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**SUSTAINABLE WATER AND SANITATION SERVICES
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**Evaluation of distribution models for household water
treatment products in Kenya**

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Marketing trials for ceramic filters and other HWTS products were carried out in Kenya over 16 months. Community education trainings and sales models were set up at four different sites with local entrepreneurs, Community Health Workers of the Public Health system, Community-based Organizations and staff of NGOs. Selling filters through the water utility, a community-based enterprise, was the most successful retail model, followed by sales done by Community Health Workers. Evidence showed that community-based organizations need to be equipped with adequate management and marketing skills to successfully sell products. Community education through household visits (independent of the stakeholder carrying out the activity) was an effective marketing strategy. Emotional attributes, social norms, if people think it is important to treat the water and education level had the highest influence on the frequency of household water treatment in households.

Background

Global efforts to scale up the promotion of household water treatment, as well as establish sustainable water treatment practices, have been difficult (Clasen, 2009). This can be attributed to challenges particular to the market at the base of the pyramid (BOP), such as lack of awareness of the importance of treating drinking water, lack of access to products, particularly, in rural areas, lack of a broad choice of suitable products and difficulties in establishing sustainable supply chains (Anderson & Billou, 2007).

The marketing of ceramic filters in BOP markets has been challenging since they are largely dominated by fast-moving consumer goods. Also, previous marketing trials with filters revealed that successful marketing is linked to the provision of microcredits among other factors (PATH, 2012).

Between January 2012 and April 2013 marketing trials for ceramic water filters and other HWTS products were carried out in Kenya to assess how different stakeholders, all of whom were responsible for community education and management of distribution and retail sales, influenced product sales and people's willingness to pay for ceramic filters.

Method

Four project sites were chosen for the marketing trial in Kenya using different promotion and distribution strategies. The selection criteria were: sufficient water supply from surface sources, ample distance between the sites to avoid a cross-flow of information, expressed interest to establish a partnership on the part of the local District Public Health and Sanitation Office and community leaders, and the fact that no previous distribution of free products for household water treatment had taken place in these areas.

Promoter

300 households received trainings at each site through household visits and community group training events. These households were surveyed at baseline and after about 11 months of marketing the products. Quantitative questionnaires were used to collect information from the households, while sales staff gathered qualitative information and sales records.

| Factor | Area 1 | Area 2 | Area 3 | Area 4 |
|-------------------------------|----------------------------------------------------|--------------------------|------------------------------------------------------------------|----------------------------------|
| Area | Thika District | Thika District | Mwala District | Mwala District |
| Promotion/Community education | Promoters of a NGO | Community health workers | Community based organizations (supervised through NGO Promoters) | Promoters of a NGO |
| Sales & Distribution | Community owned water supply utility & Local shops | | | Promoters of a NGO & Local shops |
| Price(s) for ceramic filters | 17.4 USD | 17.4 USD | 1) 18.5 USD 2) 9.8 USD | 1) 18.5 USD 2) 9.8 USD |
| Profit margin for distributor | 2.3 USD | 2.3 USD | 2.9 USD | 2.9 USD |

Establishment of the products' supply chain

At the start of the intervention, a bulk delivery of 200 ceramic filters was made from the Kenya Ceramic Project to Thika (Areas 1 & 2) for a wholesale price of 1300 KSH (15.1 USD) per filter. In Thika, the filters were sold for a retail price of 1500 KSH (17.4 USD).

Due to the transport costs from Thika to Mwala (Areas 3 & 4) the wholesale price in Mwala went up to 1350 KSH (15.6 USD). The retail price of filters in Mwala was set at 1600 KSH (18.5 USD). Customers at all sites were able to pay by instalment and filters were handed out only after full payment was received.

Population Services International (PSI) directly delivered the Chlorine products to the wholesalers at all sites to set up their supply. The wholesale price for a 150ml bottle of Waterguard was 0.2 USD, a pack of 20 tablets of Aquatabs cost 0.48 USD and a PUR sachet was 0.05 USD.

