



# TAKE A LOAD OFF WESTERN KENYA

## IMPACT ASSESSMENT

BY DENISE LAW • KOPERNIK FELLOW • JUNE 2013

## Table of Contents

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>PROJECT BACKGROUND .....</b>	<b>4</b>
SNAPSHOT OF LOCATION .....	4
COMMON PRACTICES RELATING TO TECHNOLOGY .....	7
OUR LOCAL PARTNER: YAYA EDUCATION TRUST .....	8
<b>PROJECT IMPLEMENTATION .....</b>	<b>9</b>
THE TECHNOLOGY.....	9
DISTRIBUTION MECHANISM, PRICING, AND PAYMENT .....	11
<b>IMPACT ASSESSMENT .....</b>	<b>13</b>
PROCESS AND METHODOLOGY .....	13
RESULTS OF THE IMPACT ASSESSMENT .....	14
<b>CONCLUSIONS.....</b>	<b>28</b>
<b>ANNEX.....</b>	<b>30</b>
CASE STUDIES .....	30
SAMPLE QUESTIONNAIRE .....	33

## Executive Summary

Kopernik distributed 52 Q Drums in Kenya's Western Province in 2012 through our local partner, Yaya Education Trust (YET). Matungu is a rural area where large households survive principally on subsistence farming. The vast majority of households have no access to water and sewage infrastructure or mains electricity. People face considerable difficulties collecting water, including head and neck pains from carrying water on their heads, and the significant time and effort required to make frequent trips to water sources.

This impact assessment was conducted over one month in March and April 2013. Aided by YET, the information was collected from (i) 30 face-to-face interviews with Q Drum users over 11 days, (ii) field observations and (iii) immersion in the local environment.

YET has extensive connections with the local community, making it very effective in reaching people at the most grassroots levels. However, they have had difficulties implementing some elements of the project, for example collecting payments by instalment. The majority of Q Drum customers made their purchase via an instalment plan that was still not paid up six months on.

The Q Drums have made a tangible impact on the quality of life of the people they reached. Of 30 surveyed Q Drum users:

- **93% are saving time collecting water**, giving them more time to spend on economic activity, household chores and social life;
- **77% are using more water**, namely on chores and personal hygiene;
- **100%** of users who suffered upper body pains from carrying water on their heads have experienced an improvement.

The performance of the Q Drum has exceeded people's expectations, however:

- 20% of the Q Drums exhibited defects or damage;
- People were frequently using the Q Drums to store water, in the absence of other secure water storage containers, and had not considered using the Q Drums for transporting other goods.

In light of these findings, it is recommended that future Q Drum projects:

- Ensure appropriate training on how to use and maintain the Q Drum, eg by providing an illustrated brochure;
- Explore multiple uses of the Q Drum. For instance, if people in Matungu had access to other secure water storage containers, they may be more inclined

to use or rent out the Q Drums to transport both water and other goods, such as peanuts, maize kernels or beans.

## Project Background

### Snapshot of Location

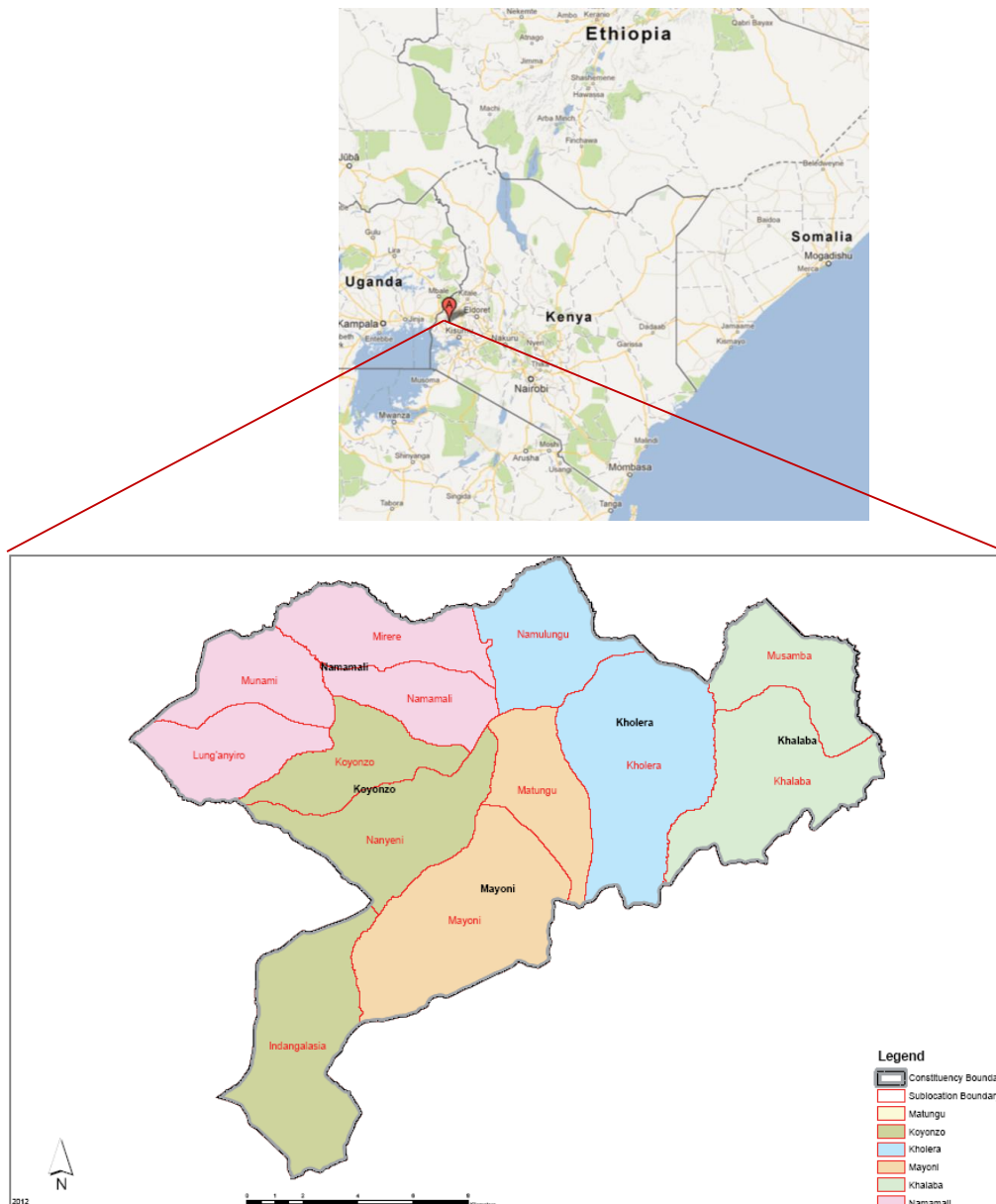


Figure 1<sup>1</sup> The Matungu district is located in Kenya's Western Province.

<sup>1</sup> Source: Google maps, [http://www.mudavadi2013.com/Western/Kakamega/Matungu/206\\_Matungu\\_Const\\_campaign.htm](http://www.mudavadi2013.com/Western/Kakamega/Matungu/206_Matungu_Const_campaign.htm), accessed 15/4/2013



The Matungu district spans 276 km<sup>2</sup> in the Kakamega county of Kenya's Western Province, and is home to 147,000 people. The majority of people live from subsistence farming (such as maize, sugar cane, cassava, potatoes, etc.) and raising animals. Salaried employment is rare. Mumias, around 30 minutes by car from YET's headquarters, is the closest large town with banks, supermarkets and internet access. Several satellite town stations (eg Lugan'yiro, Ejinja, Koyonzo, Matungu town, Shibare) are spread out within the Matungu district, serving the villages that cluster around them.

