Millennium Water Program Baseline Survey Report

Amhar, Oromia and SNNPR Regions, Ethiopia

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Executive Summary

The purpose of the baseline assessment is two-fold. First, the baseline assessment provides information about the community environment in which project activities occur. In addition, and to the extent that the data are complete and reliable, the assessment provides a point from which changes might be measured over the course of the program.

The survey was carried out in Farat, Wonchi, Damdi, Soro, Kuch and Zala woredas in rural Ethiopia with the assistance of CARE-Ethiopia, World Vision Ethiopia, Water Action and Ethiopian Kale Heywet Church.

Access to water and water usage
Individuals responsible for collecting water, mostly adult women (85.2 percent) and school-aged girls (20.2 percent) and spend an average of 57 minutes doing so, although this varies across woredas. Most families (76 percent) had no access to protected water for daily household consumption. The percent of households who use unprotected water sources did not vary from dry to rainy seasons.

People collected larger amounts of water during the dry season than during the rainy season, probably because they do not need to collect as much during the rainy season. According to various international organizations and standards, 20 to 50 liters of water per day per person constitute a minimum consumption requirement.

Rural areas are the most adversely affected by a lack of access to safe water. In response, the Ethiopian government adopted a policy of requiring 15 liters per person per day as the minimum standard for domestic water consumption in rural areas to improve hygiene.

Water Transportation and Handling
Most households transport water by human, 97.4 percent of households did transport water by their back, while only 2.5 percent used pack animals. To help keep the water safe, most respondents used narrow-mouthed containers to store their water (67.6 percent), while 17 percent used wide-mouth containers. However, among those households who has both narrow and wide mouthed container, about fifty percent of respondents distributed their water by dipping, while 31 percent did so by pouring. About 80 percent of the households covered their water at all times and 29.9 percent elevated their storage containers to prevent small children from contaminating the water. However, 20 percent of households allowed school-aged children less than five years old to collect water from the storage containers.

Level of community participation in water development activities
The community must involve itself in all stages of water development activities to ensure that water supply and sanitation systems function effectively and sustain themselves for long periods. Once community members understand the nature of the hygiene-related problems and what can be done to solve them, they are more willing to commit themselves and their resources to improving the situation. Consequently, 26.6 percent of respondents had participated in the water development activity of their area. Among those who said they had participated in a water development activity, the majority (81.9 percent) participated in labor and material contribution, while only 9.5 percent participated in all stages of the water development process.

Sanitation and Hygiene

About 36 percent of respondents said they used toilet facilities regardless of the type, while the remaining 64 percent did not use toilet facilities at all. The majority (69 percent) of those who said that they do not use latrines said they use the nearby bush for defecation, while 22 percent used their back yards, and 8.4 percent used a gully or stream for defecation. In addition, among those who had latrines, more than half (56 percent) used open (no superstructure) rudimentary pit latrines, while 35.8 percent used ventilated pit latrines, 7.8 percent of those having shelter from the sun.

More than half (53 percent) of respondents had never cleaned their toilet facilities, while 18 percent cleaned their toilets more than one week ago. Only 27.5 percent cleaned their toilet regularly (at list once per week). Based on the observation of the collected data, 44.3 percent of toilet facilities had clear signs of current usage and was clean. Another 44 percent had clear signs of current usage but was dirty, and the remaining 5.3 percent could not be observed due to the respondents not willing to show them to the data collectors.

West Disposal Practices

About 79.4 percent of households threw their garbage in the wilderness, whether close to the home or far from it. In addition, 44 percent of yards or houses were littered with garbage lying open during the interview time. Simple methods of garbage disposal, such as burying or burning should be promoted to reduce the risk of contaminating the environment.

Prevalence and management of diarrhea

Analysis of the household responses indicates that 20.6 percent of households had children with diarrhea in the two weeks preceding data collection, with Soro woreda taking the lead (40.4 percent) followed by Wonchi (22.3 percent), and Zala and Kucha (18.3 percent).

Since the type of diarrhea does not substantially influence the type of water and sanitation intervention, data on the type of diarrhea experienced was not collected during this survey. Diarrhea management, therefore, is for non-specific cases of diarrhea. Respondents indicate that among children below five years of age, 37.8 percent received an increase in fluids, and 30.2 percent received continued feeding during a recent diarrhea episode.

Knowledge of the causes of diarrhea

Child caregivers mentioned that they knew of at least one cause of diarrhea in young children (92.2 percent). The most frequently mentioned cause of diarrhea was dirty water (28.6 percent), bad/dirty food (24.5 percent) and poor hygienic practices (20 percent). In addition, 60.4 percent of child caregivers said that diarrhea can be prevented, and 95.7 percent believed that the community as a whole could do something to prevent it. The most frequently mentioned means of prevention were providing clean water (38.3 percent), helping to construct latrines (23.4 percent), and clean-village campaigns (15.8 percent).