Description of the intervention

Area 1: (Thika) Promotion: NGO, Sales: Water Utility & Local Entrepreneurs

The operating committee of the Community Water Project (CWP) organized the retail distribution and sale of HWTS products in Munyu. The CWP is a financially self-sustaining group that manages the piped water supply scheme in the area; piped water is distributed without prior treatment. The CWP sold filters to their existing network of customers and instalment payments were added to their water bills. Filters in Munyu sold for 17.4 USD each; the CWP obtained a profit margin of 2.3 USD from the sale of each filter. In addition to the CWP, two shop owners also sold HWTS products, mainly Waterguard, as well as a few Ceramic filters for 17.4 USD apiece.

Area 2: (Thika) Promotion & Sales: Community Health Workers

Community Health Workers (CHWs) of the Community Health Unit in partnership with the Public Health Officer handled the community education and the sale of ceramic filters in this area. Ceramic filters were supplied on credit to the Public Health Office for 15.1 USD apiece, whereas the CHWs could pick them up to sell. CHWs sold filters for 17.4 USD, making a profit margin of 2.3 USD per filter.

Area 3: (Mwala) Promotion & Sales: Community-based Organisations

Two community-based organizations (CBOs), "House of Drum Youth Group" and "Utithini Organic Self-help Group" were responsible for community education and the selling of ceramic filters and chlorine products at this location. "House of drum youth group" had an existing working relation with PSI as a wholesaler of health products, including Chlorine, and correspondingly had previous business experience prior to the start of the project. "Utithini Organic Self-help Group" did not have prior experience with the marketing of products. The CBOs were supposed to collect the filters from the NGO Promoter (who had the role of a wholesaler in Mwala) after pre-payment of 15.6 USD per filter and were to sell the filters to community members for 18.5 USD, making a profit of 2.9 USD from each one sold. At the midterm evaluation, no filters had been sold at this site. The selling price, therefore, was lowered to the subsidized price of 9.8 USD.

Area 4: (Mwala) Promotion & Sales: NGO Promoter

A NGO Promoter handled the promotion and sale of ceramic filters and chlorine products at this location. However, the Promoter had to stop selling the Chlorine products because the households claimed that they had always received such products for free from a NGO. Subsequently, four entrepreneurs were identified and established as retail distributors of Chlorine products. The NGO Promoter initially sold the ceramic filters for a price of 18.5 USD apiece. At the midterm evaluation, only one filter was sold at this site. The selling price, therefore, was lowered to the subsidized price of 9.8 USD.

Qualitative results

Area 1: (Thika) Promotion: NGO, Sales: Water Utility & Local Entrepreneurs

Selling filters through a CWP, as well as having community education handled by a Promoter, were the most successful interventions.

The CWP, however, received several complaints from customers. They believed that the CWP should provide safe water instead of only collected river water, since this was distributed untreated to the households, requiring the purchase of household water filters to treat it.

In Area 1, several retail shops sold chlorination products, mainly Waterguard, as well as ceramic filters. However, selling the relatively expensive ceramic filters through these kiosks has been a challenge due to their space limitations and the difficulty of collecting payments in instalments. A lack of customers' trust in the kiosk owners often prevented them from paying for the filters in instalments (filters were handed out only after full payment was received).

Area 2: (Thika) Promotion & Sales: Community Health Workers

Sales and social marketing by the health centre and the CHWs in Area 2 of Thika worked out well. The initiative was strongly supported by the Public Health Officer in Thika, who prompted the CHWs in this area to define sales targets. The CHWs were motivated to sell water filters and were interested in profiting from their sale. Financial management by the CHWs, however, turned out to be difficult for them to do and, therefore, specific bookkeeping trainings were organized for them.

The CHWs sold the filters at different prices. The wholesale price was 15.1 USD and the recommended retail price was 17.4 USD. Nevertheless, some CHWs chose to raise the retail price to increase their profit margin from 2.3 USD to 4.6 USD. No chlorination products were sold in this area.

