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Social and Gender Analysis: Findings from the Inception Phase

by

Clare Bishop-Sambrook and Shakil Akhter

Presented at Inaugural Meeting of the Research Programme, Hambantota, Sri Lanka, July 2001

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This paper reports on the findings of the fieldwork conducted by the research partners during the Inception Phase of the DFID – funded project 'Very Low Cost Rainwater Harvesting in the Humid Tropics'. The purpose of the fieldwork was twofold:

- to identify social and gender issues that would be worthy of more in-depth analysis during the Main Study; and
- to establish the suitability of various Rapid Appraisal techniques for gathering information about water collection and use from social and gender perspectives.

The research partners undertook the fieldwork during January and February 2001. Two rural locations were studied in Uganda, three urban locations in Ethiopia and one urban community in Sri Lanka. Individual interviews were conducted in 22 households.

The findings from the social and gender analysis are relevant to the DRWH project in three principal areas: to the engineering component, in terms of the design and construction of DRWH systems; to aspects of project management in terms of disseminating DRWH systems, likely rates of uptake and their sustained use; and as development practitioners for addressing issues of poverty and gender disparities.

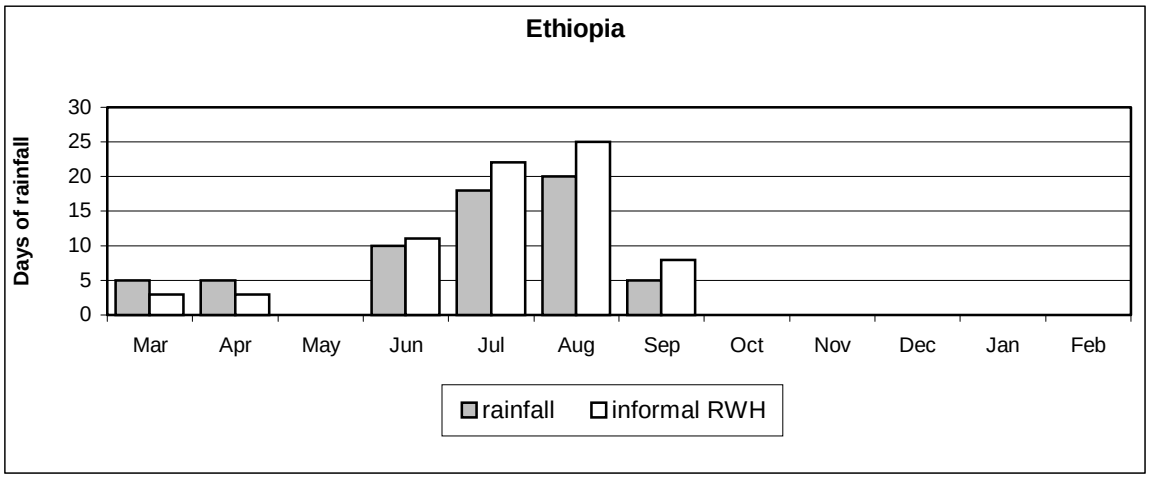
The findings are presented in six sections, covering rainfall patterns, water collection and water uses, communities' experiences and interest in rainwater harvesting to date, gender analysis and poverty analysis of water collection and rainwater harvesting. The final section discusses the implications of the gender and poverty analysis for the focus of the research to be conducted during the main study, as well as the manner in which this research will be conducted.

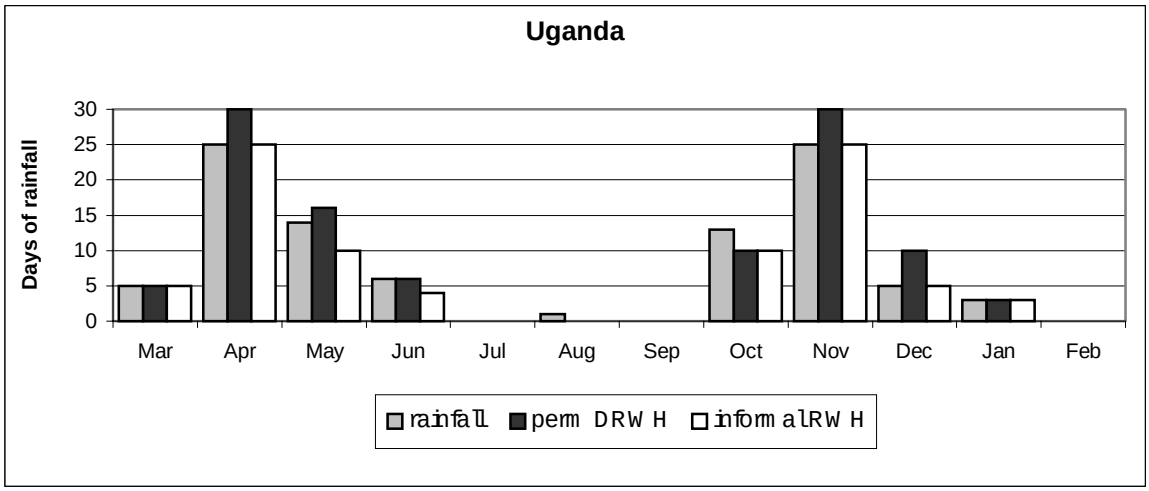
1. Rainfall and Patterns of Water Collection