Matungu is a rural area by Kenyan standards and is rarely visited by tourists.

	Kakamega county	Average of 47 counties in Kenya
<b>Population</b>	1,660,651	821,491
<b>Surface area (km<sup>2</sup>)</b>	3,051	12,368
<b>% of urban population</b>	15.2	29.9
<b>% of population with primary education</b>	70.9	66.6
<b>% of population with secondary education</b>	11.0	12.7
<b>% of households with access to electricity</b>	5.6	22.7
<b>% of paved roads</b>	4.9	9.4

Figure 2<sup>2</sup> Kakamega county, in which Matungu is situated, is a rural area that has below national average access to secondary education, electricity and paved roads.

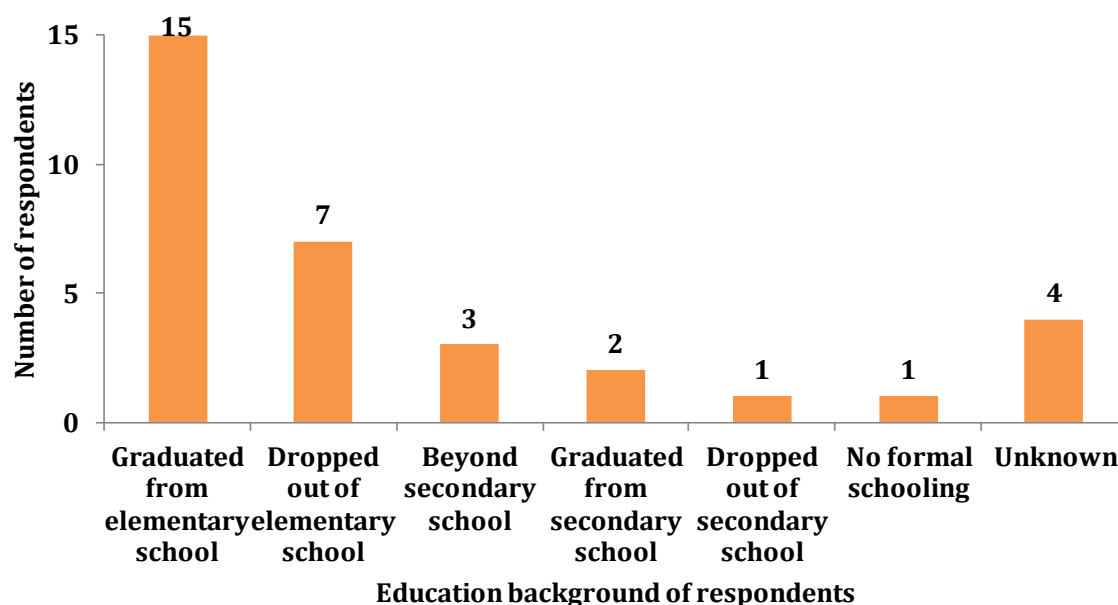


Figure 3 5 out of 33 respondents completed secondary school.

<sup>2</sup> Source: <http://kenya.usaid.gov>, accessed 14/6/2013 (Note: the data is from 2009.)

Among the 33 respondents of the 30 households interviewed, the majority of respondents (23 out of 33, or 70%) did not study beyond primary school. It is worth noting, however, that the importance of education is well understood. Surveyed households reported that none of their children miss school to collect water, and that out of the 149 children in the 30 households, only two school-aged children are out of school (“waiting to go back to school”) due to school fees that are deemed by their parents to be prohibitively high (20,000 KES or 235 USD<sup>3</sup> per annum).

	Min	Max	Average
<b>Size of HH</b>	4	15	<b>8</b>
<b>Of which children</b>	1	10	<b>5</b>
<b>Monthly HH income (KES)</b>	600	20,000	<b>3,500 (median)</b>

*Figure 4 Households in western Kenya tend to have a large number of children.  
 Note that 1 USD= 85 KES at the time of writing.*

An average household consists of eight people, including five children. The median monthly income is 3,500 KES (or 41 USD, ie 1.37 USD per day, just over the World Bank poverty line of 1.25 USD). 83% of the surveyed households derive at least part of their income from farming. Only 20% of the 82 adults in these households are engaged in salaried employment.

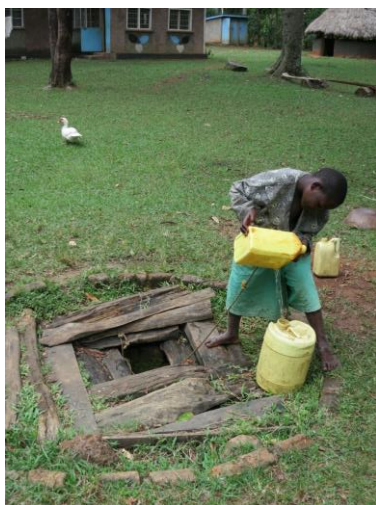
<sup>3</sup> 1 USD= 85 KES, source: [www.xe.com](http://www.xe.com), accessed 12 /6/2013

## Common Practices Relating to Technology

Due to a lack of water and sewage infrastructure, people typically collect water every day from sources including springs, boreholes and rain water (during the rainy seasons<sup>4</sup>). This poses several problems:

- (i) These water sources can be far away from household compounds (of the surveyed households, the minimum, maximum and average distances of a spring from home are 0.3 km, 2.5 km and 0.9 km respectively);
- (ii) Only a limited quantity (20 litre) can be carried during each trip due to the heavy weight of water.

Due to these factors, many trips have to be made per day, which takes up a lot of time, and in particular, precious daylight hours. During the dry season, households make from two to twelve trips each day to the spring, and on average five trips. Furthermore, water quality can be a problem, as not all sources are covered, and sometimes they dry up entirely during the dry season.



*Figure 6 A child getting water from an open borehole.*



*Figure 5 A woman collecting water from a spring, the locals' preferred source for drinking water.*



*Figure 8 A covered borehole.*

Our field visits revealed that people did not use any type of water collection technology before owning a Q Drum, even though some are aware of water pumps. However, 83% of the surveyed households have a LifeStraw, a personal water filter that was distributed in Kenya at no cost in 2011-2012.

While mains electricity is available, setting up the connection involves expensive construction work and as such, the majority of households do not have access to it

<sup>4</sup> The months of March/April to May/June constitute the "long rains" whereas October to November/December, the "short rains". (Source: <https://en.wikipedia.org/wiki/Kenya>, accessed 14/6/2013)

and burn fuel for light. Some households own a generator or solar panels. Of the 30 households we visited, 43% own solar lamps.

Typically, households use a three stone fireplace inside their houses for cooking, despite the threat of indoor pollution caused by particulates.

## Our Local Partner: Yaya Education Trust

Yaya<sup>5</sup> Education Trust (YET) was established in 2005 “to address the problems affecting the poor and the needy by involving young community members below the age 40 years old in finding practical solutions to the challenges that were facing the community”. They aim to reach “the marginalised, orphaned, vulnerable and the poorest of the poor members of the community who are victims of HIV/AIDS, neglect, and forced/ early marriages”. Their activities encompass health, education, water and sanitation, women’s rights, children’ rights, economic empowerment, and environmental conservation.

YET’s activities are concentrated in Matungu and Mumias districts of Kakamega county in Kenya’s Western Province. These districts have a total population of over 500,000 people, with youth making up of over 65% of the population.