Area 3: (Mwala) Promotion & Sales: Community-based Organisations

Working with CBOs revealed that they could successfully handle organizing distribution and social marketing, but only if they were well organized and had previous sales experience. The CBO "House of Drum Youth Group" had sales experience, having sold various PSI products before being introduced to the project. They were very successful at selling smaller HWTS products and also were able to sell a number of water filters after the price was lowered from 18.5 USD to 9.8 USD.

The other CBO "Utithini Organic Self-help Group", however, did not have any sales experience and was not very motivated. They did not sell any filters and sold only a very limited amount of chlorination products.

Area 4: (Mwala) Promotion & Sales: NGO Promoter

The NGO Promoter was effective at implementing the community education campaign. He was able to reach all 300 households several times and participated in various community gatherings. However, the model of combining community education and product sales through a Promoter was problematic as the households that received the community education demanded goods for free. This sales model, therefore, was reorganized and the responsibility to sell chlorination products was given to local shops in the project area.

The Promoter continued selling ceramic filters, but was only able to sell them after the price was lowered from 18.5 USD to 9.8 USD. He offered customers the possibility to make payment by instalment and gave them the filters only after receiving full payment.

Quantitative results

Sales numbers

Area 1: The CWP committee sold 51 filters for 17.4 USD apiece.

2 local shops in the project area sold 4 filters for 17.4 USD each.

Area 2: The Community Health Workers sold 40 filters for 17.4 USD apiece.

Area 3: One of the community groups sold 11 filters for 9.8 USD apiece and successfully sold chlorination products. The second community group did not sell any filters and hardly sold any Chlorine.

Area 4: The NGO Promoter sold 1 filter for 18.5 USD and 26 filters for 9.8 USD apiece.

Willingness to pay

Mwala District (Area 3 & 4) is more agriculturally oriented than Thika (Areas 1 & 2) and this regional difference significantly influenced people’s willingness to pay for ceramic filters. Figure 1 shows that in Mwala (Areas 3 & 4), only 13% of households were willing to pay more than 11 USD at baseline, and only 4% were willing to pay more than 11 USD after the intervention. In Thika (Areas 1 & 2), 31% of the households were willing to pay more than 11 USD for a ceramic filter at baseline, while only 18.5% were willing to pay more than 11 USD after the intervention.

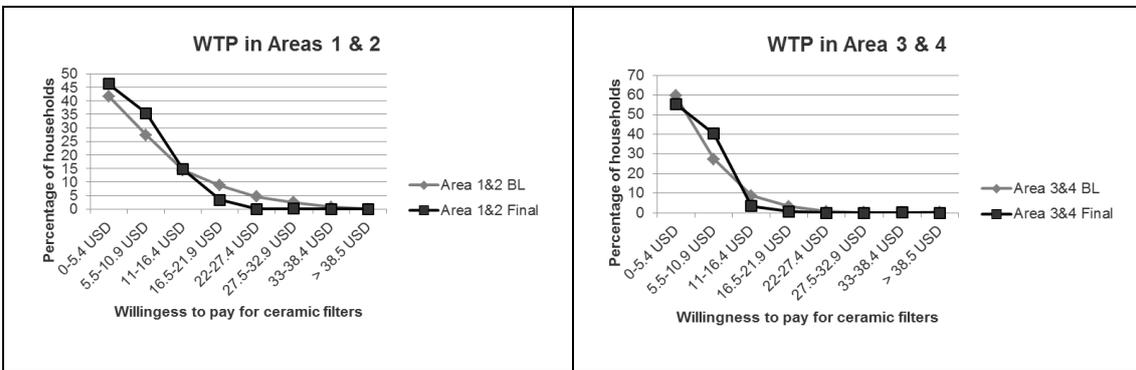
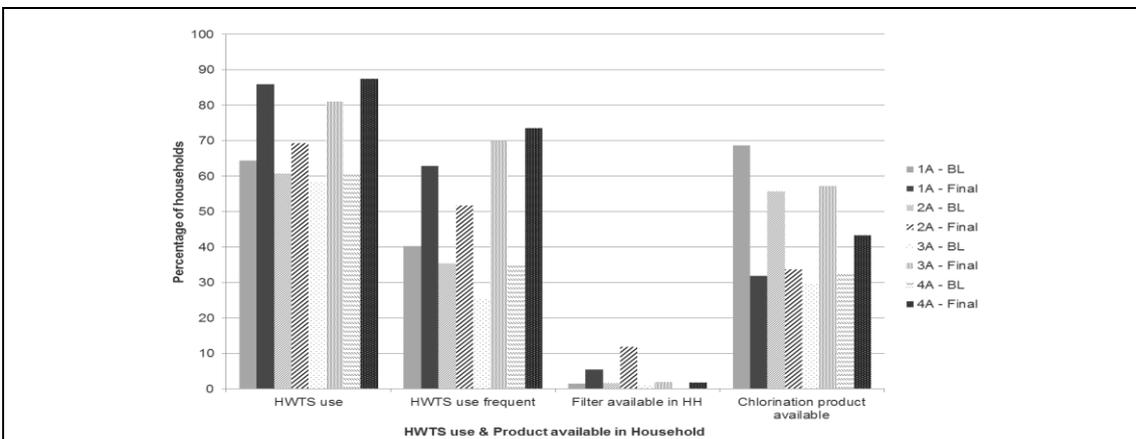