Availability of Sanitation and Hygiene Facilities at Schools and Health Centers

Safe water, basic sanitation and hygiene are important for households and communities. It is also essential that schools and health facilities adhere to minimum standards to provide a safe environment for the public. In addition, public and private institutions should serve as models for improving hygiene and setting positive examples for households and communities to follow. Schools are especially important in this respect because they contribute teaching future parents and helping them to change their behavior. However the survey data indicates that the lack of water and sanitation facilities in these key institutions. For instance, only 35.1% of the health facilities and 6% of the schools across all woreda have water supply system in their compound.

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Acronyms

CBO	Community Based Organization
DA	Development Agent
EC	Ethiopian Calendar
HH	Household
HHH	Household Head
IGA	Income Generating Activity
Lt	Liter
NGO	Non-Governmental Organization
PA	Peasant Association
PPS	Probability Proportional to Scale
PRA	Participatory Rural Appraisal
TOR	Terms of Reference
VIP	Ventilated Improved Pit Latrine
WATSAN	Water and Sanitation

Part I

Introduction and Background

1. Introduction

1.1 Background on the survey area

The combination of unsafe drinking water and inadequate sanitation facilities constitutes one of the major causes of mortality and disability among the poor in Ethiopia. Safe, convenient water supply and adequate sanitation is a fundamental component of broad-based economic growth strategies. Decreasing the mortality and morbidity caused by water-borne and sanitation-related diseases is a goal in itself. It can also lead to increased productivity and decreased absenteeism among members of the labor force by reducing the time and energy burden on the household, giving more time to crop cultivation, childcare, and income-generating activities, as well as increased regular school attendance.

Ethiopia is one of the countries in sub-Saharan Africa most affected by water and sanitation related diseases, particularly diarrhea. Diarrhea ranks first among the top three causes of death in Ethiopia, after malaria and HIV/Aids. A recent study shows that only 12 percent of the rural population had access to safe drinking water[1]. In addition, the same study shows that only seven percent of the rural population has access to basic sanitation facilities. There is clearly an urgent need to develop a safe water supply and basic sanitation for the majority of rural Ethiopians.

The major concern in water supply and sanitation activities is servicing the system over longer periods after the projects phase out. Improving access to water and sanitation services in Ethiopia requires significant new investment and a new way of conceptualizing and addressing the problems. Thus, to ensure the sustainability of the water supply and sanitation programs, one should:

- enhance the processes of shared decision-making between the primary stakeholders at all stages of the project cycle;
- promote the desire and means to respond to requests for water and sanitation services;
- Encourage the consumers and local communities to finance, over the long-term, the operation and maintenance costs of their water and sanitation services.

In view of this, since 2003 seven United States faith-based and humanitarian NGOs have been implementing water and sanitation program with the cooperation of four in country implementer NGOs (CARE Ethiopia, World Vision Ethiopia, Living water international-Ethiopian Kale Hewot Church and Water Partner International- Water Action). Their main objective was to improve the rural water and sanitation condition in the four regions of Amhara, SNNPR, Tigray and Oromia.

The millennium water supply and sanitation project has been exclusively implemented among the rural and small town communities partly because of the enormous need for water and sanitation intervention and partly the majority of the population is reside in the rural communities. The millennium water and sanitation program consists of four interrelated water and sanitation projects each of them implemented by four different NGOs including CARE-Ethiopia, World vision Ethiopia, Water Action, Ethiopian Kale Hewot Church and REST. All four projects implemented with common technical and implementing strategies to insure sustainable access to safe drinking water, basic sanitation and improved hygiene practices. The program has the following goals.

[1] The State of the World's Children, UNICEF 2003

- To increase the level of access to sustainable, safe water and sanitation services among poor and vulnerable population
- To decrease the prevalence of water and sanitation-related diseases
- To promote integrated water management at the local level with main focus on maintaining the quality and quantity of drinking water
- To develop an efficient partnership model that can be replicated in other countries

The following table summarizes the specific program implementation area.

Table 1 Geographic coverage of the program

Implemetining Partners	Region	Adminstrative Zone	Woreda	Targeted Households(HH)	Total Targeted population
CARE	Amhara	South Gondar	Farta	1,800 HH	9,000
WVE	SNNP	Hadiya	Soro	1,540HH	7,700
	Oromia	South West Shewa	Wonchi	1,060HH	5,300
EKHC	SNNP	Gamogofa	Kucha and Zala	2,400 HH	12,000
Water Action	Oromia	West Shewa	Dandi	3,350HH	16,750

1.2 Study Objective

The main objective of this study is to produce a comprehensive baseline survey on water and sanitation in five woredas of the Millennium Water Program project site including Farta Soro, Wonchi, Gofa Zuria and Dandi. In addition, identify key common indictors for the millennium water program that will enable to monitor and evalue the progress of the program against its objectives.