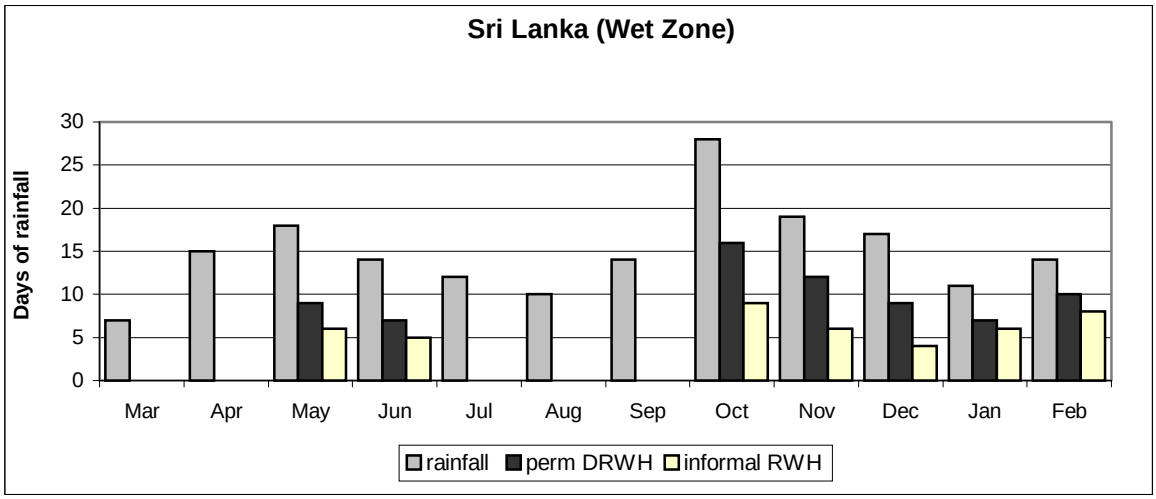
In Ethiopia, the rainfall is unimodal. The survey sites in Sri Lanka and Uganda experience bimodal rainfall but the distribution and intensity of rain (in terms of the number of days on which it rains each month) varies (Diagram 1). The main rains in Ethiopia fall from June to September, followed by five dry months. Uganda experiences two rainy seasons of similar duration and intensity: March to June and October to January, with three dry months in between. In the Wet Zone in Sri Lanka rain falls throughout the year, with peaks in October to December, and April to May.

The rainfall pattern has a direct bearing on the use of rainwater by season. The use of rainwater would appear to be most widespread in Uganda, where permanent and informal systems are used throughout the rainy seasons. Among the survey communities in Ethiopia, where there is no use of permanent DRWH, informal RWH is most significant during the heavy rains. In Sri Lanka, although rain falls throughout the year in the Wet Zone, rainwater harvesting is also most popular during the months in which the rainfall is heaviest.

Diagram 1: Rainfall Distribution in Survey Communities







2. Water Sources and Uses

2.1 Water Sources

(i) Rural communities

During the wet season in Uganda (Mbarara District), rock tanks are the main water sources; they are located within 1 km from the communities and the return journey time is completed within 1 hour 45 minutes. During the dry season, people have to travel much further to a spring or lake, 4 km and 11 km respectively, with a return journey time of between 5 to 7 hours over fairly steep/steep terrain covered in loose stones. There are many hazards associated with collecting water from the springs and lake, including attacks by wild animals, sharing the water source with livestock, falls, and personal assaults. All water sources are owned in common and no charges are levied.

(ii) Urban communities

All three communities surveyed in Ethiopia have access to three water sources: standpipes (from boreholes) are used throughout the year, the river is used during the light rains (February to May) and rainwater is used during the heavy rains (July to September). The standpipes are very close to the homes (200 – 300m) and travelling time is no more than 15 minutes. The rivers are 2 to 6 km away from the homes, the terrain is steep and muddy in the wet season, and journeys take up to 1 hour 45 minutes one way. Falls and road accidents are the principal hazards faced en route to the river.

Queuing times at the standpipes in Ethiopia varies considerable between seasons and communities. In one community, queuing takes four days during the dry season; to minimise conflicts a numbering system has been introduced to mark the position of pots and jerrycans in the queue. None of the sources have experienced pollution. All standpipes are under the administration of the town council and a charge of between US $ 0.05 to 0.1 per jerrycan is levied.

In Sri Lanka, the survey community has access to three tube wells throughout the year and two dug wells which are used in all but the driest month (August). Travelling time to the water sources varies from 10 to 15 minutes over flat land and short distances (350m), up to 25 minutes when the gradients are steeper and the distance slightly further (500 m). Falls and road accidents are hazards associated with two of the sources.

