions (appropriate relief, low vegetation cover, minimal soil coverage);
- (v) Adequate distance from sensitive receptors (houses, protected areas, etc.) to minimize potential impacts from noise, emissions, and vibrations;
- (vi) Land ownership and land parcel category, with minimal impact on privately owned land and state forest fund lands. In cases where agricultural land is selected, prior reclassification of the parcel must be done according to Georgian legislation requirements;

- (vii) Good environmental practice recommends locating crushing plants near extraction sites (quarries) or using subcontractors.
327. The establishment of temporary infrastructure must be coordinated with relevant authorities (Local Government, NEA, and others). These areas should be fenced and protected from unauthorized access from the initial stages.
328. At the early stages of mobilization, temporary infrastructure must be equipped with appropriate environmental and safety measures, specifically:
- (i) Concrete batching plants must be equipped with suitable filters;
 - (ii) Crushing plants must have facilities for treating wastewater (settling tanks). A good practice is to implement recirculating water supply systems for crushing plants;
 - (iii) Camps must be equipped with facilities for collecting or treating domestic wastewater. Good environmental practice includes using septic tanks and bio-toilets to prevent domestic wastewater discharge into gullies;
 - (iv) Camps must have adequately secured and marked temporary waste collection points, containers, and other means;
 - (v) Diesel fuel storage tanks must be equipped with emergency spill containment systems with internal capacity of at least 110% of the total tank volume;
 - (vi) Good environmental practice includes the use of water storage tanks at camps to promote rational use of domestic and technical water;
 - (vii) Camps and main construction sites must be equipped with firefighting equipment;
 - (viii) Camps must be equipped with emergency spill response equipment;
 - (ix) Camps and main construction sites must have first aid equipment;
 - (x) All areas within camps where there is a risk of petroleum product spills (including parking lots) should be covered with a layer of gravel.
 - (xi) Living accommodation and ancillary facilities should be erected and maintained to standards and scales approved by the Engineer-in-Charge; and
 - (xii) Toilets and urinals should be provided in accessible places away from the Hot mix plant and mixing yard.
329. Temporary infrastructure must have all the necessary permits from state authorities. Contracts must be signed for the temporary use of land parcels (if needed).
330. The contractor will be responsible for raising worker awareness through training on safety measures, ensuring a healthy and safe working environment, and providing all safety equipment, machinery, and personal protective gear in accordance with international standards.
331. Various impacts expected in the project implementation and operation phases are summarised in Table 22 and described below. This section shall be updated as needed during the final detailed design stage and if any changes that occur before construction.

Table 23. Project Impacts

	Construction Phase	Operation phase
Impact on ambient air quality	Low	
Noise and vibration	Low	
Risks of floods and climate change		Positive
Landscape and visual impact	Low	
Impact on river water quality	Low	Low
Impact on soil quality	Medium	Low
Impact on geological environment	Low	
Impact on flora and fauna	Low	

Impact on traffic flows	Low	
Impact on the social-economic environment	Low	Positive
Impact on historical-cultural and archaeological monuments	Medium	
Impacts due to sediment storage / disposal	Medium	
Impact related with asbestos storage / disposal due to chance find / presence of asbestos pipes	Medium	

C. Project Zone of Influence and Sensitive Receptors

332. The project zone of influence is the area that could potentially be affected by the project. Within this zone of influence that there are several sensitive receptors, and it's important to make sure that these receptors have appropriate mitigation measures in place. Based on this the sensitive receptors for this project are as follows.
333. The project area is mostly agricultural and therefore the works may impact crops during construction.
334. The project area of Package 1 is far away from protected areas. Therefore, protected areas are not considered sensitive receptors.
335. The project area of Package 1 is less sensitive in terms of proximity to cultural heritage sites. However, the possibility of late discovery of archaeological sites should be taken into account during the construction process.
336. The irrigation system takes water from the lori River which is a transboundary river and any potential impact on water quality can also cause transboundary impacts. However, impacts from this project on downstream users are unlikely as the project will not increase water take. It is also worth noting that the project area of Package 1 is a long way from the bed of the lori River.

D. Positive Impacts and Benefits

337. The overall project will improve water management and sustainable agriculture through a range of environmental, social and economic benefits. This includes:
- (i) More equitable management of water resources
 - (ii) Reduction in water loss, currently almost half the water is lost
 - (iii) More water is available for irrigation without increasing the water taken from the lori River
 - (iv) Increase in area of land that can be irrigated
 - (v) Improvements in water monitoring and understanding of the flow and use across the system
 - (vi) Improvements in the capacity of MEPA and GA to manage the system
 - (vii) Increasing awareness and capacity of sustainable water use amongst users; this will also likely reduce fertiliser and pesticide run-off
 - (viii) Increasing climate resilience
 - (ix) Improvements in agricultural outputs, productivity and income
 - (x) Support moving to a more sustainable financial management
 - (xi) Less land is needed for the modernised system
 - (xii) Less artificial infrastructure visible from cultural important sites
 - (xiii) Harder for illegal/unofficial water users, as harder to abstract and easier to monitor
 - (xiv) Improve water usage and reduce water loss
 - (xv) Improvement of local connectivity though repairs of bridges over the canal.

E. Construction Impacts

1. Biodiversity

338. Main Sources of Impact:

- (i) Earthworks and dismantling activities
- (ii) Clearing of the canal right-of-way from trees and vegetation
- (iii) Various activities generating noise and vibration

339. Main Impact Receptors:

- (i) Local degraded and low-value habitats (mainly agricultural landscapes)
- (ii) Low-value plant species (the likelihood of damage to species listed in the Red List of Georgia or other highly protected species is low)
- (iii) Animal species (particularly small-sized birds)

a) Impact on Flora

340. According to the 2023 IEE 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.

341. However, according to field surveys in 2025, the probability of encountering these species specifically in the Package 1 project corridor is very low. In addition, the main canal project does not require a deviation from the existing corridor, which further reduces the likelihood of impact on species subject to special protection. As the project follows the existing canal alignment, no additional habitat fragmentation is anticipated.

342. As noted in the description of the biodiversity baseline, windbreak lines are present at lower elevations to the south of the canal corridor. The existing windbreak lines are situated outside the construction corridor/buffer zone. No cutting or removal of windbreak trees is planned under this package. However, given the sensitivity of the habitats, any risk should be excluded. Any activity that may have an impact on these habitats (e.g., movement of large vehicles or transportation of large materials that may require the removal of these windbreaks) must comply with the requirements of Resolution No. 146 of the Government of Georgia (On Approval of the Rules for the Restoration, Cultivation, Maintenance, Protection and Supervision of Windbreaks). Any such activity must be agreed in advance with the authorized body (MEPA).

343. The length of the main canal is approximately 8400 m. Among them, the length of the open channel is 4400 m. The work will be carried out mainly in the canal alienation corridor. Currently, large-leaved trees and plants grow and thrive on approximately 70% of the entire length of the open canal, within the operational road and on adjacent slopes. The average width of such sections of the corridor is 3 m. Accordingly, by approximate calculation, the area where relatively large trees and plants will be cut is:

$$4400 \times 0.7 \times 3 = 9240 \text{ m}^2, \text{ or } 0.92 \text{ ha.}$$

344. It should be noted once again that such areas represent the canal diversion corridor, which under normal operational conditions should already be cleared of vegetation. Accordingly, the project does not envisage damage to habitats and cutting of trees and plants in areas outside the project.

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

- Prior to the onset of the construction works, instructing the personnel about the protection of the vegetation cover
- Minimise vegetation removal:
 - The standard working width within vegetated sections is approximately 2 m; the 5–8 m corridor refers to the overall construction safety and equipment movement envelope, which does not imply full vegetation clearance. Vegetation removal shall be strictly limited to the defined construction corridor not exceeding 5-8 meters in width (depending on site constraints). The borders of the construction corridor and traffic routes are to be identified accurately to avoid excess damage to the vegetation cover.
 - No mature trees (>15 cm DBH) shall be removed without written approval from the Engineer and the Supervising Environmental Specialist.
 - Topsoil shall be stripped, stored separately, and reused for site reinstatement.
 - The trees and shrubs of high conservation value (including mature trees) will be marked and, where possible, preserved or re-planted
- If Red-Listed species are encountered during construction, works in the immediate area shall cease immediately and a qualified botanist shall assess the specimen in consultation with the Ministry of Environment and Agriculture.
- 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. Compensation planting shall be undertaken at a minimum ratio of 1:3 using native species, with a minimum survival rate target of 80% after two years.
- 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.

b) Impact on Fauna

346. The field studies of 2023 and 2025 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 fauna species may enter the construction area during foraging and breeding periods and may be subject to potential project-related disturbances and impacts.
347. The rehabilitation works will take place within the canal right-of-way. This will involve cutting low-value tree and shrub vegetation (the diameter of vegetation on the canal slopes is generally less than 8 cm). Small bird nests may be present within the vegetation to be cleared, potentially causing direct impacts on them. Therefore, special attention should be given to mitigation measures and monitoring during the vegetation clearing process. It is also worth noting that outside the project area, similar habitat types are widely available, so temporary migration of animal species is not considered a significant impact.
348. 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 and thereby minimising the impact of disturbance (machines, special equipment, farmers’ active movement across the area). However, their presence in the project area in the construction or operation phase is not excluded.
349. Within some of the tunnels on the main canal, bats have been reported by those visiting the sites. The project alignment includes 9 tunnels where bat activity has been reported during site visits. While these structures may provide temporary shelter, they do not constitute a primary or natural habitat for high-conservation-value species. It is important to note that the irrigation canal undergoes significant seasonal filling during the irrigation period (this period coincides with the bat breeding period - April-October).

This hydraulic regime creates high-humidity and high-water-level conditions that prevent the formation of permanent, stable roosting sites within the tunnels.

350. The project area is situated between two major protected areas: the Mariamjvari State Reserve to the north-west and the Korugi Managed Reserve to the south. These protected areas offer extensive, high-quality, and natural habitats (forests and riparian zones) that are far more suitable for bat colonies than the artificial irrigation tunnels currently undergoing rehabilitation.
351. Despite the artificial nature of the tunnels and the availability of superior natural habitats nearby, potential impacts on bats must be addressed in accordance with the „Eurobats Agreement“, which Georgia has ratified. Paragraph 310 and Figure 39 of this assessment identify the presence of three species in the wider corridor, including the Near Threatened Mediterranean Horseshoe Bat (*Rhinolophus euryale*).
352. Construction and rehabilitation activities (noise, vibration, and physical structural work) could cause disturbance or displacement of bats if they are utilizing the tunnels as temporary roosts at the time of works. To mitigate these risks and ensure full compliance with international obligations, the Contractor is mandated to implement specific mitigation measures, including a specialized pre-construction survey, as detailed in the following sections.
353. 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 a 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 mice, water shrews, etc.).
 - 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.
354. 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. The following mitigation measures must be paid particular attention to in the construction and operation phases:
- To ensure the protection of nesting birds, small mammals, and reptiles during the peak breeding season in Kakheti, a strict seasonal prohibition on vegetation clearance will be established. Vegetation clearing and site preparation works will be prohibited from March 1st to June 30th. In exceptional cases, if clearing is urgently required during this period, it may only proceed after a documented pre-clearing survey by a qualified biodiversity expert to confirm the absence of active nests. If active nests are found, a mandatory buffer zone will be established, and works will be suspended in that specific area until the fledglings have left the nest.
 - 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.

- The duration of the works can cause disturbance to and frighten animals should be as minimal as possible.
- It is prohibited to dump or spill waste in an uncontrollable manner during construction works to avoid environmental 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). All construction personnel shall be strictly instructed to prohibit the harming or killing of fauna species. Rather, they must be allowed to escape from the area during works. In extreme cases, their disturbance should be limited to giving the animals a corridor to escape.
- Before resuming work, each morning, the Contractor shall inspect open trenches to remove any animals that may have fallen into them.
- At ravine crossings, excavated trenches shall be backfilled within a maximum of 24 hours of excavation to minimize the risk of amphibian entrapment. If the trench remains open for more than 24 hours, inclined planks or earth ramps (at an approximate 45° angle) shall be installed every 50 meters to allow any animals that have fallen in to climb out independently.
- Inspect pipes or other materials before use, as animals often seek shelter in them.

355. Bat Protection Protocol:

- The construction contractor will conduct a pre-construction bat survey within the 9 tunnels with the assistance of invited specialists. Surveys must be conducted during the active season (April to October). The survey will include both visual inspection and the use of ultrasonic detectors.
- If a roost of the Mediterranean Horseshoe Bat (or other significant species) is identified, the Contractor must stop work in that specific tunnel and notify the Ministry of Environmental Protection and Agriculture (MEPA). Works may only proceed after MEPA issues a permit and an approved "Passive Exclusion" or relocation plan is implemented by the specialist under the direct supervision and written guidance of MEPA experts.
- If no particularly high-value species are identified, the bat specialist may recommend the use of passive noise abatement measures to allow construction to proceed.

c) Fish Fauna

356. There are no rivers, lakes, artificial fish farms or other objects with standing water in them in the Package 1 project area. Therefore, the implementation of the project will not have a direct 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 also will not increase the water abstraction from the Iori River of the system, therefore having no impact on the environmental available flow.

357. In the construction phase, there is a certain risk of getting various waste or harmful substances into the water which will be harmful not only to the representatives of ichthyofauna but also to all species living in the water. See water and pollution for mitigation measures that respond to this risk.

d) d. Protected Area

358. Due to the large distance between protected areas and the project corridor of Package 1, there are practically no risks of direct or indirect impacts. In this regard, targeted mitigation measures are not required.

2. Disturbance or damage of cultural sites, Chance finds

359. There are no visible historical monuments within the Package 1 project's direct and indirect impact zones. Given the nature of the project, the likelihood of late discovery and damage to archaeological sites is also minimal. Overall, the project is not expected to have any impact on historical or archaeological monuments. However, certain mitigation measures are necessary to prevent accidental damage to archaeological sites.

360. Mitigation (preventive) measures:

- Maximum observance of safety measures during excavation works.
- Protection of the boundaries of the project area.
- Implementation of vibration mitigation measures during excavation works.
- Supervision of excavation works (excavation area) in potentially sensitive areas by additional personnel.
- At the beginning of each working day, a thorough inspection and observation of the trenches, pits, trenches dug the previous day for the presence of foreign (unidentified) objects or layers uncharacteristic for the site.
- In the event of the detection of foreign (unidentified) objects or layers uncharacteristic for the site during excavation works, immediate cessation of work:
 - Establishment of temporary protective measures on site.
 - Taking a photo of the site and GPS location.
 - Inviting a competent person (cultural heritage protection agency and consultant). Chance finds procedures need to be in place and should be managed by the cultural specialist. A cultural specialist should be employed on an intermittent basis throughout construction because of this risk.
 - Resumption of excavation works only after confirmation of the non-historical value of the discovered items/layers.

3. Natural Disaster

361. The main canal is in an area of medium risk for landslides, however, with no further excavations or cutting into the slopes, the chances that the project will destabilise the slope are low. Works are limited to the existing infrastructure.

362. Mitigation (preventive) measures:

- The Contractor shall establish control over the adjacent slopes to detect and respond to erosion and gravitational processes in a timely manner.
- Temporary or permanent stockpiling of soil in ravines crossing the canal in such a way as to restrict the water-carrying cross-sections of the ravines shall be strictly prohibited.

4. Noise, dust, light and emissions

363. **Main Sources of Impact:**

- (i) Stationary facilities operating at construction camp(s):

- Concrete batching plant
 - Crushing and screening plant (strict environmental recommendation is that crushers should be located near material extraction sites or subcontractors should be used)
 - Mechanical workshop
- (i) Dismantling works of damaged sections of the canal, including excavation by hydraulic hammer
 - (ii) Earthworks
 - (iii) Operation of diesel generators at construction sites
 - (iv) Transport operations, including the delivery, storage of inert and other construction materials, and removal of waste.

364. Main Receptors of Impact:

- (i) Nearby local population
- (ii) Project service personnel involved
- (iii) Biodiversity components (animal species)

365. Any construction activity is accompanied by increased noise, emissions and dust levels in the project area compared to the baseline levels. As per the current state, the baseline zone is in the territory of agricultural plots of fields, and there are neither industrial nor infrastructural units found in the area, whose operation would deteriorate the air quality.

366. During the construction phase, the main sources of noise, dust and emissions will be heavy construction equipment, as well as construction camps. The exact location of the camps is unknown at this stage. The alternative camp areas proposed by the Environmental Team in this IEE are located at a considerable distance from settlements, sensitive habitats and other potential receptors. This reduces the level of potential impacts.

367. Dust concentration in the air in the project area will be high following the existing infrastructure. The surface of both the access roads to the main canal is ground which leads to dust generation, especially on hot days. Besides, as the equipment is used, the ground roads produce more noise and vibration than asphalt or concrete ones.

368. Lighting around construction camps (locations to be decided) and around works at nighttime or in dark (tunnels) areas has the potential to cause disturbance to communities and wildlife.

369. The following mitigation measures should be implemented within the whole project area:

- To mitigate the spread of emissions, noise, and vibrations, it is important that the contractor uses only well-maintained construction equipment (vehicles, generators, etc.). Proper monitoring of the equipment's condition must be established. In case of any malfunction, immediate corrective action must be taken.
- When selecting transport routes, priority should be given to routes that bypass populated areas. If this is not possible, appropriate measures must be implemented in residential zones — including the villages of Badiari, Mzisguli, and Kachreti — such as reducing travel speeds, restricting the use of horns, and prohibiting movement during nighttime and public holidays. On unpaved roads, watering should be done during dry and windy weather to reduce dust.
- The movement of heavy machinery should be prohibited during non-working hours.
- Machine engine idling should be limited to the extent possible.
- The technical condition of the exploited vehicles will be constantly monitored.

- The method of covering trucks with tarpaulins during the transportation of construction materials and waste should be adhered to.
- Observance of traffic speed limits and proper management of dusty materials is needed to reduce dust propagation. An efficient way to reduce dust emissions can be periodic watering of the traffic routes in dry weather.
- Appropriate management of material and waste.
- In times of high winds, extra care is required and works that will cause a disturbance of loose material should be halted until more favourable conditions.
- Avoid lighting works sites and camps when not in use, unless vital for security. When necessary for security, ensure that the direction of the light is focused at the site (away from communities and natural habitats).

5. Impact on Soil Quality

370. Main Sources of Impact:

- Earthworks and dismantling activities
- Operation of diesel or other substance storage tanks at construction camps
- Domestic and sanitary wastewater
- Industrial effluents resulting from crushing operations
- Negligence, including vehicle washing in adjacent ravines and other similar activities
- Generation and management of solid and liquid waste

371. Main Impact Receptors:

- Mainly low-value soil cover
- Relatively higher-value soil cover may be present at construction camps and staging areas (topsoil)

372. Construction activities may lead to soil contamination (example: hydrocarbons), erosion, compaction, and loss of topsoil, particularly in areas of temporary land use.

373. Main canal rehabilitation will involve the removal of the soil, and if poorly managed can lead to runoff and erosion, causing a loss in productive farmland, water pollution and sedimentation.

374. The works should not involve any long-term storage of the material and the works of digging, laying the pipes and backfilling can be quickly and thereby minimising the impact on the soil. Where topsoil needs to be stored, appropriate transportation, siting of storage and appropriate drainage are needed. After completion of the construction works, pre-excavated topsoil shall be used for the restoration of the damaged areas and to improve productivity.

375. The impact will mainly affect low-value soil cover. Relatively higher-value soils are found in permanently cultivated agricultural lands. However, as also mentioned, such cultivated plots are minimally represented adjacent to the canal and mostly lie outside the direct influence zone of the project. Nevertheless, special attention must be paid during the mobilization phase to the removal and storage of the upper soil layer, especially at camps and staging areas.

376. Modernisation works will also include the removal of sedimentation, the storage of this sedimentation will need to also ensure that siting and storage prevent runoff and pollution and sedimentation of natural water courses.

377. During the canal rehabilitation process, there will be certain sources potentially affecting the quality of soil. Inadequate environmental management may cause

contamination by petroleum products, pollution from domestic-sanitary wastewater, and also contamination by solid waste. The risks are primarily linked to unforeseen incidents. Therefore, special attention must be paid to cautionary measures by construction personnel while working in such areas.

378. Overall, the impact of the main canal rehabilitation soil quality can be assessed as medium. The impact will be temporary and reversible. With the effective implementation of mitigation measures, the magnitude of residual impacts will be negligible.

379. Mitigation measures during earthworks will include the implementation of the measures to prevent soil damage and erosion, and maintain humus fertility and its quality, namely:

- At the initial stage of earthworks, the topsoil should be removed in all necessary places. Topsoil removal, storage and further management should be carried out in accordance with the Resolution of the Government of Georgia No. 424 of December 31, 2013 - "Rules for the Removal, Storage, Use and Recultivation of the Fertile Soil Layer". The following should be taken into account in the process of topsoil management:
 - Topsoil removal and storage should be done separately from other materials, on a pre-selected site protected from surface runoff and covered until backfilling or disposal.
 - Topsoil piles, the storage period of which exceeds 30 days, should be covered with geotextile or other appropriate material to prevent erosion and loss of its fertility.
 - The maximum period of temporary storage of topsoil should not exceed the date of completion of the project, after which it should be used for its intended purpose for recultivation.
 - After the completion of the construction, the previously removed topsoil should be used to restore the damaged areas and improve fertility.
 - The reclamation process will be considered completed only after the relevant act is signed and agreed upon with the PIC.
- The transport and equipment routes must be strictly followed.
- Digging and backfilling of trenches should be done as quickly as possible
- Temporary water-diversion channels should be provided along the perimeter of the topsoil piles
- In the case of long-term storage of topsoil, its care should also be planned to ensure its fertility is protected.
- Unfaulty construction techniques should be used to avoid soil contamination
- The fuel tank should be placed in an area protected by berms or earth fills to stop accidental spills as necessary.
- Accidental spills should be contained and cleaned up immediately using absorbent materials.
- The ground/soil contaminated accidentally during the construction should be cut and removed as soon as possible.
- Waste management control and prohibition of inappropriate practices such as vehicle washing in natural areas.
- After the completion of the construction, the reclamation of the territories and the restoration of sanitary conditions will reduce the probability of impact on soil quality and stability.

6. Impact on Water Quality

380. Main Sources of Impact:

- (i) Earthworks and dismantling activities
- (ii) Operation of diesel or other substance storage tanks at construction camps
- (iii) Domestic and sanitary wastewater

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- (iv) Industrial effluents resulting from crushing operations
 - (v) Negligence, including vehicle washing in adjacent ravines and other similar activities
 - (vi) Generation and management of solid and liquid waste

381. Main Impact Receptors:

- (i) Small ravines crossing the canal

382. There are no large, permanent water bodies within the Package 1 project corridor. This reduces the risk of water pollution. However, improper waste management can lead to long-range transport of pollutants and have long-term impacts on water quality. Impacts are particularly likely when working near small ravines.

383. The impact on water quality can be assessed as low. However, appropriate mitigation measures will need to be implemented. To protect water resources the following mitigation measures should be in place:

- Control of the good technical state of the construction equipment to prevent the leakage of fuel and oils;
- Equipping the fueling stations with a hermetic body and secondary protective casing;
- Use of technically non-faulty construction equipment and vehicles;
- All equipment running on fuel shall be placed in a secondary tank. The volume of the secondary tank must be at least 110% of the fuel volume used by the equipment.
- Control over the separate collection and timely removal of construction and household waste,
- Control of waste water used to clean and rehabilitate the canals.
- Control of the state of collection and removal of domestic and faecal waters.
- Control over the compliance with the rules of storage and use of oil products and oils and providing anti-spill kits on job sites.
- Installation of oil products and oil storage facilities at least 100 m away from water bodies. Otherwise, additional strict measures will be taken
- Conducting training for the Construction Contractor and Client's personnel.
- Development and implementation of the emergency response plan envisaging emergency actions for such cases of pollution as leaks and spills. The given plan will be updated periodically, incidents will be analyzed, and additional preventive measures will be included in it.
- Staff briefing before and after the construction works, once every six months.
- Develop a camp management plan and ensure it covers any risk of pollution.

7. Waste Management

384. Main Sources of Impact:

- (i) Operation of construction camps
- (ii) Demolition and earthworks
- (iii) Clearing of woody vegetation within the canal corridor
- (iv) Contractor support personnel

385. Main Impact Receptors:

- (i) Local population
- (ii) Water and soil
- (iii) Flora and vegetation cover

386. There will be a lot of construction waste produced as part of the construction works and domestic waste from the workers. This will include concrete, rubble, soil, dredged sediment, encroached vegetation, soil and others.
387. In quantitative terms, dredged sediment that will be removed during the Canal cleaning process should be noted. Regarding the management of dredged sediment removed during the channel cleaning process, historical water quality data for the Iori River (Para 286) suggests a low risk of heavy metal pollution. Consequently, it is highly probable that the sediment will be classified as non-hazardous waste (code: 17 05 06).
388. To formally eliminate any risk of hazardous waste (code 17 05 05*), a Sediment Sampling and Classification Protocol has been integrated into the EMP. Since such sediments primarily accumulate at flow-restricting structures, representative samples will be taken at inverted siphon locations (a total of 3 composite samples) for heavy metals, hydrocarbons (TPH), and pH analysis before disposal.
- i. If non-hazardous (17 05 06): The sediment will be transported to an authorized municipal landfill. Alternatively, subject to technical suitability, it may be reused within the project for site leveling, backfilling, or restoration of damaged areas to promote circular resource management.
 - ii. If hazardous (17 05 05*): This specific batch will be strictly isolated and will be transferred to a subcontractor holding the appropriate permit for the management and disposal of this type of waste, in full compliance with national regulations.
389. The corresponding costs for these laboratory tests have been explicitly added to the EMP monitoring budget.
390. The list of expected wastes during construction activities, along with their codes and hazard characteristics, is presented in Table 23.

Table 24. List of anticipated wastes during canal rehabilitation, including codes and hazard properties.