The purpose of the baseline assessment is two-fold. First, the baseline assessment provides information about the community environment in which project activities occur. In addition, and to the extent that the data are complete and reliable, the assessment provides a point from which changes might be measured over the course of the program.
The baseline provides data on water and sanitation-related issues and conditions in the survey area. Specifically, baseline data includes:

- Household level data, such as main demographic characteristics of the population;
- Rates of water-related illnesses and deaths;
- Access and utilization to drinking water;
- Time spent collecting drinking water;
- Access and utilization of functioning latrines;
- Common health and hygiene practices; and
- level of community participation or involved in water and sanitation activities, etc

1.4 Scope and Coverage of the Study

The quantitative data in this report were collected using structured modular questionnaires through household interviews in six woredas (Farta, Wonchi, Dandi, Soro, Kucha and Zala). The survey involved 1,152 households using a household questionnaire classified into six modules and sub-modules that analyzed elements of a water and sanitation framework.

The community level data were collected using different Participatory Rural Appraisal (PRA), tools and topical outlines were prepared based on a water and sanitation framework in 20 sample clusters. In addition, focus group discussions (FGDs) were conducted with 24 different community groups that included women, men, students, water and sanitation committees, and water borders where there are formed. Some of the PRA tools used for the community level data collection included:

- Disease analysis profile
- Access and control profiles
- Daily time use
- Seasonal calendar,
- Access to social services and infrastructure
- Social group/institutional analysis matrix

In addition, secondary information was also collected from concerned government offices and key informant discussions were conducted with woreda staff.

1.5 Working definitions of key terms

For the sake of a common understanding and interpretation of this survey, the following concepts and terms were deemed necessary to define, as they are particularly relevant in the context of this survey.

Proper hand washing involves three elements: (1) hand washing supplies, (2) hand washing technique, and (3) hand washing at critical moments.

Critical moments of hand washing include: after defecation; after handling child's feces or cleaning a child's bottom; before preparing food; before feeding a child; before eating.

Proper defecation Method refers to the proportion of children under 5 years of age defected using sanitation facility or using potty or using washable diapers or using disposable diapers.

Improved water source means protection measures are in place to prevent water from becoming contaminated, especially through runoff. This may consist of raised well heads and covered wells or spring caps.

Problem identification and problem solving: is the process by which community members understand the nature of the hygiene-related problems and what can be done to solve them. Problem identification and solving process can occur in community groups or during community events that are part of community mobilization.

An **improved and hygienic toilet facility** should meet the following criteria:

- Flush toilet with connection to a public sewer
- Flush toilet with connection to a septic system
- Pour-flush toilet
- Covered pit latrine (simple type or ventilated improved pit latrine)
- Availability of basic superstructure such as walls, roof and door

- **Hygienic** means that no feces are found on the floor, seat, or walls of the toilet facility and no flies are present.

Water treatment includes the use of chlorine solution, boiling water the water should be rolling boil for 1 minute longer in high altitudes), using water filter, solar disinfection to purify the water from an unsafe source and prevent water from becoming contaminated.

Properly cleaned toilet facilities means that no feces are found on the floor, seat, or walls of the toilet facility and no flies are present.

Safe disposal of defecation means either defecating or throwing feces in a latrine or toilet. Young children may defecate on the ground or use a "potty," in order to say it is safe disposal, caretakers should then dispose of the feces in a toilet facility. In cases where washable diapers are used, the feces can be partly disposed of in a toilet facility and partly washed away. If the wastewater from washing diapers ends up in a toilet facility, the disposal is safe overall.

Solid waste refers to all household refuse in non-liquid form.

Hygienic solid waste disposal system means A solid waste pit near the household where solids are discarded and eventually buried/burnet or a waste removal system where trash is collected and removed from the household vicinity on a regular basis.

Access to separate toilet facilities by sex means the availability of toilet facilities for girls and boys in the school and are accessible by all school members at any time (students and teachers)

2. Baseline Survey Methodology

2.1. Data Sources and Data Collection Instrument

Data were collected from various sources to satisfy the information needs for the baseline survey. Based on the type and sources of data that were required for this baseline survey, the data collection instruments were categorized into two main types — household and community questionnaires. INDAK developed the data collection instruments and the MWP staff reviewed them. The tools were subsequently revised and updated. In addition, the survey tools were translated into the local languages of Amharic and Oromifa, pre-tested in the field, then customized and updated based on the local context before the actual data collection began.

