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The Utility Approach: Extended distribution for household water filters in Ethiopia

Paper for the WASH systems symposium

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Abstract

Many towns and cities in Ethiopia has no safe drinking water supply 24/7. Broken pipes and power cuts allow contamination to enter the piped systems. In poorer and peri-urban areas especially, water is not delivered seven days per week so water has to be stored. Non-delivery of safe water has multi-fold causes which are widely known but are not often openly admitted for obvious reasons.

In 2016, the Dutch organisation Aqua for All started to discuss this water quality issue with a number of local water authorities in Ethiopia who acknowledged these problems. The result was that water utilities, private sector suppliers and Aqua for All together started an innovation called 'the utility approach'. The idea is to make a range of good quality household water filters available to customers as an additional service and as an intermediate solution until water supply entities can supply safe drinking water 24/7. This utility approach is becoming an example for water authorities in Ethiopia and can eventually become an example for other African countries which face similar challenges. This extended distribution channel for household waterfilters is also an option for rural areas where water quality problems are even more critical than in urban areas. Zonal Water Utilities could act as distribution centres for Point of Use treatment solutions and could become adequately service remote communities.

Introduction

The population of Ethiopia is around 107 million and the Ethiopian Government is intending to provide universal access to safe drinking water by 2020 (Growth and Transformation Plan 2). This is a huge challenge. Using the Joint Monitoring Program (JMP) methodology, a study in 2016 indicated that, nationally, only 13% of Ethiopians had access to safely managed services. Some of the boreholes that are supposed to be safe deliver unsafe water, and some of the improved water wells have quality problems. A high percentage of water from safe water points, especially in rural areas, is unsafe at the point of use because of recontamination in transport or unsafe storage at the household level (The Ethiopia Socioeconomic Survey's Water Quality Test. 2016). The Sustainable Development Goal indicator for water is 'use of safely managed drinking water services'. This consists of improved sources accessible on premises, available when needed, and free from faecal and priority chemical contamination. The management of chlorine treatment of rural wells is complicated as the discharge of the wells water is often not known.

One way to improve water quality is to treat it at the Point of Use (PoU) with a Household Water Treatment and Safe Storage (HWTS) option. The most common HWTS options are boiling, chlorination and water filters. Filters in combination with safe storage are especially effective: **'Point-of-use filter interventions in combination with safe storage reduces the diarrhoea risk of children under 5 by 61%'** (Wolf, 2018). The reason that water filters are efficient is because, in contrast to chlorine, filters remove Cryptosporidium and are generally used more consistently compared to boiling or chlorination.

In 2016, the Netherlands-based organisation Aqua for All started discussions with the Ethiopian Government and offered to develop a systems approach to support the target of universal access to safe water at point of use. It developed the 'Utility approach' which entailed a public private partnership between Zonal Water Utilities, private sector suppliers of filters and Aqua for All in the role of facilitator.

The agencies in charge of water and health in the Amhara Region both actively and publicly endorsed the approached. Among the barriers they identified to scaling HWTS options are the following.

- **Awareness:** People do not always know that their drinking water is unsafe nor that clear and clean water can still be unsafe.
- **Knowledge:** HWTS options like water filters are often unknown.
- **Availability:** There is as yet no supply chain of affordable and effective water filters in most towns.

These were some of the reasons for Aqua for All to start investigating **innovative distribution channels.**

Method

After an invitation from the Ethiopian government, Aqua for All started a feasibility study in 2016 followed by a pilot in **Finote Selam**, Amhara Region. The pilot, named 'Utility Led Distribution of Water Filters', was effected in this Zonal Town with 77, 000 inhabitants.

The Utility Manager and Aqua for All set some conditions on the pilot.

1. No free gifts.
2. Offer people a choice of different filters.
3. Provide training and after sales service.

4. Try different payment models.
5. The decision makers should endorse the approach and play their role.

Three filters were made available: membrane filters (Sawyer); siphon filters; and table top filters (Tulip). Of these options, customers' preference was the table top model because of convenience in use and affordability compared to the others. But above all, they chose the table top model because of its safe storage container. Later on, the pilot was scaled to other towns in Amhara Region. Some 4,000 filters were distributed reaching 20,000 people. The anticipated number of filters to be ordered until July 2019 by Water Utilities in three regions in West Amhara is 30,000.

Information

1. The plastic parts of the table top filter are produced in Ethiopia. The filter elements are imported from China.
2. Tulip Addis, the manufacturer of the table top filters, charges 550 ETB (1 US$ = 28 ETB). The cost of the siphon filters is similar, while the wholesale price of the Sawyer filter is about 1,000 ETB.
3. About 4,000 table top filters have been distributed and produced in Ethiopia, and there is a stock of about 30,000 filter elements.
4. The utility companies bought the table top filters from the manufacturer, Tulip Addis. The Sawyer filters were purchased from GEMSGAT PLC.
5. The purchase was financed on a consignment basis and paid in batches after sales to clients and to distributors.
6. The utility companies sell directly to households and in bulk to small utility companies and to woreda's (districts, the second smallest administrative unit).
7. Households are charged ETB 660 for the table top filters is and ETB 1,200 for the membrane filters.
8. The filters were tested by official water labs (most recently, Amhara Regional Water Bureau, 2017) and they comply with the WHO criteria for HWTS.
9. A monitoring review (Merton 2018) showed that the water quality as consumed at the Point of Use is good.