Figure 1. Willingness to pay for filters before (BL) and after the intervention (Final)

Use of HWTS products before and after the intervention

In all areas, the use of household water treatment (boiling, filtration, chlorination, solar water disinfection, flocculation & sedimentation) increased by an average of 20% from 61.4% to 81%. The increase in the four areas was: 65.5% to 85.9% in Area 1, 60.75 to 69.3% in Area 2, 58.7% to 81.1% in Area 3, and 60.6% to 87.5% in Area 4.



1A: Area 1, 2A: Area 2, 3A: Area 3, 4A: Area 4, BL: before intervention, Final: after intervention

Figure 2. Use of HWTS products before and after the intervention

It was observed that the intervention had a large influence on the frequent use (defined as using the method often to always) of household water treatment. It increased by an average of 30.4% in all areas: from 40.2% to 62.9% in Area 1, 35.4% to 51.8% in Area 2, 25.5% to 69.9% in Area 3, and 35% to 73.6% in Area 4.

Before the community education activities were implemented, a lower number of households in Mwala District (Areas 3 & 4) had Chlorine solution available at home; 30% in Area 3 and 33% in Area 4, compared to 68.6% of the households in Area 1 and 55.7% in Area 2. The intervention increased the availability of Chlorine in Mwala District households by 27.3% in Area 3 and 10.3% in Area 4. In Areas 1 and 2, however, the availability of Chlorine products in the households decreased. In those areas more people said that they would be boiling water rather than using Chlorine. In addition, the use of filters increased in Thika District households by 5% in Area 1 and 10% in Area 2. Households expressed greater willingness to pay for ceramic filters. In Mwala District (Areas 3 & 4), where WTP was considerably lower, only a few households took up the use of ceramic filters

Factors correlating with the frequent use of HWTS

The logistic regression for frequent use of household water treatment after the intervention revealed that socio-psychological factors, such as emotional attributes (if they like the system used – OR: 2.05, CI: 1.8-2.4), if they think it is important to treat the water (OR: 1.7, CI: 1.4-2.1) and social norms (how many neighbours are using household water treatment – OR: 1.9, CI: 1.7-2.3) had the strongest influence on the frequency of household water treatment. Educational level also had an influence (OR: 1.5, CI: 1.2-1.9). In addition, TV and radio as information sources were significantly correlated with frequent HWTS use (OR: 0.28, CI: 0.14-0.56).

