

What do you think of when you think of a water plant in Africa?



The city of Dodoma in Tanzania is the legislative capital of the nation. Sitting on the high interior plateau east of the Great Rift Valley, this capital city honor has been somewhat theoretical until the current government's firm commitment to bring all ministries inland from Dar es Salaam as soon as possible. Of course, it has been the home of the Bunge, the national legislature, for decades. Alongside these developments are the establishment of two sizeable universities, the

University of Dodoma and St. John's University of Tanzania, with associated faculty, staff and student populations, requiring housing and services. The houses are spreading across the semi-arid hills. It resembles Las Vegas.

Dodoma's water supply needs are served by the quasi-private Dodoma Urban Water Supply



and Sewer Authority (DUWASA), which operates a large wellfield in a branch of the Rift Valley, where extensive recharge, storage, and transmissive fractures meet. Water is pumped to the municipality, chlorinated and distributed in a well-managed system. Dodoma was an administrative center during the German colonial occupation before the Great War, and a legacy from then, extended to the present, is complete

sewer coverage of the urban area, also operated by DUWASA, unusual for cities in the region.

Due to the hydrogeochemistry of the ground water, essentially a high-total dissolved solids (TDS) sodium bicarbonate water, when it is chlorinated, the water can take on a salty taste. It is safe, but can be unpalatable. Calcite clings to plumbing fixtures, and metal corrosion is a problem. System-wide water treatment to modify the chemistry is still a future project. For this reason, and for the many foreign visitors, bottled water is popular, both in bulk and in portable containers. For years, much of this has been trucked in from elsewhere.

Over twelve years ago, [Dodoma Tanzania Health Development](#), which established the world-class Dodoma Christian Medical Center, now an advanced medical and dental campus south of

Dodoma, also established several income-generating and community-service projects through the related for-profit business Dodoma Innovation & Production Company (DIPC) — dedicated to sharing profits with DCMC for future sustainability. DIPC includes water and beverage bottling, grape growing and construction enterprises. DIPC supplies raw well water to neighbors, and established a modest water bottling plant. The water from the original well could be bottled as a mineral water, but some borehole-related issues required installation of filtration and reverse osmosis. Our sister company, [Ground+Water Tanzania](#), consulted on the issues with that well and the general hydrogeology locally. This information helped to site a second, more productive and better-constructed borehole.

Fast-forward 12 years, and we met our friend Bobby Griffin from Minnesota at the Anglican English service in Dodoma. Mr. Griffin, who is widely and deeply knowledgeable about matters ranging from orthoscopic surgery to reverse osmosis, is one of the main drivers of DTHD/DCMC/DIPC. He invited us out to see the new plant. This is a water bottling plant transformed, now called DIPC Beverage.



The new plant, expected to go online later in 2018, will be bottling both treated water and flavored beverages. Production capacity will be 30,000 liters/day, which is small compared to a municipal water treatment plant in Ohio, for example, but bottling plants have infrastructure issues above and beyond water treatment plants that push the water out into a distribution system:

- 1) A bottling line that expands HDPE cores and fill them in a near-sterile environment (European standards here), labeling, packaging and storage of the filled containers.
- 2) Acquisition and storage of the bottle cores.

3) Flavored beverage lines, including mixing of the flavors and associated quality control. DIPC is also testing flavors for customer acceptance.

Source water comes from the above-mentioned drilled boreholes on the DIPC property, finished in the local granite. The second borehole lacks the turbidity issues of the first borehole, but nitrate is a challenge. There is little soil cover and the aquifer is oxidizing. They also maintain an impoundment for irrigation.

With investment backing and a present and potential income stream, this water facility is certainly different from a rural borehole-pump-tank system. However, its development here, with the supply chain and technical expertise that made it happen bodes well for the next step in water development in this region, moving from just reliable water supply (still a challenge) to routine installation and operation of drinking water treatment systems.

Most groundwater-source drinking water in the Central Region is potable with little treatment. Four challenges represent most of the need: general salinity (locally an issue), disinfection in distribution lines and tanks, radionuclides associated with ore deposits in the Rift Valley, and (mostly in the North), excessive fluoride. Considerable “artisanal” gold mining is also underway, which tend to leave mercury and other toxic deposits behind. Eventually, poorly controlled solid waste and sanitary waste treatment will impact water supplies, which now can be spaced away from such problems. Already, owners of fuel stations are providing “yank a tank” work.

No shortage of things to do.