Queuing times in Sri Lanka vary from 30 minutes during the wet season at any of the sources, to between one and two hours during the dry season at the tube wells. Whilst the tube wells are more reliable throughout the whole year, the dug wells are more reliable during the times of the year when they are in use. None of the sources have experienced pollution. All are under common ownership and no charges are levied.

2.2 Preferences for Water Sources

Communities use a range of criteria to determine their preferences for water sources (Table 1); proximity, accessibility, and quality of the water are among the most important. The Ugandan community is also concerned about the risk of accidents (such as attacks by wild animals or assault or abuse) and the physical appearance of the water (turbidity) whilst the Sri Lankan community is interested in the quantity of water available. Water charges are only cited by the Ethiopian communities, where they are levied at standpipes.

Table 1: Criteria Used to Determine Preferences for Water Sources

Country	Preferences		
	First	Second	Third
Ethiopia - urban	**Bore hole**: safest water quality (good for drinking and cooking), reasonably close and accessible to community but user cost levied	**Rain water**: closest to the home and very accessible, no cost, soft water (minimises use of soap)	**River**: least attractive on all counts (quality, distance and accessibility) but useful when the public system fails
Uganda - rural	**Rock tank** (wet season): closest to community along a good path with least risk of accidents, best taste (not hard, not mineralised) but poor physical appearance (turbidity) **Spring** (dry season): closer to community than lake but poorest quality water (taste), very steep gradient with loose stones	**Lake** (dry season): least popular because furthest from community and highest risk of accidents en route, fairly steep terrain with loose stones; but best physical appearance of water	
Sri Lanka – urban	**Dug well**: short distance, good quantity, good quality, reasonable access	**Tube well**: average distance, quantity and quality but least accessible	**Rain water**: closest to home, easiest access but poorest quality and small quantity

The attractions of rainwater are its proximity to the home and accessibility. Moreover, for the Ethiopians who have to pay for collecting water from other sources, they value the fact that rainwater is available at no charge. Whilst the Ethiopians also appreciate the soft quality of rainwater, the Sri Lankans rank rainwater as the lowest quality and is available only in small quantities.

2.3 Water Vendors

Vendors are most widely used in Uganda and Ethiopia. The majority of Ugandan households use water vendors during the dry season (June to September) when it is tiring to walk long distances to fetch water, or when water is needed urgently. Purchases may take place daily during severe dry periods. Prices may double during this time, from 250/- to 500/- per 20 litre jerrycan (from US $ 0.14 to $ 0.28). Vendors source their water either from their own water storage tanks, or collect it from the lake or spring by bicycle.

Most of the Ethiopian households (90%) rely upon water vendors throughout the year for a variety of reasons, such as scarcity of supplies at public fountains or other water points, failure of water supply systems, avoiding queues and saving time. Only two Ugandan and one Ethiopian households did not purchase water from vendors on the grounds that it is expensive.

In contrast, water vendors are not widely used in Sri Lankan households unless there are many people staying in the house and it is difficult to collect sufficient water.

2.4 Storage of Water

(i) Rainwater

Storage capacity varies according to the nature of the rainwater harvesting system. In households with permanent DRWH, storage capacities are substantial and the duration of rainwater use extensive: 6000 litre ferrocement tank: 245 days (Uganda); 40 m^3 stone masonry tank: 190 days (Uganda; this person also sells water to others in the village); and 1200 litre tank: rainy season plus one month (Sri Lanka). Non permanent systems are characterised by much smaller storage capacities, with an average of 150 litres per household.

(ii) Other water

The majority of households surveyed (73% total) do not store water outside the rainy season. The main reasons given include:

- the volume of water collected in one day is only sufficient to meet the immediate needs for that day (this response is independent of household size) (Uganda)
- non rainwater is highly mineralised and not worth storing (Uganda)
- insufficient storage containers
- the water source is close to the house (Sri Lanka) or the house has a piped supply (Ethiopia)
- daily water quota from the borehole (50 litres) is too small to permit storage (Ethiopia).

A few households store water overnight throughout the year to cover activities which take place in the early morning and require water (Uganda), or for holidays and special occasions (Ethiopia). In Sri Lanka two households store water regularly for two to three days, using 200 litre barrels.

(iii) Storage facilities

Most urban households would prefer to store one large quantity of water (1000 litres) outside the house and above the ground. The exceptions come from Sri Lanka: one household would prefer to store small quantities and another prefers a one metre diameter pit. Only one tenant from Ethiopia indicated that it would not be possible to construct a store because of their tenure status; the other two tenant households did not raise this point.