The organisation is run by a management committee of six people. Daily office activities are run by three full-time, salaried staff members and six part-time volunteers. Currently the organisation has 150 fully-paid members (90 women and 60 men) and 30 regular volunteers. Our contact in YET has in-depth knowledge of, and an extensive personal network in, the community in which YET operates, making YET an excellent local partner in terms of reaching the base of the pyramid.

YET submitted a proposal to Kopernik for Q Drums in 2010. Kopernik partnered with YET because of the organisation's focus on the empowerment of women and girls and their commitment to sustainable development.

The project was crowdfunded on the Kopernik website. More than 20 donors from Australia, Germany, Indonesia, Japan, Poland, Portugal, Switzerland, Thailand, the United Kingdom and the United States of America supported the project.

Kopernik sent the Q Drums to YET in April 2012, after fully funding the project. As YET distributed the Q Drums, Kopernik provided support and advice on their progress and challenges, and suggestions on pricing and payment options.

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<sup>5</sup> “Yaya” means caretaker in Swahili.



## Project Implementation



### The Technology

The Q Drum is a “donut-shaped plastic container which when full holds 50 litres of water”<sup>6</sup>. Made from linear low-density polyethylene (LDPE), the manufacturer describes it as “practically indestructible”. This is aided by its simple design, which includes no removable or metal parts which, if broken or missing, could detract from the Q Drum’s intended purpose. A Q Drum weighs 4.5 kg when empty and 54.5 kg when completely filled with water.

In addition to being a container, the Q Drum’s donut shape allows it to roll on the ground when pulled with a rope, making it a more energy-efficient way to transport a large volume of water (or other substances) than carrying the load. Other uses proposed by the official website include: the transport of foodstuffs and fuel, a manual clothes washing machine, a means to level land and a floating device.

YET marketed the Q Drum to customers as offering the following benefits:

- (i) With a capacity of 50 litres (more than double that of containers commonly used in Matungu), fewer trips to the water source and subsequently, less time, are required;
- (ii) Rolling the Q Drum is much easier than bearing a water-filled plastic container on one’s head;
- (iii) The Q Drum’s large capacity and tight seal allow a large amount of water to be stored securely even in the presence of small children and animals.

Container			
	Q Drum	Plastic jerrycan	Clay pot
Capacity	50 L	20 L	20L
Material	LLDPE (thickness 4mm)	HDPE	Clay
Storage	Secure due to a tight screw lid	No secure lid	Lid usually consists of a plate

<sup>6</sup> <http://www.qdrum.co.za/about-q-drum>, accessed 12/4/2013

			placed directly on top of the opening of the pot
Price	500- 1,000 KES	200-300 KES	400 KES
Remarks	Respondents have observed an unexpected benefit: unlike the jerrycan, the Q Drum cools water (provided it is not stored under direct sunlight)	By far the most common container used in the project site, it is affordable and less fragile than clay pots, but tends to develop leaks at the corners	Cools water; Material is fragile; Children and domestic animals can easily tamper with the water due to the lack of a secure lid

*Figure 6 The table above shows the containers available to people in Matungu. The plastic jerrycan is the most common container used, followed by the clay pot.*

## Distribution Mechanism, Pricing, and Payment

YET distributed the 52 Q Drums in August 2012, reaching a total of 48 households<sup>7</sup>. Their strategy was to distribute four Q Drums to each of the 13 sub-locations in Matungu in order to raise awareness of YET and the Q Drum in as large an area as possible, as opposed to piloting the technology in a particular community.

The majority of people paid 450 KES (5 USD) to 1,000 KES (12 USD) per Q Drum. This price, significantly below the market price of 65 USD (and up to 130 USD in total when taking into account shipping costs), was set by YET in order to make the Q Drums affordable to farming households in Matungu. The introductory price of 1,000 KES was reduced to 700 KES and then finally to 450/500 KES as it was revealed that most people were not willing to pay 1,000 KES (c.f. section Customer Satisfaction). Some respondents reported that they were given Q Drums for free, but this was denied by our contact in YET. No tangible evidence was presented for either case.

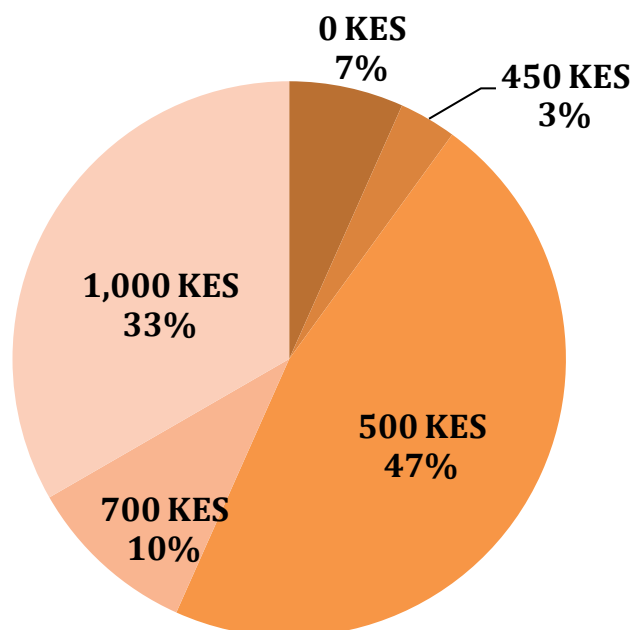


Figure 7 Most people paid 500 KES or above.

The majority of households (19 out of 30) opted, at no extra charge, to pay using the instalment plan of 50 KES per week. Of these 19 households, only one household thinks the weekly payment of 50 KES should be lower (reduced to 30 KES). Even though the vast majority of households consider 50 KES per week to be appropriate,

<sup>7</sup> At least one beneficiary received two Q Drums, and some beneficiaries' defective Q Drums were replaced.

only five households have actually completed all their payments. The remaining eleven households made their purchase with a one-off cash payment.

	Original plan	What happened in practice
Distribution model	<ul style="list-style-type: none"> <li>- Groups of five to ten women will rent the Q Drum to other women and children at a subsidised cost in order to generate income for their livelihoods.</li> <li>- 10% of the money raised through the rental system will be returned to YET to ensure sustainability of the project.</li> </ul>	Q Drums were sold directly to households for their own use
Q Drum users	Poor and marginalised women, including widows due to HIV/AIDS	Men and women representing households in Matungu
User selection criteria	<ul style="list-style-type: none"> <li>- Vulnerability of household</li> <li>- Distance from water source</li> </ul>	<ul style="list-style-type: none"> <li>- Connections with YET</li> <li>- First come, first served</li> </ul>

*Figure 8 The impact assessment found that the distribution strategy differed from the original plan.*



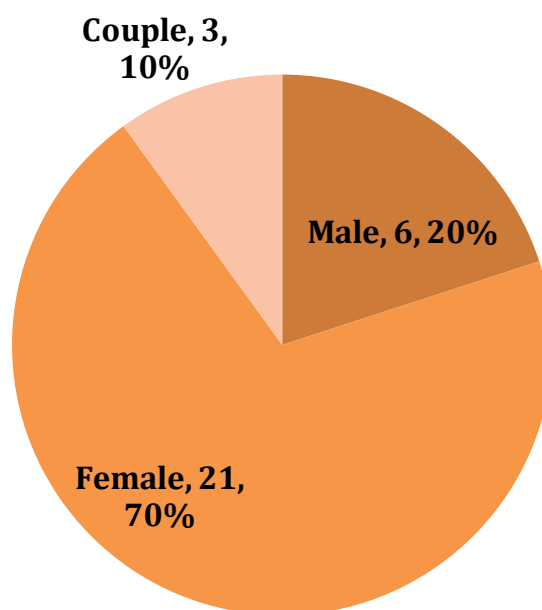
## Impact Assessment

### Process and Methodology

In collaboration with YET staff, a questionnaire that explored (i) the economic, social and health impact of the Q Drum and (ii) beneficiary satisfaction was drafted and refined after the first few interviews. 30 face-to-face interviews, lasting 30 minutes to one hour, were conducted over 11 days in March and April 2013. A YET staff member, who was present in all of the interviews, translated between English and Swahili in instances where people did not speak English.