Highly significant, but with a smaller odds ratio of 0.104 (CI: 0.05-0.2), was whether the households had received a promotion including household visits or not. The hand washing index had a stronger effect (OR: 1.3, CI: 1.2-1.4), but the two variables were not independent of each other since training was provided on household water treatment and hand washing during the household visits. Not significant, however, was the channel used to disseminate the information. The data collected indicates that it did not make a great difference if NGO Promoters, CHWs or CBO members did the community education household visits.

| Factor | B | S.E. | p | OR | 95% C.I. for OR | |
|------------------------------------------|--------|-------|------|-------|-----------------|-------|
| | | | | | lower | upper |
| Promotion received | -2.248 | .410 | .000 | .106 | .047 | .236 |
| Information through TV, Radio, Newspaper | -1.288 | .363 | .000 | .276 | .135 | .562 |
| Did promotion change behaviour | -1.798 | .306 | .000 | .166 | .091 | .302 |
| Like the method used for treatment | .717 | .076 | .000 | 2.049 | 1.764 | 2.380 |
| Importance of treating the water | .537 | .099 | .000 | 1.711 | 1.410 | 2.077 |
| Percentage of neighbours using HWTS | .671 | .072 | .000 | 1.957 | 1.699 | 2.254 |
| Hand washing index | .261 | .054 | .000 | 1.298 | 1.167 | 1.444 |
| Education level | .400 | .123 | .001 | 1.491 | 1.172 | 1.898 |
| Constant | -3.872 | 1.043 | .000 | .021 | | |

R²=0.294 (Cox and Snell), R²=0.406 (Nagelkerke), Model $\chi^2(20)=585.480$, p=0.000
(B=Beta Value; S.E= Standard Error; p= significance; OR= Odds ratio; CI= Confidence interval)
*Only factors with a significant influence on the frequent use of HWTS are listed in the table. Included in the model, but found to be not-significant were: turbidity of water; information through the health centre, information through a CBO, information through a Promoter, information through a shop owner, information through a community health worker, information through a community meeting, information through a demonstration in town, information through other sources; beliefs about whether untreated water is good or bad for one's health; money available per week; and willingness to pay for ceramic filters

Contrary to findings at baseline (data not shown), risk perception (if they think that drinking water causes diarrhoea or other illnesses or has no impact) was not significantly correlated with frequent HWTS use. Also, the economic status of the household was correlated significantly with frequent use only in a single factor analysis.

Conclusion

On the basis of insights gained through the logistic regression, we conclude that community education through household visits, independent of the stakeholder carrying out the activity, is an important strategy for the social marketing of HWTS products. Emotional attributes and norms are important factors influencing the use of HWTS and, therefore, should be addressed in the marketing strategy. Community training should be complemented with information through TV and radio.

The sales experiences revealed that the marketing of products requires a sales force with sales experience and an entrepreneurial spirit, and should involve the definition of sales targets. CBOs or CHWs can be successful at selling products, but they need to be equipped with adequate management skills and should have the motivation to make sufficient profit from their sales. Very promising is the approach of selling products through water supply utilities. Enterprises providing a basic service are well disposed at distributing higher priced products since the collection of payments by instalment can be added to their basic service bills.

Working with groups that do not have any know-how or experience in product marketing and sales is not recommended since there is a high risk that the distribution mechanism will fail.

Using NGO Promoters for community education, as well as product sales, is also not recommended because they commonly lack sales skills and customers often approach NGO representatives with the attitude of wanting to get something for free. Local entrepreneurs with small kiosks have sufficient sales experience, but the sale of bulky and expensive products, such as water filters, is a challenge for them due to space limitations and difficulties with payment by instalment. Fast moving consumer goods, such as chlorination products, however, can be sold well through small kiosks.

Questions about income levels and what an individual household would buy with 20 USD showed that the majority of households would spend their money on food (data not shown). The purchase of a higher priced product for water treatment, such as a ceramic filter, is a challenge for low-income households. In Mwala District ceramic filters were only sold after the price was lowered from 18.5 USD to 9.8 USD. In the whole project area only a few customers bought filters with upfront payments. To offer customers the opportunity to pay for a filter by instalment is an important element that facilitates product sales. If filters are only handed out after the full payment has been received, it is essential that there be a relation of trust between the customer and the seller. Only then, are the customers motivated to buy filters through such a scheme.

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