2.5 Water Collection

The volume of water collected per household varies between:

- seasons
- family size
- health of the people involved in water collection
- other demands on water collectors' time (eg working in the gardens)
- distance to the water source
- amount of water available at the source
- availability of water collection containers
- size of storage containers in the home
- money available to purchase water (Ethiopia)
- activities taking place in the home (cooking, cleaning etc)
- holy days

Nearly all households have to fetch at least some water every day, even during the wet season, including all those with no or limited storage capacity. However, even in some households with significant storage capacities, daily water collection is necessary because rainwater is used selectively. In Sri Lanka, for example, the households surveyed only use rainwater for sanitary purposes whereas rainwater is used much more extensively in Uganda and Ethiopia (see section 2.6 below). In Ethiopia, households substitute rainwater for water from the standpipes and collect less during the wet season (Table 2). In Sri Lanka water consumption also rises during the wet season but this is achieved by collecting more water from the wells.

Table 2: Volumes of Water Fetched and Used Each Day

Per household	Ethiopia		Sri Lanka	
	Wet season	Dry season	Wet season	Dry season
Total volume of water fetched/day	80 litres	100 litres	135 litres	90 litres
Total volume of water used/day	125 litres	100 litres	135 litres	90 litres

During the rainy season some households are in a position that they do not need to collect water every day. These range from one household with a piped water supply (Ethiopia), one with permanent DRWH and a 6000 litre tank (Uganda), two with limited storage capacity of 160 – 180 litres, to one household with only 50 litres storage. The latter, an Ethiopian household headed by an elderly woman, is also constrained in purchasing water by monetary considerations.

2.6 Water Use

The amount of water used in the home varies by season, with up to 50% more water being used during the wet season (from a household average of 90 to 100 litres per day in the dry season, to 125 to 135 litres in the wet season) (see Table 2). Factors, other than season, influencing the amount of water used include:

- the number of people in the house on the day (for drinking, eating and sanitation)
- the presence of sick or elderly people

- the number of infants (more clothes to be washed)
- cooking specific foods or drinks (for example, baking *injera* and preparing *tela* in Ethiopia)
- religious observance (eg during Muslim prayers in Ethiopia).

All households consider drinking and cooking to be the most important use of water. These activities also consume considerable volumes of water. Washing dishes is also important but fairly light on water use. Other activities which are water intensive often take place intermittently and are performed at the water source, such as bathing, washing clothes and watering livestock.

The use of rainwater differs considerably between the countries (Table 3). The most popular uses of rainwater in Uganda are for cooking, drinking and washing clothes, whilst in Ethiopia rainwater is used most frequently for washing clothes and dishes. Amongst the sample interviewed in Sri Lanka the only use noted for rainwater is for sanitation purposes. However, it is understood that in other parts of the country rainwater is also used for other purposes.

Table 3: Uses of Rainwater
(% of respondents using rainwater)

Activity	Ethiopia	Uganda	Sri Lanka
Cooking	44%	100%	-
Drinking	22%	100%	-
Washing dishes	56%	60%	-
Washing clothes	78%	100%	-
Sanitation	-	-	100%
Bathing	11%	40%	-
Cleaning house	22%	-	-
Total	100% = 9	100% = 5	100% = 3

2.7 Coping with Water Shortages

All households experience water shortages during the dry season when traditional sources become depleted. In addition, shortages are experienced in Ethiopia when the public water supply system fails or the slow sand filtration unit is changed.

Households respond by changing their water collection habits. They switch to alternative (usually more distant) sources, collecting water from rivers and small pits adjacent to streams (Ethiopia), purchasing water from vendors (Ethiopia and Uganda), begging from neighbours with tanks (Uganda) or storing water. More household members (such as husbands and the elderly) assist with water collection (Uganda).

Households also respond by using water more economically, prioritising their uses for drinking and cooking purposes. Some activities may be omitted during the dry season (such as cleaning the house, washing clothes and bathing) and any stored water is strictly rationed (Uganda).

3. Experiences of Domestic Rainwater Harvesting

About 14% of all the sampled households had already installed a permanent DRWHS (2 in Uganda and 1 in Sri Lanka, but none in Ethiopia). Among the remaining 86%, 27% of the households have neither considered, nor would be interested in having a DRWHS. This reluctance has been traced largely in Ethiopian households, while none of the Ugandan households have expressed this attitude. Another 27% have not yet considered but would be interested in having a DRWHS. Encouraging enough is the fact that the highest proportion (32%) of households have actually thought of and would be interested in a permanent DRWHS. About 70% of them are Ugandan and the remaining are Ethiopian. The following sub-sections discuss these issues in greater detail.

3.1 Households with Permanent DRWHS

All the households having a permanent DRWHS are MHHs. They have expressed their clear contentment in having the system, both as an occasional main or only source of water for household uses, and also as a complementary source at other times. The largest tank was found in Uganda (40 m^3), established back in 1993. The other Ugandan tank was also of some considerable size (6 m^3), established recently in 2000. The Sri Lankan tank encountered in the inception phase survey was relatively much smaller in size (1.2 m^3). Water holes and rock tanks were the alternative water sources for the Ugandan households, while the Sri Lankan DRWH household relied upon dug well or tubewell besides the tank. Neighbours with tanks have adviced the Ugandan households, while the Sri Lankan household did not receive any advise in installing his DRWHS.

