CLIMATE CHANGE ASSESSMENT

I. BASIC PROJECT INFORMATION

Project Title:	Georgia: Sustainable Water Supply and Sanitation Sector Development Program
Project Cost ($ million)**:**	150 (130 policy-based loan (PBL); 20 project loan)
Location:	Georgia
Sector:	Water supply and sanitation (WSS)
Theme:	WSS policy reforms and infrastructure
Brief Description:	The proposed sector development program (program) supports the government's pursuit of a more sustainable WSS and state-owned enterprise (SOE). The policy actions under the PBL will support WSS governance and institutional reforms to improve sector performance and financial sustainability, while ensuring funding for basic services during a period of fiscal constraints brought on by the coronavirus disease (COVID-19) pandemic. Under the PBL, the commitments are inclusive of requirements for WSS high-level policy reforms, policy and strategies to consider and adapt to climate change risks and vulnerabilities. The project will improve a critical and procurement-ready water supply systems in Telavi, a strategically important city for job creation and economic growth. The project will rehabilitate and replace dilapidated water supply infrastructure, which will reduce physical losses, improve supply pressure and energy efficiency, connect new customers through rehabilitated transmission mains and distribution network, and repair water intakes, pumps, valves, and treatment units, while providing new and renewed reservoirs and boreholes. This is combined with support for the operation and maintenance and rural WSS masterplan.

Source: Asian Development Bank.

II. SUMMARY OF CLIMATE CHANGE FINANCE

Project Financing		**Climate Finance**	
Source	**Amount** ($ million)	**Adaptation** ($ million)	**Mitigation** ($ million)
Asian Development Bank			
Ordinary capital resources (regular loan)	130.0	9.9	6.5

Source: Asian Development Bank estimates

III. SUMMARY OF CLIMATE RISK SCREENING AND ASSESSMENT

A. Sensitivity of Project Component(s) to Climate or Weather Conditions and the Sea Level

1. **Projected climate changes include:**[1]
   - (i) increased average annual temperatures by 0.8°–1.4°C by 2050 and 2.2°–3.8°C toward year 2100; greatest increase in northwest mountains;
   - (ii) precipitation data less certain, but general increase expected up to year 2050, and potential decreases of up to 24% by year 2100, with a strong heterogeneity at the scale of the country;
   - (iii) increased amount and intensity of daily rainfall, leading to increased risk of flash floods, mudflows, and landslides;
   - (iv) increase in the number of hot days, which may double in some mountain areas, and more frequent heat waves June–August;
   - (v) decrease in both days and nights with frost; and
   - (vi) complete loss of Georgia's 637 glaciers projected by year 2160 due to higher temperatures.

B. Climate Risk Screening

1. **Increased amount and intensity of short-duration rainfall** (less than one day), leading to **increased risk of flash floods and mudflows.**
2. By increasing precipitation, storm surges, and temperatures, climate change contribute to flooding and runoff that can spread sewage, chemicals, and disease agents, which may also **favour the growth, survival, and spread of bacteria, viruses, and toxins created by harmful algae**.
3. **Increased glacial melting**, decreased seasonal snowpack formation, and earlier spring snowmelt may lead to lower summer flows in surface waters and lower summer levels in reservoirs. On the Black Sea coastline and Colchis lowland, as well as in some parts of the Western Caucasus, **precipitation will increase by 50% to the end of the century** and amount 3,000 and 6,000 mm respectively that will strengthen these humid areas and increase the water resources. Although the overall precipitation will likely increase significantly, accelerated glacial melt could, at a medium and long term, offset this relative increase and **jeopardize water supply with a decrease in available water resources, combined with an increase in total water demand due to rising temperatures (and heat waves)**. The horizon at which it will happen is difficult to determine as it depends on several factors which are still highly unpredictable through the existing climate models and as it depends on human factors such as implemented actions related to mitigation of climate change.
4. **Sea-level rise (in coastal areas).** The sea-level rise could lead to following impacts:
   - (i) more frequent and intense marine submersion events leading to severe floods;
   - (ii) water supply treatment issues due to saltwater intrusion in aquifers; and
   - (iii) wastewater system operational issues due to higher sea-levels → undersizing of outlets due to downstream influence by the sea, issues in operating wastewater treatment plants.

Climate Risk Classification:
Medium

Georgia is likely to experience increased frequency and intensity of heatwaves (south eastern regions) and extreme rainfall events (western regions) and sea level rise (coastal regions) due to global climatic changes.

The policy actions, being mostly about reforms to improve WSS service provision, has a low risk level to climate conditions and sea level impacts. However, climate change impacts are likely to compound existing issues, exerting additional burden on already weak infrastructure and possibly overwhelming it.

The project, while reducing physical losses, improving supply pressure and energy efficiency, will contribute to climate change mitigation.

[1] United States Agency for International Development. 2017. *Fact Sheet: Climate Risk Profile of Georgia*. Washington, DC.

C. Climate Risk and Adaptation Assessment

1. **Adaptation measures to be included in the water supply and sanitation policy documents to be developed and/or upgraded under the program include**:
   - (i) water allocation, augmentation (construction of adduction and distribution water network);
   - (ii) efficiency and demand management (decrease of leakage rate, energy savings);
   - (iii) early warning through the provision of information and communications technology equipment (supervisory control and data acquisition, active leakage detection);
   - (iv) disaster preparedness and response through capacity building of the operator on operation and maintenance of the WSS system;
   - (v) mitigation of pollution at source (component on maintenance of wastewater collection and treatment); and
   - (vi) mitigation of climate induced high frequency of water-borne diseases, through the preparation of water safety plans.

