Strengthening small town water utilities' water safety planning and water quality monitoring

Adapted from: *Systems Strengthening for Sustainable Urban WASH Services Big Gains from Small Funds*, WaterAid (2017).

Case study

Project background and key drivers

Since 2014, WaterAid together with Yorkshire Water (UK), have been providing support to utilities on water safety planning and implementing a capacity strengthening project called 'Twenty Towns' in Ethiopia. The project includes a series of training, demonstration and system building activities across a variety of thematic areas, including assurance of safe water quality – and this briefing will focus on the findings from Phase I (2013-19) of the project.

Until recently, water quality has arguably been a lower-level priority in comparison to water coverage in the sector in Ethiopia. In fact only in 2015, national water quality standards were integrated in national water supply standards (Second Growth & Transformation Plan (GTP II), 2015).

There are numerous risks to the quality of the water supply provided by small town utilities. **Uncoordinated urban development, limited source catchment protection or fencing, aquifer contamination and a lack of catchment management all pose as pollution risks to water sources.**

Location: Ethiopia

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◀ Muluken Wondirad, Debre Tabor Water Utility Manager, assessing the water pipe network map, Debre Tabor, South Gondar, Amhara. Ethiopia 2018.

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The distribution networks face numerous contamination risks, including poor management of liquid and solid waste, along with leakage and negative pressures in the pipes from erratic water flows – which can increase the risk of contaminants entering the water supply.

Despite the numerous risks to water quality, actual performance of water quality testing is relatively limited in towns across Ethiopia. The Twenty-Town project's baseline identified that only two of the twenty water utilities had any form of water quality testing equipment, or allocated staff to do the testing. It also identified that water treatment through chlorination was often ad-hoc, if practiced at all.

Water quality testing was undertaken occasionally by the Regional or Zonal government offices, however this was not frequent or systematic, often had issues in its accuracy,[i] and did not systematically include feedback to the utilities of the results. Alternatively, the local health offices would occasionally undertake water quality testing on behalf of the utilities, often as a pay-for service, and generally only during times of epidemics in the towns. Where testing was done, it was often limited only to bacteriological parameters, and did not check the chemical parameters of the supply.

Approach undertaken

- WaterAid Ethiopia supported training at the utilities on water quality and water safety, including a two-day course facilitated by experts from Yorkshire Water, and then a one-week course facilitated with assistance from the World Health Organization's Ethiopia office and the water quality testing company Wagtech. The trainings were followed by regular monitoring of water quality test results and checks on how regularly data is shared with relevant government offices, for example the Bureau of Health. The training included aspects of:
  - Water quality theory, standards and parameters;
  - Water quality testing and use of Wagtech equipment;
  - Sampling techniques;
  - Water quality monitoring and reporting;
  - Water safety planning.

Water quality testing equipment was provided (Wagtech units) to each utility, together with their user manuals.

WaterAid/Genaye Eshetu

◀ Close up of the glass that Aliy Abebe is holding in Frat, Ethiopia. October 2020.

i. For example, some samples that were transported large distances, were left unrefrigerated, which may have influenced the results.

Following the training, trainees cascaded learnings to colleagues, and discussed with the utility management and the Board on how to establish water safety plans (WSPs) and water quality laboratories.

- **Dedicated personnel were assigned to water quality management functions, and utilities invested their own funds in establishing laboratories within their offices.** The utilities established water quality monitoring protocols for their systems, stipulating the frequency and basis for the selection of the sampling point locations.
- At the town level, multi-disciplinary and multi-agency committees were established on water quality and water safety (e.g. including staff from the utility, Health Office, Customer Forum, Town Administration, etc). These committees undertook joint assessments of the hazards to water quality from source-to-tap, and a Water Safety Plan (WSP) was produced for each town. The WSPs identified and ranked the risks and proposed phased, costed plans which were presented to the utility management and board for approval and resource allocation.
- Urban Health Extension workers were trained to increase awareness of the public on the importance of water quality and the 'safe water chain', and to monitor for environmental health issues which pose risks for water supply contamination. In some towns, such as Debere Tabor, the utility trained the customer forum committees on water quality and water safety, so they could cascade the information in their discussions with the customers across the town.

▲ Aregashe Addis in the water utility store where she works every day, Debre Tabor Water Utility, South Gondar, Amhara. Ethiopia 2018.

▼ Photos left to right: The risk assessment matrix for the WSP that was developed by stakeholders in Axum town; the Water Quality Officer in Adigrat showing the laboratory; practical training in water quality in 2016; the Water Quality Officer in Finote Selam showing the testing equipment provided; a demarcation sign in Finote Selam marking the source catchment protection zone.

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Outcomes

The following improvements have been identified:

- **The utilities have increased awareness of the quality of the water that they provide and an understanding of the importance of water quality preservation and monitoring.** This in turn has increased capacity for water supply quality analysis and hazard risk reduction.
- The utilities are now undertaking in-house water quality testing on a monthly basis, and reporting results to the Water Board, urban WASH forums and the Health Department. The increased data from water quality testing also improves the accuracy of **chemical dosing for water treatment for disinfection**, which helps improve efficiency and effectiveness of the services provided.
- The **improvements in urban environmental sanitation and increased public awareness and sanitary surveillance is reducing the contamination risks** for the water supplies in the towns. This has been identified as a gap that will be addressed in Phase II of the project.
- **There is strengthened coordination, cooperation and collaboration between the utilities, town administration and the Heath Department for water quality surveillance and preservation issues.** The integrated urban WASH management forums help to provide a platform to discuss issues that require multi-stakeholder problem solving, such as securing and managing land around water sources.
- Most of the towns have made **efforts to fence off their water sources to prevent contamination**, and some utilities have commenced the process of legally acquiring the land around the sources **to create a buffer zone and reduce contamination risks**. For example, in Finote Selam the utility collaborated with a range of stakeholders to legally secure 140 hectares of land surrounding the wellfield, partnering with the municipality and local groups to prevent development or agricultural usage of the land.

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