Code	Name	Hazardous (Yes/No)	Possible management action
08 01 11*	Waste paint and varnish containing organic solvents or other hazardous chemical substances	Yes	Will be transferred to a subcontractor holding the appropriate permit.
12 01 10*	Synthetic mechanical processing oils / lubricants	Yes	Will be transferred to a subcontractor holding the appropriate permit.
12 01 13	Residue generated during welding	No	Sagarejo Solid Waste Landfill – LLC "Solid Waste Company"
15 01 06	Mixed packaging material	No	Sagarejo Solid Waste Landfill – LLC "Solid Waste Company" or will be transferred to a subcontractor.
15 02 02*	Oil-contaminated fabrics (cleaning cloths and protective clothing)	Yes	Will be transferred to a subcontractor holding the appropriate permit.
17 02 01	Wood	No	Sagarejo Solid Waste Landfill – LLC "Solid Waste Company" or will be transferred to a subcontractor.
17 02 03	Plastic	No	Sagarejo Solid Waste Landfill – LLC "Solid Waste Company" or will be transferred to a subcontractor.
17 04 07	Mixed metals	No	Sagarejo Solid Waste Landfill – LLC "Solid Waste Company" or will be transferred to a subcontractor.
17 05 05*	Soil containing hazardous substances	Yes	Will be transferred to a subcontractor holding the appropriate permit.

	<i>(If laboratory testing confirms the contamination of this soil)</i>		
17 05 06	Soil not listed under code 17 05 05	No	Sanitary landfills or Sagarejo Solid Waste Landfill – LLC “Solid Waste Company” will be established. or will be used for project purposes, based on a written agreement with the PIC
17 09 04	Construction and demolition waste (concrete waste)	No	Based on a written agreement with the PIC and in accordance with certain conditions (see paragraph 136), it may be used for project purposes (e.g. improvement of access roads) or will be taken to Sagarejo Solid Waste Landfill – LLC “Solid Waste Company”
17 06 05*	Asbestos-containing materials (may be encountered during earthworks, such as in underground pipes)	Yes	Sagarejo Solid Waste Landfill – LLC “Solid Waste Company” (If the local municipal landfill cannot provide a regulated, isolated cell for asbestos disposal, all such waste will be transferred to a licensed subcontractor holding the specific permit for asbestos management and disposal. This subcontractor will be responsible for transporting the waste to an authorized landfill facility that possesses appropriately engineered and regulated cells specifically designed for asbestos disposal).
20 02 01	Vegetation Waste (Biodegradable waste)	No	Will be transferred to local residents only with written agreement with PIC and in coordination with local authorities or will be taken to Sagarejo Solid Waste Landfill – LLC “Solid Waste Company”
20 03 01	Mixed municipal waste	No	Sagarejo Solid Waste Landfill – LLC “Solid Waste Company”

391. Negligence by the activity implementer in the waste management process, as well as disregard for the requirements of the Law of Georgia on the “Waste Management Code” and various subordinate legal acts, may cause a range of negative environmental impacts, such as:

- Deterioration of the quality status of environmental objects (surface and groundwater, irrigation water, soil);
- Emission of unpleasant odors;
- Direct and indirect impacts on animal species;
- Obstruction of population movement and negative visual-landscape changes, etc.

392. Therefore, it is essential that the activity implementer complies with the applicable regulatory requirements in the field of waste management and fulfills the requirements of the waste management plan agreed upon with the Client and the Ministry of Environmental Protection and Agriculture (MEPA). It is important that the construction contractor assigns a dedicated staff unit responsible for waste management issues.

393. The following mitigation measures are also required:

- Good siting and storage of materials and soil to prevent run-off
- Develop a waste management plan. Waste management plan outlining each type of waste that will be produced and how it will be safely stored, how its transported, and where and how it's disposed of. The waste management plan must reflect the principles of the hierarchy, including the possibility of reusing

- concrete waste or wood waste (see IEE paragraphs 136 and 137 for details).
- All waste removed from sites as part of site clean up.
- Reuse and recycling of waste as much as possible.
- Appropriate storage and transportation of waste
- Good international practices in regard to waste disposal
- Portable or constructed toilets with storage must be provided on-site for construction workers if services are not available locally, and must be emptied in an appropriate manner
- Appropriate management of wastewater (Wastewater collected, treated, and disposed of through approved systems; discharge into soil or water bodies - prohibited, regular inspection and maintenance).
- Ensure an appropriate person is responsible for waste management in the construction contractor (As part of Georgian legislation, a named person from the contract will need to be responsible for waste management).

8. Visual-Landscape Impacts

394. Main Sources of Impact:

- (i) Operation of construction camps
- (ii) Demolition and earthworks
- (iii) Clearing of woody vegetation within the canal corridor
- (iv) Waste Management

395. Main Impact Receptors:

- (i) Local population
- (ii) Fauna

396. The project corridor of Package 1 is located far from populated areas and sensitive habitats. This significantly reduces the significance of visual and landscape impacts.

397. Impacts on the local landscape are related to the preparatory and construction works, during which the vegetation cover will be removed, trenches dug, material spoil heaps present, etc. When evaluating the impact on the landscape, the value and degree of naturalness of the area in question, and the area of the specific type of landscape to damage should be considered.

398. The visual-landscape impacts in the construction phase are expected around any construction camps. As already mentioned, at this stage, the territory of the project camp is not specified. However, potential camp sites have been proposed by the environmental group. These sites do not have visual views or high landscape value. Confirmation of these areas by the construction contractor will reduce the significance of the impact. The visual impact of the camp is temporary, as after the construction, the camp will be dismantled, and the area will be fully restored.

399. The night lighting of the camp will be another reason for a significant negative impact in the construction phase, and therefore, it will be necessary to implement efficient mitigation measures.

400. By considering the above-mentioned, it should be said that the construction works will not cause pressure on the unique type of landscape. Rather, a part of the landscape established under the anthropogenic impact will be worked on, the analogue of which can be found in the surrounding area of several hundred hectares.

401. The impacts on the visual and landscape are temporary as they can be restored after the works, through several mitigation measures:

- Fencing the perimeter of the construction camp.

- Minimizing the area of impact of the construction works and associated zones to the extent possible.
- Backfilling, reinforcing and compacting all excavated trenches as soon as possible; levelling surfaces and slopes, and if necessary, using the slope stabilization method.
- Proper management of waste and materials, adhering to the sanitary conditions, and timely waste removal from the territory.
- Proper planning and control of night lighting in the working areas to avoid bright illumination and light pollution. Light propagation in the surrounding area should be limited as much as possible.
- Strictly following the vehicle and machinery travelling routes.
- After completion of the construction works, conducting restoration works in the temporarily used areas.

9. Impact on socio-economic aspects

402. The following types of impacts and risks have been identified:

- (i) **Lease of land outside the expropriation corridor** – During the construction period, it may become necessary to lease land parcels outside the project's expropriation corridor for the installation of residential camps, concrete and crushing plants, temporary access roads, and/or storage of materials. These land parcels will mainly be state-owned; however, **in certain cases, leasing of privately-owned plots may also be required.**
- (ii) **Damage to utility lines** – In several segments alongside the project canal, there are low-voltage power lines supplying electricity to nearby villages. During construction activities, there is a likelihood of damaging these lines. Such disruptions to communal services are highly inconvenient for the local population and could negatively affect the project's public perception.
- (iii) **Damage to private property outside the expropriation corridor** – During construction, there is a risk of damaging private property located outside the expropriation corridor. Such damage could result from exceeding the corridor boundaries or from the use of public roads. These risks are especially relevant in the corridor of the second section of the canal.
- (iv) **Disruption of transportation and restricted access to resources** – At certain periods, intensive transportation of construction materials and structures may increase traffic on local roads and cause delays. The project area has a well-developed network of secondary roads, offering various alternative routes to construction sites. Therefore, the probability of significant traffic disruptions during the construction phase is low. Water resources may also be temporarily used to supply the construction camps and sites, potentially limiting local population access to water. As mentioned, nearby areas are used as pastures, and temporary access restrictions to pastures may also occur. However, such risks are considered low and manageable.
- (v) **Dust, noise, and vibration** – Dust, noise, and vibration generated during construction activities are major nuisances for the population living near access roads. These issues will be given special attention during construction.
- (vi) **Influx of labor** – The construction process will generate new employment opportunities. In addition to skilled personnel brought in by the contractor, there will be a need to hire unskilled labor, creating job opportunities for local residents and job seekers. However, the influx of a large number of outsiders may lead to conflicts with the local population and increase the risk of spreading infectious diseases.

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- (vii) **Risk of spreading animal-borne diseases** – Based on our research, no historical animal burial sites are located within the project corridor. Therefore, the risk of spreading diseases such as anthrax, brucellosis, bovine tuberculosis, etc., during earthworks is considered low. However, it is recommended that the contractor obtain a certificate from the LEPL National Food Agency confirming the absence of such burial sites before commencing earthworks.
- (viii) **Potential impacts on agriculture** – The region under consideration does not belong to land-scarce areas in Georgia. Moreover, permanently cultivated land plots are located at a considerable distance from the project corridor. Therefore, the canal rehabilitation process is not expected to have a significantly negative impact on agriculture. On the contrary, after the completion of the rehabilitation works, the main canal will clearly bring substantial benefits to local agricultural development.

403. The updated IEE integrates the findings from the May and August 2025 field surveys, which confirm the continued relevance of these socio-economic risks and provide a basis for the prioritization of mitigation measures.
404. The LARP will be updated in alignment with ADB's Safeguard Policy Statement (SPS, 2009) and will integrate results from the ongoing socio-economic and resettlement surveys conducted in 2025
405. Resettlement will be limited as much as feasible, consultation will occur periodically, and appropriate compensation measures will be provided to unavoidable resettlement. These issues and mitigation measures will be more clearly highlighted within the LARP and resettlement documents.
406. As part of this communities will need to be regularly engaged and this should be outlined through Community Awareness and Participation Plan.
407. The updated IEE also reflects enhancements to the Community Awareness and Participation Plan (CAPP) and the Grievance Redress Mechanism (GRM) to ensure that affected communities are fully informed and engaged throughout the implementation phase.

10. Occupational and Community Health and Safety

408. Construction activities may generate noise, vibration, water and air emissions, involve handling of heavy materials, vehicle and machinery hazards, work at height, water-related risks and similar occupational hazards. Rehabilitation works will also be carried out in the tunnel. There may also be the generation of asbestos-containing waste, which will require specific management. There will be a variety of risks throughout the project typical of construction activities of this kind.
409. An increase in the number of workers within an area will always bring the potential for negative social interactions with the community and the risk of transmitting diseases (communicable and sexually transmitted diseases). This level of risk will be linked to if and where any construction camps are located.
410. For this good international practice will be enforced and the following general mitigation measures will include:
- Access and use of PPE and first aid equipment
 - Health and Safety Plan, including first aid, emergency procedures, training, PPE, labelling and more will be developed and implemented throughout the project
 - Accident recording and reporting system maintained until handover to the GA
 - Sanitary facilities provided to the workers
 - Safe areas for breaks provided

- Training and awareness of health and safety measures among workers
- Person(s) on site that are fully trained in first aid
- Clear demarcation and preventing access to unauthorised personnel
- Good international practices for water, air, noise, vibration and dust management.
- Community Awareness and Participation Plan and GRM – will support community engagement to identify and manage any issues.

a) Tunnel Construction Safety Protocol

411. During rehabilitation works involving enclosed sections of the irrigation canal and associated tunnel structures, the Contractor shall implement a Confined Space Entry Procedure consistent with international good practice (e.g., OSHA confined space standards and ADB SPS 2009 occupational health and safety requirements).
412. To manage core risk factors associated with tunnel works, the Contractor must demonstrate specific competence in confined space operations prior to the commencement of any site activities. These requirements shall be specified in the bid documents:
- i. The Contractor shall provide a demonstrated track record (minimum 3 years) of successful experience in hydraulic tunnel rehabilitation or similar underground infrastructure works.
 - ii. Mandatory appointment of a designated Confined Space Supervisor who holds a valid professional certification for managing safety in enclosed environments.
 - iii. The Contractor's personnel must show proficiency in the use of specialized H&S equipment, including gas detectors and emergency retrieval systems.
413. The following measures will be mandatory:
- All construction activities within the tunnels must be executed in full compliance with Georgian Government Resolution No. 341 (July 1, 2022) on the "Technical Regulation on Minimum Health and Safety Requirements at Workplaces". Specifically, the Contractor shall ensure strict adherence to Articles 11, 12, and 15 of said Resolution, which cover risk assessment, safety coordination, and mandatory health and safety training for personnel.
 - Prior to the start of the works, all persons involved in the construction of the tunnels will be provided with appropriate training.
 - Written confined space entry permit system - In order to exclude unauthorized persons from entering the tunnel, access procedures will be developed, based on which all persons entering will be registered
 - Pre-entry atmospheric testing for oxygen (19.5–23.5%), methane (LEL <10%), carbon monoxide (<25 ppm) and hydrogen sulfide (<10 ppm)
 - Continuous multi-gas monitoring during occupancy
 - For the purpose of air quality monitoring, a competent person will be assigned who will be responsible for the constant detection of gases
 - Forced mechanical ventilation ensuring minimum 6 air changes per hour
 - Standby rescue personnel positioned outside confined spaces
 - Emergency retrieval systems (tripod, harness, winch)
 - Daily safety briefings
 - Structural stability assessment prior to entry
 - Emergency evacuation plan including secondary exit strategy where feasible
 - Flood risk assessment for tunnel sections
414. No entry shall be allowed without gas monitoring equipment calibration certificate and documented supervisor authorization.

b) Asbestos Management Procedures

415. As a result of earthworks, asbestos-containing waste may be generated in the form of old underground pipes. A precautionary Asbestos Management Procedure will be implemented:

- The Contractor shall prepare a site-specific Asbestos Management Plan prior to construction
- Works shall immediately stop in the affected area
- The area shall be isolated and access restricted
- Samples shall be analyzed by certified laboratory (If the asbestos content of the material is suspected).
- Removal and handling of ACM shall be carried out only by qualified and licensed asbestos specialists.
- Removal shall only be conducted by asbestos specialists
- Workers shall use appropriate PPE (P3 respirators, disposable coveralls)
- Wet removal techniques shall be applied to prevent fiber release
- Waste shall be double-bagged, labeled;
- Waste shall be transported by licensed operators, and all transport and disposal documentation shall be maintained. Disposal shall be undertaken only at a facility authorized to receive hazardous waste in accordance with Georgian legislation.

c) Heat Stress Prevention – Summer construction process in Kakheti

416. Given that summer temperatures in Kakheti may exceed 38°C, the Contractor shall implement a Heat Stress Management Plan including:

- Work-rest cycles (minimum 15 minutes rest per hour when temperature exceeds 35°C)
- Mandatory shaded rest areas
- Provision of minimum 5 liters of potable water per worker per shift
- Electrolyte supplements during peak heat periods
- Adjustment of working hours (06:00–11:00 and 17:00–21:00 during extreme heat)
- Daily monitoring of temperature and humidity (heat index tracking)
- Worker training on heat exhaustion and heat stroke symptoms
- Immediate medical response protocol
- Work shall be suspended if heat index exceeds 45°C.

d) Community Safety

417. Construction sites near populated areas and places of public movement will be fenced off to prevent unauthorized access. Along with the fencing, safety signs will be installed near construction sites, which will be made of reflective, visible-in-the-dark material, so that they are easily visible at night.

418. Due to the specifics of the rehabilitation facility, the risks of falling into the canal and damage should be taken into account (during the rehabilitation process, water will not move in the canal and, accordingly, the risk of drowning is significantly minimized as the canal will be dry; however, safety measures address potential risks from accumulated rainwater or accidental falls into deep trenches). When assessing the risks, it should be noted that the canal does not pass through populated points. There are no sensitive public buildings (e.g. schools, etc.) in its vicinity. Despite the above, in

order to reduce these risks, it is necessary to place warning signs in sensitive sections and arrange temporary protective barriers near open trenches and construction sites. At this stage, at least two such locations have been identified, these are public roads crossing the canal:

- 1. Crossing the road leading to the village Shibliani: Coordinates: X - 551943; Y - 4611702
- 2. At the end of the canal, crossing the road leading to the village Zemo Kachreti: X - 554274; Y - 4612024.

419. The H&S officer of the construction contractor will conduct an inspection to identify additional such sensitive sections prior to the commencement of the rehabilitation process.

420. In addition, periodic educational meetings will be held with the population living in the vicinity of the project road area to inform them about the dangers posed by the construction work and the control measures implemented.

421. Other measurable commitments:

- Implementation of a Worker Code of Conduct
- Mandatory awareness training on communicable diseases (including HIV/AIDS)
- Prohibition of child and forced labor
- All safety-related incidents or community concerns will be documented and managed through the Project's Grievance Redress Mechanism (GRM).

11. Traffic

422. During construction, there will be a higher than normal amount of traffic along the main Tbilisi-Bakurtsikhe Highway and smaller roads to access the construction area. As per the preliminary design, the movement of heavy equipment is mainly expected during the transportation of the construction materials, excavation of trenches and subsequent backfilling of trenches; besides, the movement of heavy machinery across the project area is expected during the disassembly of the existing concrete open channels and their transportation to the landfill.

423. The project may need to install traffic control measures which would cause disruption to those travelling along the route. This is unlikely to be needed along the Tbilisi-Bakurtsikhe Highway however, this is likely that the roads will be partially or fully blocked at points during the works.

424. The Contractor shall prepare a detailed Traffic Management Plan (TMP) prior to commencement of works, subject to approval by the Supervising Engineer and the PIU. This should detail traffic management procedures such as routes, timings, speed limitations and vehicle maintenance to prevent the impacts above. The traffic management plan will need to be agreed upon with the local police department.

425. The TMP should also include verification of the load capacity of rural road bridges for the weight of vehicles (typically 30-40 tons of cargo). 2 rural bridges are affected under Package 1 (their views are given below). Both of these bridges are located on a rehabilitation canal (it should be emphasized that bridges over surface water bodies are not included in the project area). Accordingly, these bridges are less exposed to the impact of surface runoff and erosion (since this canal is a regulated object and there is no water in it). Visual assessment did not indicate any significant structural (supporting elements) damage and erosion of these bridges.



Figure 42. Existing rural bridges on the canal, located within the rehabilitation process transport corridors

426. Nevertheless, the TMP should include measures for inspection of bridges and subsequent actions:

- i. Before starting work, the contractor is obliged to inspect all bridges on rural roads. The condition of the bridges should be surveyed (including high-resolution geo-tagged photography).
- ii. The load-bearing capacity of the bridges should be checked for a 40-ton load and appropriate records should be made.
- iii. If the bridge cannot withstand the load, the contractor should develop and agree with the supervisor (PIC) an alternative (bypass) route.
- iv. In the event that a bypass route does not exist, the contractor is obliged to temporarily reinforce the bridge at his own expense.

427. Other measurable commitments:

- Maximum speed limit of 30 km/h within settlements
- Installation of warning signage compliant with Georgian standards
- Traffic marshals at high-risk crossings
- Log of community complaints related to traffic

428. If access roads will be closed, then the surrounding landowners will need to be notified in a timely manner prior to the works closing; including details of the time closed, where exactly and the GRM.

F. Operational Impact

429. There will be no permanent source of noise, vibration or harmful substance emission in the operation phase

1. Health and safety risks to the community

430. For the main canal, there is always a risk of people falling in and injured or drowning in the water. This was a risk before the project, during construction and operation. This needs to be managed to minimize this risk:

431. Georgian Amelioration (GA) has established robust safety practices in recent years to mitigate public safety risks. This includes seasonal nationwide awareness campaigns and high-visibility television commercials prohibiting swimming and emphasizing caution near irrigation infrastructure. These initiatives have significantly reduced the frequency of water-related accidents across the country.

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432. Regarding Package 1, while the canal primarily passes through uninhabited areas, specific drowning prevention measures will be implemented at identified sensitive crossings to ensure a 'safety-first' approach. These measures include:
- i. Installation of permanent protective fencing at all road crossings and bridge approaches to prevent accidental falls into the canal.
 - ii. Deployment of permanent warning signage in Georgian at key access points and along the canal banks.
 - iii. Drowning risk management protocols will be formally integrated into the GA Operation and Maintenance (O&M) Manual for this specific sub-project.
 - iv. Implementation of a drowning incident reporting procedure directly linked to the Project's Grievance Redress Mechanism (GRM) to track and respond to safety concerns.
433. Detailed inspections have identified two primary sensitive sections at public road crossings:
- 1. Crossing the road leading to the village Shibliani: Coordinates: X - 551943; Y - 4611702
 - 2. At the end of the canal, crossing the road leading to the village Zemo Kachreti: X - 554274; Y - 4612024.
434. Following the completion of rehabilitation works, GA specialists will conduct a final safety audit to identify and equip any additional sensitive areas with appropriate signage or fencing if necessary.

2. Temporary Impacts during Maintenance and Repairs

435. In the project operation phase, an impact on the water resources, soil, visual landscape, emissions, dust, noise and vibration is possible only during the rehabilitation and repair works. The given impact will be local and short.
436. During operation, the canal will need to be occasionally cleaned and the pipe may need to be flushed as part of general maintenance. This will likely exacerbate the issue of high suspended sediments. When this occurs, one alternative is to time the works to ensure that it will not increase the suspended sediments above legal limits and will prevent impacts on downstream biodiversity.
437. Without flushing, the pipes will be blocked by suspended sediment which will require removal and disposal. Waste from sediments needs to be safely and legally disposed of.
438. General good construction practices are required, with good health and safety practices and appropriate management of material and waste including considerate transportation, covering of loose material, separate storage for waste etc.

3. Climate Change and Natural Disaster

439. Changes to precipitation, snowfall, glaciers and snow and glacier melt change the availability of water within the lori. . The water availability is expected to worsen after 2040 at the same time water demand is expected to increase. Glacier meltdown until 2160 will yield abundant waters and may present problems in terms of erosion and floods in irrigation infrastructure, waterways and drainage outlets. This may also lead to insufficient environmental flow which is important to biodiversity and can lower the water quality within the river basin.
440. This project was designed with climate resilience in mind however these risks are some that GA should be aware of.

4. Induced impacts

441. The project can cause induced impacts from improvements of the system and expansion of the area irrigated. This includes:
- Soil and water pollution from increased fertiliser and other agricultural chemicals use results in an increase in the risk of soil contamination and water pollution from fertilizers and pesticides. This is caused by a lack of awareness among farmers regarding the use of pesticides and fertilizers.
 - Increase groundwater levels in the project area from excessive irrigation and if water leaks occur.
 - Inefficient water uses and increasing demand for water.
442. To mitigate this, as part of any training to farmers, under Output 3 and any future training provided to the farmers by the GA, if appropriate, should incorporate sustainable use of water and appropriate use of fertilizer and pesticides.
443. There is also a risk of conversion of land to agriculture as farmers would be drawn to a well-running irrigation system. This may, in turn, may lead to the conversion of the existing forests to use the lands for agricultural use. However, it should be noted that most of the land is already agricultural, with windbreaks and trees running along boundaries, which limits this issue.

5. Environmental Flow

444. The water resources of the Iori River are subject to multiple demands, including supply to the Paldo headworks for the Zemo Samgori irrigation system, the Kvemo Samgori irrigation system, the Dalis Mta Reservoir, and the requirement to maintain environmental flow. The activities under this project will not result in an increase in water abstraction. However, potential future pressures on water resources—such as reduced river flow due to climate change or increased demand from upstream users (e.g., Zemo Samgori system)—may require a greater proportion of available water to be allocated to environmental flow.

G. Cumulative Impact

445. No industrial facilities, large-scale extraction sites, or other major construction projects are located in the immediate vicinity of the Package 1 canal corridor that could result in significant cumulative environmental effects. The only major infrastructure project in the wider area is the Rehabilitation of the Tbilisi–Sagarejo–Bakurtsikhe Motorway, currently under construction approximately 0.8 km south of the main canal alignment.

1. Identification of Potential Cumulative Pathways

446. Potential cumulative impacts were assessed considering the following environmental pathways:
447. Air Quality: Both projects involve earthworks and movement of construction machinery, which may generate dust and exhaust emissions. However, due to the separation distance (approximately 0.8 km), absence of shared confined valleys, and the linear nature of both alignments, dispersion of emissions is expected to occur before overlapping concentrations could form. Any air quality impacts would therefore remain localized and temporary.
448. Noise and Vibration: Construction noise from both projects is temporary and equipment-based. Given the spatial separation and the absence of shared sensitive

receptors (such as settlements, schools, or medical facilities) located equidistant between the two alignments, cumulative noise amplification is not anticipated. Noise impacts will remain site-specific and reversible.

449. Surface Water and Soil: The motorway rehabilitation and canal rehabilitation do not share water abstraction points, discharge points, or drainage systems. Therefore, cumulative impacts on hydrological regimes, erosion, or sediment transport are not expected.
450. Biodiversity and Habitat Fragmentation: Both projects follow existing linear infrastructure corridors. No new habitat fragmentation is anticipated. There are no protected areas or critical habitats located between the two project footprints; therefore, cumulative ecological impacts are considered negligible.

2. Temporal Overlap Consideration

451. Although it is considered unlikely that peak construction phases of the motorway and canal rehabilitation will fully coincide, even in the event of schedule overlap, cumulative impacts would remain temporary, localized, and reversible in nature due to:
- Linear alignment and physical separation of works;
 - Implementation of project-specific mitigation measures;
 - Limited duration of intensive construction activities.

3. Intra-Project Cumulative Impacts (Package 1 and Package 2)

452. Simultaneous implementation of Package 1 and Package 2 rehabilitation works may result in increased:
- Construction traffic;
 - Temporary noise levels;
 - Equipment emissions;
 - Community disturbance risks.
453. To manage these potential cumulative effects, the following coordination measures will be implemented:
- The PIU will ensure coordination between contractors of both packages through regular environmental and social meetings;
 - Contractors will harmonize traffic management plans to avoid simultaneous peak transport of materials where feasible;
 - Joint community notification procedures will be applied in settlements affected by both packages;
 - Environmental monitoring results (air, noise, grievances) will be shared between contractors to enable adaptive management if required.

