Journal of Philosophy and Linguistics
Research Article Peer-review, Open Access

MUNICIPAL WATER AND WASTEWATER SECTOR IN GEORGIA

E. Bakradze[1], T. Nebieridze [2], T. Nikuradze[3], M. Arabidze[1] A. Shekiladze[4]

1. National Environmental Agency of the Ministry of Environment Protection and Agriculture of Georgia
2. The United Water Supply Company of Georgia LLC (UWSCG)
3. Georgian Water and Power
4. LEPL G.Tsulukidze Mining Institute

Abstract— This paper presents the background analyses for the Georgia. The world's eight billion people create a lot of wastewaters — another word for sewage — enough that the natural water purification process is insufficient on its own to remove the harmful chemicals that cause disease in not just people but flora, fish and wildlife [5].

Wastewater treatment removes contaminants and suspended solids from wastewater; this treated, water can then be dispatched back into the ecosystem free from man-made contaminants. Untreated wastewater poses significant health risks, accounting for 1.7 million deaths annually —over 90 percent of those in developing nations [1].

Key words— waste water, pollution, artificial reservoirs, treatment

INTRODUCTION

The Georgian WSS sector is decentralized. Although the municipalities are responsible for the delivery of water supply (including technical water) and sanitation within their respective [2]. This paper does not provide guidelines for other uses of water such as agriculture and hydropower. Equally, while well-managed water and sanitation services are an important component of Integrated Water Resource Management (IWRM), this document does not address IWRM as this will be addressed through the new law on water resources management of Georgia. As local government bodies, the municipality-run utilities are unlicensed and therefore do not fall within the regulatory remit of the Georgian National Energy and Water Supply Regulatory Commission (GNERC). In addition to the Ministry of Regional Development and Infrastructure (MRDI), the main sector stakeholders are the GNERC, the municipalities and the various service providers, Ministry of Environmental Protection and Agriculture, several other government agencies, organizations, and key development partners that participate in the sector.

About 95% of the urban and 35% of the rural population is supplied by centralized water service. This indicates high network coverage by international standards. The actual performance

of this system is a problem, however. Poor quality of the distribution network can result in a water loss rate of 10-51%, and 40% water loss. urban households suffer interrupted supply, receiving water much less than 24 hours a day, in some cities as little as 8-10 hours a day. In rural areas the supply system often does not function at all. This affects mainly people living on higher floors of buildings, because of low pressure in the sys- teem.

The majority of the connected urban households can have potentially good water quality, as the main source is groundwater. Groundwater sources

provide about 90% of the water supply apart from Tbilisi. (In Tbilisi 44% is from surface water). Drinking water quality problems are related to leaking pipes and cross contamination from the sewage system. The centralized sewage system exists in 37 towns in Georgia. 78% of the population is connected to sewerage, indicating high network penetration by international standards [3].

The utility sector is the main polluter of surface water, and one of the main directions and challenges for the UWSC company is to reduce harmful effects on the environment and protect ecological safety.

The goal is to reduce the harmful effects of waste water on the environment as a result of complex works. The company operates wastewater treatment plants in Anaklia, Abastuman, Urek and Zugdidi. The treatment plants of Telavi and Tskaltubo are in the stage of acceptance, the construction works of the treatment plants in Gudauri, Marneuli and Poti are in progress.

For 2025-30 years there should be 19 traditional mechanical/biological treatment plants [3].

Four purely mechanical treatment plants with a design capacity of 0.03 million m3/day are available. However, the plants are typically 10-25 years old; some are as yet unfinished, and most are not maintained. Some's of the existing plants are actually providing biological treatment since the technical facilities are out of order. Power and other resources are also needed. Mechanical treatment is effective to a certain degree only in Tbilisi (GWP's Treatment plant serves Tbilisi, Rustavi and Gardabani), Rustavi, Kutaisi, Tkibuli, Gori and Batumi and its total estimated daily capacity is 0.7 million m3.

Starting from 2004 the improvement of water supply was initiated with funding from the state budget and international donors. Extensive reconstruction-rehabilitation works were carried out in Tbilisi in 2005- 2022. Most central water supply pipelines have been rehabilitated and all major drinking water quality-monitoring laboratories have been refurbished and equipped with modern computerized systems (ECBSea, 2009).

Currently, Tbilisi is provided with an up-to-date high-quality water supply service ensuring delivery of good quality drinking water without significant interruptions 24 hours a day to 400, 000 customers, of which about 2000are public and state organizations, about 15,000 - commercial enterprises and the rest are in the residential sector (GEO-Cities 2011).