The community questionnaire was used to collect qualitative data from focus groups on variables that affect all households equally in a given locality. These variables include:

- Knowledge and behavior of the community regarding water and sanitation
- Water point management and sustainability
- Cultural barriers regarding sanitation and hygiene
- Level of community participation in water and sanitation development activities etc.

The household questionnaire, the largest component of the survey, was used to address the elements and interaction of the household livelihoods system including:

- Demographic characteristics and socioeconomic of the households
- Education
- Health
- Access and utilization of Water
- Access and utilization of sanitation facilities
- Hygiene Behaviors and Knowledge

In addition, the study team gathered secondary information from woreda government line offices and the program area office. A literature review was also undertaken from different studies and PRA reports conducted in the survey area.

2.2 Sampling Methods

To produce reliable analytical results, data was collected from statistically representative samples households drawn from the population that will enable to provide statistically representative information about household characteristics at the program (CS program or implementation area) level. Therefore, the existing statistic about access to safe drinking water among Ethiopian rural households was used as the key outcome variable with binomial distribution (a household either has access to safe water or it does not) to determine a statistically acceptable minimum sample size. The key outcome variable, taken from the MWP proposal, is that only 12 percent of the rural population has access to safe drinking water. Thus, the proportion of the targeted population (households) that has no access to safe water sources is 88 percent. In order to determine a statistically acceptable sample size, the following scientific formula which is normally applied for variables with binomial distribution, was used (Kothari, 1995 and Fisher et al, 1991).

Using standard parameters:

- degree of accuracy (d) = 0.05
- standard normal deviate (z) = 1.645
- (p)=0.88, the proportion of the targeted population (households) that has no access to safe water sources.

Two further parameters included in the calculations were:

- the design effect, d (set at 2.0 to compensate for the use of a two-stage sampling method)
- a “security factor”, S, of 10 percent added to account for attrition and non-response cases.

The following basic equation was applied to calculate the sample size:

$$n = k\frac{z^2 p(1-p)}{d^2}$$, Where

n = statistically acceptable minimum sample size.
z = the standard normal deviate.
p = the proportion in the targeted population (households) estimated to have no access to safe water sources.
d = degree of accuracy desired,
k = design factor, providing a correction for the loss of sampling efficiency resulting from the use of cluster sampling instead of simple random sampling. Every time a stratum is added to a sampling system, it is recommended to double the design factor. Thus, in this case since it is a two-stage cluster sample, k should be 2.

Table 2 z values corresponding to d values[2]

D	*Z*
0.1	1.282
0.05	**1.645**
0.025	1.96
0.0125	2.326

Based on this premise and using the above-mentioned parameters, the computed sample size, *n* would indicate 231 households per program area. The consultant, therefore, collected data from a minimum of 231 HH from each CS program area or woreda (the program area could be a woreda, depending on the specific program intervention area, except in Kale Hiwat which includes two woredas). In addition, a two-stage selection process was followed in each program area to select the sample household. First the clusters were selected from the sample frame of the program area or woreda, and then households were selected from each of the selected clusters.

Once each partner's implementation program area was identified, the primary sampling units (PAs) were selected using a randomly generated list derived from the Probability Proportional to Scale (PPS) method within each of the woredas. The secondary sampling units (the households) were selected after the team had arrived at the program area. They used the updated list of households in the village, where an updated list existed. In places where no updated household lists existed, the team applied the spin bottle method.

2.4 Field Survey Structure

A consultancy firm, INDAK International PLC, was contracted to do the training, provide field coordination, enter the data, write the interim reports and prepare the first draft and final report of the survey. In addition, develop key common monitoring and evaluation indictors at the program level with respective data collect method. The baseline survey used a combination of INDAK professionals, woreda government office staff, and recruited data collectors. INDAK dispatched qualitative survey facilitators and socio-economist, including the survey coordinator. In addition, five experienced field supervisors were deployed in each survey area to oversee the fieldwork. Twelve enumerators were hired locally in each survey are and trained in household survey techniques and deployed to collect data on the household questionnaires.

2.5 Data Entry, Quality Control and Analysis

Survey field data collection started on February 13th, 2006 and ended on March 10, 2006. Data entry was completed on March 25th, 2006. However, before the data entry process began, all questionnaires were checked and verified by INDAK supervisors for consistency and legibility. Ten percent of the data was entered using a double-entry protocol. Random visual comparisons between the original questionnaires and the computer were performed after the data was entered into the computer database to check double entries.

[2] Source: Sampling Guide, Robert Magnani, 1997, Washington D.C.