Research questions for this pilot.

1. Is there a **business case** for water utilities in supplying household water filters?
2. Does the distribution of household water filters through water utilities contribute to **continuous access to safe drinking water?**
3. Is the engagement of water utilities in HWTS distribution a viable option to **reach vulnerable target groups?**

Findings

1. Is there a business case for water utilities?

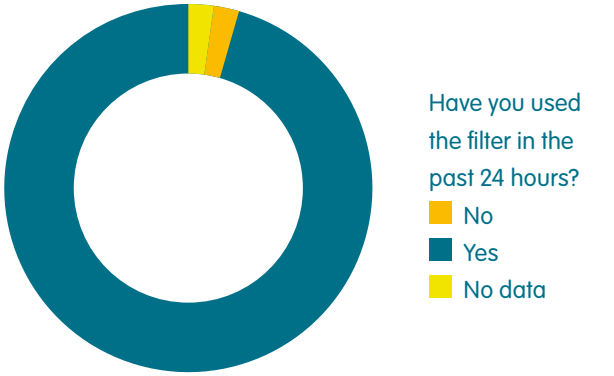
This question was answered after two years, and the answer is yes, there seems to be a valid business case. Partly this is because of the huge demand to scale up this approach to other towns and regions. In summary:

- The sales of filters fits within the mandate to provide safe water. Water utilities in Ethiopia are mandated **to generate an income.** The water utilities get **satisfied clients** and in turn, client satisfaction is important for the water utilities.
- The following percentages are enough to create a margin to cover the costs for distribution, monitoring and aftersales:
  - 5% stock keeping, monitoring by zonal utilities
  - 6% for smaller entities who buy in bulk from zonal water utilities and distribute
  - 9% incentive for sales force
  - Total = 20% margin over wholesale price
- A margin of 20% over the wholesale price allows utilities to reach out to rural areas.
- In this system, the Zonal Water Utility serves as a warehouse and distribution centre. Of course the profitability depends on the volume of sales, but the water utilities are not losing money.
- The distribution of the profit margin between the zonal utility and the smaller entities, and the incentive to the sales force may need to be adapted to each situation, for example because of the costs of transport to remote areas. That said, 20% seems to cover the costs.
- In Amhara Region, the Head of the Regional Health Bureau endorses this approach, saying that household filters are the best option to prevent cholera.
- This approach will help the Ministry of Water, Irrigation and Energy to reach the target of Universal Access to Safe Water by 2020.
- Water utilities can offer household filters as an **intermediate** solution as long as utility managers and the boards are willing to **acknowledge** that there is a water quality problem.

2. Does it contribute to continuous access?

It is still difficult to say if all users will keep on using the filter they bought, but after one year, all the users interviewed said that they would not revert to drinking unsafe water. In a survey by Aqua for All, most people said they had used the filter in the last 24 hours.

Figure 1 One of the Finote Selam pilot HWTS survey questions through water utilities (Nov '16-Dec '18)



- Baseline, (February 2017) mid-term and end line (March 2018) survey executed to assess client satisfaction and 'correct and continuous use of HWTS'.
- After one year of use, **41 out of 43** respondents indicated that they have **used the filter** in the past 24 hours.

Source: Merton, M, April 2018, M.Sc. Research

3. Can vulnerable target groups be reached?

Aqua for All found that payment in instalments of up to four months helps many households pay for filters. However, there is currently no mechanism for payment in instalments in rural communities where there is no water utility. ETB 660 (ETB 24) is too small an amount to be of interest for a Micro Finance Institute (MFI), and the interest may make the product too expensive. To give an idea of affordability, in Amhara Region, almost every family has cattle. If they sell one goat they can buy a filter. But ETB 660 is a large investment for poorer families. Farmers Associations (cooperative shops) may make ideal distribution centres, and many farmers can afford filters, especially in harvesting time. To support Farmers Associations to act as suitable distribution centres for filters, preparatory work is needed to create the system and minimise risks. Aqua for All is currently investigating the extent to which Farmers Associations can take on the role of distribution centres of filters for rural areas.

Potential of filter sales in Ethiopia

- 1,000 large cities that have big water utilities.
- 17,000 smaller towns that have water utilities.
- There is a huge number of other smaller towns emerging.
- All water utilities could become retail centres.
- Business model 5% + 6% + 9% margin to cover costs of distribution.
- Revenues from carbon credits (see next section) to fund costs of monitoring and scaling.