3.2 Other Households

The interest of households not having a permanent DRWHS has also been explored in this study. In Uganda, there was no household who has neither thought of, nor interested in a permanent DRWHS. One household expressed the interest of adopting a permanent DRWHS, though he has not thought of it earlier. It was a MHH, the head being of middle age (34 years), having a family of 6, and doing farming for livelihood. He did not thought of a DRWHS because his house has got an unsuitable (soft) roof, and he did not have the money either to improve the house, or to install a DRWHS. The other Ugandan households (50% of the Ugandan sample) not having any permanent DRWHS, have actually thought of DRWHS and would be interested in adopting a system. Most of them are MHHs, middle aged farmers. Their family size varied from small (4 members) to very large (14 members). There was one young (24 years) FHH with a family of 5. The major reason for their not having a system is lack of money.

Half of the Ethiopian sampled households have neither thought of, nor are interested in a DRWHS. The FHHs are headed by elderly housewives. One MHH is headed by an elderly daily labourer. All of them have expressed the lack of financial resources as their cause of aloofness from DRWH. The other MHH was headed by a middle aged merchant, having private water connection and thus feeling no need or interest of DRWH. 30% the sampled Ethiopian households had no permanent DRWHS, but would be interested to have one. Two were FHH and the other was a MHH. One female was a young cashier and the other was an elderly housewife. The male's occupation could not be identified. One Sri Lankan household has neither considered, nor is concerned in a

DRWHS. It was an elderly FHH of two. Other two Sri Lankan households have not thought of a DRWHS but would like to adopt the system. Both are MHH. One is a vendor supporting a family of four and the other one is a mechanic having a family of six

The issues that were in the non-DRWH households' mind were the cost of the materials and labour, source of financial and technical support and possibility of joining a credit scheme. The factors that they thought as important before introducing DRWHS include: type and size of one's house, roof catchment size, material and labour requirement, household water demand and thence tank size and location of tank (Uganda); preparing a place for construction of tank; changing the catchment area, i.e., the roof; arranging materials for construction of the system and saving money for construction of DRWHS (Ethiopia). The Sri Lankan households have not expressed any concerns in this regard.

These households have expressed their expected benefits out of a DRWHS as:

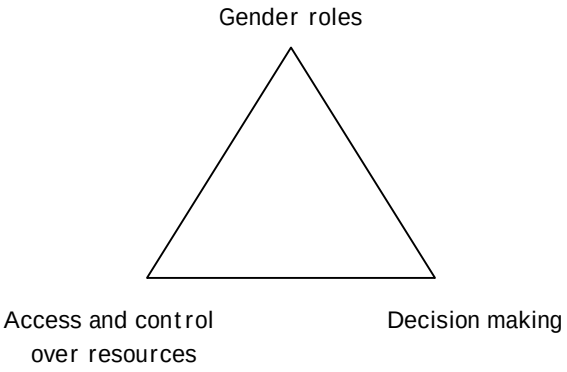
- saving the burden of walking long distance for carrying water;
- improved quality and quantity of water at doorstep;
- reduced risk of accidents, assaults and abuse for the family;
- money used for buying water can be diverted to other uses;
- reduced expense on medical grounds;
- solution to the problem of water shortage;
- get additional water for household use;
- save time in fetching water;
- improve the overall quality of life.

They would utilize the time saved by using DRWHS in diverse productive activities including, attending village and other meetings; getting involved in leisure activities like sports; devoting more time to study.

4. Gender Analysis

This section reviews issues associated with water collection from a gender perspective. It is structured around three core features of gender analysis (Diagram 2). The section concludes with an overview of likes and dislikes associated with collecting water.

Diagram 2: Framework for Gender Analysis



4.1 Gender Roles

The nature of the task of collecting water is time consuming, occurs on a daily basis, and fragments the use of people's time (several journeys are made each day). It is physically demanding, particularly on the return journey, and becomes more burdensome during the dry season.

Women and girls usually perform the task of fetching water. However, their relative contribution, and that of men and boys, varies between cultures, water sources and season. In an urban community in Ethiopia, the task is evenly divided between women and girls (each accounting for 40 - 50% of collection activities), with men and boys participating to a small extent (10%) (Table 4). Between one and half to two hours are spent each day in fetching water, with half of that time spent queuing at the standpipe (Table 5). All journeys are on foot.

Table 4: Fetching Water
(% of people collecting water from each source)

Performance of task	Ethiopia	Uganda		Sri Lanka
		Wet season	Dry season	
Women	40%	80%	37%	80%
Girls	45%	15%	4%	10%
Men	5%	1%	25%	5%
Boys	5%	1%	4%	5%
Water vendors	5%	3%	30%	-

Table 5: Daily Activities Associated with Fetching Water

Per household	Ethiopia		Sri Lanka	
	Wet season	Dry season	Wet season	Dry season
Number of journeys/day	2	2	3	3
Total travel time/day	1 hour	1 hour	1.5 hours	1.5 hours
Total queuing time/day	0.5 hours	1 hour	1.5 hours	3.5 hours
Total time spent fetching water/day	1.5 hours	2 hours	3 hours	5 hours

In the urban community in Sri Lanka, women bear the burden of water collection (responsible for up to 80% of total collection), with some support from girls (10%) and the balance from men and boys. The time burden of water collection is significant, with up to five hours spent collecting water in the dry season; much of that time is consumed queuing at tube wells. Women and girls may travel on foot or by bus; men and boys may also use bicycles or motorcycles.