A computer based data dictionary and data entry system was developed for household survey questionnaires and child anthropometry forms using CSPro 2.6. CSPro 2.6 is simple to use and powerful in controlling data entry errors, editing and initial cross-tabulations.

Once the data entry and cleaning were completed, the data was exported to Statistical Packages for Social Scientist (SPSS) version 12.0 software for analysis. Further data cleaning was done by using SPSS to look into frequency distributions and cross tabs to identify outlier cases. INDAK then prepared the tabulation plan, analysis, and a first draft and final report. The full set of the data in SPSS format and the tabulation results are included as a CD-ROM with the hard copy of this report.

Part II

Survey Findings

3. Survey Area Socio-demographics

The socio-demographic and other essential household data were collected from 1,152 households in six woredas. These households constitute 6,576 individuals, with an average family size of 5.7 people per household. The male to female ratio is slightly higher in the survey area, with males representing 51.3 percent of respondents and females 48.7 percent. On the other hand, the male to female proportion is split equally for the mean family household size (the mean number of men per household was 2.9 and 2.8 for females). See Table 3 below.

Table 3 Major demographic characteristics of survey population and relation of household members to household heads (% of population)

Relation to HHH		**Proportion of population**	**Mean number of person per household**	Head of HH	1st Spouse	2nd Spouse	Son/daughter	Son/daughter in-law	Grandson/daughter	Mother/father	Father/mother in-law	Brother/sister	Other relatives	Stays here
Farta	**M**	**52.9**	**3.1**	85.8	2.3	4.2	56.2	0.0	61.5	33.3	100	58.3	50.0	75.0
	F	**47.1**	**2.8**	14.2	97.7	95.8	43.8	100	38.5	66.7	0.0	41.7	50.0	25.0
	T	**100.**	**5.9**	17.2	13.0	1.8	61.7	0.7	2.9	1.1	0.1	0.9	0.4	0.3
Wonchi	**M**	**50.4**	**2.8**	83.5	0.0	0.0	52.7	100	53.8	0.0	0.0	14.3	66.7	0.0
	F	**49.6**	**2.8**	16.5	100.0	100	47.3	0.0	46.2	100	100	85.7	33.3	100.0
	T	**100**	**5.6**	17.9	14.2	0.2	63.8	0.2	1.0	0.2	0.1	1.1	1.2	0.2
Dandi	**M**	**49.5**	**2.7**	77.6	0.0	0.0	51.6	50.0	47.4	50.0	33.3	65.0	42.1	75.0
	F	**50.5**	**2.8**	22.4	100.0	100	48.4	50.0	52.6	50.0	66.7	35.0	57.9	25.0
	T	**100.**	**5.5**	18.5	13.5	0.1	62.4	0.2	1.5	0.2	0.2	1.6	1.5	0.4
Soro	**M**	**51.9**	**3.3**	85.1	0.5	0.0	53.9	50.0	66.7	50.0	0.0	63.6	50.0	0.0
	F	**48.1**	**3.0**	14.9	99.5	0.0	46.1	50.0	33.3	50.0	0.0	36.4	50.0	0.0
	T	**100**	**6.3**	16.0	13.3	0.0	69.2	0.1	0.2	0.3	0.0	0.8	0.1	0.0
Kucha & Zala	**M**	**51.8**	**2.8**	86.1	0.6	0.0	55.1	0.0	46.9	7.1	0.0	61.1	33.3	42.9
	F	**48.2**	**2.6**	13.9	99.4	100	44.9	0.0	53.1	92.9	0.0	38.9	66.7	57.1
	T	**100**	**5.4**	18.5	14.5	0.2	59.3	0.0	2.6	1.1	0.0	1.4	1.7	0.6
Total	**M**	**51.3**	**2.9**	83.6	0.7	0.8	53.9	40.0	55.3	28.1	26.7	52.5	48.4	38.6
	F	**48.7**	**2.8**	16.4	99.3	79.2	46.1	40.0	44.7	71.9	33.3	47.5	51.6	41.4
	Both	**100**	**5.7**	17.6	13.7	0.5	63.3	0.2	1.6	0.6	0.1	1.2	1.0	0.3

Of all household heads participating in the survey, 83.6 percent were male, while 16.4 percent were female. The majority of parents, i.e. mother and father, of the household head, tended to be female (71.9 percent). In general, it appears that the norm is for sons and daughters to stay with their biological parents after marriage. This is the case 40 percent of the time for each (sons and daughters). However, the situation varies greatly across the survey area. For example, in Wonchi in 100 percent of cases, sons stayed with their biological parents after marriage. In addition, of all the survey respondents, about 77.4 percent were related to the household head either as a spouse or a child.