Six men, 21 women and three couples represented the 30 households during the interviews.

Information was also obtained from field visits.



*Figure 9 Most of our interviewees were female.*

## Results of the Impact Assessment

### Socio-economic Impact

An overwhelming majority of households (28 out of 30) report that they save time every day by using the Q Drum (between 20 minutes and eight hours, median 2 hours). The majority spend this newfound free time on boosting household income, such as tending to crops and animals, and performing household chores. The remaining two households use the Q Drum only for storage purposes, hence maintaining the same number of trips and time spent per trip even after the purchase of a Q Drum.

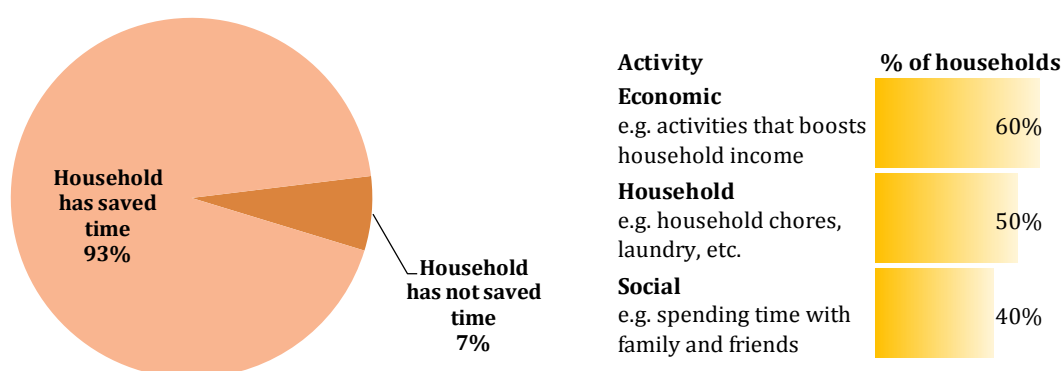


Figure 10 A summary of how households use the time they save collecting water.

Figure 11 A minority of households has not saved time because they use the Q Drum only for water storage.

Most households (23 out of 30) report that they are enjoying the use of more water, mostly on household chores, followed by personal hygiene, such as showering. Those who use less water report that they don't need to collect water so often, as the water they collect with the Q Drum can now be stored in a sanitary manner.

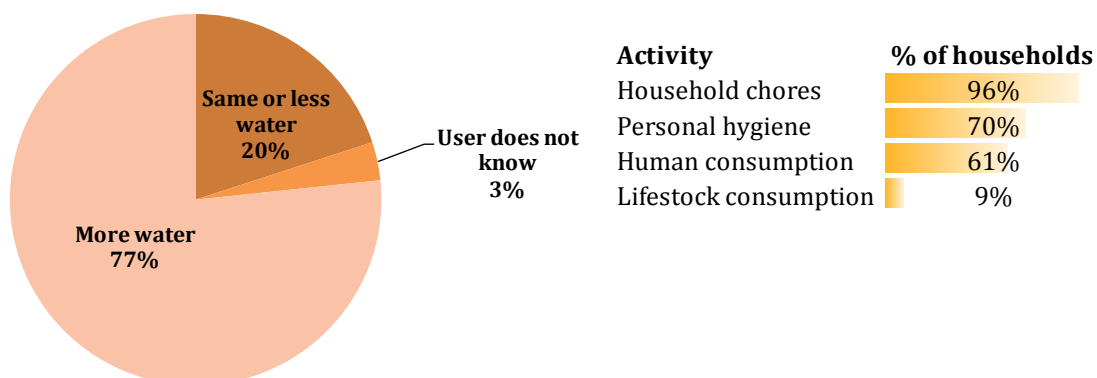


Figure 13 Relative quantity of water used after purchasing the Q Drum.

Figure 12 A summary of how the households use the extra water.

## Changes in Household Health

80% of respondents purchased the Q Drum because they consider it an easier way to transport water compared to their previous plastic containers. Our survey reveals that the Q Drum not only meets, but also exceeds this expectation (c.f. section Beneficiary Satisfaction). This is motivated by the fact that 70% of surveyed beneficiaries report that they suffered from pains caused by carrying weights on their heads, water being one of the loads carried every day.

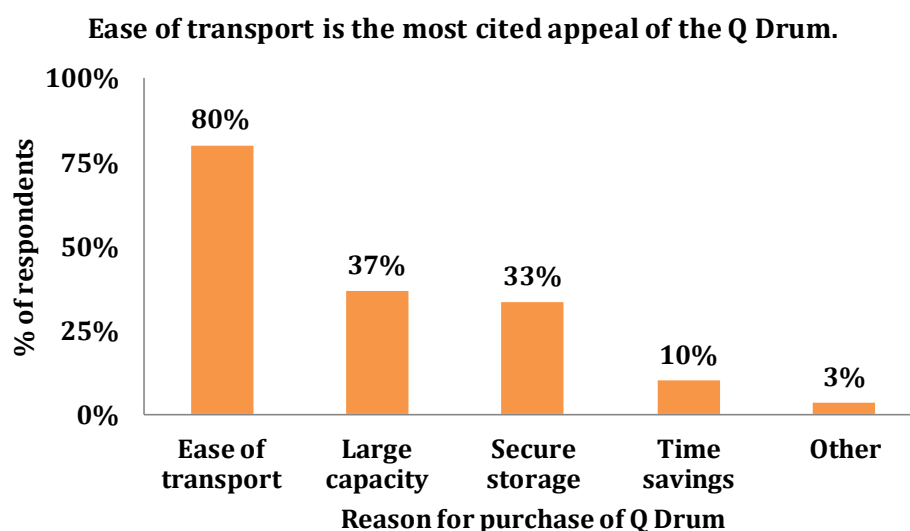
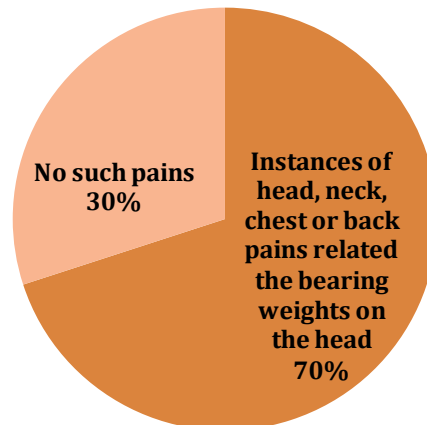


Figure 14 Reasons for purchasing a Q Drum.



*Figure 15 The majority (70%) of respondents suffered from upper body pains before using the Q Drum. All of these respondents report that the pains have been alleviated since using the Q Drum.*

While all respondents report that the Q Drum alleviates pains, it's important to note that the practice of bearing weight on one's head is deeply ingrained in the local culture and water is only one of the many things that people carry on their heads. While the Q Drum reduces the daily burden of carrying water, people may still be susceptible to back and neck injuries from carrying other items.