The development of water and sewerage systems has become an important priority at all levels in the country. Extensive rehabilitation projects are ongoing in several regions in Georgia (Task Force for Regional Development in Georgia, 2009). Development and improvement of municipal infrastructure, including water supply and sanitation systems, is one of the objectives of the State Strategy for Regional Development of Georgia for 2010-2017. Specifically, the Strategy aims at creation of favorable environment for investments in the sector; rehabilitation and construction of water supply/sanitation infrastructure; ensuring access to safe drinking water

and sanitation; improving water metering; reducing water loss; improving cost recovery etc. In 2009 about 120 mln USD was allocated for the rehabilitation and development of drinking water systems, and an additional 35 mln USD - for sewerage network. There has also been increased involvement of donor organizations in supporting rehabilitation of water supply and sewerage sectors in recent years. Among them is the recently completed project of the US Millennium Challenge Corporation, which, through Georgian Municipal Development Fund, supported the USD 57.7 mln regional infrastructure development project for improvement of municipal water and sewerage services in five cities throughout Georgia [6-7].

Analysis of the current state

When Georgia became independent in 1991, the country's WSS system was in poor condition. The government implemented several reforms and in 2003 established the Western Water Company and the Eastern Water Company, transferring the responsibilities for WSS from local governments to them. Tbilisi, the capital, and the adjacent cities of Gardabani, Mtskheta, and Rustavi were served by four independent water companies, which in 2008 were merged and privatized to form Georgian Water and Power (GWP). By 2009, an additional 66 WSS companies had been merged into three companies: East, West, and Adjara Water. In 2010, the government consolidated East and West Water and formed the UWSCG. Adjara Water Company, which operated in the autonomous region of Adjara, was renamed Batumi Water Company (BWC).

As of August 2020, nine service providers, known as licensees, cover 56% of Georgia's population, while 44% of largely rural residents are serviced by local government units. The three largest companies cover 92% of the urban population: (i) privately owned GWP, which provides services in Tbilisi and surroundings; (ii) BWC, owned and managed by the municipal government of Adjara; and (iii) state-owned UWSCG, which operates in 10 regions. As the sole state-owned enterprise (SOE) in the sector, UWSCG has the largest share of infrastructure assets (Table 1) and the scale to have a positive impact on sector development and growth.

Table 1: Infrastructure Assets of Three Utilities

Table 1: Infrastructure Assets of Three Utilities

	Water Supply Assets					Wastewater Assets		
Utility	Water Intakes	Production (no. of WTPs)	Storage (m^3)	Pumping Stations	Network (km)	Collection Network (km)	Pumping Stations	WWTP
GWP	1 underground 2 surfaces	2	320,000	141	3,600	1,600	N/A	1 WWTP (1,000,000 m^3/day)
UWSCG	289 tubewells 19 surfaces	19	175,000	166	5,189	1,098	N/A	N/A (not functional) – over 20 under construction and planned
BWC	2 surfaces	2	20,000	N/A	N/A	N/A	12	1 WWTP (30,000 m^3/day)
Total			515,000		8,789	2,698	-	-

BWC = Batumi Water Company, GWP = Georgian Water and Power, km = kilometer, m^3 = cubic meter, N/A = not available, UWSCG = United Water Supply Company of Georgia, WTP = water treatment plant, WWTP = wastewater treatment plant.
Source: Asian Development Bank estimates.

Four main bodies regulate the sector: the Ministry of Regional Development and Infrastructure (MRDI) is responsible for policy formulation, infrastructure development, and administration of line agencies such as UWSCG; the Ministry of Environment Protection and Agriculture is tasked with environmental regulation; the Ministry of Labor, Health, and Social Affairs monitors the quality of drinking water; and the Georgian National Energy and Water Supply Regulatory Commission (GNERC) regulates sector operators and sets the tariffs. Key areas for improvement are the overlapping roles and responsibilities of the MRDI and UWSCG, and deficient performance requirements and incentives. The institutional framework lacked a consolidated WSS policy and coordination for sector planning, development, and monitoring. The current tariff is skewed in favor of residential consumers and is subsidized by commercial

consumers. The revenue from commercial customers represents nearly 75% of total revenue. As a consequence, commercial customers increasingly opt for alternative sources of water supply. GNERC plans to reduce this cross-subsidization through a rationalized tariff structure

GWP and UWSCG took over obsolete infrastructure when the smaller utilities were consolidated. GWP provides services in densely populated Tbilisi, while UWSCG's service area stretches across regions with low population density, which drives up operating costs. (Table 2). With support from international finance institutions, UWSCG was able to access low-cost financing and had the means to support the sector's infrastructure needs (Table 3). UWSCG has more than 60 ongoing and planned projects, including an ADB-funded $500 million multitranche financing facility (MFF) in 2020 [4]. It has built up significant debt to cover large capital programs. The COVID-19 has hurt its financial position, and it expects a revenue loss of up to 30% in 2020. UWSCG has a significant room for efficiency improvements. As it stands, the government supports the inefficient operations of UWSCG with various direct and indirect subsidies but its service standards remain deficient, which underscores the need to reduce government subsidies for SOEs.

