

Asset registration ...as foundation for asset performance improvement

Non-Revenue Water levels of water supply schemes operated by Central Region Water Board has varied from 26% to 32% between 2015 and 2022 (on average 30 %). In the absence of a digital asset register (i.e. reliance on 'as-built' drawings and/or sketches of) water distribution assets, CRWB is currently digitising all of its water distribution assets in Quantum-GIS (QGIS) using a novel onsite and online collaboration with field staff (plumbers and meter readers) and with support from peers in Nakuru and Kisumu (Kenya).



Context

In an effort to improve service delivery, CRWB is working on asset management by automating internal working processes and leveraging QGIS to track, monitor, and evaluate the performance of distribution network assets (i.e. proactive detection of recurring leaks, and timely replacement plans for aged and dilapidated infrastructure).

To boost O&M cost coverage levels, the utility wants to reduce water (implying lost water production i.e. treatment and pumping costs) and revenue (meter under-registration, water theft) losses. A comprehensive evaluation of asset performance (i.e. locations of recurring leaks and malfunctioning meters), requires all water distribution assets i.e. mains, reservoirs, distribution lines, (air release, gate, pressure reducing) valves and customer connections to be registered in the Geographic Information System (GIS).

Challenge

There were two major challenges to this process:

- There was no dedicated NRW or GIS Team that the CRWB could spare to work on this process and the skilled staff that was involved in GIS was heavily engaged in other routine activities at the utility.
- 2) Field staff had limited to no prior experience working digitally which attributed to their impression of being partially, or not at all, included in the digitization process.

A conventional method of digitization process was considered and applied in the beginning: surveys to collect data were conducted by persons from the main office and then maps of water supply schemes



COP3-COP6

Asset Management - Water Distribution





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were produced and given to plumbers and meter readers in the field to furnish with attributes of the distribution network features. This did, however, not produce the desired outcome. The process created a certain level of perceived mistrust, was misunderstood, and consequently left the field staff feeling excluded and dismissed.

By asking plumbers and meter readers to share all the information in their heads, this created an unintended, reactionary sentiment of loss of selfvalue to the company (as they felt compelled to relinquish all the information and knowledge accrued over the years that makes them valuable). A new approach was required to adapt to the new environment.

Approach

Rather than simply printing schematics of the distribution networks on A0 charts and sending them to the field, Local Project Coordinator, Ed Nhlane, from CRWB WWX adapted the WOP approach to prioritize a combination of onsite and online collaborations with field staff (plumbers, plant operators, and meter readers) in real-time digitization process. The idea behind this approach was that, by sitting together with the plumber and meter readers, they would start to get more comfortable working with computers; they can see where the new information that they supply is going and how it is being used; they get an opportunity to ask question in a conducive environment; and they also can verify and promptly suggest corrections, where necessary, when validating existing data - making them continuously part of the process, instead of just of engaging them at isolated times.

In the initial stage, the field staff were engaged in developing the database model for the GIS, then the digitization started on site in the field for a few days with the collaboration of the scheme managers, the plumbers, plant operator and/or meter reader. This time was also used to prepare the collaborators for the later migration to online meetings.

Ed also reached out to the <u>Global WOPs - Community of Practice on Water Distribution</u> where ±30 GIS/hydraulic modelling experts met (online mid-December 2022) to share experiences in (first-time) data collection (software and hardware used, involvement of young graduates and plumbing staff for continuous updating during leak repair) and GIS utilization in asset performance (leak recurrence) monitoring and hydraulic modelling (to get a better grip on distribution network hydraulics and optimize water distribution).

Evans Obura and Bramwel Ouma from Nakuru and Kisumu, respectively, responded are now engaged in providing valuable advisory support to CRWB on the introduction of QGIS and the use of EPANET and GISWater.

Ed also reached out to Northern Region Water Board (NRWB) where the VEI NRWB WOP that ended in 2021 had related experience in improving water efficiency. Peter Mbisah from NRWB (Malawi) is also engaged and has been instrumental in providing valuable support to the work at CRWB.

Once momentum is gathered, the field staff are aware of what is happening and what is expected of them, the real-time registration of distribution assets takes place online. Considering the enormous workload to digitize the (technical drawing based) asset register and validate/update it based on the reality in the field, the real-time digitization becomes a knowledge sharing event and a platform to empower plumbers and meter readers by

acknowledging and using their contribution and validating their worth. Plumbers have been trained/equipped as the eyes and ears on the ground to co-implement this process and avoid unnecessary (and costly) travel. Periodically, real visits to the field are scheduled to prevent detachment (as prolonged online meetings can also create monotony, separation, and disengagement between the parties).



Results

At the start of the WOP in 2022, none of the 21 supply schemes had been digitised in GIS. Since then data collection has been initiated for 3 supply schemes: Salima (47%), Kasungu (43%), and Dedza (10%).

The new approach has contributed to the disaggregated maturity levels of the supply scheme to reach level 3 from the baseline of 1, in Salima and Kasungu (and the same is projected for Dedza) in a space of 6 months. This accelerated growth is significantly contributing to the general improvement in maturity of the utility under Phase II of the WOP to reach the desired target level 3 where all 21 schemes will have \leq 50% of the CRWB distribution assets registered in the GIS by 2026 (WWX - Phase II); \geq 75% by 2026 and 100% by 2030 (WWX - Phase III). CRWB is looking to hire young professionals (recent graduates) to fast-track progress.

Success factors

CRWB head office (GIS) - operational field staff collaboration and peer-to-peer support between the Local Project Coordinator Ed Nhlane (on the left in the picture below) and peers from NRWB - Malawi (Peter Mbisah), Nakuru (Evans Obura, on the right in the picture below) and Kisumu (Bramwel Ouma) - Kenya have proven to be key success factors so far.





Charles Chawinga (Scheme Manager) and Evans Rashid (Meter Reader) in a real-time digitization with Ed Nhlane (Local Project Coordinator) online



<u>Here</u> you can register <u>here</u> -free of charge- on the Global WOPs Community of Practitioners (Workplace) platform hosted by GWOPA.

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