

ECONOMIC ANALYSIS

A. Introduction

1. The economic analysis of the sector development program covers both the Telavi project component and the policy-based loan (PBL) component. The economic analysis of the project was conducted following the Guidelines for the Economic Analysis of Projects, 2017 of the Asian Development Bank (ADB).¹ The analysis assessed the benefits and costs of the project by comparing with-loan and without-loan scenarios. Sensitivity analysis determined the effects of several adverse economic conditions on economic viability of the project, such as increased capital investment and operation and maintenance (O&M) costs, reduced and delayed benefits. In addition to the project, the analysis also highlights some of the major economic benefits emanating from the proposed reforms under the PBL component. The qualitative analysis elaborates the transmission mechanism of various policy actions and their economic benefits. While the project component will improve water supply and sanitation (WSS) systems in Telavi city, the policy actions will strengthen the governance and performance of public service delivery and the quality of WSS services across Georgia.

2. United Water Supply Company of Georgia (UWSCG), a state-owned water and wastewater utility, is the project's implementing agency. UWSCG was formed from an amalgamation of 66 municipal utilities. The Telavi WSS systems were developed in the 1930s, with minimal rehabilitation and reconstruction works since 2000, so the overall quality of WSS service delivery has deteriorated significantly. The water supply is intermittent and amounts on average to just 4 hours a day. Poor WSS infrastructure and limited water availability appear to be a critical constraint on inclusive growth in Georgia. In addition to the infrastructure deficit, WSS service provision lacks a sound policy, legal, and institutional framework; and UWSCG's poor financial performance means that the utility relies heavily on government subsidies. With a view to boosting the quality of WSS public service delivery and minimize operational losses, the program, which also includes technical assistance, supports both reforms and project activities.

B. Economic Impacts of Reforms Linked to Policy-Based Lending

3. The proposed policy reforms are expected to significantly improve the effectiveness of the government's WSS governance and institutions, reduce sector inefficiencies, and ultimately raise the standards of living, yield environmental benefits, improve public health outcomes, and raise the business profile of UWSCG to attract private players. Significant improvements of the government's fiscal space are also expected as a result of policy changes and actions required under the program. As it stands, the government supports the inefficient operations of several WSS operators with various direct and indirect subsidies, but WSS service standards remain deficient.

4. The policy actions will enhance WSS planning, coordination, and institutions nationwide. The PBL will help institute a cohesive and consistent policy, lay the legal basis for sustainable urban and rural WSS development, provide a strategic anchor to WSS goals, prepare UWSCG for an institutional transformation, and deal with change responsively. The reform impacts will extend beyond UWSCG since the reforms will strengthen the country's infrastructure-driven growth, support parallel assistance by development partners, and catalyze private sector participation (PSP) and public-private partnerships (PPPs) in WSS service delivery. Planned legislation on water management will prescribe the integrated management of water resources and river basins in line with the European Union's Water Framework Directive, and create the

¹ ADB. 2017. [Guidelines for the Economic Analysis of Projects](#). Manila.

legal basis for licensing and regulating surface and ground water abstraction, wastewater discharge, and allocation and distribution of water in the event of user conflict. This has implications for all WSS stakeholders.² The government, through policy and a central WSS coordination platform, will implement a more balanced and inclusive sector development and ensure efficient allocation of resources. The Energy and Water Supply Law and related resolutions will provide incentives for utilities to step up their operational efficiency; improve investment appraisals, planning, and monitoring activities; and ensure transparent, stable, and fair tariff setting by the Georgian National Energy and Water Supply Regulatory Commission (GNERC).³

5. The policy reforms will lead to commercialized operations and the adoption of industry best practices by UWSCG. Stronger WSS governance and oversight, more effective utility management, combined with the adoption of commercial principles and practices, will help transform UWSCG into a professional, efficient, and self-sustaining WSS company. Partnerships with the private sector will facilitate change and increase operational efficiency and staff productivity. The government subsidies under the UWSCG reform scenario are estimated to be \$100 million lower over 10 years than without any reforms.⁴ With a comprehensive set of corporate reform measures, UWSCG will be operationally sustainable from 2023. The expected budget savings from the policy reforms will allow the government to allocate these resources to more productive investments and initiatives that will stimulate economic growth and improve living standards. The well-being of Georgia's people is expected to improve as a result of better service levels and better water quality. International experience shows that effective corporate governance of state-owned enterprises (SOEs) can have a positive impact on a country's economy. The benefits of stronger governance include better financial performance by SOEs, better service delivery, and greater access to capital markets.⁵

6. Both urban and rural residents will also spend less time and resources on alternative and often unreliable water sources, and could allocate these savings to more productive activities. This specifically applies to women, who are typically responsible for water collection. Health outcomes are also expected to improve since the continuous supply of better-quality water will directly reduce the number and frequency of waterborne diseases, which will lower the burden on the health care system and reduce unproductive time because of sickness. Additionally, the policy reform specifies actions for the government to attract players from the private sector, where efficiency tends to be higher, which is expected to improve the overall WSS performance. Increased private involvement in WSS will in turn be instrumental in driving investments and economic growth. More importantly, the policy reforms and project activities are interlinked and complement each other to catalyze overall sector development. The PBL component will be particularly instrumental in improving the overall quality of public service delivery and creating an enabling environment for upscaling private sector investments. This will also have a significant and positive impact on the project's sustainability and local employment.