The data on age distribution of people in the sample area shows that individuals in the zero to five years age range count for 12 percent of the population, while six to 15 year olds account for about 34.8 percent (see Table 4). About half (49.7 percent) of the population are considered economically inactive. These include those who are less than 14 years and above 59 years old, who are dependent on the remaining half of the population, who are between the ages of 15 and 59 years**.** The male to female ratio is equally split both within the economically active and inactive group age range.

Of all household heads participating in the survey, 83.6% are male while 16.4% are female. Siblings, i.e. mother and father of the household head, tend to be female. Siblings living with household heads are female in 71.9% of the cases. In general, it appears that the norm is for sons and daughter to stay with their biological parents after marriage. This is the case 40% of the time for each (sons and daughters). Whoever the situation greatly varies across the survey area, for example, in Wonchi in 100% of the cases sons stays with the biological parents after marriage. In addition, of all the survey respondents, about 77.4% of them are related to the household head either as a spouse or child.

The data on age distribution of persons in the sample area shows that individuals in the age range of zero to 5 years count for 12% of the population while the population of the age group between 6 and 15 years old accounts about 35%. See Table 4. About half (49.7%) of the population of the survey area are accounted as economically inactive group, those less than 14 years old and above 59 years old, and are dependant on the remaining half of the population between the ages of 15 to 59 years old**.** The male to female population ratio is equally split both within the economically active and inactive age range, from 15 years old to 59 years old, and lower for ages zero to 14 years.

Table 4 Household composition by sex and age (% of HH member)

Age Group (year)	Sex	<5	5- 15	16 - 60	>60	Mean age of household head
Farta	**M**	11.2	35.8	48.2	4.9	46.0
	F	11.0	36.6	49.8	2.7	49.2
	T	11.1	36.1	48.9	3.8	46.5
Wonchi	**M**	13.4	31.2	50.8	4.6	43.8
	F	14.3	33.5	48.4	3.7	51.9
	T	13.9	32.4	49.6	4.2	45.1
Dandi	**M**	12.8	32.3	50.7	4.2	43.2
	F	12.3	31.7	55.3	0.8	44.7
	T	12.6	32.0	53.0	2.5	43.5
Soro	**M**	9.5	37.7	51.6	1.2	40.8
	F	11.7	39.1	48.8	0.4	43.4
	T	10.5	38.4	50.3	0.8	41.2
Kucha & Zala	**M**	10.8	35.1	51.5	2.5	41.9
	F	13.3	36.1	48.8	1.8	43.0
	T	12.0	35.6	50.2	2.2	42.0
Total	**M**	11.5	34.5	50.5	3.4	43.1
	F	12.5	35.4	50.2	1.9	46.4
	Both	12.0	35.0	50.4	2.7	43.7

The marital status of the household heads appears to be associated with that person's gender. Of all male household heads, 85.6 percent were married. Male household heads rarely live without a spouse, being single, divorced or separated and widowed in only 3.8 percent of the cases (see Table 5). However, 67.0 percent of female household heads have no spouses. In addition, of all female household heads, 10.9 percent of them are divorced or separated and 53.0 percent of them are widowed.

Table 5 Marital status of household heads by sex (% of HHHs)

Marital status		Married	Widowed	Single	Divorced/Separated
Farta	**M**	97.5	2	0.5	0
	F	15.2	63.6	6.1	15.2

Marital status		Married	Widowed	Single	Divorced/Separated
	T	85.7	10.8	1.3	2.2
Wonchi	**M**	96.9	1.6	1.6	0
	F	15.8	76.3	2.6	5.3
	T	83.5	13.9	1.7	0.9
Dandi	**M**	95.5	1.7	1.7	1.1
	F	17.3	63.5	3.8	15.4
	T	77.9	15.6	2.2	4.3
Soro	**M**	99.5	0	0.5	0
	F	79.4	17.6	0	2.9
	T	96.5	2.6	0.4	0.4
Kucha and Zala	**M**	92	3.5	4.5	0
	F	37.5	43.8	3.1	15.6
	T	84.4	9.1	4.3	2.2
Total	**M**	96.3	1.8	1.8	0.2
	F	33.0	53.0	3.1	10.9
	Both	85.6	10.4	2.0	2.0

As is the case in most parts of the country, the survey area also, in general, has limited access to educational services. Consequently, nearly 37 percent of the population above age seven is illiterate (see Table 6). Even when one considers only the current school age cohort of seven to 14 year olds, the proportion of illiteracy is still significantly high with 31 percent of them being illiterate.

Educational inequity between boys and girls is also high in survey area. Girls are less likely to attend school, which indicates a 60 percent illiteracy rate among girls, as compared to boys at 40 percent. However, among seven to 14 year old children, the proportion of uneducated boys to girls is almost equal at 52 percent for boys and 48 percent for girls. Similar trends occur across all grade levels and woredas.