4. Conclusion

454. Based on the qualitative assessment of spatial separation, absence of shared sensitive receptors, temporary nature of construction activities, and implementation of coordinated mitigation measures, cumulative environmental impacts associated with Package 1 are expected to be low, localized, and not significant. No additional targeted cumulative mitigation measures are required beyond those already specified in the EMP.
455. During operation, cumulative effects of Packages 1–4 are expected to be predominantly positive. Rehabilitation of the irrigation infrastructure will:
- Improve reliability and efficiency of water delivery to Sagarejo and Gurjaani

-
- municipalities;
 - Reduce water losses associated with canal deterioration;
 - Improve agricultural productivity;
 - Decrease risks of uncontrolled water abstraction and inefficient irrigation practices.
456. Potential cumulative risks related to increased water abstraction have been assessed and are not anticipated, as the project does not increase overall water withdrawal volumes beyond licensed limits.

VII. ANALYSIS OF ALTERNATIVES

457. One of the objectives of an IEE is to investigate alternatives to the Project. In relation to a proposed activity, “alternatives” means different ways of meeting the general purposes and requirements of the proposed activity. The following section provides an assessment of alternative alignments as well as the ‘No-Project’ alternative.

A. ‘No Project’ Alternative

458. Effective irrigation and drainage services are vital components of vibrant Georgian agriculture. In the 1980s, nearly half a million hectares of Georgian farmland was equipped for irrigation. Today irrigated area has shrunk to less than a fifth of that, and the actually irrigated area in 2015 was only 43,000 hectares. Alongside that shrinkage, agricultural production and productivity have fallen dramatically. Between 2000 and 2010, the production of annual crops declined by 44%, while the output of perennial crops fell by 10%. With a handful of exceptions, yields for major crops are well below those of neighbouring countries.

459. Currently, the Kvemo Samgori irrigation system is in need of modernisation; water is being inequitably distributed and the system has high water loss. This is due to issues with operation and maintenance.

460. This issue is and will be exacerbated by climate change's effects on the water resources available within the area. Without the project, the system will further deteriorate having a negative effect on agriculture within the area. The project has several advantages listed below:

- (i) Modernisation of the irrigation systems is a priority for the Government of Georgia and is envisaged by the ADB Country Partnership Strategy document
- (ii) Improve equitably water distribution
- (iii) High water loss within the current system
- (iv) Without repairs and/or modernisation part of the system in part will fail
- (v) With other parts of the system rehabilitated separate from the project, without this project previous activities can be seen as lost investments
- (vi) The project is being designed to be climate-resilient.
- (vii) Improved understanding of the water and the irrigated area will lead to improved monitoring, operation and maintenance.
- (viii) The project generally supports the GA plan to move to a tariff based on water used will lead to improvement in sustainable water use and a fairer financial system.
- (ix) More equitable distribution and better monitoring will also be able to identify areas of excessive water use, and the related fertilisers and pesticide runoff that can be caused and as such this can support the prevention of this issue.

461. This in general is affecting the agricultural output, productivity and income. Most farming households cannot rely on the income from their farms, as seen by the high number that need second jobs, this is an issue regarding the sustainability of farming within the region. More efficient systems and equitable distribution of water will help improve the socio-economic situation by leading to a greater area being covered by the same amount of water taken and increasing the agricultural output per water used.

462. Based on the above 'No Project' Alternative is not acceptable. Implementation of the project will significantly increase the socio-economic situation of the local population (farmers). Positive environmental benefits are expected at the operating stage, including rational use of Water Resources.

B. Project Selection

463. The ideas were selected based on what will provide the greatest benefit well ensuring no excessive impacts on protected areas and cultural resources. The area close to the headway has already been rehabilitated and therefore was ruled out early on. It was also decided that no work would be undertaken within the protected areas that border the project. This was to prevent any unacceptable impacts on biodiversity.
464. The subject selection also considered the location of cultural resources. The cultural site in Area 1 is not part of the net irrigation area, the secondary and tertiary canals currently are located close to the sites. Impacts should be mitigated, with no residual or permanent impacts on them. The design will consider the asset to ensure that they will not impact these two sites.

C. Design Alternatives

465. Package 1 involves the rehabilitation of the existing main canal of the irrigation system. The main canal of the irrigation system (Package 1: Main Canal Ch 313+42 to Ch 397+00) is represented by tunnels, open canals, and siphons.
466. Changing the corridor of the main canal cannot bring any significant benefits from a technical perspective. This alternative would lead to a significant impact on additional land areas and the socio-economic environment. Therefore, maintaining the existing technical specifications is the most acceptable alternative.
467. It will not be possible to increase or decrease the capacity of the canal, as the previous sections have already been rehabilitated with the same specifications.
468. Based on the above, Package 1 does not have significant alternatives in its design. The rehabilitation of the canal should be carried out according to the original technical specifications

VIII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

469. One of the main goals of the IEE is to facilitate the participation of all stakeholders and local communities at all stages of the project cycle: from the pre-construction phase and construction activities to its operation. In this regard, public consultations were held in Sagarejo to capture the stakeholders' opinions about the project, and agree on the project activities.
470. In 2023, initial consultations with stakeholders have been undertaken, meeting with representatives of the community. In 2026, following the IEE update, additional public consultations were held.
471. Following the removal of Areas 5 & 6 (Gurjaani Municipality) from the project scope, the PIU has initiated a targeted consultation process to inform the local authorities and affected stakeholders of this change. This engagement ensures compliance with ADB SPS (2009) regarding continuous consultation.
472. The PIU is currently documenting this communication through official correspondence and focused meetings. The records of these consultations, including the rationale for the scope change and feedback from Gurjaani Municipality, will be reflected in the Environmental Due Diligence Report (EDDR). All future engagement activities in these areas will continue to be managed through the project's established communication channels and Grievance Redress Mechanism (GRM).

A. Initial Consultations, 2023

473. Aiming at organizing an information campaign within the scope of the Kvemo Samgori Left Main Canal Irrigation Scheme, the Consultant's social group prepared an information leaflet.
474. Prior to the onset of the information campaign, the concerned parties and legal and private entities were identified on whom project implementation would or could have a positive or negative impact. The concerned parties were represented by the representatives of the local authorities, non-governmental sector and local population, who live or run businesses in the project zone or adjacent to it. The local population along the given project area section ran both, legal and illegal businesses receiving certain profits.
475. In June 2022, the Consultant's social group met with the representatives of both, non-governmental and governmental local self-government authorities. The goal of the meeting was to communicate the details, goals and objectives of the planned project to the representatives of the local authorities and learn about their views and expectations in respect of the project.
476. Meetings were held with Mr Paata Asratashvili, the Mayor of the city of Sagarejo, Mr Alex Gilashvili, the First Mayor deputy, Mr Rostom Bakradze, the Head of the Department of City Hall Infrastructure and Spatial Planning and Mr Nikoloz Digmelashvili



Figure 42. Meetings at Sagarejo Municipality and Georgian Amelioration Sagaredjo Office

477. At the meetings, the representatives of the local self-governing bodies showed full support for the project. In their opinion, this project will promote the development of the region, will support agriculture, which is one of the leading branches in the region and will help increase the budget consequently. All these benefits will have a positive impact on the youth of the region and will reduce migration, which is one of the major problems of Sagarejo and Gurjaani municipalities today.

478. In addition, the representatives of the self-governing bodies stated their wish to engage the local population in the construction works to the extent possible. At the project planning and implementation stages, in their opinion, major attention must be paid to the following issues:

- (i) The expected negative project impact on the population must be studied in detail and a fair compensation plan must be developed.
- (ii) To the extent possible, the population must be informed about the current project and the population must be given a clear understanding of the advantages of the project.
- (iii) The local workers must be employed to the extent possible at the project implementation stage.
- (iv) The women's wishes and expectations are desirable to study on their own at the project implementation stage.

479. As per the primary plan developed by the Consultant during the implementation of the information campaign, the meetings were to be held in the villages, which were to be crossed by the project area or where the project area is located near a village or a settled area. After the meetings, it was decided that the information campaign would be given on a larger scale and the information would be disseminated among more

people, particularly among the women living in the region. It was also decided to try and find additional ways to receive information from them.

480. Within the prepared information campaign, the Consultation Company held some additional meetings in the villages and settled areas adjacent to the project zone. Within the scope of the said campaign, not only the population was informed about the planned activities, but information about the population's opinions and wishes was gathered as well. Going forward, a stakeholder engagement plan (SEP) shall be developed and implemented prior to the start of civil works. SEP includes the most effective methods to disseminate project information and it is gender inclusive and tailored to the needs of the disadvantaged and vulnerable.
481. As per the information gathered as a result of the held information campaign, the following mitigation measures and recommendations were developed related to social issues within the scope of the project.
482. Regarding the employment of the local staff, the following requirements are to be envisaged in the contract to be concluded with the construction Contractor: (i) in case of equal qualification, advantage should be given to the local staff for employment purposes within the scope of the project, and (ii) 70% of the non-qualified labour should be the local staff.
483. The population has a great desire to have irrigation water supplied to their homes. At this stage, they use drinking water for irrigation, which is associated with large costs.

B. Information Disclosure and Public Consultations, 2026

1. Requirements

484. It is one of the main principles of ADB SPS, 2009 to carry out meaningful consultation with affected people and facilitate their informed participation. It defines meaningful consultation 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 makings, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues". For category B subprojects under CSISDP, at least one consultation shall be conducted when the IEEs have been prepared, to inform stakeholders about the project, its potential impacts and likely mitigation

2. Objectives of Consultations

485. Stakeholder engagement (including consultation and the disclosure of information) is a key element of project planning, development, and implementation. Effective stakeholder engagement assists good design, builds strong relationships with local communities, and reduces the potential for delays through the early identification of issues to be addressed as a project progresses. The objectives of these consultations are:
- (i) To inform and educate the common public, especially potentially impacted communities/ individuals and stakeholders about the proposed project activities;
 - (ii) To familiarize the people with technical, environmental, social, and economic issues of the project for better understanding;

- (iii) To solicit the opinion of the affected communities/ individuals on environmental issues and assess the significance of impacts due to the proposed development;
- (iv) To foster cooperation among the staff of MEPA and the PIU, the communities, and the stakeholders to achieve a cordial working relationship for the smooth implementation of the project;
- (v) Assess the views of the beneficiary communities and their willingness to participate in the project in a bottom-up planning and decision-making process;
- (vi) To secure people's inputs in respect of project planning, selection of mitigation measures, and monitoring strategies; and
- (vii) To ensure the lessening of public resistance to change by providing them with a platform in the decision-making process.

3. Information Disclosure

486. As noted above, for category B subprojects under CSISDP, at least one consultation shall be conducted when the IEEs have been prepared, to inform stakeholders about the project, its potential impacts and likely mitigation.

487. Field meetings with stakeholders were held in February and March 2026. Pre-prepared information brochures (see Appendix 9) were distributed to residents and farmers of nearby villages. During the meetings, the opinions of stakeholders on the planned project and their main challenges were noted. During the meetings, it was revealed that the stakeholders welcomes the implementation of the project and hopes that the possibility of providing irrigation water will improve. During the meetings, stakeholders were provided with information about the planned public hearing.

488. Also, information brochures indicating the time and place of the planned public hearing were posted at the Sagarejo Municipality office, nearby agricultural and grocery stores, schools and other public buildings.

489. Below are photos that illustrate the process of meeting with stakeholders and Information disclosure.





Figure 43. The process of field meeting with stakeholders and Information disclosure.

4. Public Consultation

490. The public hearing was held on March 6, 2026, at the Shibliani Public School, Sagarejo Municipality (The minutes of the meeting are presented in Appendix 10).
491. The meeting was organized by PIU and local government representatives. The meeting was led by PIC's environmental and social specialists and engineering team. Representatives from ADB and GA also attended the meeting. The meeting was attended by residents and farmers from nearby villages, local school teachers and other stakeholders (Photos of the public consultation process are provided below).



Figure 44. Meeting at the Shibliani village school

492. During the meeting, it was revealed that the public in attendance welcomes the implementation of the project. In their opinion, the implementation of the project is very important for the development of agricultural activity in the region. Improving the supply

of irrigation water will positively affect crop yields and, accordingly, the living conditions of local residents.

493. As stated in minutes of the meeting, two questions were raised by stakeholders during the meeting:
494. **Question 1:** A local resident, Mr. Tamaz Gvelukashvili, noted that he owns several agricultural plots adjacent to the project section of the irrigation canal, at the upper elevations. Vineyards are planted on the plots. In addition, there are other private plots in the same area, which are also cultivated and vineyards are planted within them. The total number of plots is approximately 32. The approximate location of the aforementioned plots was indicated on the cartographic material presented by the author of the question during the meeting.
495. The author of the question was interested in whether the rehabilitation of the canal will provide irrigation water for the mentioned area; and/or whether it is possible to further consider the possibility of irrigating this area (for example, by installing water pumps on the canal or by other methods).
496. **Answer:** Yuri Gogelidze, an engineer from the design organization - “Dolsars Engineering”, explained that the project envisages the rehabilitation (and not reconstruction) of the irrigation canal. Accordingly, the project envisages the restoration of the irrigation network in a historically defined area. According to the project, water will be supplied to the 2nd and 3rd row distributors of the irrigation network, which are located at lower points from the canal, by gravity. The arrangement of pumping stations to supply water to additional agricultural fields located at the upper points of the canal is not envisaged. Accordingly, the area indicated by the author of the question (which is located at the upper points of the canal and historically did not represent the irrigation areas of the left main canal of the Kvemo Samgori irrigation system) is not envisaged in the project.
497. During the question-and-answer session, it was emphasized that the inclusion of additional territories in the irrigation areas of the canal under consideration requires additional study and assessment, namely:
- (i) Technical and economic assessment and justification of this possible change;
 - (ii) Study and assessment of the irrigation water balance as a result of this possible change, including an analysis of the risks of possible water loss for beneficiaries downstream of the canal;
 - (iii) Analysis of other types of socio-economic and environmental risks. Also, an assessment of the need to comply with various requirements of the environmental legislation of Georgia.
498. In addition, Yuri Gogelidze noted that this question asked by the public present during the meeting will definitely be reflected in the minutes of the meeting. This issue will be further discussed by both the project team and environmental and social specialists, and substantiated answers or alternative ways to resolve the issue will be presented additionally.
499. It was decided that consultations on this issue should continue in the future. The consultations should particularly involve representatives of the GA and local authorities. The possibility of installing additional wells and irrigating the indicated areas independently of the irrigation scheme under consideration may be considered. The alternative of connecting the mentioned plots to the canal requires further significant studies, especially engineering, environmental and social studies, in order not to disrupt the water supply to the beneficiaries downstream of the canal.
500. Additional arguments and justification on this issue are presented in Section II-G.

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501. **Question 2:** During the meeting, a local resident voiced a problem related to the current state of irrigation canals. According to him, in many cases, water from damaged canals overflows and flows into adjacent areas, resulting in damage (flooding) of both agricultural plots and access roads to the canals. Erosion processes develop and public roads become muddy. Accordingly, the free movement of the local population becomes more difficult. This situation is especially problematic during rainy periods, when the water flow in the canals increases and the existing infrastructure cannot ensure proper water drainage. Accordingly, the author of the question was interested in what measures are envisaged within the project framework to prevent similar problems from arising in the future.
502. **Answer:** The engineer explained that the problem is directly related to the current technical condition of the canal and the reduction in water permeability, which is mainly caused by sediment and waste accumulated on the bottom of the canal, as well as vegetation cover developed on the slopes of the canal.
503. The project plans to clean the canal bed, restore its capacity, and adjust the structural elements. As a result of the above works, the water capacity will significantly improve and the risks of water flowing outside the canal will be reduced.
504. In addition, the canal rehabilitation process also includes improving the condition of access roads. The engineer noted that after the completion of the above works, the territory will be more orderly, the functioning of the canal will become stable, and the use of roads will no longer be associated with problems. It was emphasized that during the operation stage of the canal, the technical condition will be monitored by GA, and significant attention will be paid to identifying and responding to such problems in a timely manner.
505. The ADB comments and responses matrix on the IEE document is provided in Appendix 11.

C. Future consultations

1. Methodology used for Consultations

506. The MEPA are committed to transparent and respectful dialogue with stakeholders throughout the lifecycle of the project. The approach to stakeholder engagement adopted by the IA should be in line with Good International Industry Practice for IEE and should ensure that all stakeholders with an interest in the Project have been identified and consulted.
507. Stakeholder engagement should include:
- (i) The provision of relevant, timely, and accessible information to stakeholders in a culturally appropriate and understandable format;
 - (ii) Consultation with stakeholders on their opinions, concerns, preferences and perceived gains and risks with respect to the project planning and implementation, including the design and proposed management and mitigation measures to reduce potential impacts and to enhance possible benefits; and
 - (iii) A grievance mechanism to guide the response and resolution process for stakeholder concerns or grievances.

The stakeholder engagement approach should be focused on:

- (i) National and good international practice requirements for public consultation and disclosure that the company will conform to;
- (ii) Identifying project stakeholders;

-
- (iii) Strategy, format, and timetable for consultation and information disclosure from the design phase through to the operation phase;
 - (iv) The PIU's resources and management structure for developing and implementing the stakeholder engagement activities;
 - (v) Grievance mechanism(s) for stakeholders; and
 - (vi) Means of reporting on consultation and disclosure activities
508. **Resources and responsibilities.** The PIU will take overall responsibility for consultation with all stakeholders in relation to the Project and will use available resources to ensure that all consultation activities are conducted to the appropriate standard.
509. **Monitoring and reporting.** It is important to monitor stakeholder engagement to ensure that consultation and disclosure efforts are effective, and in particular that stakeholders have been meaningfully consulted throughout the process. Monitoring will include:
- (i) monitoring consultation activities conducted with government authorities and non- governmental stakeholders;
 - (ii) monitoring the effectiveness of the engagement processes in managing impacts and expectations by tracking feedback received from engagement activities and recording and tracking commitments made to stakeholders; and
 - (iii) monitoring any grievances received and their resolution.
510. The stakeholder engagement process will be revised and updated as needed and appropriate during the construction phase of the project.

2. Information Disclosure

511. According to ADB SPS 2009 requirements, environmental information on the project will be disclosed as follows:
- (i) The IEE report will be available for review on the IA/PIU's website. The electronic copies of the mentioned reports will remain in the public domain up to the completion of the construction phase.
 - (ii) This current IEE will be disclosed on ADB's website prior.
 - (iii) Hard copies of the project IEE report will be made available upon request; and
 - (iv) during implementation, semi-annual monitoring reports on compliance with the IEE and EMP will be disclosed on ADB's website.
512. With regards to information disclosure, ADB is committed to working with IA (GA) to ensure that relevant information (whether positive or negative) about social and environmental safeguard issues is made available in a timely manner, in an accessible place, and in a form and language(s) understandable to affected people and other stakeholders, including the general public, so they can provide meaningful inputs into project design and implementation.
513. In compliance with ADB's SPS (2009), the draft IEE will be provided for disclosure on the ADB, MEPA and (if possible) GA Websites (in the local language).
514. The IA will be responsible for notifying and informing the public of construction operations prior to construction works and publish an emergency response plan. During operation, information about any maintenance (location, type of maintenance required, etc.) will be communicated to the stakeholders by GA through established procedures.
515. Periodic Public information campaigns via different communication channels, to explain the project details to a wider population will be conducted in cooperation with local self-

government bodies. Public disclosure meetings will be conducted at key project stages to inform the public of progress and future plans. Prior to the start of construction, the PIU will issue notification on the start date of implementation in information banners placed at public places (pharmacies, public transport, markets, construction sites). A board showing the details of the project will be displayed at the construction site for the information of the public.

IX. GRIEVANCE REDRESS MECHANISM

516. 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.
517. ADB's SPS requires the borrower/client to establish a GRM (Refer Annex 2 for a sample grievance registration form) 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.
518. 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:
519. Name of the administrative body to whom the complaints are addressed;
- a. Name, address and contact details of the claimant;
 - b. Name of the administrative body, whose decisions or administrative acts are the subject of the complaint;
 - c. Name of the administrative act or decision, which is subject to complain
 - d. Content of the claim;
 - e. The context and facts, based on which the complaint is substantiated; and
 - f. List of attachments.
520. 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 the individual administrative legal act. The standard period given for the issuance of the decision in relation to the grievance is one month.

A. GRM, Grievance Redress Committee and Grievance Focal Persons

521. 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.

522. 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 an environmental safeguards specialist of the PIC 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.
523. The GRM 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 land acquisition and resettlement issues and complaint resolution. MEPA representative, PIU management representative 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.
524. GRCEs will be established at the community level with PIU order and the following composition: Environmental and social safeguards specialists of design and PIC, Gamgebeli – concerned Gamgeoba (village level), representatives of civil works contractor, NGO representative, APs representative, acting as grievance focal person (GFPs).
525. Environmental specialists of the PIC should coordinate 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.
526. The PIC 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.
527. 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:
- (i) Introduction of key personnel of each stakeholder including roles and responsibilities;
 - (ii) 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;
 - (iii) 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

- (iv) Elicit and address the immediate concerns of the community based on the information provided above.

B. Grievance Redress Mechanism (Environmental Specialist Input)

528. A project-specific Grievance Redress Mechanism (GRM) will be established to receive, assess, and resolve social and environmental concerns of project-affected persons (APs) in compliance with Georgian legislation and ADB SPS 2009. While the Grievance Redress Community/Committee (GRCE) has not yet been formed, its establishment is planned at the start of project implementation under the coordination of the PIU. Social Specialists will handle social grievances, while Environmental Specialists will address environmental grievances.

529. Environmental Specialist Responsibilities:

- (i) Serve as the primary contact for environmental complaints (water, soil, biodiversity, environmental safety).
- (ii) Collect, verify, and document grievances, including photos, field observations, and progress reports.
- (iii) Coordinate with contractors to implement timely mitigation or corrective actions.
- (iv) Support Grievance Focal Persons (GFPs) and GRCE members in understanding environmental issues.
- (v) Ensure the grievance process is transparent, culturally appropriate, and gender-sensitive.
- (vi) Track environmental grievances through all GRM stages: Registration → Initial Resolution → Strategy Selection → Execution and Documentation.

530. Note: Social components of the GRM, including employment-related complaints and participatory decision-making, remain under Social Specialists' responsibility (PIU/PIC).

531. This mechanism ensures that environmental concerns are addressed promptly and documented, while also facilitating ADB reporting and compliance monitoring.

C. Project Grievance Redressed Process

532. During the actual operationalization of the GRM, the process and communication flows will be centered with 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:

1. Stage I: Registration and Initial Assessment

533. 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:

- a. **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. An example form is included in Annex 2.

- b. **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.
- c. **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 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.

2. Stage II: Initial Resolution

534. 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:

- a. **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 MOEPA, 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.
- b. **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.
- c. **Reject the complaint with a clear explanation:** When in the opinion of the committee complaint is not project related, it is rejected and such a 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.

3. Stage III: Selection of Approach and Strategy

535. At this stage, the complaint will be accepted and agreed upon 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:

536. **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 the 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.

537. **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.
538. **Third-party arbitration:** In complicated matters where the complainant is reluctant to work directly with the contractor, the complaint can be elevated for 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.
539. **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.

4. Stage IV: Execution of Measures and Documentation

540. At this stage, the agreed solution or measures are implemented by the contractor under the supervision of the PIC firm and tracked by the GRM coordinator for documentary purposes.
- a. **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 PIC.
 - b. **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.
541. At this stage, the complainant may either be satisfied or not satisfied, and the issue persists. The following pathways ensure 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:
- a. **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.
 - b. **Recording acceptance:** In the end, the GRM coordinator will put an entry in the GRM registry book that the grievance is resolved.
542. 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:
- a. **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.
 - b. **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.

- c. **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.

543. The PIU will be responsible for the GRM, with support from PIU, this includes the steps to address and record the grievance, records of meetings and reporting to ADB during Quarterly Reporting.