*Figure 16 Women in particular tend to carry most things on their heads; left: a woman balancing a wooden stool, a basket, a plastic container and an umbrella on her head; right: a woman carrying a jackfruit on her head.*



## Changes in Water Collection Habits

The majority of respondents get their water for free from a spring (fresh and running), a borehole (underground pool, covered or not), or both. Those who have access to both prefer to use water from the spring for drinking and cooking, and borehole water for uses other than human consumption, such as household chores like laundry and cleaning. A small number of respondents pay village collectors to get water for them when they do not have time to do it themselves. It is worth noting that the Q Drum's large capacity and tight lid have contributed to a reduction of the use of village collectors, and hence reduced the total number of water sources villagers use.

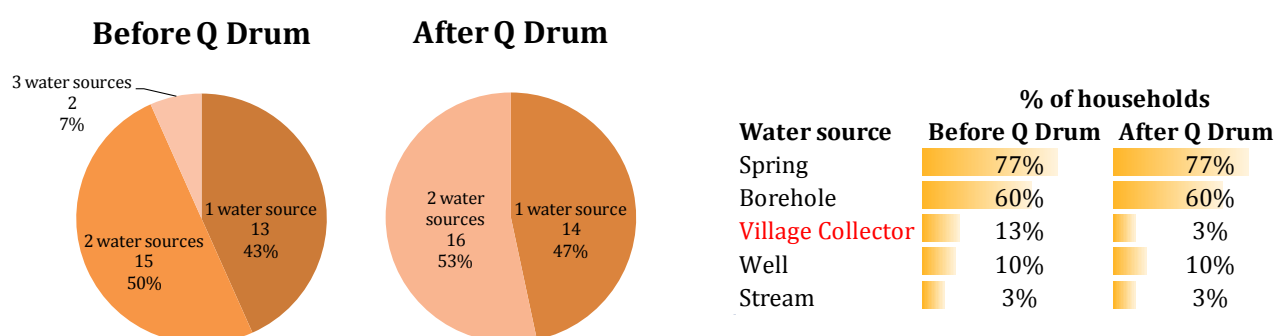


Figure 17 People now use two water sources at most, and only one person continues to pay the village collector.

Women and children are most commonly responsible for collecting water for their households. The survey reveals that this has not changed significantly after the adoption of the Q Drum. Two men have started to sometimes use the Q Drum to collect water, but it seems that their relative youth and their amusement derived from the novelty of the Q Drum are the real reasons behind the (probably unsustainable) change. In general, water collection is still very much considered a household chore to be performed by women. However, all households insist that their children never miss school to collect water.

- Of the 29 households that used yellow jerrycans to collect water before they purchased the Q Drum, the majority (83% or 24 households) now use only the Q Drum.

## User Satisfaction

All 30 households surveyed are happy to have purchased the Q Drum. In order to gauge the Q Drum's performance in more detail, the beneficiaries were asked to rate its different aspects on a scale of one (poor) to five (excellent). The ratings on the core features, namely the transport of water, followed by its storage, are very positive. The Q Drum scores an overall rating of 4.1, exceeding expectations on average.

**The beneficiaries find the transport and storage aspects of the Q Drum to exceed their expectations and deem it satisfactory overall.**

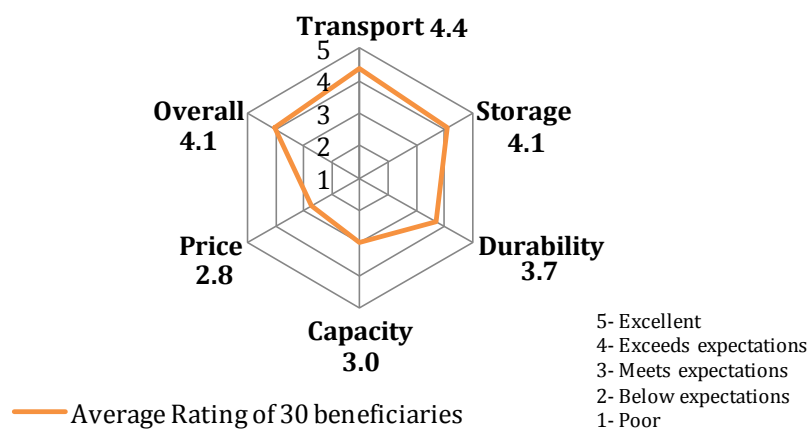


Figure 18 The Q Drum has an overall rating of 4.1.

A detailed breakdown of the different aspects is as follows:

**Apart from the 3 beneficiaries that do not use the Q Drum for transporting water, the vast majority finds it to exceed their expectations.**

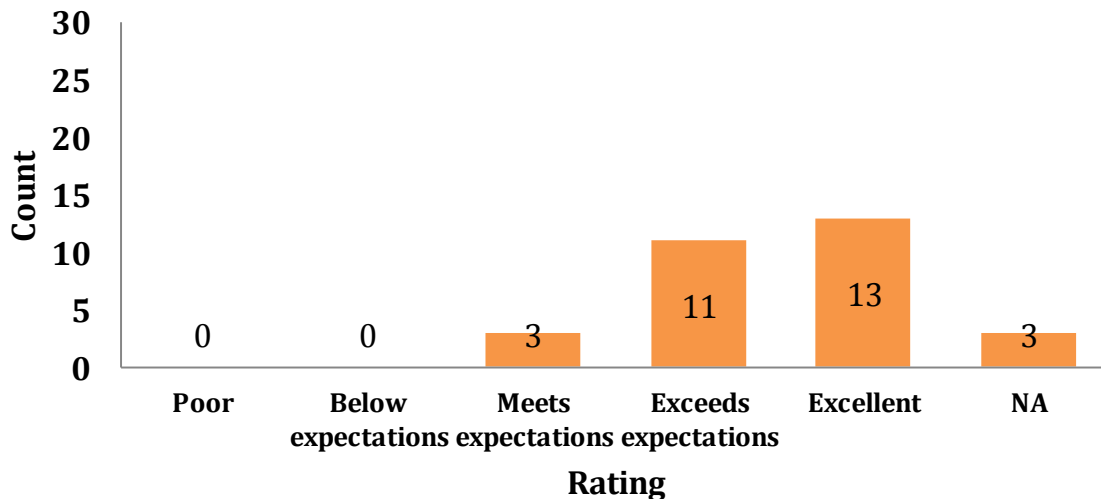
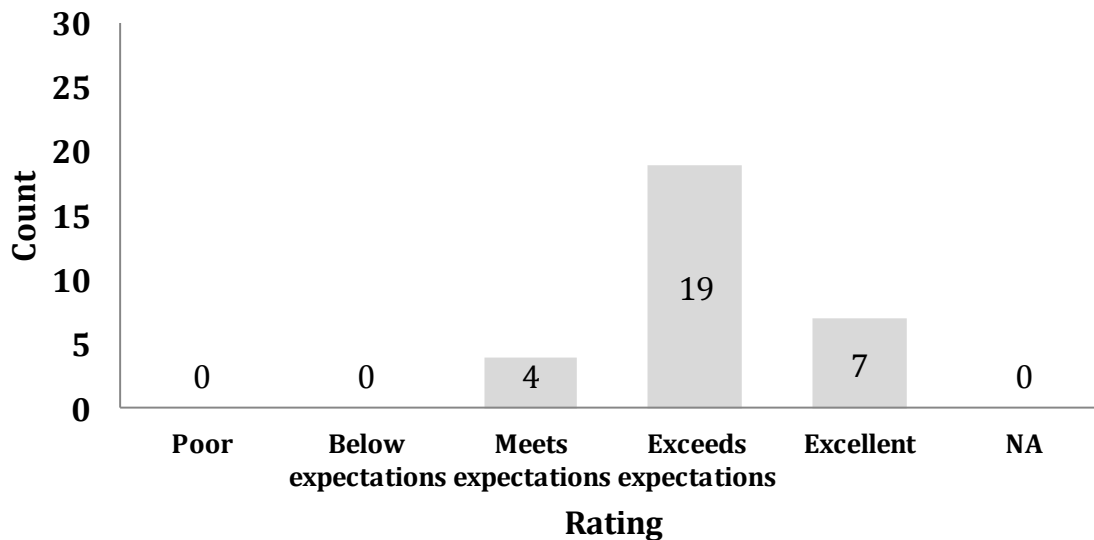


Figure 19 The average rating for the transport aspect of the Q Drum is 4.4.