Table 6 Survey households educational level (% of HHs)

	Farta			**Wonchi**			**Dandi**			**Sorro**			**Kucha & Zala**			**Total**		
	Male	**Female**	**Both**	**Male**	**Female**	**Both**	**Male**	**Female**	**Both**	**Male**	**Female**	**Both**	**Male**	**Female**	**Both**	**Male**	**Female**	**Both**
Education level of all HH members 7 years and above																		
Illiterate >= 7 years	42	58	48	36	64	24	41	59	34	43	57	43	40	60	36	40	60	37
Adult education	71	29	17	42	58	6	58	42	2	43	57	2	73	27	2	57	43	6
Religious education	97	3	6	67	33	0	50	50	0	100	0	0	60	40	1	75	25	1
Grade 1-4	58	42	49	51	49	39	54	46	40	52	48	46	53	47	46	54	46	44
Grade 5-8	61	39	23	56	44	31	53	47	34	64	36	37	65	35	35	60	41	32
Grade 9-10	78	22	4	68	33	15	48	52	11	70	30	7	62	38	9	65	35	9
Above grade 10	69	31	2	68	32	10	65	35	14	80	20	7	67	33	8	70	30	8
Education level of all HH members of age 7 -14 years																		
Illiterate 7-14 years	54	46	42	56	44	16	48	52	27	53	47	45	52	48	27	52	48	31
Adult education	100	0	1	0	0	0	0	0	0	0	0	1	100	0	1	40	0	0

	Farta			Wonchi			Dandi			Sorro			Kucha & Zala			Total		
	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
Religious education	100	0	1	100	0	0	0	0	0	0	0	0	0	100	1	40	20	0
Grade 1-4	55	45	84	48	52	71	53	47	74	50	50	72	52	48	75	52	48	75
Grade 5-8	46	54	14	53	47	24	49	51	24	57	43	25	51	49	22	51	49	22
Grade 9-10	0	100	1	64	36	4	67	33	1	25	75	2	33	67	1	38	62	2
Above grade 10	100	0	1	0	100	0	50	50	1	0	100	0	0	100	0	30	70	1

4. Socio Economic of the Survey Area

This section will describe the physical structure of homes, the type of energy used in the household, and the primary occupation of the household heads.

Household Physical Structure

Walls and roofs are built with a variety of materials, much of this depending on the area, the climate and the locally available materials–as evident in the environmental differences between woredas. The majority of the homes' walls (91.1 percent) were made of wood and mud plaster. Most homes' roofs (74.1 percent) were made of wood and grass, while 29.1 percent consisted of corrugated iron sheet (see Table 7).

Table 7 type of house owned by the households (% of households)

		Farta	Wonchi	Dandi	Soro	Kucha and zala	Total
Main Material for wall	Wood with Mud	89.5	100.0	98.7	99.6	67.8	91.1
	Stone	12.2	0.0	0.0	0.0	0.0	2.4
	Wood with straw	0.0	0.0	0.9	0.4	31.7	6.6
	Concrete blocks	0.0	0.0	0.4	0.0	0.4	0.2
Main Materials for roof	Wood with grass	100.0	55.9	31.6	99.1	81.4	74.1
	Corrugated iron sheet	14.3	42.8	67.1	1.8	19.0	29.1
	Stock/wood with Mud	1.3	2.6	1.3	0.9	0.0	1.2

About 41.4 percent of homes had two rooms, 36.4 percent had more than three rooms, and about 22.3 percent had only one room. Here again, the number of rooms a household contained varied according to the woreda. Most households (66.6 percent) cooked in the same room as their living space. In addition, more than half (53.3 percent) shared the same room with their animals (see Table 8).

Table 8 number of rooms in the main house of the HHs (% of HHs)

	No of room	Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
Number of	1	47.3	23.1	23.8	4	13.2	22.3

	No of room	Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
rooms in the main house	2	36.3	58.1	56.7	10.3	45.4	41.4
	>=3	16.4	18.8	19.5	85.7	41.4	36.4
HHs stays with animals in the same room		56.8	36.4	13.9	90.2	69.1	53.3
HHs using the same house for living and cooking		73.6	66.4	29.9	91.6	71.6	66.6
Average number of rooms in the main house of the HHs by woreda		1.67	1.99	2.03	2.79	2.28	2.2

The most common lighting method used in homes was kuraz lantern (79.3 percent), followed by firewood and electricity at 12.1 and 13.3 percent respectively. However this parentage varies greatly among the woredas and kebeles in the target area. The majority of households surveyed used firewood for cooking (97.8 percent) followed by dung (16.9 percent). It is not a positive sign that many households use firewood and dung for cooking. Firewood used as a source of energy for lighting and cooking has a negative impact on human health and the local ecosystem (see Table 9).