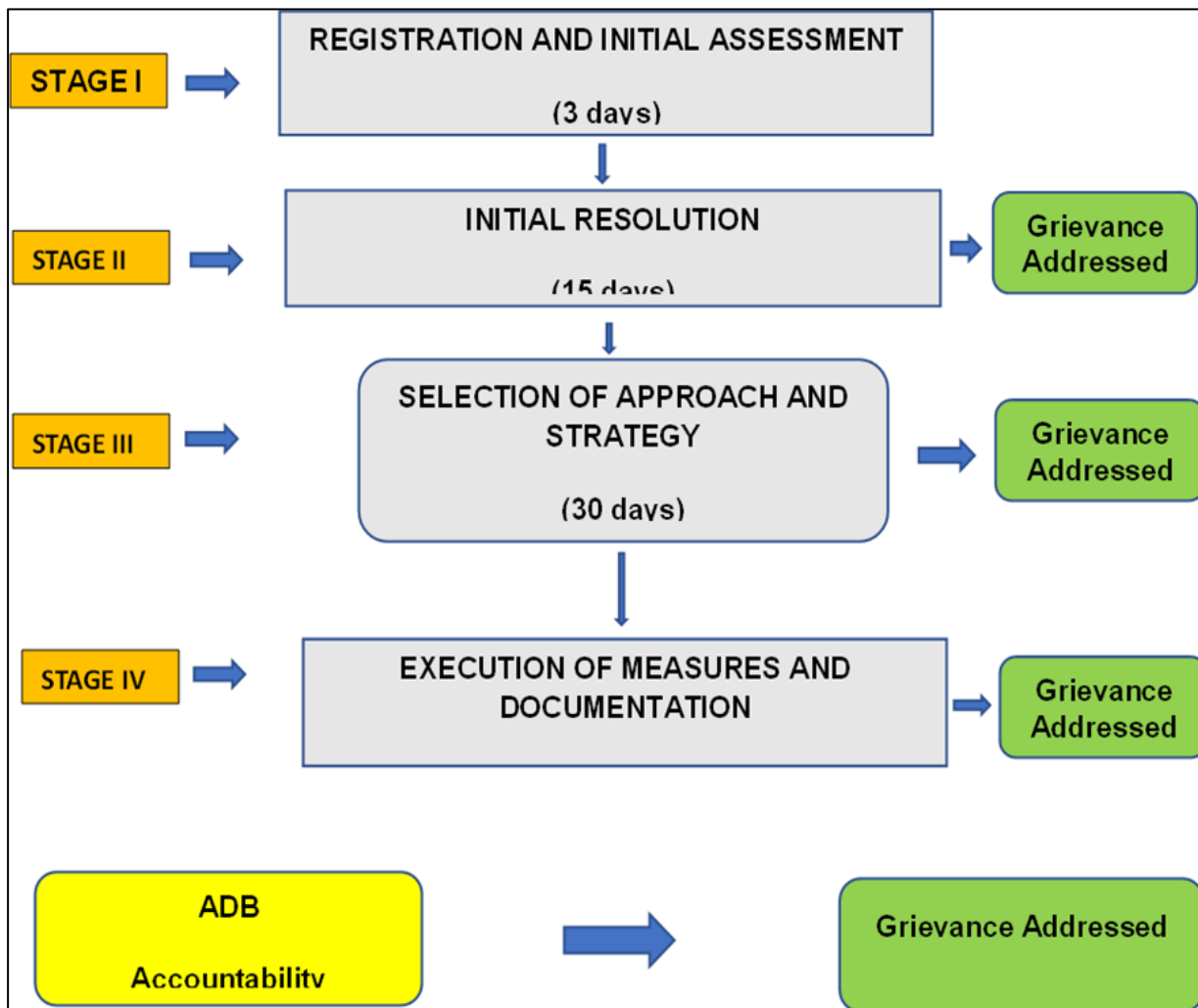


Figure 45. Flow Diagram GRM Mechanism

X. ENVIRONMENTAL MANAGEMENT PLAN

544. Following the requirements of the SPS 2009, an important component of an IEE report is the environmental management plan (EMP). The goal of the EMP is to develop the mitigation and monitoring measures for the impacts identified within the scope of the IEE procedures to be used in practice by the project implementing agency - the MEPA, and thus, bring its activities into compliance with the environmental and social requirements envisaged by the national legislation as well as with the environmental and social policies of the international finance organizations.
545. The given EMP is based on the information given in the previous chapters, in particular, activity specifics, background properties of the natural and social environment of the working area and expected negative impacts during the activity and their propagation area. The EMP is drafted for different stages of activity, including preparatory works planning phases. The EMP is a live document, and it can be detailed immediately during the accomplishment of the activities following the monitoring outcomes or other practical terms. Any changes or corrections to this EMP will be done based on the formal agreement between MEPA and the ADB.
546. The EMP document will be incorporated in the work tender documents and the tender participants will have the possibility to specify their environmental protection duties in their proposals. After the onset of the construction works, the EMP will be part of the agreement between the client and the construction contractor, and it will be necessary to accomplish during the construction works.

A. Objectives

547. EMP provides a mechanism to address the adverse environmental impact of a project during its construction, accelerate project benefits, and introduce standards of good practice to be adopted for all project works. The objectives of the EMP are to:
- Define the responsibilities of the project proponents, contractors and PICs;
 - Facilitate the implementation of the mitigation measures identified in the IEE;
 - Define a monitoring mechanism and identify monitoring parameters;
 - Provide a procedure for timely action in the face of unanticipated environmental situations; and
 - Identify training requirements at various levels.
548. This EMP is for Package 1 - Main Canal Ch 313+42 to Ch 397+00 - This main canal will need to be cleared, cleaned, repaired or replaced, cleaning, repairs of other structural units, improvements to the access road and repairs and improvements of overpasses and bridges. The main canal is 8358 m (Pk. 313 + 42 ÷ Pk. 397 + 00), comprising of 3,938.7m open trapezoidal canals, 309 m rectangular canal, 9 tunnels (3,623m), inverted siphons (440.3 m) and and a spillway (47 m).

B. Institutional Responsibilities

549. **Implementation arrangements.** MEPA is the executing agency responsible for overall guidance, strategic decisions, oversight of the implementation of the project, and financial management and administration. program procedures and guidelines.
550. The existing **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 all measures, and requirements outlined in the EARF and IEEs, and any corrective or preventive actions outlined in the safeguards monitoring reports.

551. 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.

1. Safeguard Implementation Arrangement

552. **PIU.** The existing 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.
553. 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.
554. The PIU will be responsible for supervision on implementation of EMP. 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 supervise process of (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;
555. 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.
556. The PIU already has an Environment Specialist. The PIU Environment Specialist will receive support from PIC consultant team / consultants in the implementation of environmental and social related tasks at the PIU level.
557. The PIU 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. The PIU will review 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.

558. PIU will also provide any training that is required, during the pre-construction phase, during construction and at handover.
559. The PIU will support the handover to the GA and ensure that the GA understands the environmental requirements for the operation and maintenance phase.
560. The PIU may require. Additionally, a pool of experts would be required for intermittent support:
- a. Biodiversity Specialist – Intermittent
 - b. Waste Specialist – Intermittent
 - c. Cultural Specialist – Intermittent and short-term
 - d. Asbestos Specialist – Intermittent and short-term (during any works involving asbestos)
561. **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.
562. **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, 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.
563. 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 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.
564. A copy of the EMP or approved SSEMP will be always kept on-site during the construction period. 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.
565. **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 6 and Table 14 summarize the institutional responsibility of environmental safeguards implementation at all stages of the project.

Table 25. Institutional Roles and Responsibilities for Environmental Safeguards Implementation

Project Implementation Organization	Management Roles and Responsibilities
MEPA Executing agency	<ul style="list-style-type: none"> • Ensuring safeguards compliance.

Project Implementation Organization	Management Roles and Responsibilities
PIU (MEPA) Implementing agencies	<p>Pre-Construction</p> <ul style="list-style-type: none"> • Timely, transparent procurement of works, services, equipment and materials in line with ADB procedures. • Preparation of plans, surveys, studies, detailed designs, capacity development activities, and workshops, as required. • Preparation of Kvemo Samgori areas' Final IEEs (including EMPs), and submission to ADB for clearance and disclosure. • Ensuring meaningful consultation during the preparation of IEEs. • Preparing environmental safeguards documents in accordance with national relevant regulations and ensuring their timely approval. • Disclosing environmental safeguards documents (including IEEs, EMPs and SAEMRs). • Ensuring the bidding documents of PIC and Construction Contractor include all tasks as described in the approved IEE and EMP. • Obtaining all necessary government permits and licenses, for all civil works. • Reviewing and clearing contractors' SSEMPs. • Ensuring that the SSEMPs contain health and safety management plans following international good practices and relevant national/local requirements. • Establishing a GRM. • Coordinating the conduct of technical studies <p>Construction</p> <ul style="list-style-type: none"> • Supervising civil works and reporting on progress. • Arranging annual project audits in accordance with ADB and national requirements. • On-the-job training of staff in implementing ADB guidelines and procedures and safeguards compliance, and efficient project management and scheduling. • Preparing and submitting to ADB quarterly, semi-annual and annual progress reports on both the physical and financial progress of project activities. • Carrying out public consultation during the implementation of Kvemo Samgori modernization. • Environmental monitoring and ensuring that construction activities are carried out following EMPs and SSEMPs and in an environmentally-sound and sustainable manner. • Ensuring corrective actions are implemented when necessary. • Preparing and submitting the Semi-Annual Environmental Monitoring Reports to the ADB for disclosure within 30 days of the end of monitoring periods until ADB's Project Completion Report is issued. • Disclosing relevant information from environmental safeguards documents (including the SAEMRs) to affected persons. • Reporting in a timely manner to ADB any non-compliance or breach of ADB safeguard requirements. • Updating the IEEs in case of unanticipated impacts. • Ensuring that the GRM is operational to effectively handle the environmental and social concerns of affected persons.

Project Implementation Organization	Management Roles and Responsibilities
GA Operation of the Irrigation System	<p>Pre-Construction</p> <ul style="list-style-type: none"> • Review feasibility and design documentation prepared by the PIU and provide comments and recommendations for revisions as required within a reasonable timeframe. • Assist the PIU in dealing with design organizations, contractors and other persons involved in the project in planning and implementation of Kvemo Samgori modernization works. • As required and within its authority, manage relations with Kvemo Samgori water users and land users. <p>Operation</p> <ul style="list-style-type: none"> • Upon completion of modernization works and after handing over the modernized facilities to the GA, confirm the obligation for the maintenance of those facilities. • Ensure following repairs and works follow good international practices and national legislation.
ADB (Financier)	<ul style="list-style-type: none"> • Guidance to MEPA (and the PIU) and GA throughout project implementation in accordance with the agreed implementation arrangements. • Review and approval of plans, schedules and detailed designs for project activities upon the submission by the PIU. • Review of all documents requiring ADB approval upon submission by the PIU. • Posting on the ADB website updated project information documents for public disclosure and safeguards documents in accordance with disclosure provisions of ADB's SPS, 2009. <p>Periodic loan review missions, a midterm review, and a project completion mission.</p>
Design Contractor	<p>Pre-Construction</p> <p>Final detailed design and updating the IEE and EMP in line with ADB's SPS.</p>
Construction contractor	<p>Pre-Construction</p> <ul style="list-style-type: none"> • Ensure all legally required permits and clearances (including waivers) are obtained before work starts, including: <ul style="list-style-type: none"> ○ Obtaining licenses for sand and gravel pits ○ Clarification of the location, master plans and composition of construction camps and landfills and agreement with the local authorities ○ Change of agricultural land for camps and landfills to non-agricultural categories (only if necessary) ○ Obtaining water abstraction permits ○ Preparation of a technical report on the inventory of stationary sources of harmful substances in the atmospheric air and agreement with NEA ○ Preparation of a waste management plan and agreement with MEPA • Develop the Site Specific EMP, waste management plan, traffic management plan, etc (listed below). <p>Construction</p> <ul style="list-style-type: none"> • Implementation of the EMP and SSEMP including mitigation measures and monitoring environmental parameters • Establish and maintain site records, incident recording and monitoring data • Assist in the GRM process

Project Implementation Organization	Management Roles and Responsibilities
	<ul style="list-style-type: none"> • Comply with non-compliance notifications and corrective action plans issued. Produce monthly reports and monitoring reports plus incident/accident reporting.
Project implementation consultants (PIC)	<p>Pre-Construction</p> <ul style="list-style-type: none"> • Support PIU in the review of safeguarding documents. <p>Construction</p> <ul style="list-style-type: none"> • Oversee the construction contractor, including implementation of the EMP • Assist in monitoring and reporting Providing training

2. Personnel Required

566. The PIU has a safeguards team which includes an environmental officer, this position should be maintained until the end of the construction and hand over to the GA.
567. The design team for Package 1 will require an environmental specialist to lead the updates of the IEE and EMP, public consultations and ensure the incorporation of safeguards into the design.
568. The construction contractor requires an environmental staff throughout the construction works. They would be responsible for mitigation, monitoring and any environmental reporting and would also be responsible for waste management (legal requirement). A full-time Health and Safety staff is also required.
569. The PIC requires an environmental specialist for the 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:
- Biodiversity Specialist – Intermittent
 - Waste Specialist – Intermittent
 - Asbestos Specialist – Intermittent and short-term (during any works involving asbestos)
570. All specialists should have appropriate qualifications and experience to ensure that the national requirements and ADB SPS can be met and ensure good environmental management and monitoring.

C. Mitigation and Monitoring Plan

571. Based on the assessment of impacts and risks, good practice under ADB SPS 2009, and applicable national requirements the mitigation measures to manage and prevent adverse risks and impacts are included. This is followed by monitoring measures that are required to ensure that each measure manages the risk and identifies any issues.
572. 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, and PIC will undertake site inspections and document review to verify compliance with the EMP and progress toward the outcome.
- Prior to the commencement of the work, the 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.

- During construction, results from internal monitoring by the 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.
- 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 7) to ensure completeness of safeguards requirements.
- 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.
- 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.
- 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.

Table 26. Mitigation and Monitoring Plan for Package 1

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Pre-Construction Activities								
Integration of safeguards related aspects into the bidding documents	Bidding documents are not responsive to safeguards related issues and the performance of the contractor is low	Include all safeguards related clauses and integrate IEE and EMP into the bidding documents	Procurement Officer	PIU	n/a	Bidding documents contain all necessary clauses related to safeguard issues; IEE and EMP are attached to the bidding documents and contractor is performing accordingly	Project start phase	Costs included in the procurement t
Preparation SEMP	Increase the negative environmental and social impact	Preparation SEMP	Construction contractor	PIU/PIC	All project sites	SEMP approved by PIC	Before construction activities start	1 500
Environmental Screening Report Preparation	Violation of Georgia's environmental requirements. Increased environmental impact	<ul style="list-style-type: none"> • A documents must be prepared in the case of activities provided for in Annex II of the Environmental Assessment Code, including: <ul style="list-style-type: none"> ○ Construction and operation of a crushing plant; 	Construction contractor	PIU/PIC	All project sites	Documents agreed with NEA	Before mobilization work begins	(It is recommended that no independent construction facilities be set up. Factories already operating in the region should be used. Therefore, this expense will most likely not be

²⁹ Given according to the official exchange rate of the National Bank of Georgia as of February 24, 2026, namely: 1\$ = 2.6751 GEL

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹ (necessary.)
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> ○ Construction and operation of a wastewater treatment plant ● The contractor will be strictly required to source sand, gravel, and stone only from legally licensed suppliers/quarries that have valid Environmental Decisions and approved Emission permits. Before any material is sourced, the contractor must submit copies of the supplier's licenses and environmental permits to the PIC for verification. ● If any temporary crushing or wastewater treatment activities are conducted within the project site/buffer, the contractor must prepare a Site-Specific Environmental Management Plan (SSEMP) covering dust suppression (water spraying), noise barriers, and wastewater management (sedimentation pits). 						
License for Sand-Limestone Quarries	Violation of Georgia's environmental requirements.	Obtaining a license from the "National Agency of Mineral Resources"	Construction contractor	PIU/PIC	All project sites	There is a license from the "National Agency of	Before the extraction of inert materials begins	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
	Increased environmental impact					Mineral Resources"		
Exact Locations, Master Plans, and Composition of Construction Camp(s) and Storage Yards	Increase the negative environmental and social impact	Agreement with local authorities	Construction contractor	PIU/PIC	n/a	There is an Agreement with local authorities	Before mobilization work begins	Costed by contractor and cost carried into contract
Water Intake Permit — Use of Water for Technical Purposes	Violation of Georgia's environmental requirements. Increased water environmental impact	Obtaining a license from NEA or the local water supply company	Construction contractor	PIU/PIC	Construction Sites and Camps	There is a license from NEA or the local water supply company	Before mobilization work begins	Costed by contractor and cost carried into contract
Preparation Technical Report on the Inventory of Stationary Sources of Harmful Substances Emission into the Atmospheric Air	Violation of Georgia's environmental requirements. Increased air quality impact	Obtaining an agreement from NEA	Construction contractor	PIU/PIC	Construction Sites and Camps	There is an agreement from NEA	Before construction activities start	(It is strongly recommended that no independent construction facilities be set up. Factories already operating in the region should be used. Therefore, this expense will most likely not be necessary.)
Preparation Waste Management Plan	Violation of Georgia's environmental requirements. Increased environmental impact.	Obtaining an agreement from Waste and Chemicals Management Department of the MEPA The document must be prepared in accordance with the requirements of the Georgian Law "Waste Management Code".	Construction contractor	PIU/PIC	All project sites	There is an agreement from Waste and Chemicals Management Department of the MEPA	Before construction activities start	1 800

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Preparation Asbestos-Containing Waste Management Plan	Violation of Georgia's environmental requirements. Increased environmental impact	Obtaining an agreement from Waste and Chemicals Management Department of the MEPA The document must be prepared in accordance with the requirements of the Georgian Law "Waste Management Code".	Construction contractor	PIU/PIC	All project sites	There is an agreement from Waste and Chemicals Management Department of the MEPA	If asbestos waste is found on construction sites	
Preparation of Traffic Management Plan (TMP)	Increased traffic on local roads, disruption to movement, and inconvenience to local residents. Risks of damage to local roads and bridges	The document will specify the vehicles used by the construction contractor, traffic intensity, and transportation routes. In addition, the TMP must include: <ul style="list-style-type: none"> • Bridge Capacity Verification: Mandatory inspection of all rural bridges on haulage routes to verify load-bearing capacity for 40-ton loads. • Alternative Routing: Identification of approved bypass routes or requirement for temporary reinforcement (at contractor's expense) if bridge capacity is insufficient. • Baseline Road Survey: A comprehensive pre-construction structural and photographic/video 	Construction contractor	PIU/PIC	All project sites	Document approved by PIC. Bridge inspection reports; Baseline survey report with geo-tagged photos	Before construction activities start	Costed by contractor and cost carried into contract (Specific budget lines potential bridge reinforcement)

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		survey of all proposed routes to document baseline conditions and prevent damage attribution disputes. <ul style="list-style-type: none"> • Safety Measures: Maximum speed limits (30 km/h in settlements), warning signage, and use of traffic marshals at high-risk crossings 						
Updating the Emergency Response Plan	Creation of emergency situations, increase in risks of accidents and environmental pollution	The document should be updated prior to the start of construction, taking into account the identification of specific accident risks, their management measures, and the resources available to the construction contractor.	Construction contractor	PIU/PIC	All project sites	Document approved by PIC	Before construction activities start	Costed by contractor and cost carried into contract
Preparation of Fire Safety and Evacuation Plan	Creation of emergency situations, increase in risks of accidents and environmental pollution	The document includes fire risks and preventive measures, personnel responsibilities, evacuation routes and procedures, a safe assembly point, emergency contacts, and coordination with fire services.	Construction contractor	PIU/PIC	All project sites	Document approved by PIC	Before construction activities start	Costed by contractor and cost carried into contract
Obtaining a Certificate of the Absence of Animal Burial Sites within the Area of Earthworks	Risk of impact on the health and safety of workers and local residents	n/a	Construction contractor	PIU/PIC	All project sites	Obtaining a certificate from "National Food Agency,"	Before excavation activities start	n/a
Informing stakeholders	Unpreparedness of local	Informing stakeholders in advance of the start of the	Construction contractor	PIU/ PIC	All project sites	At least 50% of interested	10 days before construction	Costs related to the

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Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
before starting the works	communities; delays in the learning process	civil works Consultation activities should be gender-responsive. Women and vulnerable groups shall be specifically targeted in information dissemination. Feedback from these groups should be recorded separately in line with SEP commitments				persons are informed about the start of the project	activities start	dissemination of information
Construction Phase								
Permits, agreements, licenses	-	Arrange appropriate environmental documents and obtain appropriate licenses, permits and agreements. All permits, licenses and agreements (and their copies) must be kept at the Contractor's office.	Construction contractor	PIU/ PIC	Contractor's office.	n/a	During works	n/a
Environmental, Social and HS specialists	-	The contractor should have separate staff units responsible for environmental, social, and health and safety issues from the initial stages of construction. Appropriate contracts should be signed with specialists.	Construction contractor	PIU/ PIC	Contractor's office.	n/a	During works	60 000 (Salary, minimum 2 staff in 2 years)
Contractors with subcontractors	-	All contracts should be signed in advance between contractors and licensed companies.	Construction contractor	PIU/ PIC	n/a	n/a	During works	n/a

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Emissions of harmful substances into the atmospheric air, propagation of dust, noise and vibration	Disturbing the local population, pollution of agricultural fields,	<ul style="list-style-type: none"> • The movement of heavy machinery should be prohibited during non-working hours. • Machine engine idling should be limited to the extent possible. • The technical condition of the exploited vehicles will be constantly monitored. • Covering trucks with tarpaulins during the transportation of construction materials and waste • Observance of traffic speed limits and proper management of dusty materials is needed to 	Construction contractor	PIU/ PIC	Construction Sites and Camps	Dust	Daily observations except if a problem is observed or complaint received where tests should be conducted	Costed by contractor and cost carried into contract
						Noise	Daily observation except if a problem is observed or complaint received where tests should be conducted	

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>reduce dust propagation.</p> <ul style="list-style-type: none"> • Water is sprayed periodically if construction activities are causing dust emissions • Construction transportation routes are set up and appropriate traffic management is adhered to. • Material handling and construction activities that could cause dust limited in high winds. • In times of high winds, extra care is required and works that will cause a disturbance of loose material should be halted until more favourable conditions. <p>Avoid lighting works sites and camps when not in use, unless vital for security. When necessary for security, ensure that the direction of the light is focused at the site (away from communities and natural habitats)</p>				Vibration: most sites	Daily observation except if a problem is observed or complaint received where tests should be conducted	

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Accessing the site, siting of spoil heaps etc.	Impact on soil quality and erosion	<ul style="list-style-type: none"> At the initial stage of earthworks, the topsoil should be removed in all necessary places. Topsoil removal, storage and further management should be carried out in accordance with the Resolution of the Government of Georgia No. 424 of December 31, 2013 - "Rules for the Removal, Storage, Use and 	Construction contractor	PIU/ PIC	All project sites	Monitor management of soil to ensure runoff and contamination are prevented	During works	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>Recultivation of the Fertile Soil Layer". The following should be taken into account in the process of topsoil management:</p> <ul style="list-style-type: none"> ○ Topsoil removal and storage should be done separately from other materials, on a pre-selected site protected from surface runoff and covered until backfilling or disposal. ○ Topsoil piles, the storage period of which exceeds 30 days, should be covered with geotextile or other appropriate material to prevent erosion and loss of its fertility. ○ The maximum period of temporary storage of topsoil should not exceed the date of completion of the project, after which it should be used for its intended purpose for recultivation. ○ After the completion of the construction, the previously removed topsoil should be used to restore the damaged areas and improve fertility. 						

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> ○ The reclamation process will be considered completed only after the relevant act is signed and agreed upon with the PIC. ● Unfaulty construction techniques should be used to avoid soil contamination ● The fuel tank should be placed in an area protected by berms or earth fills to stop accidental spills as necessary. ● Accidental spills should be contained and cleaned up immediately using absorbent materials. ● The ground/soil contaminated accidentally during the construction should be cut and removed as soon as possible. ● After the completion of the construction, the reclamation of the territories and the restoration of sanitary conditions will reduce the probability of impact on soil quality and stability. 						

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Works, spoil site locations, construction camp, etc	Visual-Landscape Impacts	<ul style="list-style-type: none"> • Fencing the perimeter of the construction camp. • Minimizing the area of impact of the construction works and associated zones to the extent possible. • Backfilling, reinforcing and 	Construction contractor	PIU/ PIC	All project sites	Monitor visual mitigation measures implementation and compares the restored site	During and end of construction works	Costed by contractor and cost carried into contract
		<ul style="list-style-type: none"> • compacting all excavated trenches as soon as possible; levelling surfaces and slopes, and if necessary, using the slope stabilization method. • Proper management of waste and materials, adherence to the sanitary conditions, and timely waste removal from the territory. • Proper planning and control of night lighting in the working areas to avoid bright illumination and light pollution. • Strictly following the vehicle and machinery travelling routes. • After completion of the construction works, all sites should be restored to their original condition or better. 				after construction with the original condition		

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Movement of vehicles, equipment and materials, road closures for works	Loss of Access, Encroachment and Resettlement of Farmland	<ul style="list-style-type: none"> • Minimization of these risks through good design and construction practice • Consultation and engagement activities. This includes a community awareness and participation plan. • Effective management of the GRM • Implementation of the LARP • Providing appropriate resettlement in line with ADB SPS 	Design and Construction contractor	PIU/ PIC	All project sites	Area resettled and the amount compensated	Throughout LARP activities	Covered in LARP

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Storing and transporting waste and material, clearing and cleaning the canal.	Impact on Water Quality	<ul style="list-style-type: none"> • Control of the good technical state of the construction equipment to prevent the leakage of fuel and oils; • Equipping the fueling stations with a hermetic body and secondary protective casing; • Use of technically non-faulty construction equipment and vehicles; • All equipment running on fuel shall be placed in a secondary tank. The volume of the secondary tank must be at least 110% of the fuel volume used by the equipment. • Control over the separate collection and timely removal of construction and household waste, • Control of water drainage systems. • Control of the state of collection and removal of domestic and faecal waters. • Control over the compliance with the rules of storage and use of oil products and oils and providing anti-spill kits on job sites. • Installation of oil products 	Construction contractor	PIU/ PIC	Iori River up and downstream of the project	pH, Diluted Oxygen, BOD, Cod, Total Nitrogen, Total Suspended Solids	Bi-annually	2000 (Secondary protective casing, spill kits, and other similar costs)

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>and oil storage facilities at least 100 m away from water bodies.</p> <ul style="list-style-type: none"> • Good maintenance of vehicles and machinery • Conducting training for the Construction Contractor and Client's personnel. • Development and implementation of the emergency response plan envisaging emergency actions for such cases of pollution as leaks and spills. The given plan will be updated periodically, incidents will be analyzed and additional preventive measures will be included in it. • Staff briefing before and after the construction works, once every six months. 						

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Dredging, waste from construction works and domestic waste from workers, excess soil	Waste Management	<p>Develop a waste management plan. Waste management plan outlining each type of waste that will be produced and how it will be safely stored, how its transported, and where and how it's disposed of. The waste management plan must reflect the principles of the hierarchy, including the possibility of reusing concrete waste or wood waste (see IEE paragraphs 136 and 137 for details).</p> <ul style="list-style-type: none"> • Laboratory testing of sediments accumulated in the canal to determine their hazard and determine further management procedures. • All waste removed from sites in a timely manner as part of site clean up • Reuse and recycling of waste as much as possible • Appropriate storage and transportation of waste. • Good international practices in regard to waste disposal 	Design and Construction contractors	PIU/ PIC	All project sites	Waste is safely stored, transported and disposed of in line with legal requirements Waste hierarchy is applied	Throughout the construction works	<p>5000 (Costs of contracts signed with contractors for the final disposal and utilization of hazardous waste) + 1000 (for laboratory testing of channel sediments)</p>

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> • Waste should only be transferred and disposed of by certified contractors. • ACM will be collected, double-bagged, and transferred to a licensed subcontractor for disposal at an authorized landfill equipped with specialized, regulated cells. • Appropriate disposal of wastewater • Littering by workers is prohibited and bins should be provided temporarily across working areas. • Waste management training for workers should be provided. • Portable or constructed toilets with storage must be provided on-site for construction workers. 						