Outcome payment (carbon credits) to enable further scaling

Filtering water at household level not only protects families from water borne diseases, but at the same time, negates the need to boil water to make it safe to drink. This thus helps reduce the use of fossil energy. In this way, household water filters potentially decrease carbon emissions. This is recognised by the Gold Standard and can be used in the carbon credits trade. In the approach developed in Ethiopia, the water utilities register the sales of each filter and monitor its use over seven years, offering replacement filter candles in due time, thus creating evidence on the correct and consistent use of filters. The revenues from carbon credits will enable the scaling of filter sales in Ethiopia through a Result Based Finance mechanism, and may eventually also be used to create mechanisms to make filters affordable for all households.

Conclusions

- The preferred customer choice is the table top filter model because of convenience in use, safe storage capacity and affordability.
- After two years, selling filters is proving to be an interesting business activity for water utilities.
- There is huge demand for filters and activities will be scaled up to other towns and regions.
- Besides urban areas, utilities can also distribute filters to peri-urban and rural areas.
- The Utility Approach is a disruptive and promising market-based approach that has significant potential to help Ethiopia reach its 'safe drinking water for all' goal. The model could eventually be used in other countries.

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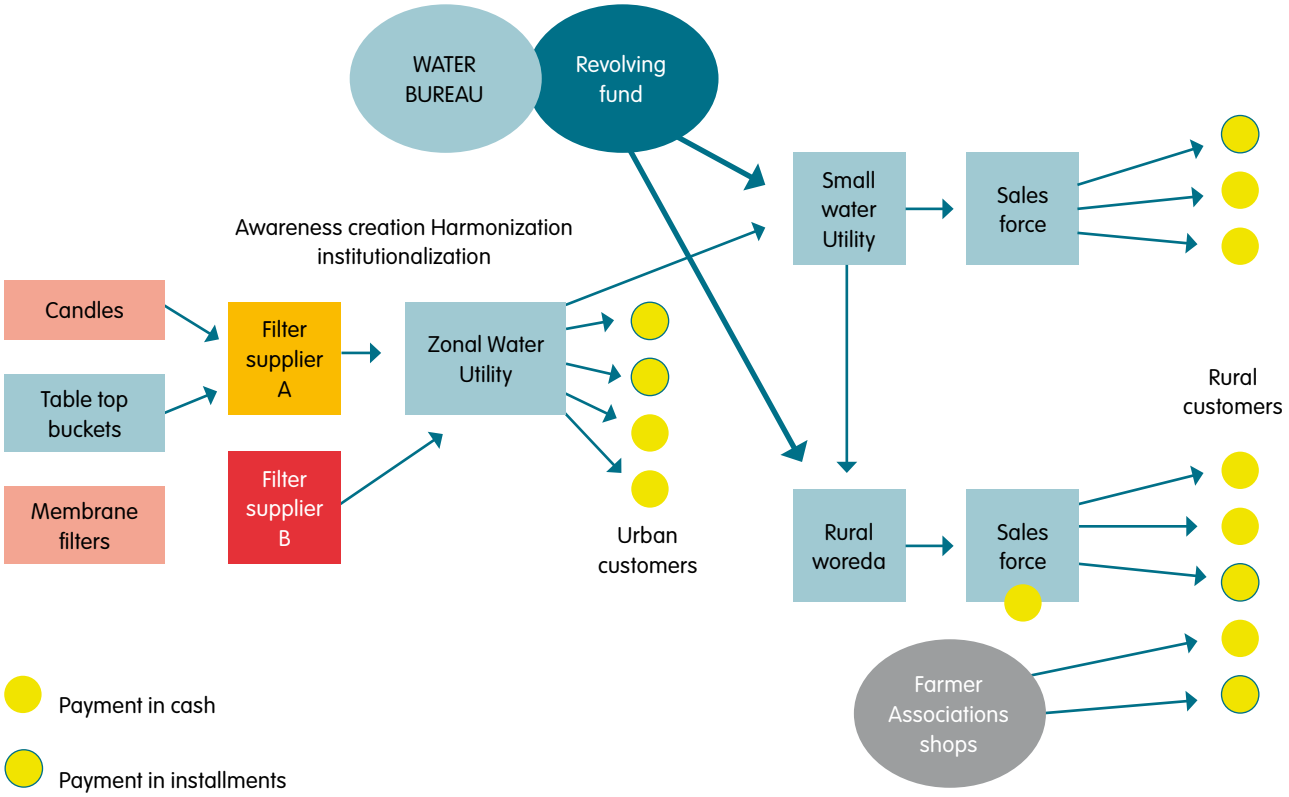
Extended supply chain for household water filters through untilities - how to reach rurl and vulnerable groups?



CUSTOMER BUYING A FILTER AT THE WATER UTILITY OFFICE, FINOTE SELAM

TABLE TOP FILTER PRODUCED IN ETHIOPIA

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