The vast majority of beneficiaries (27 out of 30) use the Q Drum to transport water from the water source to their homes. As evidenced by the high average rating of 4.4/5, users report that using the Q Drum is a superior way to transport water compared to carrying 20 litre plastic containers of water on their heads. Not only does rolling the Q Drum prevent straining the head, neck and chest, its rolling motion is very energy efficient, especially on flat and downhill terrain, and hence makes it possible to carry more than twice the amount of water (ie 50L as opposed to 20L) than before while exerting less effort and in a shorter time. Two users even express that they “enjoy” using the Q Drum. Some say that it is “lighter than expected”.

**All 30 beneficiaries are satisfied with the **storage** ability of the Q Drum.**



*Figure 20 The average rating for the storage aspect of the Q Drum is 4.1.*

In terms of storage, the Q Drum is most lauded by beneficiaries for its lid that provides a very good seal. It effectively keeps out dirt and keeps the water clean. The screw-top lid fits so snugly that children cannot access the water, unlike alternative containers like clay pots and plastic jerrycans. Four households no longer fetch water every day in the rainy season as the water they collect can be stored and used over an extended period of time.

A second, unintended but much appreciated benefit of the Q Drum is that it keeps the water cool despite a high ambient temperature (provided that the Q Drum is stored under shade), possibly due to its thick walls. It is reported that local plastic containers do not keep water cool, and while clay pots can keep water cool, they are fragile and easily accessible to children.



While most beneficiaries consider the Q Drum to be of good **durability**, there are some instances of defects and leakages.

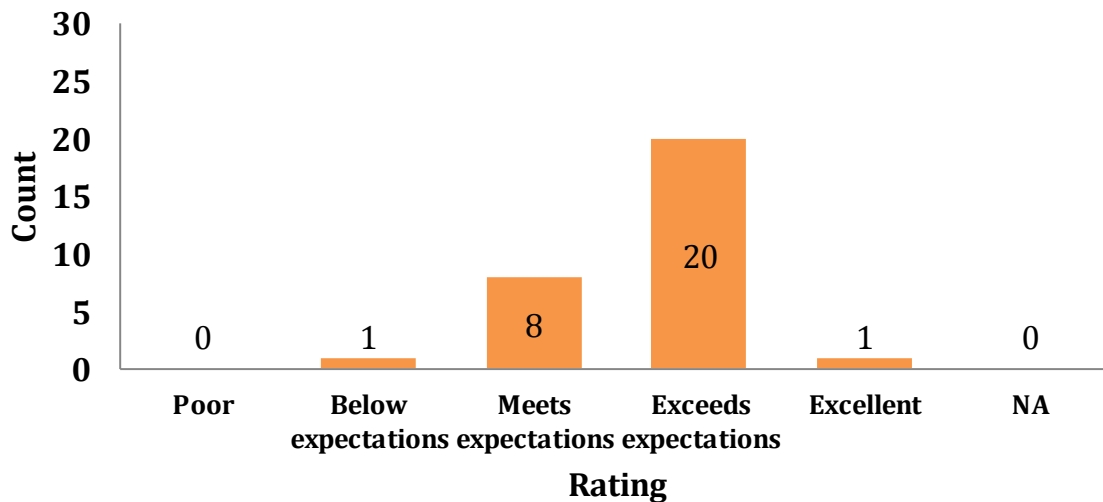


Figure 21 The average rating for the durability of the Q Drum is 3.7.

While the vast majority of people think that the Q Drum is more durable than their previous containers, six out of 30 (20%) have seen their Q Drums exhibit damage other than normal wear and tear, principally in the form of a leak at the seam on the outside of the Q Drum, mostly either during the first use or after a particular incident, such as going through a particularly rough patch of ground (as opposed to gradual deterioration).



Figure 23 One household fixed the leak by applying melted plastic to the leak.



Figure 24 Water leaks from the outer seam of a Q Drum.



Figure 22 A leak at the inside seam of a Q Drum is sealed by melted plastic.

Beneficiaries are divided with regards to the Q Drum's **capacity** of 50L: while the majority is satisfied, 40% prefers a higher capacity.

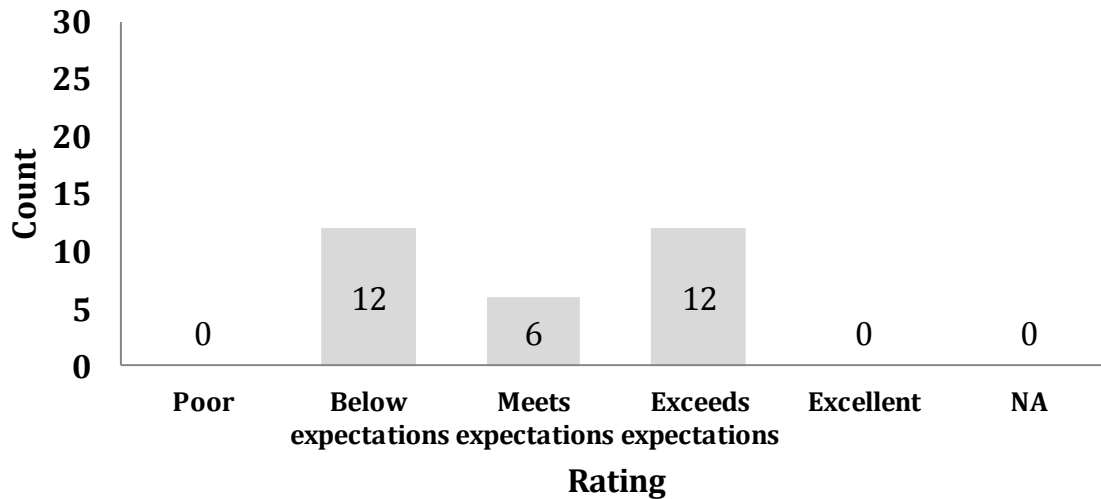


Figure 25 The average rating for the capacity of the Q Drum is 3.0.

Given the unparalleled storage capability of the Q Drum, 40% of the surveyed beneficiaries rate the Q Drum to be “below expectations” in terms of capacity because they would prefer it to be bigger. Most of these respondents think that 100L would be appropriate, despite the high weight. Further, many others report that, while they are happy with their Q Drum’s capacity, they would be willing to buy an extra, larger Q Drum (up to 100L) or a container of the same durability and security purely for storage purposes, and dedicate the original Q Drum to transporting water.

Despite high levels of satisfaction in all performance aspects, the **price** of the Q Drum is considered to be too high by 43% of beneficiaries.