Project Activity/ Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Removal of old pipes, repair works of canal structures containing asbestos	Asbestos presents a health and safety risk	<ul style="list-style-type: none"> • An asbestos specialist should be contracted prior to construction works; • An asbestos management plan should be developed, outlining health and safety measures and waste management measures needed to ensure safe management of the material. • Training workers involved in this activity. • Asbestos waste needs to be disposed of at an appropriate, certified facility to ensure appropriate management of the material") 	Design Consultants and Construction contractor	PIU/ PIC	All project sites	As set by the Asbestos Management Plan	Throughout any activity involving asbestos	5000 (This cost depends on the generation of asbestos-containing waste during the works).
Movement of materials, waste, machinery, equipment and workers. Works may need to close access roads.	Traffic safety and congestion issues	<ul style="list-style-type: none"> • A traffic management plan should be set up and approved by the local police department. • Transportation routes and schedules defined • Any road closures require surrounding land owners to be notified in a timely manner. • The transport routes should avoid going within 150m of Nameless Tower and the protected area where alternatives are available. • Local speed limits 	Construction contractor	PIU/ PIC	All project sites	Record any complaints, incidents or accidents relating to traffic. Ensure traffic management is being enforced.	Throughout works	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> complied to • Vehicles well maintained • Good vehicle loading practices should be followed • Lose material being transported is covered and appropriate wetting of wheels when necessary to prevent dust • Contractor is responsible for repairing any damage caused by the project construction activities • The local police department needs to be informed of any corrective actions caused by the poor traffic management 						
All construction works, Especially earthworks	Biodiversity	<ul style="list-style-type: none"> • Seasonal prohibition - No vegetation clearing shall take place between March 1 and June 30. Any emergency clearing requires a prior nesting survey by a biodiversity specialist and written approval from the PIC. • Visual control of the construction site to identify the Georgian Red-Listed species. • Carrying out observations to identify the impact on species. • Monitoring their condition 	Construction contractors	PIU/ PIC	All project sites	Observation surveys on protected species. Monitoring the condition of known species	Before construction, before removal of vegetation, periodically after removal of vegetation and post-construction.	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>and, if necessary, developing relevant conclusions and recommendations.</p> <p>Siting of the construction site away from the protected areas and away from windbreaks.</p> <ul style="list-style-type: none"> • The duration of the works causing a disturbance and frightening animals should be as minimal as possible. • Before resuming work, each morning, the Contractor shall inspect open trenches to remove any animals that may have fallen into them. • At ravine crossings, excavated trenches shall be backfilled within a maximum of 24 hours of excavation to minimize the risk of amphibian entrapment. If the trench remains open for more than 24 hours, inclined planks or earth ramps (at an approximate 45° angle) shall be installed every 50 meters to allow any animals that have fallen in to climb out independently. • Inspect pipes or other materials before use, as 						

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		animals often seek shelter in them.						
Removal of vegetation encroaching the canal or accessing the work locations	Impacts on Flora	<ul style="list-style-type: none"> Seasonal prohibition - No vegetation clearing shall take place between March 1 and June 30. Any emergency clearing requires a prior nesting survey by a biodiversity specialist and written approval from the PIC. Prior to the onset of the construction works, instructing the personnel about the protection of the vegetation cover Minimise vegetation removal: The standard working width within vegetated sections is approximately 2 m; the 5–8 m corridor refers to the overall construction safety and equipment movement envelope, which does not imply full vegetation clearance. Vegetation removal shall be strictly limited to the defined construction corridor not exceeding 5-8 meters in width (depending on site constraints). The borders of the construction corridor and traffic routes 	Construction contractors	PIU/ PIC	All project sites	Number of trees and type recorded. Replanting activities recorded Red list flora species recorded	Before vegetation is removed During site restoration activities Throughout	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>are to be identified accurately to avoid excess damage to the vegetation cover.</p> <ul style="list-style-type: none"> • No mature trees (>15 cm DBH) shall be removed without written approval from the Engineer and the Supervising Environmental Specialist. • Topsoil shall be stripped, stored separately, and reused for site reinstatement. • The trees and shrubs of high conservation value (including mature trees) will be marked and, where possible, preserved or re-planted • If Red-Listed species are encountered during construction, works in the immediate area shall cease immediately and a qualified botanist shall assess the specimen in consultation with the Ministry of Environment and Agriculture. • 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 						

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>the damaged trees, compensation plantings shall be provided. Compensation planting shall be undertaken at a minimum ratio of 1:3 using native species, with a minimum survival rate target of 80% after two years.</p> <ul style="list-style-type: none"> • 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. • Avoid any physical impact on windbreak lines located south of the canal. In the unlikely event that removal or trimming is required for access, the Contractor must conduct an inventory and obtain written approval from MEPA in accordance with Government Resolution No. 146 						
All construction activities	Health and Safety	<ul style="list-style-type: none"> • Access and use of PPE and first aid equipment 	Construction contractors	PIU/ PIC	All project sites	Incidents and accident	Throughout works	Costed by contractor

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Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>Health and Safety Plan, including first aid, emergency procedures, training, PPE, labelling and more will be developed and implemented throughout the project</p> <ul style="list-style-type: none"> • Accident recording and reporting system • Sanitary facilities provided to the workers • Safe areas for breaks provided • Training and awareness of health and safety measures and local social norms amongst the workers • Clear demarcation and prevent access to unauthorized personnel • Good international practices for water, air, noise, vibration and dust management • Encourage local recruitment • Clean drinking water is available to the workers. • Locate construction camps away from local towns and villages • Ensure all equipment and vehicles are in good working order 				<p>records Implementation of Health and Safety Plan Siting and condition of a construction camp Training records</p>		<p>and cost carried into contract</p>

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
Tunnel Construction (rehabilitation) works	Health and Safety	<ul style="list-style-type: none"> • Prior to the start of the works, all persons involved in the construction of the tunnels will be provided with appropriate training • Written confined space entry permit system - In order to exclude unauthorized persons from entering the tunnel, access procedures will be developed, based on which all persons entering will be registered • Pre-entry atmospheric testing for oxygen (19.5–23.5%), methane (LEL <10%), carbon monoxide (<25 ppm) and hydrogen sulfide (<10 ppm) • Continuous multi-gas monitoring during occupancy • For the purpose of air quality monitoring, a competent person will be assigned who will be responsible for the constant detection of gases • Forced mechanical ventilation ensuring minimum 6 air changes per hour • Standby rescue 	Construction contractor	PIU/ PIC	Tunnel sections	Incidents and accident records Implementation of Health and Safety Plan Siting and condition of a construction camp Training records	During tunnel-related work	10000 (Air monitoring costs)

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		personnel positioned outside confined spaces <ul style="list-style-type: none"> • Emergency retrieval systems (tripod, harness, winch) • Daily safety briefings • Structural stability assessment prior to entry • Emergency evacuation plan including secondary exit strategy where feasible • Flood risk assessment for tunnel sections 						
Tunnel Construction (rehabilitation) works	Impact on bats	<ul style="list-style-type: none"> • The construction contractor will conduct a pre-construction bat survey within the 9 tunnels with the assistance of invited specialists. Surveys must be conducted during the active season (April to October). The survey will include both visual inspection and the use of ultrasonic detectors. • if a roost of the Mediterranean Horseshoe Bat (or other significant species) is identified, the Contractor must stop work in that specific tunnel and notify the Ministry of Environmental 	Construction contractor	PIU/ PIC	Tunnel sections	Contractor's daily logs confirming no tunnel works commenced prior to specialist clearance. Copies of official correspondence or permits issued by the Ministry in case of roost discovery.	Before the start of tunnel work	3500 (Cost of pre-construction bat survey)

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<p>Protection and Agriculture (MEPA). Works may only proceed after MEPA issues a permit and an approved "Passive Exclusion" or relocation plan is implemented by the specialist under the direct supervision and written guidance of MEPA experts.</p> <ul style="list-style-type: none"> • If no particularly high-value species are identified, the bat specialist may recommend the use of passive noise abatement measures to allow construction to proceed. 						
Performing work in the summer, during hot days	Health and Safety	<ul style="list-style-type: none"> • Work-rest cycles (minimum 15 minutes rest per hour when temperature exceeds 35°C) • Mandatory shaded rest areas • Provision of minimum 5 liters of potable water per worker per shift • Electrolyte supplements during peak heat periods • Adjustment of working hours (06:00–11:00 and 17:00–21:00 during extreme heat) 	Construction contractors	PIU/ PIC	All project sites	Incidents and accident records Implementation of Health and Safety Plan Siting and condition of a construction camp Training records	Throughout works	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> • Daily monitoring of temperature and humidity (heat index tracking) • Worker training on heat exhaustion and heat stroke symptoms • Immediate medical response protocol • Work shall be suspended if heat index exceeds 45°C. 						
All construction activities, including transportation operations	Community Safety	<ul style="list-style-type: none"> • Implementation of a Worker Code of Conduct • Mandatory awareness training on communicable diseases (including HIV/AIDS) • Prohibition of child and forced labor • GRM accessible to workers and community members • A dedicated GRM monitoring indicator should be added: number of grievances received, resolved, and pending — to be reported in semi-annual EMR • Maximum speed limit of 30 km/h within settlements • Installation of warning signage compliant with Georgian standards 	Construction contractors	PIU/ PIC	All project sites	Incidents and accident records Implementation of Health and Safety Plan Siting and condition of a construction camp Training records	Throughout works	Costed by contractor and cost carried into contract

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> • Traffic marshals at high-risk crossings • Log of community complaints related to traffic • Implementation of safety measures to prevent accidental falls into the canal or open trenches, including: Installation of temporary protective barriers and reflective warning signage at all sensitive construction sites. Specific focus on high-risk public road crossings (e.g., Shibliani road at X-551943; Y-4611702 and Zemo Kachreti road at X-554274; Y-4612024). • Holding periodic educational meetings with local residents to inform them of hazards related to open excavations and canal rehabilitation activities. 						
Any excavation activities including digging trenches	Chance finds	<ul style="list-style-type: none"> • Works should be paused at the location of the suspected chance find immediately • The site needs to be protected. • The Ministry of Culture, Sports and Youth need to be informed as soon as possible in event of chance finds. 	Construction contractors	PIU/ PIC	All project sites	Records of chance finds	As found	Costed by contractor and cost carried into contract

Project Activity/ Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		<ul style="list-style-type: none"> • Work will only resume after the Ministry of Culture, Sports and Youths provides permission. • For workers working near river / water, adequate PPEs shall be provided and training on ensuring safety shall be imparted prior to start of work. 						
Shutting off water supply during works	Interruption of irrigation water supply	<ul style="list-style-type: none"> • Coordinate with GA on timings • Inform the farmers of when and for how long with sufficient warning in advance 	Construction contractors	PIU/ PIC	Areas where supply is disruption	Timing and dates of consultations Timing and dates of disruption	Before and during the timescale of water disruptions	Costed by contractor and cost carried into contract
Operations								
Throughout operations	Strengthening Capacity	<ul style="list-style-type: none"> • Training on EMP implementation, GRM and good international environmental practices for irrigation operation to PIU and GA 	PIC	MEPA	n/a	Training Records	n/a	Costed by PIC and cost carried into contract
During repairs and maintenance	Temporary impacts on soil, water, air, noise, vibration, waste, visual, etc.	<ul style="list-style-type: none"> • Same as construction. Good maintenance and correct use of equipment and vehicles • Minimise vegetation removal • Appropriate materials and waste management to prevent pollution • Inform the water users if the irrigation system will be temporarily turned off or if their access to their 	GA	MEPA	Any area of repairs	Noise and dust observations	Daily during works	GA

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		land is disrupted <ul style="list-style-type: none"> • Resue topsoil • Appropriate management of waste 						
Throughout operations	Induced impacts	<ul style="list-style-type: none"> • Farmers trained on good agricultural practices in relation to sustainable water use, soil health and appropriate fertiliser and pesticide use • Monitoring and management of water use, water loss and illegal connections. 	PIC and GA	MEPA	n/a	Training Records	n/a	Costed by PIC and cost carried into contract
Throughout operations	Safety risk to communities	<ul style="list-style-type: none"> • Continuation of GA's seasonal information campaigns (TV commercials, social media) to warn the public about the dangers of swimming in the canal. • Installation and permanent maintenance of protective fencing and bilingual warning signs at identified high-risk locations, specifically: Shibliani road crossing (X-551943; Y-4611702) and Zemo Kachreti road crossing (X-554274; Y-4612024). • Conduct annual safety audits along the canal banks to identify any new sensitive areas that may require fencing or 	Construction contractors and GA	MEPA	n/a	Record of incidents and accidents	Throughout	Constructi on contractor' s costs and GA

Project Activity/Item	Potential Risks and Impacts	Mitigation			Monitoring			Related Costs (\$) ²⁹
		Mitigation Measures	Institutional responsibility		Location	Indicators	Implementation Schedule	
			Implementation	Supervision				
		signage due to changes in local movement patterns. <ul style="list-style-type: none"> • rowning risk management protocols and safety procedures must be formally integrated into the GA Operation and Maintenance (O&M) Manual. • Record incidents and accidents, and interpret the information 						
Other								
Any construction activities	Cumulative impacts from Tbilisi-Sagarejo-Bakurtsikhe Rehabilitation Project	<ul style="list-style-type: none"> • Coordination with Tbilisi-Sagarejo-Bakurtsikhe Rehabilitation Project to minimise cumulative impacts 	Construction contractors	PIU	n/a	Records of communication	Before construction	n/a

Note: Project implementation shall ensure adherence to the working hours as per the National and International labor requirement

D. Monitoring Plan

573. The monitoring will be used to monitor environmental impacts and to verify EMP implementation.
574. Detailed monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations that will signal the need for corrective actions; and monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation are provided in below. All parameters should be monitored against standards outlined within Section III; in line with national legislation or WB EHS Guidelines, whichever is most stringent.

Table 27. Detailed Monitoring Measures for Package 1.

Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
Pre – Contraction stage						
include all safeguards related clauses and integrate IEE and EMP into the bidding documents	Environmental Issues	Once before the bid announcement	n/a	Environmental audit of bidding documents to ensure relevant sections of the EMP have been included	The bidding document shall reflect all environmental mitigation measurements	Construction Contractor
Preparation of Environmental Management Plans	Environmental Issues	Once before Contraction activities start	n/a	Compliance of the document with the requirements should be checked	The construction contractor will not be allowed to start the work	Construction Contractor
Preparation SSEMP	Environmental Issues	Once before Contraction activities start	n/a	Compliance of the document with the requirements should be checked	The construction contractor will not be allowed to start the work	Construction Contractor
Permits, agreements, licenses	Environmental Issues	Once a quarter	n/a	Compliance of the document with the requirements should be checked	The construction contractor will not be allowed to start the work	Construction Contractor
Contraction Stage						
Ambient Air	Dust	Once a quarter	Boundaries of the construction site	Instrumental measurement	Stop construction and develop additional mitigation measures	Construction Contractor
Ambient Air	Noise and vibration	Once a quarter		Instrumental measurement	Stop construction and develop additional mitigation measures	Construction Contractor
Ambient Air	Emissions	Once a quarter		Instrumental measurement	Stop construction and develop additional mitigation measures	Construction Contractor
Ambient Air	Dust emission, emissions, noise and vibration	Daily inspection	Boundaries of the construction site	Visual observation: <ul style="list-style-type: none"> o No significant dust dispersion is observed; o Appropriate speeds are maintained when driving on dirt roads; o Sensitive sections are 	Stop construction and develop additional mitigation measures	Construction Contractor

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Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
				periodically (in dry and windy weather) watered. Machinery and equipment are technically sound and do not have significant emissions/noise		
Ground	Erosional and gravitational processes, swamping of agricultural areas	Monthly inspection	Boundaries of the construction site, especially tree crossings, as well as camps and shelters	Visual observation; <ul style="list-style-type: none"> o No evidence of gravitational processes and erosion, waterlogging and subsidence; o Bulk material is not deposited in ravines and other sensitive areas 	Ensuring engineering and geological stability. Prevention of hydrological risks. Develop additional mitigation measures	Construction Contractor
	Topsoil	After completion of earthworks, daily.	Construction corridor; Temporary soil/soil storage areas and permanent landfills	Visual observation: <ul style="list-style-type: none"> o The lower soil layer and the fertile layer are dug separately; o The height of the fertile soil pile does not exceed 2 m; o The slope of the piles does not exceed 45o; o The soil is away from surface water bodies; o There are water drainage channels on the perimeter of the storage site; o Temporary storage of soil is carried out in areas previously agreed with the technical supervisor; o No erosion or other dangerous processes are observed. 	Maintaining the quality and fertility of the fertile soil layer, protecting it from degradation	Construction Contractor

Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
Water Quality	Wastewater	Daily inspection	Crushing and sorting plant or other wastewater generating facility (if any)	Visual inspection: <ul style="list-style-type: none"> No untreated wastewater is discharged into rivers; Wastewater has appropriate treatment systems (sediment tanks, oil traps); Sediment tanks are not filled with sludge and the treatment process is satisfactory 	Prevention of surface water pollution	Construction Contractor
		Once a quarter	Wastewater before discharge	Laboratory control of the following suspected substances: <ul style="list-style-type: none"> Weighted particles; Petroleum products (TPH); 	Prevention of surface water pollution. Compliance with Georgian legislative requirements.	Construction Contractor
Water Quality	Water quality in the canal	<ul style="list-style-type: none"> Once in Pre-construction phase 'first-flush' water quality analysis as soon as water is let into the canal but before major earthworks begin Once after rehabilitation 	Water flowing in the canal, at the end of Package 1 - Ch 397+00 (Handover point and hydraulic interface with Package 3).	Laboratory control of the following suspected substances: <ul style="list-style-type: none"> PH Total Suspended Solids (TSS) Organic pollutants Petroleum products (TPH); 	Prevention of surface water pollution. Compliance with Georgian legislative requirements. Establish pre-construction baseline to monitor downstream area of influence as per SPS Appendix 1.	Construction Contractor
Water Quality	Potential sources of contamination of gullies and surface runoff	Daily inspection	Construction camps; Construction sites, especially riverside areas	Visual inspection: <ul style="list-style-type: none"> All facilities with the potential for water pollution are properly protected and are located away from active riverbeds. The requirements of the "Technical Regulations on Water Protection Zones" approved by the Resolution of the 	Prevention of surface water pollution.	Construction Contractor

Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
				<p>Government of Georgia No. 440 of December 31, 2013 are met</p> <ul style="list-style-type: none"> o Facilities with the potential for pollution are equipped with secondary protection; o Cars are not washed in riverbeds 		
Sediments Quality	Quality of sediments in the channel	Once, before the canal sediment clearance begins	At the entrance to the inverted siphons, at ≈3 locations	<p>Laboratory control of the following suspected substances:</p> <ul style="list-style-type: none"> o PH o Petroleum products (TPH); o Heavy Metals Package (Pb, Cd, Hg, As, Cr, Cu, Zn, Ni) 	Determining the hazard of the waste generated and the appropriate management method	Construction Contractor
Waste Management Implications	Segregation, Storage and transport of wastes	Daily inspection	Waste collection, storage and disposal sites	<p>Visual assessment during the Works;</p> <ul style="list-style-type: none"> o Field inspection, o Report of waste volumes generated. o Report and record all leakages and spills o Impact Monitoring. o Compliance Monitoring 	Prevention of environmental pollution by waste	Construction Contractor
	Oil and petroleum product management	Daily inspection	Construction camps; Warehouse areas	<p>Visual observation:</p> <ul style="list-style-type: none"> o Protected areas are designated for oils, petroleum products and other liquid substances, which are marked; o Oil storage tanks are properly enclosed with concrete berms or similar material. 	Prevention of environmental pollution by waste	Construction Contractor
Biodiversity	Habitats and vegetation	Visual observation - at the end of the working day;	The construction corridor, especially those sections where	<p>Visual observation:</p> <ul style="list-style-type: none"> o Work is being carried out within the boundaries of the 	Prevention of additional damage to habitats and vegetation	Construction Contractor

Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
			the natural quality of the habitats is more or less preserved.	marked area and there is no additional damage to plants or illegal felling;		
	Pits, trenches and other dangerous areas for animals	Each working day	Construction areas; Quarries	Visual observation: <ul style="list-style-type: none"> Before resuming work, each morning, the Contractor shall inspect open trenches to remove any animals that may have fallen into them. Are such areas properly fenced and how high is the risk of injury to animals? Are planks placed in the pits? 	Animal injury prevention	Construction Contractor
Biodiversity (Botany)	Presence of active bird nests or sensitive vegetation	Once, prior to site clearance / vegetation cutting	Entire construction corridor, especially sections with dense shrubs/trees	Pre-clearing Survey Act	Pre-clearing Survey Act. If nests found, establish buffer zones and suspend clearing.	Construction Contractor / Specialist
Biodiversity (Bats)	Presence of bat roosts and active colonies in tunnels	Once, before the start of any tunnel rehabilitation (April-October window)	9 Tunnels within the project corridor (Package 1)	Acoustic and Visual Survey	If roosts are found, stop work and notify MEPA.	Construction Contractor / Specialist
Landscape and Visual	Surface treatment of temporary	Once the Completion of work	Construction areas after construction	Minimum disturbance of the original landscape. Impact Monitoring	Required to ensure the recommended mitigation measures are properly implemented	Construction Contractor

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Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
	structures					
Traffic	Technical condition of access roads, possibility of free movement	During intensive transport operations	Highway corridors	Visual observation: <ul style="list-style-type: none"> ○ Vehicles move along predetermined routes, avoiding populated areas as much as possible; ○ Roads used for movement are in satisfactory condition; ○ There are no restrictions on free movement; ○ Traffic speeds are observed 	Proper management of traffic flows and elimination of local population dissatisfaction	Construction Contractor
Health and Safety	Health and Safety	Visual observation - before the start of each working day;	Work area; Especially tunnel construction areas	Visual observation: <ul style="list-style-type: none"> ○ The territory is fenced and protected from unauthorized entry by outsiders; ○ Personnel are provided with individual protective equipment; ○ The technical condition of the installed mechanisms used is satisfactory; ○ Electrical and fire safety is maintained; ○ Warning, prohibitory and indicative signs are placed in appropriate places on the territory and its perimeter; ○ A banner about primary safety rules is posted on the territory; ○ Smoking areas are allocated 	Ensuring human health and safety	Construction Contractor

Item	Parameter	Frequency	Location	Action Level	Response Action Level Exceeded	Responsibility
	• Work area safety	• At the beginning of the workday, before entering the tunnel	• Tunnels	Pre-entry atmospheric testing for oxygen, methane, carbon monoxide and hydrogen sulfide.	Ensuring human health and safety	Construction Contractor
	• Work area safety	Continuous, during tunnel works	• Tunnels	Continuous multi-gas monitoring during occupancy	Ensuring human health and safety	Construction Contractor
Operational Phase						
Water losses	Illegal connections	Once a Month	Intake and SCADA system	Visual Monitoring	Penalty subscription and connection interception	GA
System efficiency monitoring	Filling pipes with sediment	Once a month or In the event of a complaint		Visual monitoring	Eliminate the accident	GA
Conduct source water quality monitoring	As per the government regulations	1 sample from each section	-	Comparison with the base values and standards as per government regulations	Required to ensure the recommended mitigation measures are properly implemented.	GA

E. Environmental Documents and Records

575. The Construction Contractor and PIU are required to ensure all permits, clearances and waivers are collected. Prior to the onset of the construction works, the Construction Contractor will develop the following management plans and agree on them with the supervisor:

- (i) Traffic management plan;
- (ii) Occupational Health and Safety Plan
- (iii) Waste Management Plan
- (iv) Replanting Plan
- (v) Emergency response plan
- (vi) Community Awareness and Participation Plan
- (vii) Camp Management Plan

576. The contractor companies are also responsible for the preparation of Site Specific Environmental Management Plan based on the generic EMP. The plans shall be submitted to PIU by the contractor ten days before taking possession of any work site.

577. In addition, the Implementer (and the Construction Contractor on his errand) shall keep and use the following records in practice during the construction:

- (i) Plan and schedule of the works;
- (ii) List of the machines and equipment needed for construction;
- (iii) Records related to the occurring environmental problems;
- (iv) Records about waste management;
- (v) Written marking of the areas of waste disposal and waste transportation instructions issued by the local authority;
- (vi) Records about the supplies of necessary materials and their consumption;
- (vii) Complaints log books;
- (viii) Incident registration logs;
- (ix) Reports about the correction actions;
- (x) Records of environmental monitoring;
- (xi) Logs of equipment control and technical maintenance;
- (xii) Reports about the personnel training.

F. Capacity Building

578. The capacity building programme should focus on ensuring the implementation of the mitigation and monitoring actions highlighted within the EMP, the GRM, stakeholder engagement and to meet national requirements, ADB's SPS and international good practices. The training programme below should support the awareness and implementation of the EMP and should be led by the PIC.

Table 28. Training Programme

Topic	Content	Attendees	Frequency
Pre-Construction Phase - Preparation	<ul style="list-style-type: none">• EMP Content• Impacts• Mitigation	MEPA and PIU	Half Day Course

Topic	Content	Attendees	Frequency
	<ul style="list-style-type: none"> • Monitoring • Reporting • GRM 		
Construction Phase - Environmental Management	<ul style="list-style-type: none"> • National and ADB Requirements • EMP mitigation and monitoring measures • Good construction practices covering waste management, worker behaviour, traffic measures, biodiversity, etc. • GRM • Reporting Process 	<ul style="list-style-type: none"> • MEPA and PIU • Construction Contractor's senior and safeguarding staff 	1 day course before the start of works
	<ul style="list-style-type: none"> • Refreshing above • Update on progress 		Every 6 months
	<ul style="list-style-type: none"> • Confined Space Entry Safety: Mandatory procedures for the tunnels, including gas monitoring and emergency rescue. 	<ul style="list-style-type: none"> • Construction Contractor's site staff, engineers, and workers involved in tunnel works. 	Mandatory before any tunnel works start.
	<ul style="list-style-type: none"> • ACM Awareness training: identification of potential ACM during earthworks and emergency 'stop-work' procedures 	<ul style="list-style-type: none"> • Earthworks teams and site supervisors 	Once, before earthworks commence (integrated into general induction training)
Operational Phase - Environmental Management	<ul style="list-style-type: none"> • National and ADB Requirements • EMP mitigation and monitoring measures for operation • Good construction practices during operation 	GA	1 day course as part of handover

G. Unanticipated Environmental or Social Impacts

579. If any unanticipated environmental or social impacts become apparent during project implementation, the operations department advises and requires the borrower/client to:

- Assess the significance of such unanticipated impacts;
- Evaluate the options available to address them; and
- Prepare or update the IEE.