Table 2: Performance comparison – United Water Supply Company of Georgia and Georgian Water and Power LLC

Table 2: Performance comparison – United Water Supply Company of Georgia and Georgian Water and Power LLC

Key indicators	UWSCG	GWP
Population (million)	0.9	1.1
Assets (GEL million)	999	495
Operating ratio	1.45	0.6
Employees	2,700	2,800
Staff productivity (no. of staff per 1000 connections)	8	4
Metering level (%)	57	32
Nonrevenue water (%)	77	67
Infrastructure Leakage Index	43	79
Energy efficiency (kWh/m^3)	0.8	0.45

GEL = lari, Georgia's currency; GWP = Georgian Water and Power LLC; kWh/m^3 = kilowatt-hours per cubic meter; UWSCG = United Water Supply Company of Georgia.
Source: Asian Development Bank estimates.

Table 3: Operational Overview of United Water Supply Company of Georgia, 2019

Table 3: Operational Overview of United Water Supply Company of Georgia, 2019

Key indicators	Unit	Value
Access to piped water	% population	79.5
Access to stand posts	% population	58.6
Access to wells/boreholes	% population	84.8
Access to septic tanks	% population	67.1
Domestic water consumption[a]	liter/capita/day	188.3
Revenue collection	% sales	98
Cost recovery	% total costs	69
Residential tariff	US¢/m^3	13.5
Commercial tariff	US¢/m^3	108.9

¢ = cent, m^3 = cubic meter, US = United States.
[a] Average domestic water supply per capital per day is based on the utility's residential connections and excludes unconnected customers.
Source: United Water Supply Company of Georgia.

The Socio-Economic Development Strategy of Georgia (Georgia 2020) sets the overall strategic objectives for the provision of continuous water supply, rehabilitation of drainage systems, and wastewater treatment for the Georgian population. The cross-sector Regional Development Program of Georgia 2018–2021 includes a measure for the development of water, sewerage, and wastewater infrastructure, excluding the autonomous region of Adjara and Tbilisi. With assistance from the Asian Development Bank (ADB), the government also prepared an urban WSS development plan for 2011–2020 to tackle the problems and constraints prevalent in urban WSS. Some of the pending policy and institutional targets are on track to be met as part of the government policy reforms in the sector in 2020 and 2021. The government is preparing a new consolidated WSS vision and policy, as well as the updated and expanded targets for the WSS framework 2021–2030. The investment targets outlined in the plan have been substantially met. The government requested additional support for operational efficiency improvements in UWSCG, preparation for rural WSS development, and upgrade the water supply system in Telavi,

the regional center of Kakheti, 158 kilometers from Tbilisi, and the 13th largest city in Georgia. It is economically and strategically important for tourism, agribusiness, and wine production, and is identified as a priority city in the Regional Development Program of Georgia.

The government's WSS reforms are anchored in the planned new law on water resources management to be aligned with European Union (EU) legislation, the 2020–2025 decentralization strategy, and the planned reform of SOEs that is being discussed with the International Monetary Fund. The government plans to incorporate the EU Water Framework Directive in a new law on water resources management that embraces EU water quality standards and an overall integrated approach to water management. The 2020–2025 decentralization strategy devolves more power to local governments, which precipitates the need for a feasible institutional framework for rural WSS development and management.

The government initiated SOE reforms in 2020 for a faster post-COVID-19 recovery and increased macroeconomic stability.12 The Ministry of Finance (MOF) selected UWSCG to be one of the first SOEs to implement the national reforms to transform UWSCG into a more efficient SOE and will use it to model SOE reforms. MOF wishes to capture the advantages of private sector engagement for government subsidy reduction and quality services. However, UWSCG covers cities with low population density and tariff level, which are not attractive to the private sector. The government will pave the way for greater PSP and PPP opportunities by making UWSCG's operational data more reliable, and improving its operational performance. The government considers UWSCG a strategic asset to meet its socioeconomic goals, and sees sector reforms as a prerequisite for a next generation of physical investments. The government support for UWSCG reforms are based on the following reasons: (i) UWSCG functions as a key conduit for channeling development funds for WSS to meet the government's Sustainable Development Goals and protect the Georgian population from the spread of COVID-19; (ii) the preconditions to private sector participation (PSP) and public–private partnership (PPP) projects are not met mainly from lack of operational data, perceived high regulatory and tariff risks; and (iii) GWP and Armenia experience showed that gradual approach is better for successful private sector engagement. UWSCG will explore optimal ways to engage with the private sector, starting with outsourcing and performance-based management contracts and progressively transitioning to expanded PPP through careful planning and implementation. UWSCG will prepare a road map that sets out options for introducing contract-based PSP/PPPs over time, and a plan for the PSP/PPP project pipeline development and tendering to procure a commercially viable PSP/PPP transaction [8].