D. Climate Risk Screening Tool and/or Procedure Used

Climate risk screening performed through data analysis was based on following references:

- (i) Georgian climate change under global warming conditions, M. Elizbarashvili, et. al., February 2017;
- (ii) Climate Change Adaptation Technologies for Water Practitioner's Guide to Adaptation Technologies for Increased Water Sector Resilience, United Nations Environment Programme–Technical University of Denmark Partnership;
- (iii) United States Agency for International Development Fact Sheet, Climate Risk Profile of Georgia;
- (iv) Climate Change in the South Caucasus: A Visual Synthesis, EnvSec / Zoî Environment, 2012;
- (v) Water Supply and Wastewater Systems in West Georgia: Operational Assessment and Improvement Action Plan, Asian Development Bank, February 2019; and
- (vi) 5th Intergovernmental Panel on Climate Change Assessment Reports (AR5 reports).

Source: Asian Development Bank staff estimates.

IV. CLIMATE ADAPTATION PLANS WITHIN THE PROJECT

Adaptation Activity	**Target Climate Risk**	**Estimated Adaptation Costs** ($ million)	**Adaptation Finance Justification**
Policy Action 10: Law on Water Resources Management submitted to the Parliament for approval.	All climate risk identified, as relevant per broad geographic areas.	2.2	The Water Law (1997) will be replaced with the Law on Water Resources Management to harmonize with the European Union (EU) legislation in accordance with the EU Water Framework Directives under the EU Association Agreement, among other requirements, incorporate climate change adaptation strategies for projected impacts described in sections C and D. Proportionality principle was applied for the PBL portion of the loan (which includes 20 policy actions in total, so $6.5 million each), and scored this PA as 1/3.

Adaptation Activity	Target Climate Risk	Estimated Adaptation Costs ($ million)	Adaptation Finance Justification
Policy Action 11: MRDI approved a Vision and Policy Statement for the WSS sector covering both urban and rural including wastewater and stormwater management strategy and promoting adherence to integrated water resources manage principles, good sector and service provider governance. The Vision and Policy Statement will include environmental, and climate-friendly features and gender-specific provisions addressing women's access to water.	All climate risk identified as relevant per broad geographic areas.	2.2	The WSS Vision and Policy Statement will be revised to, among other requirements, incorporate climate change adaptation strategies for projected impacts described in sections C and D. Proportionality principle was applied for the PBL portion of the loan (which includes 20 policy actions in total, so $6.5 million each), and scored this PA as 1/3.
Policy Action 12: MRDI issued a WSS Sector Development Framework for 2021–2030 to achieve continuous urban WSS and safe WSS in rural areas by 2030, with considerations for technical sustainability—including climate resilience, and environmental protection, as well as institutional and financial sustainability for the urban and rural WSS.	All climate risk identified, as relevant per broad geographic areas.	2.2	The WSS Sector Development Framework for 2021–2030 will be revised to, among other requirements, to incorporate climate change adaptation strategies for projected impacts described in sections C and D. Proportionality principle was applied for the PBL portion of the loan (which includes 20 policy actions in total, so $6.5 million each), and scored this PA as 1/3.
Policy Action 19: UWSCG adopted a Water Safety Plan, targeting cities with a population of 20,000 or more, on UWSCG's emergency responses to disasters, including from virus pandemics and higher likelihood and frequency of waterborne diseases induced by climate change, following the WHO Water Safety Manual (2005 as amended from time to time).	Increased frequency of water-born diseases.	3.3	The Water Safety Plans will include requirements to mitigate water contamination, including from water-borne diseases whose frequency and incidence is increased by raising temperatures, increased stormwater, etc. Proportionality principle was applied for the PBL portion of the loan (which includes 20 policy actions in total, so $6.5 million each), and scored this PA as 1/2.

MRDI = Ministry of Regional Development and Infrastructure, PA = policy action, PBL = policy-based loan, UWSCG = United Water Supply Company of Georgia, WHO = World Health Organization, WSS = water supply and sanitation.
Source: Asian Development Bank.

V. CLIMATE MITIGATION PLANS WITHIN THE PROJECT

Mitigation Activity	**Estimated GHG Emissions Reduction** (tCO_2e/year)[a]	**Estimated Mitigation Costs** ($ million)	**Mitigation Finance Justification**
Policy Action 17: UWSCG adopted (i) Asset Management Policy, and (ii) Nonrevenue Water Reduction Strategy 2020–2025 to progressively reduce nonrevenue water to at most 47% in 2025 from 77% of the water supplied in the network in 2019.		6.5	Efficiency and demand management (decrease of leakage rate, energy savings). Proportionality principle was applied for the PBL portion of the loan (which includes 20 policy actions in total, $6.5 million each), and scored this PA as 1.
PROJECT COMPONENT			Nominal contributions from the incremental attribution to climate mitigation from measures for reducing physical losses and improving supply pressure and energy efficiency.

GHG = greenhouse gas, PA = policy action, PBL = policy-based loan, tCO_2e = tons of carbon dioxide equivalent, UWSCG = United Water Supply Company of Georgia.

[a] Energy savings/year x emission factor = GHG emissions reduction.

Source: Asian Development Bank.