580. ADB will help the borrower/client mobilize the resources required to mitigate any adverse unanticipated impacts or damage.

H. EMP Summary Costs

581. Most costs associated with the environmental recommendations of the EMP are a normal part of preparing the bid and contract documents and ensuring that proper environmental provisions are incorporated therein. The installation of septic systems at construction camps, for example, is an environmental necessity, but not generally considered an "environmental cost". Below is the EMP Summary Costs table.

Table 29. EMP Estimated Costs

#	Item	Unit	No of Item	Month cost	Total Cost (\$)
Contractor Environmental, Social, Health and Safety Staff Costs					
1	Environmental & Social Specialist	month	24	1500	36 000
2	HS Specialist	month	24	1000	24 000
Total					60 000
Preparation and updating of environmental documents at the pre-construction stage					
1	Preparation SSEMP	Unit	1	1 500	1 500
2	Preparation Waste Management Plan	Unit	1	1 800	1 800
Total					3 300
Environmental measures and equipment during construction					
1	Secondary protective casing, spill kits, and other similar equipment	-	-	-	2 000
2	Pre-construction Specialist Botanical Survey (8.4 km)	L.S.	1	1500	1 500
3	Pre-construction Bat Roost Assessment (9 Tunnels)	L.S.	1	3500	3 500
4	ACM Management (Dismantling & Disposal) ³⁰	m	≈200	50	10 000
5	General Hazardous Waste Management (Oily rags, chemicals, etc.)	L.S.	1	2000	2 000
6	Air monitoring costs during tunnel Construction (rehabilitation) works	Unit	9	1000	9 000
7	Monitoring – Dust, noise and vibration instrumental measurements	Unit	10	300	3 000
8	Monitoring – Water, Wastewater Laboratory control or laboratory control of soil in case of spillage	Unit	12	100	1 200
9	Monitoring – Laboratory control of sediments accumulated in the canal (3 samples)	Unit	3	300	900
Total					33 100
Sub-total					96 400
Contingency 10%					9 640
SUM					106 040

³⁰ The budget for ACM management is calculated based on a realistic estimate of encountering approximately 200 linear meters of medium-diameter asbestos-cement pipes or an equivalent volume of other ACM (such as roofing sheets or insulation materials) across the 8.4 km alignment. A unit rate of \$50 per meter (including VAT) has been applied. This comprehensive rate covers specialized dismantling, wetting/dust suppression, double-layer plastic packaging, secure transport, and final disposal at a licensed hazardous waste facility.

XI. CONCLUSIONS AND RECOMMENDATIONS

582. Project has been categorized as Category 'B'. This is based on the fact that the project site is not located in any environmentally sensitive areas and near densely populated areas and heavy with developmental activities. The project would provide numerous socio-economic benefits with mostly temporary and mitigatable impacts on the environment. This is the IEE and EMPs covering Packages 1. Without the project, the system will further deteriorate leaving the area without irrigation water.
583. As a great part of the existing system is damaged, the irrigation system uses excess water and not all plots receive irrigation water currently. Even though following the rehabilitation, the area served by the rehabilitated irrigation system will sharply increase, according to all calculations, the amount of water the irrigation system will take from the Iori River will not change. It may be said that the Project will not have an impact on the villages in the lower reaches of the Iori River and on the Mingechauri Reservoir in Azerbaijan.
584. The background environmental conditions in the Package 1 project corridor have practically not changed during the period 2023-2026. Previously conducted studies, including measurements and laboratory tests, can be considered valid. The project corridor and design have also not changed. During this period, the amendments made to the environmental legislation of Georgia are not related to the Package 1 project. Therefore, the characteristics, area and levels of environmental impacts from the project implementation have practically not changed.
585. The environmental impacts attributable to the project pertain more during construction stage. In the construction phase, the environmental impact is expected during the movement of construction equipment, as well as during the repairs and rehabilitation of the Main Canal.
586. The project will drastically improve the social conditions of the local population. During the social survey, 100% of the population welcomes and supports the project.
587. Another infrastructure project is underway in the Kvemo Samgori Irrigation System Project area. The Roads Department is implementing the construction/rehabilitation of a section of the existing Tbilisi-Bakurtsikhe road. This road does not cross the Package 1 corridor. It is also unlikely that the rehabilitation works of Package 1 will coincide with the progress of this project. Accordingly, the potential cumulative impact will be of low significance.
588. The project will not have transboundary impacts. Although the Iori River is transboundary, in the project implementation phase, following the preliminary design of the project, the risk of pollution of the Iori River is very low. Besides, in the operation phase, no additional water intake is planned from the river.
589. There is a potential risk that the project will have the following induced impacts, in particular: (i) as the region suffers from a lack of irrigation water, the areas of the agricultural fields may increase following the project implementation, perhaps at the expense of cutting down the existing forests; (ii) the number of processing and transportation companies may increase in the area what will increase the risk of the environmental impact; (iii) as the areas of the agricultural land increase, the use of pesticides and fertilizers in the area will increase as well. In the case of improper use of pesticides and fertilizers, the risk of soil pollution will increase, while in the long term, the risk of Iori river pollution will increase as well.
590. Based on the above-given conclusions, the following recommendations were developed within the project:
- The IEE document must be an integral part of the contract signed with the construction contractor, and the construction contractor must undertake to fulfil the requirements of the said document;

-
- The construction contractor must have the appropriate human and infrastructural resources to fully realize the mitigation measures and conditions of the IEE;
 - Prior to the onset of the construction, the construction contractor should prepare a Site- Specific Environmental Management Plan (SSEMP) and all environmental management plans given in the submitted IEE report. The building company must start the construction activities only after the said plans are agreed upon with the project implementing agency and the supervisor;
 - An Environmental Specialist should be employed by the PIU to ensure that they can effectively manage the safeguard implementation, by the design consultations to be able to update the IEE, the Construction Contractor to appropriately implement the IEE and the Project PICs to be able to supervise the activities and provide support to the GA and PIU.
 - Before the construction starts, the preparation plans, which must be agreed with other organizations by the construction contractor under the requirements of the national legislation, must be agreed according to the effective legal requirements;
 - When developing the detailed project plan, the construction contractor should discuss and consider the construction schedule of the second Tbilisi-Bakurtsikhe Road construction/rehabilitation infrastructural project in the project area, as well as the locations of camps and quarries to avoid the risk of cumulative impact.
 - The project's grievance redressal mechanism will provide the stakeholders with a platform for redressal of their grievances, and describes the informal and formal channels, time frame, and mechanisms for resolving complaints about environmental performance. In the operational phase, it is desirable to develop and realize the training project for the local farmers to improve their skills in the use of pesticides and fertilizers.
 - Output 3 and future training provided to the farmers by the GA, should incorporate sustainable use of water and appropriate use of fertilizer and pesticides where appropriate.

APPENDICES

APPENDIX 1: RAPID ENVIRONMENTAL ASSESSMENT CHECKLIST

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 (Verified on 08-09.2025)

Screening Questions	Yes	No	Remarks
A. Investment Siting		No	
Is the Investment area adjacent to or within any of the following environmentally sensitive areas?			There are no protected areas near the main irrigation canal corridor of Package 1. The closest protected areas are: <ul style="list-style-type: none"> The direct distance from the Package 1 corridor to Mariamjvari State Reserve is 19 km. The direct distance from the Package 1 corridor to Tsiv-Gombori Managed Reserve is 19 km. The direct distance from the Package 1 corridor to Khorugi Managed Reserve is 4.4 km. There are highways and settlements between the Package 1 corridor and the protected areas. Given the large distances, the rehabilitation works of Package 1 are not connected to the protected areas.
▪ Protected area		No	.
▪ Wetland		No	
▪ Mangrove		No	
▪ Estuarine		No	
▪ Buffer zone of protected area		No	.
▪ Special area for protecting biodiversity		No	
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		No cultural heritage sites are included in the Package 1 project area. It should be noted that the project area 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 excavation works.
▪ Conflicts in water supply rights and related social conflicts?		No	The project plans the modernization of the existing irrigation system.
▪ Impediments to the movements of people and animals?		No	The project will mainly rehabilitate existing irrigation systems. This will not create any obstacles to the movement of people or animals. The disruption to movement during the construction phase is likely to be short-term and there are no difficulties in managing this impact
▪ Potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		No	There is no activity of high-significance hazardous geological processes in the project corridor of Package 1.
▪ Insufficient drainage leading to salinity intrusion?		No	
▪ Overpumping of groundwater,		No	In the operation phase, the project will use

leading to salinization and ground subsidence?			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	
▪ Noise from construction equipment?		No	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 residential areas are quite far from the potential camps.
▪ Dust during construction?	Yes		The access roads mainly covered with a ground layer. Consequently, dust generation is expected during the movement of the equipment in the construction phase. However, the roads used in the rehabilitation of Package 1 are located quite a long distance from densely populated areas.
▪ 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		

<ul style="list-style-type: none"> ▪ 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.
<ul style="list-style-type: none"> ▪ Clogging of canals by weeds? 		No	
<ul style="list-style-type: none"> ▪ Seawater intrusion into downstream freshwater systems? 		No	
<ul style="list-style-type: none"> ▪ Introduction of increase in incidence of waterborne or water related diseases? 		No	
<ul style="list-style-type: none"> ▪ Dangers to a safe and healthy working environment due to physical, chemical, and biological hazards during construction and operation? 	Yes		There is a high probability that asbestos-containing materials will need to be dismantled during the rehabilitation works of Package 1.
<ul style="list-style-type: none"> ▪ Large population influx during construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 		No	
<ul style="list-style-type: none"> ▪ Social conflicts if workers from other regions or countries are hired? 		No	
<ul style="list-style-type: none"> ▪ 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	
<ul style="list-style-type: none"> ▪ 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	

Category A (EIA)	X	Category B (IEE)	Category C
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<p>Projects that are 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 EIA is required.</p>	<p>Project with potential negative environmental impacts that 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 IEE is required.</p>	<p>Projects that are likely to have minimal or no adverse environmental impacts. No. environmental assessment is required although environmental implications need to be reviewed.</p>
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APPENDIX 2: GRIEVANCE REGISTERING AND MONITORING FORMS

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 (Specify)			
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

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Completed By	
Signature	
Date	

APPENDIX 3: 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 4: 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

Compliance status with National/State/Local statutory environmental requirements

Package No.	Subproject Name	Statutory Environmental Requirements	Status of Compliance	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) approved by Project Director? (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (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)

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						

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	CO µg/m3

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

Updated Initial Environmental Examination Kverno Samgori Left Main Canal Irrigation Scheme – Package 1:
Main Canal Ch 313+42 to Ch 397+00

			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 5: CHANCE FIND PROTOCOL

Introduction

This Protocol applies to the 8.4 km section of the Kvemo Samgori Left Main Canal. While the project is located within a rural agricultural landscape, there is a possibility of encountering archaeological artifacts or structures during excavation, particularly in the proximity of the Nameless Tower corridor. The finds could be tools used in ancient agriculture, military equipment, or something else. 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.

Contractors' instruction: As soon as contractor recovers any chance find during any excavation works, they should immediately inform PIU/Consultant at the project site 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.

- General location record – measuring its position and orientation within the protected site / in relation to surrounding structures
- 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- In accordance with Article 70 of the Law of Georgia on Cultural Heritage (2007), the PIU/Consultants must immediately inform the National Agency for Cultural Heritage Preservation of Georgia in writing. Photographs and record drawings should be sent

as part of the official notification. In case of significant finds, the Ministry of Culture must be notified within 48 hours. Works may only resume after a written permit is issued by the National Agency.

APPENDIX 6: SAMPLE CONSTRUCTION SITE CHECKLIST FOR EMP MONITORING

Project Name: CSISDP Name of the Subproject: Contractor:	
	Yes (√) No (x)
Monitoring Details: <hr/>	
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	
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 7: QUARTERLY PROGRESS REPORT CHECKLIST

ENVIRONMENT SAFEGUARDS QPR CHECKLIST

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

<ul style="list-style-type: none"> Contractors provided PIU with a notification/incident report of any accident(s) within 24 hours of its occurrence? 		
<ul style="list-style-type: none"> Reports of complaints/grievances reported monthly to PIU? 		
<ul style="list-style-type: none"> Records of information disclosure/consultations submitted by PIU to PIU monthly? 		
<ul style="list-style-type: none"> Records of site inspection by PIU submitted to PIU monthly? 		

APPENDIX 8: SUGGESTED ASBESTOS MANAGEMENT PLAN

1. Background and Project Description

Asbestos is a fibrous mineral from the silicate group that was widely used in the 20th century for its tensile strength, thermal stability, and electrical resistance. The World Health Organization (WHO) considers all forms of asbestos to be carcinogenic to humans. The extraction, production, and use of asbestos-containing materials (ACM) continues in many parts of the world, although more than 60 countries around the world have banned the use of asbestos due to its health effects, including its association with asbestosis, asbestos-related lung cancer, and mesothelioma.

The rehabilitation of the Kvemo Samgori Left Main Canal (Package 1) involves the modernization of existing infrastructure constructed during the Soviet era. Based on the technical audit and site inspections, ACM is expected to be generated during the earthworks, which may primarily be in the form of underground pipes. These materials are primarily associated with old drainage crossings and auxiliary irrigation structures. The potential for the generation of such materials is based on examples from various projects in the region. In addition to pipes, ACM may be generated in the form of roofing materials (slate) for houses, as well as in the form of insulation material that may be poured into the canal. A rough estimate (taking into account similar projects) is that approximately 2.5-3.0 m³ of such waste may be generated, which corresponds to approximately 200 m of average diameter pipes.

While the AC pipes are currently in a non-friable state, the planned excavation and rehabilitation works pose a potential risk of fiber release if the materials are damaged or improperly handled. In accordance with the ADB Safeguard Policy Statement (SPS 2009) and the project's EARF, this Asbestos Management Plan (AMP) has been developed to ensure that the removal, transport, and disposal of Asbestos-Containing Materials (ACM) are conducted in a manner that eliminates risks to workers and the local community. The plan establishes a "Zero-Tolerance" approach to uncontrolled asbestos disturbance and mandates the use of international best practices (e.g., wet-methods and double-bagging) throughout the construction phase.

The primary objective of this AMP is to establish a rigorous framework for the identification, handling, and disposal of ACM to ensure the safety of the environment and human health. Specific objectives include:

- To prevent the release of airborne asbestos fibers during excavation, removal, and transport activities.
- To ensure all activities align with the Government of Georgia's environmental regulations and the ADB Safeguard Policy Statement (SPS 2009).
- To provide clear protocols for the use of Personal Protective Equipment (PPE) and specialized tools by the contractor's personnel.
- To define a secure "cradle-to-grave" pathway for asbestos waste, from the point of generation to an approved hazardous waste disposal facility.
- To establish immediate response procedures in the event of accidental breakage or incidental discovery of ACM during construction.
- To define the roles and responsibilities of the Contractor, the Project Implementation Consultant (PIC), and the PIU in monitoring and enforcing asbestos safety.

This AMP is a dynamic document. It will be formally updated and finalized by the Construction Contractor prior to the commencement of any site activities to include specific site-logistics, finalized disposal agreements, and staff certifications. Furthermore, the plan shall be subject to immediate revision and detailed adjustment in the event of any incidental discovery of ACM during the construction phase, ensuring that unforeseen findings are managed with site-specific precision and in full coordination with the PIC and PIU."

2. Regulatory Framework, Standards and Protocols

All activities involving the management of Asbestos-Containing Materials (ACM) under this project will strictly adhere to both Georgian national legislation and international safety standards. The primary regulatory pillars are:

National Legislation:

Waste Management Code of Georgia (2015): Defines ACM as hazardous waste and mandates specific requirements for its collection, transport, and disposal.

Technical Regulation on "Safety Requirements for Working with Asbestos" (Government Resolution No. 145): Establishes the legal framework for protecting workers from asbestos-related risks during construction activities. This regulation sets out special requirements for the management and processing of ACM. This plan takes into account these requirements.

Law of Georgia on Environmental Protection: Mandates the prevention of environmental pollution during infrastructure rehabilitation.

International Standards and ADB Requirements:

ADB Safeguard Policy Statement (SPS 2009): Requires the application of pollution prevention and control technologies consistent with international good practices.

World Health Organization (WHO) Guidelines: Recognizes all forms of asbestos as carcinogenic and provides the basis for the "Zero-Exposure" objective.

EU Directive 2009/148/EC: On the protection of workers from the risks related to exposure to asbestos at work.

Mandatory Exposure Limits and Protocols:

The project mandates that the concentration of airborne asbestos fibers must not exceed 0.1 fibers per cubic centimeter (0.1 f/cm³) as an 8-hour Time-Weighted Average (TWA). If friable asbestos is encountered or high-risk removal is required, air quality monitoring must be conducted by an independent certified laboratory to ensure compliance with the 0.1 f/cm³ threshold.

The Construction Contractor is legally mandated to develop a comprehensive Waste Management Plan prior to the commencement of works, which must include a detailed section on ACM. This plan must be formally submitted to and approved by the MEPA. The PIC will ensure that all site-specific activities and disposal acts are strictly consistent with the MEPA-approved plan throughout the project duration.

3. Existing/Baseline Conditions

The project area primarily consists of an irrigation canal corridor where infrastructure was installed several decades ago. The baseline assessment for ACM is based on visual inspections and historical context of the project area. The following conditions have been identified:

- Historically, AC pipes were standardly laid parallel to access and service roads. Consequently, there is a higher probability of encountering ACM during excavation works in sections adjacent to the roads leading toward the villages of Shibliani and Zemo Kachreti.
- In areas near local farms and livestock facilities, there is a risk of finding ACM (primarily broken slate and insulation materials) that may have been historically discarded directly into the canal bed or along its embankments. These "hotspots" require specialized attention during the initial dredging and cleaning phases.
- Beyond official infrastructure, ACM is frequently present as asbestos-cement roofing sheets (slate). Local communities have used these materials for decades for roofing residential and auxiliary buildings, as well as for constructing makeshift fences and barriers within or near the project's Right of Way (ROW).
- While underground pipes generally remain non-friable, the ACM found near farms or used in fences is often weathered and brittle. This increases the potential for fiber release if disturbed by heavy machinery.
- A final pre-construction survey will be conducted to map these high-probability areas (especially near Shibliani and Zemo Kachreti roads) to ensure that the Contractor's environmental team is on high alert during earthworks in these specific locations.

4. Risk Assessment

The risk assessment for ACM is primarily focused on human health exposure and environmental contamination. The level of risk is directly linked to the proximity of receptors and the method of handling.

Primary Receptors (Workers): The highest risk is associated with occupational exposure. Workers involved in excavation, manual handling, and transport are at direct risk of inhaling airborne fibers if safety protocols are not strictly followed. This is the project's most critical safety concern.

Secondary Receptors (Local Community): Since the canal primarily passes through unpopulated or sparsely populated agricultural lands, the risk of exposure to the general public is considered low. The distance between active work zones and residential areas provides a natural buffer.

Environmental & Long-term Risks: While immediate public exposure is low, the long-term presence of unmanaged ACM on-site poses a significant threat. Leaving ACM fragments scattered or improperly stored could lead to:

- Soil contamination.
- Fiber release during future maintenance works.
- Accidental disturbance by local farmers.
- Potential secondary use of discarded materials by locals.

Risk Levels by Activity:

- Low Risk: General site activities in areas where ACM remains buried (in-situ) and undisturbed.
- Medium Risk: Manual excavation around AC pipes and clearing of surface debris (broken slate), provided that wet methods are used.
- High Risk: Mechanical excavation near roads (Shibliani and Zemo Kachreti), cutting or crushing of pipes, and dredging of "weathered" debris near farms.

The risk strategy focuses on protecting workers through PPE and strict protocols, while eliminating public and environmental risks through immediate containment and scheduled disposal.

5. Roles and Responsibilities

To ensure the successful implementation of the AMP, the following roles and responsibilities are defined:

Construction Contractor:

- Directly responsible for the safe handling, removal, transport, and disposal of all ACM encountered within the project zone.
- Must appoint a qualified Environmental Specialist/Safety Officer to supervise ACM-related activities on-site.
- Responsible for providing all necessary Personal Protective Equipment (PPE) and ensuring that workers are trained in asbestos-safe working methods.
- Must prepare and submit the Site-Specific Waste Management Plan (including the ACM section) to MEPA for approval prior to the start of works.
- Maintains a detailed log of all ACM encountered, including volumes, locations, and disposal manifests.

Project Implementation Consultant (PIC):

- Responsible for the monthly monitoring and supervision of the Contractor's compliance with this AMP.

-
- Has the authority to suspend works (Stop-Work Authority) if ACM is being handled in an unsafe manner or if inappropriate equipment is used.
 - Verifies and signs off on the final disposal certificates provided by the hazardous waste facility.

Project Implementation Unit (PIU):

- Provides overall project oversight and ensures alignment with ADB Safeguard Policies.
- Facilitates high-level coordination with state agencies (MEPA, Solid Waste Management Company) if required.
- Reviews monthly environmental monitoring reports to ensure that ACM management is being documented correctly.

6. Permissible Exposure Limits (PEL)

To ensure the safety of workers and the surrounding environment, the project adheres to the following exposure standards:

- **Exposure Limit:** The concentration of airborne asbestos fibers must not exceed 0.1 fibers per cubic centimeter (0.1 f/cm³) calculated as an 8-hour Time-Weighted Average (TWA).
- **Compliance:** This limit is consistent with both Government of Georgia Resolution No. 145 and international occupational health standards (WHO/EU).
- **Action Level:** If there is a suspicion of high dust generation or if ACM is accidentally crushed, the PIC may require air quality monitoring to verify that levels remain below this PEL.

7. ACM Management Process

This section outlines the step-by-step operational procedures for managing asbestos-containing materials:

7.1. Chance Find Protocol & Emergency Response

Chance Find Procedure (For New Discoveries):

- **Immediate Stop-Work:** In the event of discovering suspected ACM (e.g., previously unidentified pipes or buried slate), all activities within a 10-meter radius must cease immediately. The suspected zone must be cordoned off using hazard warning tape (red/white) to prevent unauthorized access and accidental disturbance.
- **Cordoning & Signage:** The area must be isolated with hazard tape and "Authorized Access Only" signs. If the discovered material appears damaged or is being disturbed by wind/water, it must be temporarily covered with a weighted plastic sheet or kept damp with a fine water mist until a formal removal plan is activated.
- **Notification:** The Contractor's Environmental Officer and the PIC must be notified instantly. Works may only resume after the PIC provides written clearance.
- **Verification:** GPS coordinates and photographs must be taken to document the find for the monthly monitoring report.

Emergency Response (For Accidental Breakage or Scattering):

- **Accidental Disturbance:** If an AC pipe is accidentally broken or crushed by machinery, the operator must shut down the equipment immediately to avoid further agitation of dust.
- **Dust Suppression:** A fine water mist must be applied to the broken material and the immediate surrounding soil to "lock" any released fibers.
- **Decontamination:** The affected equipment (excavator bucket, etc.) must be wet-cleaned before being moved from the exclusion zone. All cleaning materials (rags, etc.) must be disposed of as hazardous waste.

7.2. ACM Removal Protocol

*Updated Initial Environmental Examination Kvemo Samgori Left Main Canal Irrigation Scheme – Package 1:
Main Canal Ch 313+42 to Ch 397+00*

Appendix. 8-4

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- Every worker involved in ACM removal, handling, or site preparation within the exclusion zone must be fully equipped with the required Personal Protective Equipment (PPE), including FFP3 respirators and disposable coveralls, as detailed in Section 8 of this plan.
 - Wetting (Pre-treatment): Before any physical contact, all ACM (pipes or slate) must be thoroughly sprayed with water or a wetting agent. The material must remain saturated throughout the removal process to prevent fiber release.
 - Mechanical excavation is prohibited within 0.5 meters of suspected AC pipes. The final exposure of the pipes must be done manually using hand tools.
 - Every effort must be made to remove AC pipes in their original lengths. Deliberate breaking or crushing for easier handling is strictly forbidden.

7.3. ACM Handling Protocol

- Workers must handle ACM with care, avoiding dropping or throwing materials.
- All tools used during the removal (shovels, saws) must be cleaned with wet rags immediately after use. The rags must be treated as asbestos waste and disposed of accordingly.
- A basic decontamination station (water and soap) must be available for workers to clean their PPE and hands before leaving the active work zone.

7.4. ACM Storage Protocol

- Removed ACM must be double-wrapped in 200-micron polyethylene sheeting and sealed with industrial adhesive tape (goose-neck seal).
- All packages must be labeled with: "DANGER: CONTAINS ASBESTOS. DO NOT INHALE DUST."
- Wrapped ACM must be stored in a lockable, covered container (skip) or a fenced, shaded area to prevent accidental damage and unauthorized access. The storage area should be clearly marked with warning signs.

7.5. ACM Stabilization and Treatment

- During temporary storage, if a package is found to be torn or damaged, it must be immediately over-wrapped with an additional layer of polyethylene.
- Under no circumstances shall ACM be used as fill material or for any other purpose on-site. All identified ACM must be stabilized for final disposal.

8. Personal Protective Equipment (PPE) Requirements

All personnel entering the exclusion zone or involved in the handling of ACM must be equipped with the following mandatory PPE. The Contractor is responsible for the provision, maintenance, and correct disposal of all protective gear.