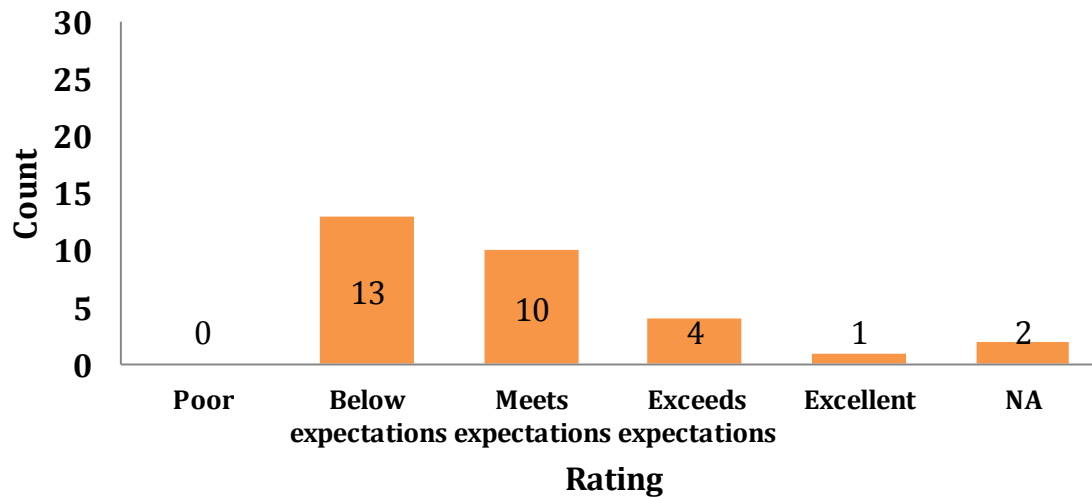


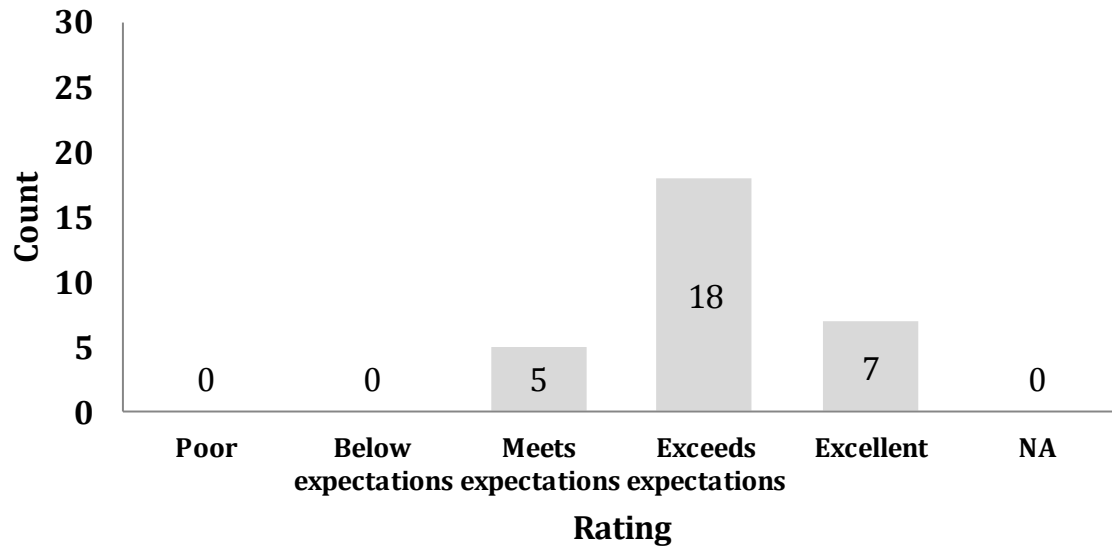
Figure 26 The average rating for the pricing of the Q Drum is 2.8.

		Rating						No. of beneficiaries
		Poor ☹️	Below expectations	Meets expectations 😐	Exceeds expectations	Excellent 😊	NA	
₹ ₹ ₹	1000	0%	60%	20%	10%	10%	0%	10
Price paid by	700	0%	100%	0%	0%	0%	0%	3
beneficiary	500	0%	29%	50%	21%	0%	0%	14
(KES)	450	0%	0%	100%	0%	0%	0%	1
₹	0	0%	0%	0%	0%	0%	100%	2
Overall		0%	43%	33%	13%	3%	7%	30

Figure 27 This figure summarises the prices paid by respondents and their respective opinion. A dark colour denotes that, for the same price, a high percentage of beneficiaries give it that particular rating. Note that at the time of writing, 1 USD= 85 KES.

The majority of customers who paid up to 500 KES were happy with paying that price. Above this threshold, the majority of respondents reported that they are unhappy with the price. It is worth noting that the higher price of 1000 KES was initially proposed to and accepted by households with more resources, and the price was adjusted downwards after this initial phase of distribution.

**Overall**, all 30 beneficiaries are happy that they bought the Q Drum.



In conclusion, all 30 users are satisfied with the Q Drum, which further confirms our findings that the Q Drum has made a positive, tangible impact on people's lives.



## User Customisations

The Q Drum is designed to have minimal removable parts and a simple structure in order to minimise the chances of it being misused or broken. Consequently, only a few user customisations were observed:

- (i) Some households tie a knot at the ends of the rope to permanently attach the rope to the Q Drum in order to prevent theft/ loss of the rope;
- (ii) One user scrunches up the rope in order to reduce its length so that the Q Drum is more stable when being pulled.



*Figure 28 A girl demonstrates how she shortens the rope to stabilise the Q Drum.*

## Alternative Uses

Despite the many potential uses suggested on the official Q Drum website (c.f. section IV.1 Overview of Technology), only one household uses the Q Drum to store goods other than water. Furthermore, three households use the Q Drum only for water storage and never for water transport, despite the latter being the principal intended use of the Q Drum.



*Figure 29 The Q Drum is an ideal container for peanuts as it effectively keeps out moisture.*

Currently, all households use the Q Drum to store the water they collect, meaning that they cannot use the Q Drum to collect more water or for other uses until they have used up the water already in the Q Drum. The vast majority of households would like to store more water in the house, as reflected by the following statistics: (i) at least 23 out of 30 surveyed households said that they would like to get more Q Drums and (ii) 43% would like the capacity of the Q Drum to be increased. It turns out that the users are so impressed with the storage ability of the Q Drum that they are reluctant to store water in their previous containers.

The fact that the versatility of the Q Drum has not been explored suggests that the value of the Q Drum as a water storage device is higher than that of its other uses, including its primary intended purpose, water transport. To extract maximum utility from the Q Drum:

- (i) Future projects and users may benefit from training in potential uses of the Q Drum (other than water transport and storage, which is the focus of this project's marketing efforts), such as the transport of common goods like peanuts, maize kernels and beans;



- (ii) Future projects might want to consider ways to maximise the transportation uses of the Q Drum by complementing Q Drum distribution with access to cheaper, secure water storage containers.

### The Q Drum in Western Kenya



*Figure 30 One way to flip the Q Drum is to simultaneously hold one side of the Q Drum down with your foot and pull the other side with the rope in a swift motion.*

### Observations from a field trip using a Q Drum:

- (i) Flipping a filled Q Drum is difficult due to the heavy weight and the lack of handles. Given that women and children are often responsible for water collection, it is important that they are taught how to perform the flip correctly so that they do not injure themselves.
- (ii) The lid can easily be lost as it is not attached to the body of the Q Drum. For instance, when we followed a respondent to collect water, they

realised only after five minutes of walking that they had left the lid at home as it was removed when the Q Drum was being emptied.

