

Tbilisi Water Supply Systems - From Source to Tap

Tinatin Lagvilava

tinatin.lagvilava561@ens.tsu.edu.ge

Department of Geology, Faculty of Natural and Exact Science, Iv. Javakhishvili Tbilisi State University
University Street 13, Tbilisi, Georgia, 0186

The Tbilisi water supply system is a multi-stage, historically formed infrastructural complex, the development of which can be considered in several stages: the activities of the Metulukhches, the introduction of centralized systems in the 19th century, and the creation of large-scale engineering networks in the Soviet period. The paper reviews this evolutionary process and focuses on the modern water supply system, which today is based on both underground and surface sources, including the Aragvi filtrates, the Zhinvali Reservoir, and the Tbilisi Sea resources.

The infrastructure includes a 4,800 km distribution network, headworks, 320,000 m³ regulation reservoirs, local pressure regulating and pumping stations. The paper discusses the geological and hydrological conditions of the Aragvi basin, which have a significant impact on the natural filtration of water, seasonal fluctuations in flow and the sustainability of water resources. Data on hydrological observations, changes in the water regime and dynamics are presented, including the Q–H relationship, which is used to determine the river flow.

The water quality control system, which is based on constant laboratory monitoring of 53 parameters, is separately considered. The quality fully complies with the requirements of both the national regulations and the World Health Organization. State supervision is provided by the National Environmental Agency and other regulatory agencies.

The paper reflects the current challenges of the infrastructure: the deterioration of the pipe network, high loss rates, risks caused by climate change. The main directions of development are considered to be the effective management of water resources, rehabilitation of networks, optimization of pressure zones and introduction of technologies adapted to climate risks. In conclusion, the paper notes that sustainable management and the use of modern technological approaches are critical for ensuring a safe and stable water supply.