Respiratory Protection:

- FFP3 (N99) Respirators: Minimum requirement for all workers in the ACM zone. High-efficiency filters are essential to capture microscopic asbestos fibers.
- Half-face or Full-face Masks (with P3 filters): Required for high-risk activities such as manual excavation or handling of broken slate.

Body Protection:

- Disposable Coveralls (Type 5/6): Single-use, hooded coveralls designed to resist hazardous dust and particles. They must be anti-static and breathable.
- Hood up: The hood of the coverall must be worn over the respirator straps to ensure no skin/hair exposure.

Hand and Foot Protection:

- Gloves: Disposable nitrile gloves or heavy-duty rubber gloves. If heavy-duty gloves are used, they must be thoroughly wet-cleaned after each use.
- Footwear: Laceless rubber boots (wellies) are preferred as they are easy to decontaminate. If safety boots with laces are worn, they must be covered with disposable overshoes.

Eye Protection:

- Safety Goggles: Tight-fitting goggles to protect eyes from dust, especially during windy conditions or when using water mists.

Hygiene and Decontamination Gear:

- Cleaning Rags and Water: For "wet-wiping" PPE and tools before leaving the work zone.
- Waste Bags: Dedicated hazardous waste bags for the disposal of used PPE at the end of each shift.

9. List of Approved ACM Handlers and Disposal Facilities

To ensure full compliance with Georgian legislation and ADB standards, all ACM waste generated by the project must be managed through officially licensed entities.

Authorized Disposal Facilities:

- Solid Waste Management Company of Georgia (SWMCG): The primary authority for hazardous waste disposal. ACM must be transported to a dedicated hazardous waste cell approved by the SWMCG at the time of disposal.
- Licensed Private Contractors: Alternatively, the Contractor may use private companies that hold a valid license from the MEPA for the collection, transport, and disposal of hazardous waste.

Before the commencement of ACM removal, the Contractor must provide the PIC with a copy of the valid license/permit of the selected disposal facility or the formal agreement with the SWMCG.

The disposal facility must be capable of providing a formal receipt/certificate confirming the safe burial of the specific volume of ACM delivered.

Only vehicles and companies registered in the MEPA Electronic Waste Management System are permitted to transport ACM. Each shipment must have a unique tracking number generated through this system.

This part will be thoroughly checked and detailed by the construction contractor before the start of work, in a site-specific plan.

10. Health and Safety Protocol

To complement the technical handling procedures, the following occupational health and safety rules apply:

- Before starting works in suspected ACM areas, the Contractor must conduct a Toolbox Talk specifically focused on asbestos risks and the requirements of this AMP.
- * Eating, drinking, or smoking is strictly prohibited within the ACM exclusion zone to prevent accidental ingestion of fibers.
- Workers must wash their hands and faces with soap and water before breaks and at the end of each shift.
- The work zone must be marked with visible warning signs: "CAUTION: ASBESTOS WORK AREA - AUTHORIZED PERSONNEL ONLY."

-
- In case of accidental injury (cuts/scrapes) in an ACM zone, the wound must be immediately cleaned and covered to prevent fiber entry into the bloodstream.

11. Training

As outlined in the project's overarching Environmental Training Plan, specific capacity building regarding asbestos is mandatory for the site personnel:

- ACM Awareness Training: This training is focused on the identification of potential ACM during earthworks and the practical execution of emergency "stop-work" procedures.
- Target Group: Mandatory for all Earthworks teams (excavator operators, laborers) and Site Supervisors.
- Timeline: The training must be conducted once, before earthworks commence. It is strictly integrated into the General Induction Training for all new staff assigned to the Shibliani and Zemo Kachreti sections. Key Topics:
 - How to recognize potential ACM (pipes and slate).
 - The health risks associated with asbestos fiber inhalation.
 - Correct use and disposal of PPE.
 - Step-by-step walkthrough of the Chance Find Protocol.
- Daily Reinforcement: In addition to the formal induction, Daily Toolbox Talks will be held at the specific locations where high-probability ACM encounters are expected (e.g., road-parallel excavations).
- Records: The Contractor must maintain an attendance log for the induction sessions, specifically highlighting the ACM awareness module, which will be verified by the PIC during monthly monitoring.

12. Reporting and Monitoring

This section defines the verification process to ensure the AMP is being followed in the field.

Contractor's Self-Monitoring:

- The Contractor's Environmental Officer must conduct daily site inspections during ACM handling and record findings in a dedicated ACM Logbook.
- The logbook must track the volume of ACM removed, its temporary storage status, and the PPE compliance of the workers.

PIC Supervision (Monthly Monitoring):

- The Project Implementation Consultant (PIC) will conduct formal monthly monitoring visits to verify the Contractor's compliance with this AMP.
- The PIC will audit the Contractor's ACM records, inspection logs, and disposal certificates.
- The PIC has the authority to conduct ad-hoc inspections if high-risk activities are reported.

Monthly Environmental Reports:

- The results of ACM management (including any chance finds, volumes removed, and disposal status) must be included as a dedicated section in the Monthly Environmental Monitoring Report submitted to the PIU.


Disposal Documentation:

- Final verification of successful ACM management is only achieved when the Certificate from the licensed landfill is submitted and verified by the PIC.

APPENDIX 9: Information brochure used during meetings with stakeholders

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა (CSISDP)

ქვემო სამგორის სარწყავი სისტემის მარცხენა მთავარი არხის PK 313+42-დან PK 397+00-მდე ქვე-მონაკვეთის (8,4 კმ სიგრძის) რეაბილიტაცია



პროექტის გარემოსდაცვითი და სოციალური დოკუმენტების საჯარო განხილვა:

❖ დრო: 2026 წლის 06 მარტი, 12:00 საათი,
❖ ადგილი: სსიპ - საგარეჯოს მუნიციპალიტეტის სოფელ მიხლიანის საჯარო სკოლა

საჯარო განხილვაზე დასწრება შეუძლია საზოგადოების ნებისმიერ წარმომადგენელს.

საკონტაქტო პირი:

❖ საპროექტო ორგანიზაციის წარმომადგენელი - იური გოგელიძე, ტელ: 591041705
❖ მერიის წარმომადგენელი - რამაზ კოლოტაძე, ტელ: 595-85-66-21


პროექტის საქართველოს გარემოს

განმაზრცილებელი : დაცვისა და სოფლის მეურნეობის სამინისტრო

პროექტის დამფინანსებელი: აზიის განვითარების ბანკი (ADB)

საპროექტო ორგანიზაცია: კონსულტანტი- „Dolsar Engineering“.

სარწყავი სისტემის ოპერატორი კომპანია: შპს "საქართველოს მელიორაცია".



არხის საპროექტო ქვე-მონაკვეთის სიგრძე 8,4 კმ.

არხი წარმოდგენილია რამდენიმე გვირაბით, დიუკერით, გალერეითა და ღია, ტრაპეციული კვეთის არხით.

ღია არხი მთლიან სიგრძეზე ძლიერ დაზიანებულია. მოშლილია ბეტონის მოპირკეთება და წყალმიღები ფარები, არხის ფსკერი ამოვსებულია გრუნტით ან ნარჩენებით, ზოგიერთ მონაკვეთზე განვითარებულია ეროზიული და გრავიტაციული პროცესები. მნიშვნელოვნად შემცირებულია არხის წყალგამტარობა და მაღალია წყლის ინფლიტაცია.

არხის სარეაბილიტაციო სამუშაოები გულისხმობს შემდეგს:

- არხის ფერდებზე ბეტონის ან ტორკრეტის მოწყობა;
- გვირაბების რეაბილიტაცია, ბეტონის მოსახვა;
- დაზიანებული უბნების აღდგენა და რეაბილიტაცია.

არხის რეაბილიტაციის შედეგად, მნიშვნელოვნად გაუმჯობესდება ადგილობრივი მოსახლეობის/ ფერმერული ორგანიზაციების სარწყავი წყლით მომარგების შესაძლებლობა.

APPENDIX 10: Minutes of the meeting

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა (CSISDP)

ქვემო სამგორის სარწყავი სისტემის მარცხენა მთავარი არხის PK 313+42-დან PK 397+00-მდე ქვე-მონაკვეთის რეაბილიტაცია

გარემოსდაცვითი და სოციალური საკითხების საკონსულტაციო შეხვედრები დაინტერესებულ მხარეებთან

საჯარო განხილვის სხდომის ოქმი

შეხვედრის ადგილი და ფორმატი:	საგარეჯოს მუნიციპალიტეტი, სოფელი შიბლიანი
თარიღი:	06.03.2026
დამსწრეთა რაოდენობა (ხელმოწერების მიხედვით):	43
მოწველადი ჯგუფის წევრების ტიპი და რაოდენობა (არსებობის შემთხვევაში)	არა

შეხვედრა, მთავარი სარწყავი არხის ბენეფიციარებთან/ ადგილობრივ ფერმერებთან, საზოგადოების და სოფლის წარმომადგენლებთან. შეხვედრა ჩატარდა საგარეჯოს მუნიციპალიტეტის სოფელ შიბლიანის საჯარო სკოლაში. შეხვედრის ორგანიზატორი იყო საქართველოს გარემოს დაცვისა და სოფლის მეურნეობის სამინისტროს პროექტის განმახორციელებელი რგოლის გარემოს დაცვის სპეციალისტი და ადგილობრივი ხელისუფლების წარმომადგენელი. შეხვედრას უძღვებოდა საპროექტო კომპანია „Dolsars Engineering“-ის გარემოს დაცვისა და სოციალური მიმართულების სპეციალისტები და საინჟინრო ჯგუფი.

შეხვედრის მიზანი:

შეხვედრის მიზანი იყო ადგილობრივი ადგილობრივი დაინტერესებული მხარეების ინფორმირება მთავარი სარწყავი არხის რეაბილიტაციის დაგეგმილი სამუშაოების შესახებ, პროექტის ტექნიკური შინაარსის გაცნობა და ძირითადად გარემოსდაცვითი და სოციალური საკითხების განხილვა. ასევე დამსწრე საზოგადოების მხრიდან პროექტთან დაკავშირებული შეკითხვების და შენიშვნების დაფიქსირება და მათზე რეაგირება.

განხილული საკითხები:

საპროექტო ორგანიზაციის - „Dolsars Engineering“-ის წარმომადგენელმა და პროექტის მენეჯერის მოადგილემ, იური გოგელიძემ - დამსწრე საზოგადოებას გააცნო პროექტის მიზნები და ტექნიკური მახასიათებლები. წარდგენილი იქნა მოკლე ინფორმაცია პროექტის განმახორციელებელი (საქართველოს გარემოს დაცვისა და სოფლის მეურნეობის სამინისტრო), პროექტის დამფინანსებელი (აზიის განვითარების ბანკი) და საპროექტო („Dolsars Engineering“) ორგანიზაციების შესახებ. აღინიშნა, რომ რეაბილიტაციის შემდგომ

არხის ოპერირებას განახორციელებს შპს „საქართველოს მელიორაცია“. დასაწყისშივე დაფიქსირებული იქნა, რომ განხილვას ესწრება ჩამოთვლილი ორგანიზაციების წარმომადგენლები.

შეხვედრის მონაწილეებს დაურიგდათ ბროშურები, სადაც ასახული იყო პროექტის შესახებ მოკლე ინფორმაცია. ასევე დარიგდა საჯარო შეხვედრის დღის წესრიგი.

შემდგომში, საპროექტო ორგანიზაციის - „Dolsars Engineering“-ის გარემოსდაცვითი სპეციალისტის, **გიორგი ბჟალავას** მიერ განხილული იქნა პროექტის პარამეტრები, დაგეგმილი სარეაბილიტაციო სამუშაოები. წარდგენილი იქნა შესაბამისი კარტოგრაფიული მასალა. მოსახლეობას მიაწოდა ინფორმაცია პროექტის განხორციელების სავარაუდო გრაფიკის შესახებ, მათ შორის ინფორმაცია სამომავლოდ, სარწყავი სისტემის სხვა მონაკვეთების რეაბილიტაციის შესახებ.

მიმოხილული იქნა პროექტთან დაკავშირებული ეროვნული საკანონმდებლო ასპექტები და აზიის განვითარების ბანკის უსაფრთხოების მოთხოვნები პროექტთან მიმართებაში.

განხილვის დროს მოხდა გარემოსდაცვითი შეფასების ანგარიშის (IEE) ძირითადი ასპექტების წარდგენა, მათ შორის აღნიშნული დოკუმენტის სტრუქტურა და ძირითადი შინაარსი.

შეხვედრის მნიშვნელოვანი ნაწილი დაეთმო არსებული გარემოს მდგომარეობის აღწერას, სადაც წარმოდგენილი იყო ფიზიკური გარემოს (კლიმატი, გეოლოგია, ნიადაგი, ზედაპირული და მიწისქვეშა წყლები, ჰაერის ხარისხი, ხმაური), ბიოლოგიური გარემოს (ფლორა, ფაუნა, დაცული ტერიტორიები) და სოციალური გარემოს (მოსახლეობა, მიწათსარგებლობა, ეკონომიკური საქმიანობა და კულტურული მემკვიდრეობა) ძირითადი მახასიათებლები.

განხილული იყო პროექტის განხორციელების სხვადასხვა ეტაპზე (მოდერნიზაცია და ექსპლუატაცია) ბუნებრივ და სოციალურ გარემოზე მოსალოდნელი ზემოქმედებები, მიახლოებითი სივრცითი და დროითი საზღვრები; ზემოქმედების ძირითადი წყაროები და რეცეპტორები. პროექტის შესაძლო ზემოქმედებებიდან ხაზი გაესვა შემდეგს: ჰაერის დაბინძურების ალბათობა, ხმაური და ვიბრაცია, წყლისა და ნიადაგის დაბინძურების ალბათობა, წყლის რესურსებზე ზემოქმედება, ბიომრავალფეროვნებაზე ზემოქმედება, ნარჩენების წარმოქმნა და მოსალოდნელი ზემოქმედებები (მათ შორის აზბესტმემცველი ნარჩენების მართვა) და ა.შ.

ამის შემდეგ, განხილვაზე ასევე წარმოდგენილი იქნა გარემოსდაცვითი მართვის გეგმის (EMP) ძირითადი ასპექტები, შემარბილებელი ღონისძიებები, რომლებიც მიზნად ისახავს შესაძლო უარყოფითი ზემოქმედებების თავიდან აცილებას ან შემცირებას. მაგალითად მტვრის და ხმაურის კონტროლი, წყლის რესურსების დაცვა, ნიადაგის დაცვა და რეკულტივაცია, ბიომრავალფეროვნების დაცვის ღონისძიებები და ა.შ. აღინიშნა, თუ როგორ მოხდება გარემოსდაცვითი მოთხოვნების შესრულების კონტროლი.

საპროექტო ორგანიზაციის - „Dolsars Engineering“-ის განსახლების და სოციალური საკითხების სპეციალისტმა - **სოფიო ბერიშვილიმა** დამსწრე საზოგადოებას წარუდგინა პროექტთან დაკავშირებული ძირითადი სოციალური ასპექტები. მოსახლეობას განემარტა, რომ თუ პროექტის განხორციელება შეეხება მიწას, სახლს ან სხვა საკუთრებას, რომლის გამოყენებაც შეიძლება საჭირო გახდეს, ამ პროცესში ადამიანების უფლებები უნდა იყოს დაცული. მაგალითად, აზიის განვითარების ბანკის გარემოს დაცვისა და სოციალური უსაფრთხოების პოლიტიკის მიხედვით, თუ პროექტის ფარგლებში საჭიროა ადგილობრივი მოსახლეობის საკუთრებაში არსებული მიწის ნაკვეთის ან ქონების გამოყენება, აუცილებელია მიიღოს სამართლიანი კომპენსაცია ან ალტერნატიული საცხოვრებელი.

ასევე მოსახლეობს განემარტა, რომ მნიშვნელოვანია, რომ დაინტერესებულ მხარეებს წინასწარ მიეწოდოთ ინფორმაცია, მოისმინონ მათი მოსაზრებები და საჭიროების შემთხვევაში მიიღონ მხარდაჭერა, რათა მათი საცხოვრებელი პირობები არ გაუარესდეს. სწორედ ამ მიზნების მიზნით ტარდება საზოგადოებასთან შეხვედრები, მათთვის შესაბამისი ინფორმაციის მიწოდება და მათგან შესაბამისი მოსაზრებების მოსმენა.

საუბარი ასევე შეეხო სოციალურ გარემოზე და ადგილობრივების ცხოვრების პირობებზე შესაძლო ზემოქმედებას და ამ თვალსაზრისით დაგეგმილ შემარბილებელ ღონისძიებებს. მოსახლეობას განემარტა, რომ პროექტის განხორციელების პროცესში მთავარია ზიანი არ მიადგეს მოსახლეობას და საჭიროების შემთხვევაში მათ ჰქონდეთ სამართლიანი და უსაფრთხო პირობები.

მოსახლეობას განემარტა პროექტის განხორციელების პროცესში წარმოქმნილი საჩივრების განხილვის მექანიზმები, საჩივრების გადაჭრის საფეხურები და მოსახლეობასთან უკუკავშირის პროცედურები.

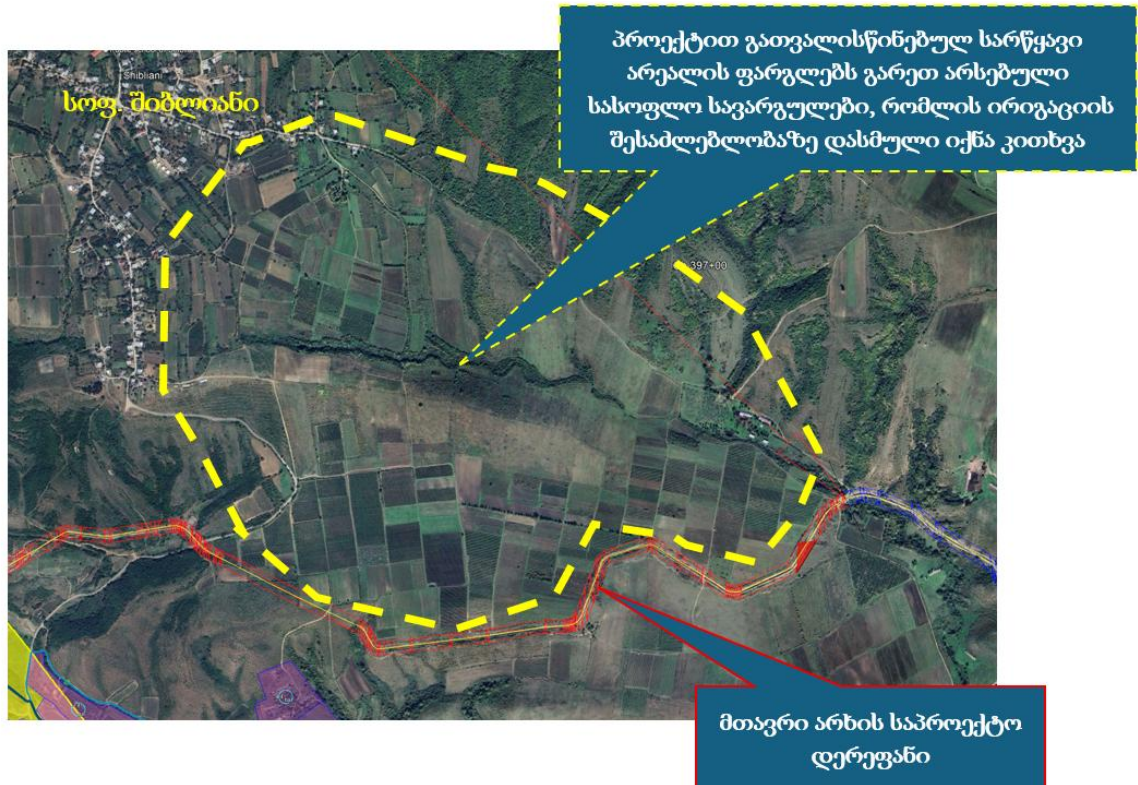
შემდგომ შეხვედრა წარიმართა კითხვა-პასუხის რეჟიმში.

განხილვის პროცესში დასმული შეკითხვები:

კითხვა 1:

ადგილობრივი მოსახლის - ბატონი თამაზ გველუკაშვილის მიერ აღინიშნა, რომ მას გააჩნია რამდენიმე სასოფლო-სამეურნეო ნაკვეთი სარწყავი არხის საპროექტო მონაკვეთის მიმდებარედ, ზედა ნიშნულებზე. ნაკვეთებზე გაშენებულია ვენახები. მის გარდა, ამავე არეალში არსებობს სხვა კერძო ნაკვეთებიც, რომლებიც ასევე მუშავდება და მათ ფარგლებშიც გაშენებულია ვენახები. ჯამში ნაკვეთების სერთო რაოდენობაა დაახლოებით 32. შეკითხვის ავტორის მიერ შეხვედრის პროცესში წარმოდგენილ კარტოგრაფიულ მასალაზე მითითებული იქნა აღნიშნული ნაკვეთების მიახლოებითი ადგილმდებარეობა (იხ. რუკა 1).

რუკა 1.



კითხვის ავტორი დაინტერესდა, არხის რეაბილიტაციის შედეგად გათვალისწინებულია თუ არა აღნიშნული არეალისთვის სარწყავი წყლის მიწოდება; ან/და შესაძლებელია თუ არა შემდგომში იქნეს გათვალისწინებული ამ არეალის მორწყვის შესაძლებლობა (მაგალითად არხზე წყალსაქაჩი ტუმბოების დამონტაჟების გზით ან სხვა მეთოდებით).

კითხვაზე პასუხის გაცემისას საპროექტო ორგანიზაციის - „Dolsars Engineering“-ის ინჟინერმა, იური გოგელიძემ განმარტა, რომ პროექტი ითვალისწინებს სარწყავი არხის რეაბილიტაციას (და არა რეკონსტრუქციას). შესაბამისად პროექტი ითვალისწინებს საირიგაციო ქსელის აღდგენას ისტორიულად განსაზღვრულ არეალში. პროექტის მიხედვით საირიგაციო ქსელის მე-2 და მე-3 რიგის გამანაწილებლებს, რომლებიც არხიდან ქვედა ნიშნულზე მდებარეობს, წყალი მიეწოდება თვითდინებით. არხის ზედა ნიშნულზე არსებული დამატებითი სასოფლო-სამეურნეო სავარგულებებისთვის წყლის მიწოდების მიზნით სატუმბო სადგურების მოწყობა გათვალისწინებული არ არის. შესაბამისად, კითხვის ავტორის მიერ მითითებული არეალი (რომელიც არხის ზედა ნიშნულზე მდებარეობს და ისტორიულად არ წარმოადგენდა ქვემო სამგორის სარწყავი სისტემის მარცხენა მარცხენა მაგისტრალური არხის საირიგაციო ტერიტორიებს), არ არის გათვალისწინებული პროექტში.

კითხვა-პასუხის რეჟიმში ხაზი გაესვა, რომ განსახილველი არხის სარწყავ არეალებში დამატებითი ტერიტორიების შეყვანა, მოითხოვს დამატებით შესწავლა-შეფასებას, კერძოდ:

- ამ შესაძლო ცვლილების ტექნიკურ-ეკონომიკურ შეფასებას და დასაბუთებას;
- ამ შესაძლო ცვლილების შედეგად სარწყავი წყლის ბალანსის შესწავლა-შეფასებას, მათ შორის არხის ქვედა დინებაში არსებული ბენეფიციარებისთვის წყლის შესაძლო დანაკლისის რისკების ანალიზს;
- სხვა სახის სოციალურ-ეკონომიკური, ასევე გარემოსდაცვითი რისკების ანალიზს. ასევე საქართველოს გარემოსდაცვითი კანონმდებლობის სხვადასხვა მოთხოვნების შესრულების საჭიროების შეფასება.

ამასთან, იური გოგელიძემ აღნიშნა, რომ შეხვედრის დროს დამსწრე საზოგადოების მხრიდან დასმული ეს შეკითხვა აუცილებლად აისახება შეხვედრის ოქში. ეს საკითხი შემდგომში განხილული იქნება როგორც საპროექტო ჯგუფის, ასევე გარემოსდაცვითი და სოციალური სპეციალისტების მიერ და დასაბუთებული პასუხები ან საკითხის გადაჭრის ალტერნატიული გზები დამატებით იქნება წარმოდგენილი (მათ შორის საკითხი აისახება გარემოსდაცვითი შეფასების დოკუმენტის (IEE) საბოლოო ვერსიაში).

კითხვა 2.

შეხვედრის მიმდინარეობისას ადგილობრივმა მოსახლემ გააჟღერა პრობლემა, რომელიც დაკავშირებულია სარწყავი არხების ამჟამინდელ მდგომარეობასთან. მისი განცხადებით, ხშირ შემთხვევაში დაზიანებული არხიდან წყალი გადმოდის, გადადის მიმდებარე ტერიტორიებზე, რის შედეგადაც ზიანდება (იტმორება) როგორც სასოფლო-სამეურნეო ნაკვეთები, ისე არხებთან მისასვლელი გზები. ადგილი აქვს ეროზიული პროცესების განვითარებას და ხდება საზოგადოებრივი გზების ატალახება. შესაბამისად რთულდება ადგილობრივი მსოახლეობის ტავისუფალი გადაადგილება. აღნიშნულ მდგომარეობას განსაკუთრებით პრობლემური ხასიათი აქვს ნალექიან პერიოდებში, როდესაც არხებში წყლის ნაკადი იზრდება და არსებული ინფრასტრუქტურა ვერ უზრუნველყოფს წყლის სათანადო გატარებას. შესაბამისად, კითხვის ავტორი დაინტერესდა, რა ღონისძიებებია გათვალისწინებული პროექტის ფარგლებში იმისათვის, რომ მომავალში მსგავსი პრობლემები აღარ წარმოიშვას.