Conclusion

Georgia and the European Union (EU) have established and maintained close ties, notably in the framework of the EU Eastern Partnership (EaP) starting in 2009. A new milestone was reached in 2014 with the signing of the EU-Georgia Association Agreement (AA), which entered into force in 2016. Through the AA, Georgia committed to align its national legislation with EU directives and to implement international standards, including in the fields of environment and water management.

The AA defines timeframes in which Georgia is expected to approximate the EU directives related to water quality and resource management, including the marine environment. All

provisions need to be implemented by 2026, which will mark ten years of the AA's entry into force. Of these directives, the Water Framework Directive (WFD) is the most crucial legal act concerning protection of water regulation. It aims to ensure the viable, socio-economic management of resources; protect the quantity and quality of water; and promote sustainable water use.

Georgia enjoys plentiful water resources. Its annual renewable freshwater availability per capita is consistently the highest among EaP countries by a wide margin (e.g. 12 418 cubic meters [m^3] in 2017 compared to 6 355 m3 in Belarus, the next EaP country in the ranking) (European Environment Agency, 2020[2]). As such, at the national level, Georgia does not suffer from water stress. Given the country's stable population and water abstraction rates, Georgia does not face the same water security risks as many of its EaP peers [7].

Although water is abundant in Georgia, its quality due to anthropogenic factors varies widely. A prominent source of pollution is the discharge of untreated wastewater into surface waters. over a third of wastewater discharged into water bodies in Georgia is insufficiently treated. Therefore, water quality depends highly on the type of wastewater discharged and its level of treatment. Abstraction from surface water bodies for agricultural needs has more than doubled since 2003. Higher concentrations of agriculture-linked pollutants have been recorded near agricultural areas due to leaching (European Environment Agency, 2020[2]).

An additional challenge in Georgia is the population's relatively low level of access to modern water supply and sanitation (WSS) systems. The share of Georgians connected to public water supply systems and sanitation has consistently increased. However, as of 2019, a third of the population still lacked access to public water supply and about half did not have access to wastewater collection systems. Improving access to modern WSS services and minimizing the discharge of untreated or insufficiently treated wastewater into surface water bodies should be key objectives in Georgia's strategy to safeguard its water resources.

Currently, Georgia has a shortage of experts in environmental engineering, which is also caused by missing fields and missing curricula. The shortage of experts in the field of environmental engineering is a critical issue with far-reaching implications. According to recent data, there is a significant gap between the demand for environmental engineering expertise and the available professionals. This shortage negatively impacts the timely execution of vital environmental projects and hinders the effective management of environmental challenges. Causes of this shortage include a lack of comprehensive educational programs and an increasing demand for sustainable solutions. academic institutions, and private industries collaboration is crucial to develop strategies for attracting and training a new generation of environmental engineers to address this pressing issue.

REFERENCES

i. World Water Assessment Programme (UNESCO,WWAP), https://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/, Accessed March 10, 2020.
2. Government of Georgia. 2014. Socio-Economic Development Strategy of Georgia (Georgia 2020).
3. Government of Georgia. 2018. Regional Development Program of Georgia 2018–2021. Tbilisi.
4. ADB. 2010. Technical Assistance to Georgia for Developing an Urban Water Supply and Sanitation Sector Strategy and Regulatory Framework. Manila

5. European Environment Agency (2020), *Water availability, surface water quality and water use in Eastern Partnership countries: An indicator-based assessment*, https://www.eea.europa.eu/publications/regional-water-report.
6. European Union (2014), "Association agreement between the European Union and the European Atomic Energy Community and their Member S tates, of the one part, and Georgia, of the other part", *Official Journal of the European Union* I. 261/4, https://eur-lex.europa.eu/legal-content/en/TXT/PDF/?uri=CELEX:22014A0830(02).
7. GeoStat (2020), *Natural resources of Georgia and Environmental Protection 2019*, https://www.geostat.ge/media/35351/Natural_resources_of_Georgia_and_environmental_protection_2019.pdf.
8. Sustainable Water Supply and Sanitation Sector Development Program: Report and Recommendation of the President Reports and Recommendations of the President | September 2020 Sustainable Water Supply and Sanitation Sector Development Program: Report and Recommendation of the President | Asian Development Bank (adb.org)