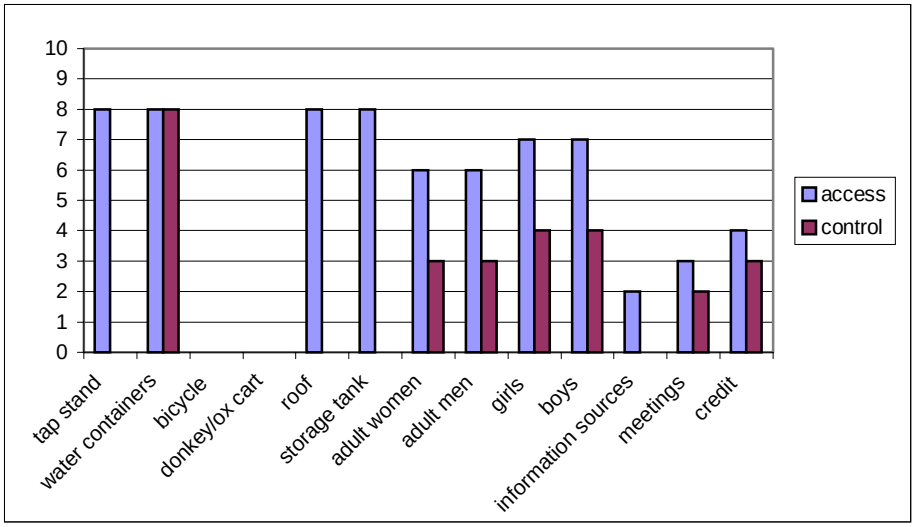
Men are most active in collecting water in the rural community in Uganda: they assist with fetching water from distant water sources used during the dry season (lake or spring) (accounting for 25% of water collection activities). Nevertheless, women still account for over one third of water collection activities from these sources. These sources are also important for water vendors. Children are not very involved with collecting water from distant sources. During the wet season when water is collected from rock tanks close to the community, women are the principal carriers (80%), along with girls (15%); there is almost no contribution from men and boys. Women and girls usually travel on foot. Men, including vendors, use bicycles when the terrain permits; boys either walk or cycle.

4.2 Access and Control over Resources

The resource base of women and men differ significantly, in terms of the resources they are able to use (access) and those which they control (that is, with full authority to make decisions about the use of a resource). These points are illustrated in Diagrams 3 and 4, demonstrating differences between women's and men's access and control over resources associated with water collection from a community in Ethiopia.

Women typically enjoy high levels of use of resources associated with water collection, such as tap stands, water containers, roofs and storage tanks (Diagram 3). They also have good access to labour to assist with water collection, particularly girls and boys. However, they have no access to any means of transport, such as bicycles or animal drawn carts. Similarly they have very limited access to sources of information, meetings and credit. In contrast with their high levels of access over essential resources, women have almost no control over these assets, with the exception of water containers.

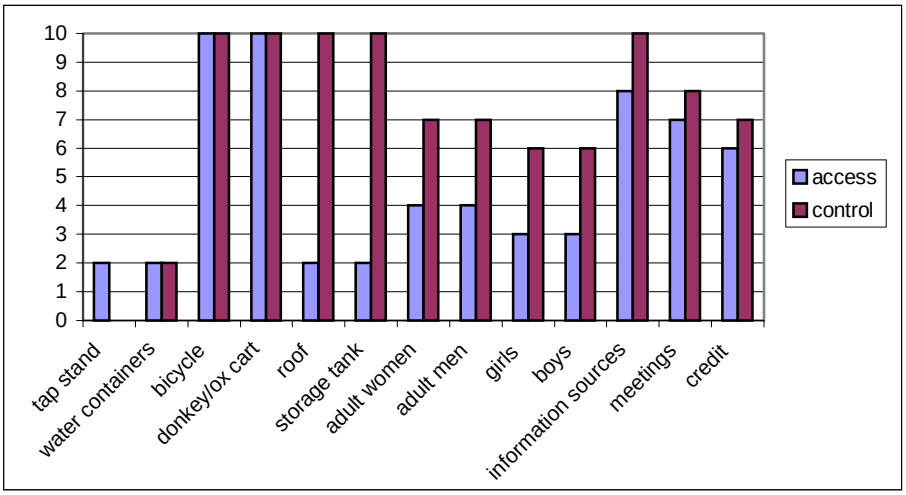
Diagram 3: Women's Access and Control over Resources, Ethiopia



NB A maximum of 10 points was allocated between women and men to represent their relative access to, and control over, each resource listed. A score of 10 for access indicates that that person has sole access to a particular resource, whereas a score of 5:5 would indicate women and men enjoy equal access. A similar procedure is adopted with regards to control.