7. International evidence suggests that improved corporate governance and professional management bring significant efficiency gains and boost the quality of public services. For example, the Metropolitan Waterworks and Sewerage System, an SOE in the Philippines,

² Stakeholders include the Ministry of Environmental Protection and Agriculture, Ministry of Regional Development and Infrastructure, WSS operators such as UWSCG and municipal water companies, local governments, community-based organizations, Georgian Amelioration, River Basin Management Committees, industries, as well as other water users.

³ The Georgian Water and Power company will be the first licensee to be subjected to the new Energy and Water Supply Law and related resolutions on investment appraisal and tariff methodology in 2020.

⁴ Fiscal Impact Assessment (accessible from the list of linked documents in [Appendix 2](#)).

⁵ World Bank. 2012. *SOE Reform: Time for Serious Corporate Governance*. Washington, DC.

provides valuable insights on how better governance and regulations can enhance public service delivery. Reforms of the utility brought about efficiency gains while reducing operational losses. More specifically, because of the reforms, water coverage increased from 67% in 1997 to 82% in 2002, while water availability rose from 17 hours to 21 hours a day. The reforms were also helpful in significantly improving the quality of the water supplied. Other examples from Asia and the Pacific corroborate this—significant efficiency gains are possible when factors for production are allocated more appropriately. Empirical evidence suggests that by improving corporate governance while using the same level of inputs, the output of public utilities can be increased by 32% in Indonesia, by 17% in Kazakhstan, and by 9% in the People's Republic of China.⁶ These are quite substantial gains and they emphasize the importance of managing public utilities more effectively. The proposed program's policy measures under output 1 that will result in a stronger legislative and regulatory framework and corporate restructuring can play an important role in boosting the quality of Georgia's public services as well.

C. Economic Analysis of the Project

8. **Telavi water system.** The government has proposed Telavi for the project investment because it is a priority city for development, famous for its agriculture, wine industry, and cultural heritage.⁷ Telavi is in the eastern part of the country, about 158 kilometers (km) east of the capital, Tbilisi. The Telavi WSS system was developed in the 1930s and expanded in subsequent decades, but no fundamental rehabilitation or reconstruction works have taken place since 2000, so customers suffer from intermittent water supply (totaling an average 4 hours per day), and both households and commercial consumers (including hotels and resorts) need to ration water. Only 40% of households connected to the network are metered.⁸ The project will construct or rehabilitate 11 boreholes, build transmission mains (14.5 km) and new reservoirs totaling 7,000 cubic meters (m³), rehabilitate the distribution network (59 km), enable electronic data collection, and install metered household connections, bringing metering to 100% in the city.

9. The project will enable 24-hour water supply in Telavi, reduce nonrevenue water (NRW), and improve supply pressure and energy efficiency. It will also improve UWSCG's O&M capacity in about 57 cities and towns in 10 regions; develop a strategy, investment plan, and related local capacity for rural WSS; strengthen project management, monitoring, and evaluation; and increase public awareness of the importance of health, hygiene, sanitation, and water conservation. Combined, the activities will result in efficient, reliable, and sustainable WSS in all service areas covered by UWSCG.

1. Methodology

10. The economic analysis of the project was conducted for 2020–2060, i.e., 4 years of construction and 36 years of operation from entry into service. The estimated useful life of the network is 40 years. The following assumptions apply:

- (i) Household water consumption was projected forward based on historic consumption data per connection, growing at 1% per year.
- (ii) Metered households will increase their annual consumption from 109 m³ in 2019 to 149 m³ in 2060. By comparison, unmetered households are estimated to

⁶ ADB. 2020. [Reforms, Opportunities, and Challenges for State-Owned Enterprises](#). Manila.

⁷ Telavi is the capital of the Kakheti Region and has a population of about 20,000. Water supply is critical for wine and agricultural production, and for tourism. Most large Georgian wine producers are in Telavi.