- (iii) Pulling the Q Drum over paths that are narrower than the drum causes it to flip. This phenomenon can be reduced by shortening the rope, which stabilises the Q Drum.
- (iv) Getting water out of the Q Drum can be a challenge as it is difficult to tip the drum while it is full of water. Many users dip a mug in the Q Drum through its opening. In one case, a plastic mug was stuck inside the Q Drum.

## Conclusions

This impact assessment reveals that, despite not being distributed in the manner suggested in the proposal, the Q Drums have made a tangible, positive impact on all 30 surveyed households:

- 93% have saved time every day using the Q Drum. The median savings are two hours per day, during which 60% of users engage in activities to boost household income, 50% in household chores, and 40% in social activities.
- 77% of respondents report that their family uses more water, with the main uses being household chores, followed by personal hygiene.
- 70% of Q Drum users suffered from upper body pains from carrying water on their heads. All of them agree that the Q Drum has helped alleviate this problem.



*Figure 31 A typical, open borehole and plastic containers used by locals to transport and store water.*

Overall, people are satisfied with the performance of the Q Drum and find it to exceed their expectations, in particular for transport and storage. However, while the

vast majority think that the Q Drum is more durable than their previous containers, 20% see their Q Drums exhibit damage other than normal wear and tear. This raises concerns about the defect rate of the Q Drum, and the training provided by our local partner on how to use and maintain the Q Drum. The latter might also play a role in explaining why the Q Drums are rarely used beyond collecting and storing water.

In light of the above, future Q Drum projects and users may benefit from:

- Greater awareness of how to maintain and use the Q Drum, including the many possible uses of the Q Drum, through training or by providing an illustrated brochure;

Complementing Q Drum distribution with access to cheaper, secure water storage containers, in order to to maximise the transportation uses of the Q Drum.



## Annex

### Case Studies



**40 year-old David Okwalo** is the head of a household of five. As a university graduate and someone that is actively involved in local NGOs, David is no stranger to appropriate technology. His family owns a biomass cooker and is participating in an economic empowerment programme centred on organic farming.

He remarks that the extra free time that comes with the purchase of the Q Drum has made a difference to every member of the family: his wife is able to take up more tailoring jobs and the children now have more time to do their school work and help with household duties. Last but not least, unlike most other men in the village, David goes to the spring to get water for his family. He explains that, since there are only two Q Drums in the village, it is a privilege and a mark of social status to be seen using the Q Drum. More importantly, there is no risk of looking “unmanly”, unlike carrying water on his head.



**Crescentia O'wang'ona, a 60 year-old mother and grandmother** recalls how she learnt about the Q Drum while working at her fish stall in Harambee Market. She tells us that she first heard about the Q Drum from a neighbour, who saw it and



immediately thought that it would be perfect for her, as she cannot bear heavy loads due to a knee disability.

Her face lights up when we ask her what she thinks of the Q Drum. She expresses that she now dedicates more time to her grandchildren and to her business as one trip to the spring with the Q Drum gets her five times more water than the small plastic can that she used. Not only does the Q Drum bring about extra time that results in a higher income and closer family bonds, she adds, “Now I don’t have to be selfish with water anymore. When the people at the church next-door pass by and ask me for drinking water on Sundays, I can offer them nice, cool water as opposed to turning them down!”

**31 year-old Caroline Akoth Akelo, a fishmonger**, lives with her husband, a petrol station attendant, and their seven children in Hamamali sub-location. Her home is



one kilometre from the closest spring, from which she gets water four times a day during the dry season. She prefers to use the Q Drum only for storage, as she finds that it provides an unparalleled airtight seal. During our visit, she shows us how it is an ideal container to keep legumes dry and away from pests. She sometimes also makes refreshing cold water for her family by mixing water and ice in her Q Drum.

## Sample Questionnaire

### 1. Introduction

Good morning! We are representatives from YET, the organiser of the Q Drum Project and Kopernik, the NGO that supplied the Q Drums. We would like to ask you some questions about your experience with the Q Drum. This information will help us understand your needs and consequently, improve our products. Can we talk to you for 45 minutes?

### 2. Household Information

1. Village
2. Sub-location
3. Full name
4. Age
5. Education background (Dropped out/ graduated from elementary school/ high school/ university/ no formal schooling)
6. Role in the household
7. Number of people in the household
  - of which children (specify if they are at school)
  - of which adults (specify if they work)
8. Sources of income of household
  - Eg: farming, business, labour/ irregular jobs, salaried employee, unemployed, other
9. Average household monthly income (KES)
10. What other appropriate technologies do you own?
  - Eg: Lighting, water filtration and transport, farming, health, cooking, etc.
11. What other NGO's do you work with other than YET? Specify name and domain.

### 3 Initiation and Participation

1. How did you hear about YET?
2. Eg: Approached by staff, from friends and family, etc.
3. Were you a beneficiary of YET before the Q Drum Project?
4. What other YET programmes are you participating in?
5. How did you hear about the Q Drum?
6. Eg: from YET, from others
7. Do you know about the partnership between Kopernik and YET? (No, because it was never explained.)
8. What information did you receive before you made the decision to buy the Q Drum?  
Eg: physical product, demonstration, pictures, oral description, etc.

9. Why did you want to buy the Q Drum? (What expectations did you have?)
10. What support did you ask for and receive after your purchase?  
Eg: demonstrations, repairs, questions
11. Who made the decision to buy the Q Drum?

#### **4 Social and Economic Impact**

Please specify the following for both **before** and **after** the purchase of the Q Drum:

1. Sources of water
  - Source: eg. spring, well, borehole, river, other villagers, bottled, etc.
  - Distance from home
2. Details of trip
  - Number of trips per day to each source during dry and rain season respectively
  - Roundtrip duration (leave home, queue, fill, go home)
3. Resources
  - Type of container and capacity
  - Number of containers used per trip
  - People responsible
  - Money spent to obtain water

Regarding the changes after the purchase of the Q Drum:

4. Have you gained more free time per day? How much? (triangulate with answers from 4.2 and 4.3)
5. What do you do with this newfound free time? (both social activities and economic activities)
6. Are you consuming more water per day? How much? (triangulate with answers from 4.2 and 4.3)
7. What do you use this new water on? (ex: household chores, personal hygiene, human/cattle consumption, etc.)

Please rate the Q Drum on a scale of 1 to 5. 1 being very poor, 3 average/ meets expectations, 5 being excellent, on the following aspects:

8. Transport ability
9. Storage ability
10. Durability
11. Size
12. Price (specify how much you paid and how much you think the price should be)
13. Ability to meet your expectations in general
14. Overall quality of product

If you participated in the instalment plan (50 KES/week):

15. Are you happy with the instalment plan? Did you have difficulties meeting the payments?
16. Have you finished your payments? If not, how much longer do you think it will take?
17. What changes would you like to see in order to make the instalment plan more appropriate to you?
18. Would you prefer a different business model? Instead of buying a drum for your household, would you rather:
  - Ex: Pay per use, lease, share with neighbour, etc.
19. At X KES (appropriate price as per user), how many Q Drums would you buy for your household?

## **5 Other questions**

1. Any other feedback
2. In what other domains in life would you like to receive assistance?
  - Eg: lighting, cooking, healthcare, etc.
3. What other appropriate technologies would you be interested in buying?

## **6 Visual check**

1. The number of Q Drums in the household
2. Where is it kept?
3. Is the rope still there?
4. Look for areas of uneven and excess wear and tear
5. Is it serving any purpose other than what is intended?
6. Look for modifications and customisations