Men are resource rich, dominating the control of nearly all resources available at the household level (Diagram 4).

Diagram 4: Men's Access and Control over Resources, Ethiopia



4.3 Decision Making

Women are usually responsible for deciding which source of water to use, how much water to collect, and how to cope during periods of water shortage. A few households in Uganda indicated that the male head of the household makes these decisions and another indicated the selection of the water source is a joint decision between husband and wife.

Even though women play the principal role in the day to day decisions regarding water, men usually control the decision to introduce permanent DRWH systems into their household. However, once installed, wives usually have responsibility for the system. The exception is female headed households where women take all these decisions.

4.4 Likes and Dislikes of Fetching Water

All respondents noted at least one dislike associated with fetching water, in particular the time consumed in this activity which could be put to other uses (Table 6). All Ugandan households dislike the long distance to the water source which is tiring, particularly when carrying water; many are also concerned about the risk of accidents (such as children drowning in the well, children developing bad habits from others, women and girls being raped, and attacks by snakes and other wild animals). In Ethiopia concern focuses around the long queues at the standpipes which sometimes result in conflicts and queue jumping. In Sri Lanka, people dislike the time they spend fetching water and carrying heavy loads.

Table 6: Likes and Dislikes of Fetching Water

Likes	Dislikes
❖ socialising with others, sharing experiences ❖ unlimited access to water from natural sources (no rationing)	❖ tiring due to distance, terrain and weight of water ❖ waste of time due to long distance and queuing (particularly in dry season) ❖ less time for other productive activities ❖ waiting a long time when the standpipe tap attendant is late ❖ risk of assault, rape, abuse, accidents ❖ fear of wild animals (snakes rampant in dry season) ❖ risk of children drowning ❖ children develop bad habits from mixing with others ❖ theft of containers ❖ limited number of containers and carriers (bicycles) ❖ conflicts if the water is scarce

Three quarters of the respondents were unable to note any reasons why they liked collecting water. However, a few enjoyed socialising with their friends at the water source, as well as the opportunity to exchange experiences and share ideas. It is relevant to note that this response may be influenced by the sex of the respondent; female headed households were more likely to record some positive aspects of water collection than male respondents. Hence this question should be addressed to those people responsible for collecting water, not necessarily the head of the household (who is usually male and may not have direct experience of water collection).

5. Poverty Analysis

There are marked associations between socio economic characteristics of the household and the practice of DRWH. An example from a rural Ugandan community is presented in Table 7. Only 6% of the households in the community have permanent DRWH systems; they are typically commercial banana farmers, owning several cattle and a range of household assets. Whilst they do not participate a lot in community activities, they regularly attend meetings and training courses, belong to groups and

enjoy good access to credit. Both husband and wife have completed upper primary school.

At the other extreme, households with non permanent roofs usually farm on a very small scale, growing bananas and beans for subsistence purposes. Their sole income source is based on subsistence agriculture, although some of these households do receive remittances from family members living elsewhere. They have very few assets and do not own any water storage containers. Whilst these households have a high degree of participation in community activities, they are under represented amongst groups and on committees, have no access to information sources and extremely limited access to credit. Adults in the household have attained minimal standards of education.

There is little association between female headed households (FHH) and use of non permanent RWH systems; however, there are no FHH amongst those households with permanent DRWH systems.

The most marked association would appear to be between those households with impervious roofs and those without, rather than those with permanent DRWH and those practising opportunistic rainwater harvesting.

Table 7: Socio Economic Characteristics of Households and the Practising of DRWH, Uganda

Characteristics	Households with permanent DRWH	Households with hard roofs but no permanent RWH system	Households with soft roofs
Number of people living in house	10	6	10
Number of children	8	4	6
Main economic activities (farm/off farm)	Fairly large commercial farm (bananas)	Subsistence farm (bananas, vegetables)	Very small subsistence farm (bananas, beans)
Number of livestock	5 cattle	A few	None
Income sources – men	Cultivation, livestock, local brew	Cultivation, livestock, local brew	Cultivation
Income sources - women	Cultivation, local brew	Cultivation, saloon, local brew	Cultivation
Remittances	No	No	Yes
Type of house (materials of floor, walls, roof)	Mud or cement floor, brick walls, iron sheets	Mud or cement floor, mud and poles walls/ bricks, iron sheets	Mud floor, mud and poles walls, thatch roof (grass or banana)
House ownership	Yes	Yes	Yes
Assets in household (radio, bicycle, etc)	Common	Rare	Very rare
Water containers	Permanent cement tank	Clay pots; barrels -rare	None
Education of adult male	Upper primary	Upper primary	Mid primary
Education of adult female	Upper primary	Upper primary or lower secondary	Lower primary
Participation in community activities	Average	Very high	Very high
Attendance at meetings and training	High	High	Average
Membership of groups and committees	High	High	Minimal
Contact with information sources	Average	Average	Nil
Use of credit	Good access	Limited access	Little access
Number of houses in community in each category (277 = 100%)	17 (6%)	230 (83%)	30 (11%)
Number of FHH in community in each category (25 = 100%)	0	22 (88%)	3 (12%)

Similar patterns are observed in Ethiopia and Sri Lanka. In Ethiopia, those households with permeable roofs (usually old iron sheets) have less diverse sources of income (mainly brewing local alcohol or engage in petty trading) than households with permanent roofs (farming, rental income from the house, working in town, trading in pepper, making and selling local food and drinks, or running a pharmacy). In Sri Lanka, the household with permanent DRWH receives remittances from one family member working in the Middle East.