⁸ UWSCG's estimate of the share of connected customers (79.5%) was used because no reliable estimates are currently available for Telavi on the share of households not connected to the city's WSS network. Also, a considerable share of connected households collect water from other sources and use their own storage facilities to compensate for the unreliable service. Demand for piped water is expected to increase from new connections and from customers that will switch from other water sources.

consume 200 m³ per year. All unmetered households are to install meters by December 2024, in line with the project objectives. Metering encourages water conservation, resulting in less per capita consumption and less average consumption per connected household.

- (iii) Average commercial consumption (m³) was assumed to increase by 1% per year per connection.
- (iv) Historic UWSCG figures for nonrevenue water (NRW) in the Telavi area were consistently high at more than 75%. It is expected that the project, once completed, will lead to a 30% reduction in NRW.
- (v) The water production volume was calculated by adjusting water consumption estimates by NRW targets. Production was forecast to fall from 5.5 million m³ in 2019 to 1.7 million m³ by 2025, and then to increase steadily to meet demand requirements. The water production volume is expected to decline significantly because of (a) a considerable reduction in NRW from 75% to 30%; and (b) the completion of the metering program, which will reduce the average consumption per household.
- (vi) Energy consumption (mainly from pumping stations) will also decrease in line with the decline in production volume.
- (vii) Staffing was projected to remain constant at 48 over the project life. However, salaries and benefits were expected to increase steadily to bring remuneration in line with market levels of pay.
- (viii) Bill collection efficiency holds steady at 95%, with uncollected receivables going into working capital and then being collected in subsequent periods instead of being written off entirely.
- (ix) The water tariff was assumed to increase in nominal terms by 50% in 2024 and then by 10% every 3 years thereafter.

2. Economic Costs

11. The economic cost of the capital investment and of O&M expenditures is based on 2020 constant values. Price contingencies, financial charges, and taxes and duties were excluded because they represent transfer payments rather than a real accretion of wealth to the Georgian economy. Physical contingencies were included because they represent real consumption of resources. Financial prices are converted into economic costs by applying appropriate conversion factors. The principal differences between economic and financial costs are that (i) taxes, import duties, and price contingencies are excluded from economic costs; and (ii) local labor costs are adjusted using a shadow wage rate (estimated to be 0.7).

12. Investments will be made to (i) acquire equipment such as vehicles, meters, and laboratory tools; (ii) pay for consulting services; (iii) rehabilitate the networks; and (vi) pay for the formulation of the rural WSS development.

3. Economic Benefits

13. The project will bring both incremental and non-incremental benefits. The main economic benefits include incremental water consumed by Telavi residents and consumer surplus. Incremental benefits expected to be realized because of the project are based on additional water sold to the customers as a result of NRW reduction versus the without-project scenario. Incremental benefits were valued based on willingness to pay, which was estimated using the average per unit user cost with and without the project.

14. Non-incremental benefits included in the economic analysis are savings in the time spent collecting water, savings from less spending on well and pump installations, and avoided investment on water storage facilities. Other non-incremental benefits such as health benefits and reduction in NRW losses have also been captured.

4. Economic Internal Rate of Return

15. The economic internal rate of return (EIRR) and discounted net cash flows were determined by comparing benefit streams with cost streams. Following ADB guidelines, the economic opportunity cost of capital (EOCC) was set at 9.0%, and the results show that the base-case EIRR of 13.6% exceeds the EOCC.

5. Sensitivity Analysis

16. The sensitivity analysis considered four adverse changes: (i) a 10% increase in the capital cost; (ii) a 10% increase in O&M costs; (iii) a 10% decrease in benefits; and (iv) a 1-year delay in construction completion, resulting in a 1-year delay in realized benefits. The resulting EIRRs compare favorably with the EOCC of 9.0%. The EIRRs were tested for sensitivity and proved to be robust, as shown in the table below.

Summary Results of Economic Analysis		
	EIRR	ENPV
	%	(\$ million)
Base case	13.6	3.865
Increase in capital cost by 10%	12.5	3.187
Increase in O&M costs by 10%	13.5	3.770
Net reduction in benefits by 10%	12.3	2.705
1-year delay in benefits	12.2	2.851

EIRR = economic internal rate of return, ENPV = economic net present value, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

D. Conclusions

17. The project is economically viable because its EIRR exceeds the EOCC in the base-case scenario. The sensitivity analysis demonstrates that the project is viable even when tested under adverse economic conditions. The financial analysis of the project concluded that the project is financially viable and sustainable, and UWSCG's financial performance is projected to be stable to support the project's operation and maintenance costs.

18. Both the policy reforms and project components will help improve the overall quality and reliability of WSS service provision in the country. Stronger sector governance and oversight, more effective utility management, combined with the adoption of commercial principles and practices will help transform UWSCG into a professional, efficient, and self-sustaining WSS company.