კითხვაზე პასუხის გაცემისას პროექტში ჩართულმა ინჟინერმა განმარტა, რომ აღნიშნული პრობლემა პირდაპირ უკავშირდება არხის ამჟამინდელ ტექნიკურ მდგომარეობას და წყლის გამტარიანობის შემცირებას, რაც ძირითადად გამოწვეულია არხის ფსკერზე დაგროვილი ნალექით და ნარჩენებით, ასევე არხის ფერდებზე განვითარებული მცენარეული საფარის გამო.

პროექტის ფარგლებში დაგეგმილია არხის კალაპოტის გაწმენდა, გამტარუნარიანობის აღდგენა და კონსტრუქციული ელემენტების მოწესრიგება. აღნიშნული სამუშაოების შედეგად მნიშვნელოვნად გაუმჯობესდება წყლის გამტარუნარიანობა და შემცირდება წყლის არხის ფარგლებს გარეთ გადასვლის რისკები.

გარდა ამისა, არხის რეაბილიტაციის პროცესში გათვალისწინებულია მისასვლელი გზების მდგომარეობის გაუმჯობესებაც. ინჟინერმა აღნიშნა, რომ აღნიშნული სამუშაოების დასრულების შემდეგ ტერიტორია იქნება უფრო მოწესრიგებული, არხის ფუნქციონირება გახდება სტაბილური და გზების გამოყენება აღარ იქნება დაკავშირებული პრობლემებთან. ხაზი გაესვა, რომ არხის ოპერირების ეტაპზე ტექნიკური მდგომარეობის მონიტორინგს განახორციელებს შპს „საქართველოს მელიორაცია“ და მსგავსი პრობლემების იდენტიფიცირებას და დროულ რეაგირებას მნიშვნელოვანი ყურადღება მიექცევა.

შეხვედრის დასასრულს, დამსწრე საზოგადოების მისამართით გაკეთდა მიმართვა, თუ კიდევ არსებობდა რაიმე შენიშვნები და მოსაზრებები, წარმოდგენილი ყოფილიყო ზეპირი ან წერილობითი სახით.

საჯარო განხილვის პროცესის ამსახველი ფოტო-მასალა














Updated Initial Environmental Examination Kvemo Samgori Left Main Canal Irrigation Scheme – Package 1:
Main Canal Ch 313+42 to Ch 397+00

საჯარო განხილვის დამსწრეთა სია

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა
 გარემოს დაცვითი და სოციალური დოკუმენტების საჯარო განხილვა
 2026 წლის 6 მარტი
 დამსწრეთა სია

No	სახელი/გვარი	დასაქმება/სამუშაო ადგილი	საკონტაქტო
1	სომეხ ბეზუგია	ჭეოცონსეცონგი	ს. ბეზუგია
2	გომიხვი ზეგოვას	ჭეოცონსეცონგი	577641880
3	გომიხვი ვეკლიაძე	ჭეოცონსეცონგი	გ. ვეკლიაძე
4	ივანე გომიხვი	ჭეოცონსეცონგი	ი. გომიხვი
5	ოსკარი ბიხვიძე	ჭეოცონსეცონგი	ოსკარი ბიხვიძე
6	ოქროსი მკვირვა	აბსაძის სახლი	ოქროსი მკვირვა
7	ნამან კვიციანი	შინგანდი მხარის ხედი	ნამან კვიციანი
8	ბიხვი მკვირვა	შინგანდი მხარის ხედი	ბიხვი მკვირვა
9	ოთახი მკვირვა	ფრეზი	ო. მკვირვა
10	ივანე ზაძე	ფრეზი	ი. ზაძე

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა
 გარემოს დაცვითი და სოციალური დოკუმენტების საჯარო განხილვა
 2026 წლის 6 მარტი
 დამსწრეთა სია

11	აქაი დედაძალი	დედაძალი	
12	შოთაძე ჯანა	დედაძალი	
13	თაძე მარკარიანი	დედაძალი	
14	ნოზაძე ხატია	დედაძალი	
15	აქაი ხატია	დედაძალი	
16	ბერიძე ვინა	დედაძალი	
17	ქაბაძე ნინო	დედაძალი	
18	ბერიძე სოფია	დედაძალი	
19	ბერიძე სოფია	დედაძალი	
20	ბერიძე თინათინ	დედაძალი	
21	ბერიძე სოფია	დედაძალი	

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა
 გარემოს დაცვითი და სოციალური დოკუმენტების საჯარო განხილვა
 2026 წლის 6 მარტი
 დამსწრეთა სია

22	თხვინ გუთაძე	დერბინი	თ. გუთაძე
23	გუთა ძონჯუაძე	დერბინი	გ. ძონჯუაძე
24	თამარ ხუციშვილი	დერბინი	თ. ხუციშვილი
25	გურამ ბილაშვილი	დამსწრე	გ. ბილაშვილი
26	ინგა ყუბანაძე	დამსწრე პრეზენტი	ი. ყუბანაძე
27	მინა გვრიტიანი	დამსწრე	მ. გვრიტიანი
28	ქაინო შინაძე	დამსწრე	ქ. შინაძე
29	მარი ნიქიძე	დამსწრე პრეზენტი	მ. ნიქიძე
30	ნათა ნიქიძე	დამსწრე	ნ. ნიქიძე
31	ნინო აბაშიძე	დამსწრე პრეზენტი	ნ. აბაშიძე
32	ნათია ხუციშვილი	პრეზენტი	ნ. ხუციშვილი

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა
 გარემოს დაცვითი და სოციალური დოკუმენტების საჯარო განხილვა
 2026 წლის 6 მარტი
 დამსწრეთა სია

No	სახელი/გვარი	დასაქმება/სამუშაო ადგილი	საკონტაქტო
33.	ნინო ლომთაძის შვილი	მედიკოსი	ნ. ლომთაძე
34.	თაბაკაძე ვერვიტე	მედიკოსი	თ. თაბაკაძე
35.	იანთხაჭაშვილი	მედიკოსი	ი. იანთხაჭაშვილი
36.	მანია ჯამბუკიძე	პედაგოგი	მ. მანია
37.	ნათია სხუძე	სტუდენტი	ნ. სხუძე
38.	ჭაჭავაძე გიორგი	დამსწერი	გ. ჭაჭავაძე
39.	თამარა მჭედიაძე	საქმიანობის მუშაობის	თ. მჭედიაძე
40.	მანუჩაძე გიორგი	ფერმერი	მ. მანუჩაძე
41.	თამარა თონჯიჭიანი	ფერმერი	თ. თონჯიჭიანი
42.	ვინოკური ვინოკური	ADB	ვ. ვინოკური

კლიმატ გონივრული ირიგაციის სექტორის განვითარების პროგრამა
 გარემოს დაცვითი და სოციალური დოკუმენტების საჯარო განხილვა
 2026 წლის 6 მარტი
 დამსწრეთა სია

No	სახელი/გვარი	დასაქმება/სამუშაო ადგილი	საკონტაქტო
43	საიენს მუკუაჭიეი	MEPA (PIU)	

Climate-smart Irrigation Sector Development Program (CSISDP)

Rehabilitation of the sub-section of the left main canal of the Kvemo Samgori irrigation system from PK 313+42 to PK 397+00

Environmental and Social Stakeholder Consultation Meetings

Public Consultation Meeting Minutes

Meeting location and format:	Sagarejo Municipality, Shibliani Village
Date:	06.03.2026
Number of attendees (based on signatures):	43
Type and number of vulnerable group members (if any)	no

Meeting with beneficiaries/local farmers, community and village representatives of the main irrigation canal. The meeting was held at the Shibliani village public school in Sagarejo municipality. The meeting was organized by the Environmental Protection Specialist of the Project Implementation Unit of the Ministry of Environment and Agriculture of Georgia and a representative of the local government. The meeting was led by the environmental and social specialists and engineering group of the project company “Dolsar Engineering”.

Purpose of the meeting:

The purpose of the meeting was to inform local stakeholders about the planned rehabilitation works of the main irrigation canal, to familiarize themselves with the technical content of the project and to discuss mainly environmental and social issues. Also, to record and respond to questions and comments related to the project from the attending public.

Issues discussed:

The representative of the project organization - “Dolsar Engineering” and the deputy project manager, Yuri Gogelidze - introduced the project goals and technical characteristics to the attending public. Brief information was presented about the project implementing organization (Ministry of Environment Protection and Agriculture of Georgia), the project financier (Asian Development Bank) and the project (“Dolsar Engineering”) organizations. It was noted that after the rehabilitation, the canal will be operated by “Georgian Amelioration” LTD. It was noted at the beginning that representatives of the listed organizations would attend the discussion.

The participants of the meeting were given brochures with brief information about the project. The agenda of the public meeting was also distributed.

Subsequently, the project parameters and planned rehabilitation works were discussed by **Giorgi Bzhalava**, an environmental specialist of the project organization - “Dolsar Engineering”. Relevant cartographic material was presented. The population was provided with information about the estimated schedule of project implementation, including information about the rehabilitation of other sections of the irrigation system in the future.

National legislative aspects related to the project and the Asian Development Bank’s security requirements for the project were reviewed.

During the discussion, the main aspects of the Environmental Assessment Report (IEE) were presented, including the structure and main content of the mentioned document.

A significant part of the meeting was devoted to the description of the current state of the environment, where the main characteristics of the physical environment (climate, geology, soil, surface and groundwater, air quality, noise), biological environment (flora, fauna, protected

areas) and social environment (population, land use, economic activity and cultural heritage) were presented.

The expected impacts on the natural and social environment at different stages of project implementation (modernization and operation), approximate spatial and temporal boundaries; main sources and receptors of impacts were discussed. The following were highlighted from the possible impacts of the project: probability of air pollution, noise and vibration, probability of water and soil pollution, impact on water resources, impact on biodiversity, waste generation and expected impacts (including management of asbestos-containing waste), etc.

After that, the discussion also presented the main aspects of the Environmental Management Plan (EMP), mitigation measures aimed at preventing or reducing possible negative impacts. For example, dust and noise control, water resource protection, soil protection and reclamation, biodiversity protection measures, etc. It was noted how the implementation of environmental requirements will be monitored.

The specialist for resettlement and social issues of the project organization - "Dolsar Engineering" - **Sofio Berishvili** presented the main social aspects related to the project to the audience. The population was explained that if the project implementation affects land, houses or other property, the use of which may be required, people's rights must be protected in this process. For example, according to the Environmental Protection and Social Safeguards Policy of the Asian Development Bank, if the project requires the use of land or property owned by the local population, it is necessary to receive fair compensation or alternative housing.

It was also explained to the population that it is important to provide information to interested parties in advance, listen to their opinions and, if necessary, receive support so that their living conditions do not deteriorate. Meetings with the public are held for these purposes, to provide them with relevant information and to listen to their relevant opinions.

The discussion also touched on the possible impact on the social environment and living conditions of the locals and the planned mitigation measures in this regard. The population was explained that the main thing during the project implementation process is not to harm the population and, if necessary, to provide them with fair and safe conditions.

The population was explained the mechanisms for reviewing complaints arising during the project implementation process, the stages of resolving complaints and the procedures for feedback from the population.

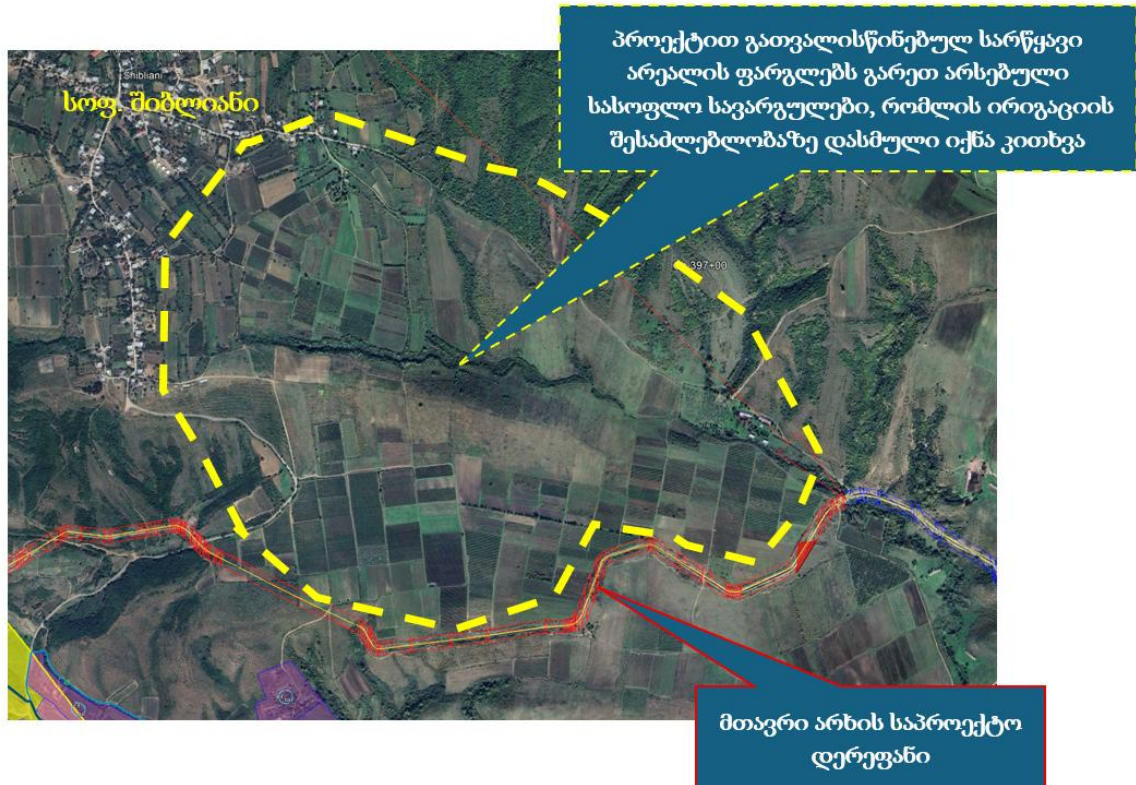
The meeting was then held in a question-and-answer mode.

Questions asked during the discussion process:

Question # 1:

A local resident, Mr. Tamaz Gvelukashvili, noted that he owns several agricultural plots adjacent to the project section of the irrigation canal, at the upper elevations. Vineyards are planted on the plots. In addition, there are other private plots in the same area, which are also cultivated and vineyards are planted within them. The total number of plots is approximately 32. The approximate location of the aforementioned plots was indicated on the cartographic material presented by the author of the question during the meeting (see Map 1).

Map 1.



The author of the question was interested in whether the rehabilitation of the canal will provide irrigation water for the mentioned area; and/or whether it is possible to further consider the possibility of irrigating this area (for example, by installing water pumps on the canal or by other methods).

In response to the question, Yuri Gogelidze, an engineer from the design organization Dolsar Engineering, explained that the project envisages the rehabilitation (and not reconstruction) of the irrigation canal. Accordingly, the project envisages the restoration of the irrigation network in a historically defined area. According to the project, water will be supplied to the 2nd and 3rd row distributors of the irrigation network, which are located at lower points from the canal, by gravity. The arrangement of pumping stations to supply water to additional agricultural fields located at the upper points of the canal is not envisaged. Accordingly, the area indicated by the author of the question (which is located at the upper points of the canal and historically did not represent the irrigation areas of the left main canal of the Kvemo Samgori irrigation system) is not envisaged in the project.

During the question-and-answer session, it was emphasized that the inclusion of additional territories in the irrigation areas of the canal in question requires additional study and assessment, namely:

- Feasibility study and justification of this possible change;
- Study and assessment of the irrigation water balance as a result of this possible change, including analysis of the risks of possible water losses for beneficiaries downstream of the canal;
- Analysis of other socio-economic and environmental risks. Also assessment of the need to comply with various requirements of Georgian environmental legislation.

In addition, Yuri Gogelidze noted that this question raised by the public present during the meeting will definitely be reflected in the meeting minutes. This issue will be further discussed

by both the project team and environmental and social specialists, and substantiated answers or alternative ways to resolve the issue will be additionally presented.

Question # 2.

During the meeting, a local resident voiced a problem related to the current state of irrigation canals. According to him, in many cases, water from damaged canals overflows and flows into adjacent territories, resulting in damage (flooding) of both agricultural plots and access roads to the canals. Erosion processes develop and public roads become muddy. Accordingly, the free movement of local residents becomes more difficult. This situation is especially problematic during periods of precipitation, when the water flow in the canals increases and the existing infrastructure cannot ensure proper water drainage. Accordingly, the author of the question was interested in what measures are envisaged within the project framework to prevent similar problems from arising in the future.

When answering the question, the engineer involved in the project explained that the problem is directly related to the current technical condition of the canal and the reduction in water permeability, which is mainly caused by sediment and waste accumulated on the bottom of the canal, as well as vegetation cover developed on the slopes of the canal.

The project plans to clean the canal bed, restore its capacity, and adjust the structural elements. As a result of the above-mentioned works, water capacity will significantly improve and the risks of water flowing outside the canal will be reduced.

In addition, the canal rehabilitation process also includes improving the condition of access roads. The engineer noted that after the completion of the above-mentioned works, the territory will be more orderly, the functioning of the canal will become stable, and the use of roads will no longer be associated with problems. It was emphasized that during the operation stage of the canal, the technical condition will be monitored by “Georgian Reclamation” LLC, and significant attention will be paid to identifying and responding to similar problems in a timely manner.

At the end of the meeting, an appeal was made to the audience, asking them to submit any additional comments or opinions, either orally or in writing.

Photo materials of the public discussion process



APPENDIX 11: The ADB comments and responses matrix

#	Comment	Response
1.	<p>Compliance Requirement: The IEE lacks the environmental audit of government-completed Areas 5&6 required under ADB SPS (2009) Para 11. This audit is essential to identify legacy environmental issues that may affect Package 1 implementation and establish clear accountability boundaries between government and ADB-financed sections.</p>	<p>As a result of consultations with ADB, it was decided to completely remove Areas 5&6 from the IEE. ADB has prepared a ToR for EDDR specifically for Areas 5&6, this confirms ADB's recognition that Areas 5&6 require environmental due diligence. The ToR stipulates that meetings and consultations with interested parties will be held separately for Areas 5&6 during the EDDR preparation process.</p> <p>It should also be noted that the Canal section Ch 313+42 to Ch 397+00 has less connection with Areas 5&6 than the continuation of the main Canal - section Ch 397+00 to 488+66.7 (Package 3). As is known, a separate IEE is planned for the Ch 397+00 to 488+66.7 section in the future. In addition, the section discussed in the IEE and Areas 5&6 are located in different administrative units - Sagarejo and Gurjaani municipalities.</p> <p>Based on all the above and below this table, Package 2 and Areas 5&6 have been almost completely removed from the IEE. Package 2 and Areas 5&6 are mentioned only in Section II-F. of the IEE, where the project packages are explained.</p>
2.	<p>Stakeholder Engagement Deficiencies: No evidence of stakeholder re-consultation following significant project scope changes (government completion of adjacent areas). Per SPS SR1 Para 20, meaningful consultation must continue throughout implementation when project changes occur. The absence of 2025 consultation records despite fundamental changes represents a breach from safeguard standards.</p>	<p>Taken into account:</p> <p>Based on this comment, field meetings with stakeholders were held in February and March 2026 in accordance with the requirements of Per SPS SR1 Para 20. Pre-prepared information brochures (see Appendix 9 of the IEE report) were distributed to residents and farmers of nearby villages. During the meetings, the opinions of stakeholders on the planned project and their main challenges were noted. During the meetings, it was revealed that the stakeholders welcomes the implementation of the project and hopes that the possibility of providing irrigation water will improve. During the meetings, stakeholders were provided with information about the planned public hearing.</p> <p>Also, information brochures indicating the time and place of the planned public hearing were posted at the Sagarejo Municipality office, nearby agricultural and grocery stores, schools and other public buildings. The public hearing was held on March 6, 2026, at the Shibliani Public School, Sagarejo Municipality. Additional information</p>

		about the public hearing is provided in Section VIII-B of the IEE document. The minutes of the meeting are presented in Appendix 10 of the IEE document.
3.	Baseline Data: The IEE relies on 2023 baseline data despite conducting field surveys in May and August 2025. This 2-year data gap undermines the validity of impact assessments for the 8.4km corridor. Either update all baseline sections with 2025 data or provide technical justification for using outdated information.	Taken into account: Additional field surveys were conducted in 2026 to verify the previous surveys: <ul style="list-style-type: none"> • Verification of the current state of habitats and vegetation in the project corridor • Identification of important animal habitats in the project corridor • Measurements of background noise levels • Current state of waste • Socio-economic conditions, including agricultural activities (See Section IV of the document) As a result of the verification, it was determined that the background state of the environment did not change in 2023-2026. No critical environmental objects were identified. It was determined that the results of the field survey conducted in 2023 are valid.
4.	Coordination and Management: The document inadequately addresses the coordination mechanism between ADB-financed Package 1 and government-completed sections. Missing elements include: unified GRM protocols for cross-boundary grievances, water quality monitoring at interface points (Ch 313+42 and Ch 397+00), and cost-sharing arrangements for cumulative impacts.	The following issues should be considered in relation to this comment: <ul style="list-style-type: none"> • During recent consultations with ADB, it was decided to remove the areas rehabilitated by the Government of Georgia - 5&6 from the IEE of the Main Canal (Ch 313+42 to Ch 397+00); • EDDR and SDDR will be prepared for Areas 5&6; • The Main Canal (Ch 313+42 to Ch 397+00) and Areas 5&6 are located in different administrative units of the Kakheti region: the Main Canal - in Sagarejo Municipality and Areas 5&6 - in Gurjaani Municipality. • The Main Canal - Ch 313+42 to Ch 397+00 is not directly related to Areas 5&6. Irrigation areas 5&6 water intakes are arranged on the next section of the main canal - Ch 397+00 to 488+66.7. As is known, the IEE for the section of the main canal Ch 397+00 to 488+66.7 will be prepared independently and this issue may be taken into account later. Nevertheless, it is possible to discuss this issue and take into account comments as much as possible after the public consultations of the IEE for the main canal - Ch 313+42 to Ch 397+00, with the involvement of the project's social experts.
5.	Technical Documentation Gaps: Several critical elements lack sufficient detail including tunnel construction safety protocols (confined space procedures, gas monitoring), quantified vegetation clearance limits, asbestos	Taken into account: These parts have been corrected in the document: <ul style="list-style-type: none"> • Section VI-E-1 – „Impact on biodiversity - Flora“

	management procedures beyond general statements, and specific heat stress prevention measures for summer construction in Kakheti.	<ul style="list-style-type: none"> • Section VI-E-1 – „Occupational and Community Health and Safety: <ul style="list-style-type: none"> ○ Tunnel Construction Safety Protocol: ○ Asbestos Management Procedures: ○ Heat stress prevention measures for summer construction in Kakheti.
6.	Monitoring and Budget Provisions: Unlike the 2023 IEE which embedded costs in BOQ, this version lacks specific budget allocations for SSEMP implementation, environmental monitoring activities, and corrective actions.	Taken into account: Estimated environmental costs are provided in the EMP. They are also presented as a separate table in Section X-H.
7.	<p>(1) The Updated IEE have reviewed contains multiple explicit references to Areas 5&6 within its text. Specifically:</p> <ul style="list-style-type: none"> • Section 2.3 (Project Description) lists "Package 5 (CSISDP NCW 05) Area 5 and 6 (GA distribution branches G41 and G42)" as an indicative package • Figure 2.8 shows "Project Target Areas" including all six areas • The document describes the integrated hydraulic system where Main Canal delivers water to all downstream distribution areas <p>When reviewing a document, standard practice requires to address internal inconsistencies. If the IEE states it "only applies to Package 1" but includes Package 2 and Areas 5&6 content throughout, this creates a document coherence issue that requires improvement.</p> <p>(2) The disclosed project documents on ADB's website confirm Areas 5&6 were part of the original ADB project scope:</p> <ul style="list-style-type: none"> • PAM Procurement Plan: includes "Phase 2 Areas 5 and 6" number of times as part of the project, for procurement arrangements...etc. • 2023 IEE (Page 51): States "Phase 2 covers the Main Canal Ch 397+00 to Ch 488+66.7 and Areas 5 (distribution branch G41) and 6 (distribution branch G42)" • PAM PIC Terms of Reference: Requires consultants to "prepare the IEEs for areas 2 to 6 and main canal (phase 2)" <p>The government's completion of Areas 5&6 without ADB notification represents a change to the disclosed project scope that, from an environmental safeguards perspective, requires acknowledgment in the IEE.</p> <p>(3) My comments were based on specific SPS provisions:</p> <ul style="list-style-type: none"> • EARF Para 110 (Environmental Audit of Existing Facilities): "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...." 	<p>Taken into account: EDDR will be prepared for Areas 5&6. Public meetings and consultations will be conducted independently. Therefore Areas 5&6 mainly have been removed from the IEE.</p> <p>In Section II-G. the Main Canal (Ch 313+42 to Ch 397+00) and Areas 5 and 6 hydraulic connectivity and safeguard boundary clarification is presented.</p>

	<ul style="list-style-type: none"> • SPS Appendix 1, Para 6 (Area of Influence): Requires assessment of "associated facilities that are not funded as part of the project" and "cumulative impacts from further planned development" • PAM Page 12 (PIU Responsibilities): Explicitly includes "assessing legacy issues on the areas to be modernized" <p>The Main Canal (Package 1) and Areas 5&6 share hydraulic connectivity—water flows from the Main Canal to distribution networks G41 and G42. This creates a legitimate safeguards nexus requiring coordination mechanisms, unified GRM protocols, and assessment of interface points.</p> <p>(4) ADB has prepared a ToR for EDDR specifically for Areas 5&6, this confirms ADB's recognition that: i. Areas 5&6 require environmental due diligence; ii. Legacy issues need to be identified and iii. A Corrective Action Plan may be required</p> <p>We understand the urgency of finalizing IEE to integrate it into the bidding document and suggest that PIU ensures internal consistency (either remove all Package 2/Areas 5&6 references, and/or explain why they appear in a Package 1-specific document) in the revision. This approach will address the EDDR requirement as a precondition for IEE clearance; however, the EDDR and CAP will still be required to address the legacy issues separately as you have indicated.</p>	
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