6. Implications of Social and Gender Analysis

The main findings from the social and gender analysis of activities associated with water collection and use are summarised in Table 8. The existing position of women and men with regards to their active participation in water collection, their access and control over resources, and participation in decision making is recorded in the left hand column. The socioeconomic characteristics of households with and without permanent DRWH systems are also noted. The implications of these findings for the design, development and promotion of DRWH systems are recorded in the right hand column.

From the fieldwork findings, there are four principal socioeconomic and gender questions to be addressed during the Main Phase:

A. How does DRWH fit in with existing patterns and preferences of water collection and use in the community? (Year 1)
B. What socioeconomic and gender factors influence the adoption and sustained use of permanent DRWH at the household level? (Year 1)
C. What role does DRWH have in addressing the issues of poverty? (Year 2)
D. How might DRWH be best disseminated? (Year 2)

In addition, the gendered nature of water collection has significant implications for many aspects of conducting the main study:

- ***Conducting meetings in the community and the household***: Who will attend? Who will speak? Who will make decisions? Who will be affected by those decisions? How can efforts be made to ensure all voices are heard, including those of women and the poor?
- ***Developing new technologies***: Whose needs are being met? How will they use the new resource? What implications will it have for the use of other household resources, including the use of time?
- ***Constructing new technologies***: Who will develop the necessary skills? Will the training be an opportunity to empower certain members of the community?
- ***Testing the new designs***: in whose households will the new tanks be sited? Will all members of the community have access to these sites?
- ***Assessing the impacts***: Whose views are being recorded? Who will benefit from the introduction of DRWH? How will they benefit? What will they do with any time saved? How will any cash savings be used? Who will make those decisions? Has any member of the community been disadvantaged?

The findings stress the importance of adopting a gender approach, rather than focusing solely on women. Although women are principally involved in fetching water, many decisions about investing in new household resources, and redeploying household labour, involve men. The challenge is to develop a DRWH system that men will want to buy and women will want to use. Hence it important that both are involved in any decisions regarding new RWH designs and have opportunities for skills development.

Table 8: Summary of Social and Gender Issues Associated with Water Collection

What is Happening?	What are the Implications?
Gender roles ❖ women (with varying assistance form girls – depending on the season, location of water source and culture) are responsible for the task of fetching water ❖ collecting water is time consuming, occurs on a daily basis, and fragments the use of people's time (several journeys are made each day, occupying a total of between 1.5 to 5 hours per day) ❖ women ands girls usually travel to water sources on foot ❖ the task of collecting water is physically demanding, particularly on the return journey, and becomes more burdensome during the dry season ❖ men help occasionally (travelling to more distant water sources in dry season) ❖ men may travel to water sources by bicycle if the terrain permits ❖ men become active in water collection as an income generating activity (for example, water vendors (in Uganda)	❖ collecting water consumes a lot of time ❖ women loose the opportunity to undertake other productive activities ❖ water collection can interfere with children's studies (attending school, completing homework) ❖ collecting water exposes family members to various risk (attacks, abuse and assaults) ❖ although women derive enjoyment from socialising whilst collecting water, their main concern is with the time this activity consumes
Access and control ❖ women have access to, but little control over, practical resources which help with water collection ❖ women don't have access to means of transport ❖ men exercise control over a wide range of household assets associated with water collection and use, even though they don't use many of them ❖ men benefit more from external services (information, meetings, credit) than women	❖ both women and men need to be involved in discussions regarding water source options: women do the work, have access to the assets, and make many of the decisions; however, men control most of the assets, attend meetings, are in contact with information sources, use credit ❖ whilst priorities for HH expenditure include improving home and installing permanent DRWH, the reality is that current expenditure is dominated by food, school fees and medical expenses ❖ households without impervious roofs tend to be resource poor; hence they may find it difficult to invest even in very low cost systems
Decision making ❖ women play a central role in deciding which source of water to use, how much to collect, and how to cope during periods of water shortage ❖ decision to introduce DRWH undertaken by men but women have overall responsibility for system once installed	
Socioeconomic characteristics ❖ households with impervious roofs have more diverse sources of livelihoods, are more involved in monetary economy, better educated ❖ households with soft roofs tend to have fewer assets, less contact with external sources, remittances often more important, lower levels of education	