Table 9 Household lighting and cooking methods (% of HHs)

		Farta	Wonch	Dandi	Sorro	Kucha & Zala	Total
Main Lighting method	Latern(Kuraz)	93.1	62.3	60.2	92.5	88.7	79.3
	Firewood	30.3	19.0	1.7	7.9	1.3	12.1
	Lantern(Fanos)	0.0	0.4	0.0	0.0	0.4	0.2
	Lantern(Masho)	0.0	0.0	0.9	0.0	0.4	0.3
	Electricity	0.0	18.2	37.7	0.0	10.4	13.3
Main cooking method	Firewood	93.7	99.1	98.3	98.7	99.1	97.8
	Dung	81.2	0.4	0.9	2.2	0	16.9
	Charcoal	0	0.4	1.3	0	0.4	0.4
	Electricity	0	0	0	0	0.9	0.2
	Kerosene	0	0	0	0.4	0.4	0.2

Despite the cultural and environmental diversities across the sample area, there was not much variation in the main occupations of the households across the woredas.

The most important occupations of the household heads were agriculture, unpaid domestic work, and other paid labor (handicraft and artisan work). Examining more specifically the occupations among males versus female heads, crop agriculture was again mentioned by the majority of male heads (80.4 percent), followed by salaried work (5.7 percent) and trading (4.2 percent). Female heads showed a slightly more diversified set of occupations besides unpaid domestic work, including crop agriculture, trading and other paid work (handicrafts, etc). Occupation types were homogenous across the survey area with some differences, the most notable being crop agriculture which males in Dandi woreda mentioned less frequently. In addition, in Dandi woreda, other paid work for both male and female households was frequently mentioned.

Table 10 Primary occupation of household Heads by sex

Occupations	Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total

	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Both
Cultivate family land	99.5	72.7	79.3	10.5	56.4	13.5	90.2	26.5	76.4	21.9	80.4	29	72
Unpaid domestic help	0	18.2	1.6	57.9	1.1	21.2	0	58.8	0.5	40.6	0.6	39.3	6.8
Other paid work	0	3	3.6	2.6	19.6	34.6	1.5	0	5.5	3.1	6	8.7	6.7
Trader	0.5	0	4.1	21.1	5	17.3	5.7	2.9	5.5	21.9	4.2	12.6	5.6
Salary occupation	0	0	6.7	0	12.3	7.7	0.5	0	9	0	5.7	1.5	5
Other non paid work	0	0	1.6	0	1.7	3.8	0	5.9	0.5	6.3	0.8	3.2	1.1
No occupation	0	6.1	0.5	5.3	2.2	0	0	5.9	0.5	0	0.6	3.5	1.1
Student	0	0	1	0	1.1	1.9	1.5	0	1	3.1	0.9	1	1
Herding	0	0	1	2.6	0.6	0	0.5	0	0	0	0.4	0.5	0.4
Ill/disabled	0	0	0.5	0	0	0	0	0	1	0	0.3	0	0.3

5. Water Supply System and Accessibility

5.1. Access and utilization of water

The amount of time spent collecting water reveals additional information regarding the availability and accessibility of this fundamental necessity. The data also provide insight into the human resources allocated to accessing water–resources that could be applied to other activities. In short, the data provide some sense of the social cost of collecting water in the survey area.

The survey examined the availability, access and utilization of water in the survey area during the rainy and dry seasons. Results show that about 76 percent of the sampled households had no access to protected water[3] for their household consumption needs during the rainy season. In addition, the main source of drinking water for most of the population (75.6 percent) during dry season was unprotected[4]. This proportion varies greatly across the woreda, for instance in Farta and Wonchi the proportion of household who have access to unprotected sources is about 90.9 and 81.4 percent, respectively. (see Table 11).

Table 11 Source of drinking water during rainy and dry season

Source		Farta	Wonchi	Dandi	Soro	Kucha & Zala	Total
Wet season	Unprotected[5]	90.9	81.4	64.1	73.2	70.6	76.0
	Protected[6]	9.1	18.6	42.0	32.5	44.2	29.3
Dry season	Unprotected	90.0	81.4	65.7	70.9	70.0	75.6
	Protected	10.0	18.6	41.7	37.9	45.2	30.6

[3] Protected: Home/yard tap; public tap; private protected well; public protected well; developed spring; pond with filtering system, and surface water with filtering system

[4] Unprotected: Private open well; public open well; surface water; non-developed spring, pond or canal.

Respondents were asked about the time that it took to obtain drinking water, comparing again between the two main seasons of the year. Regardless of the season, people overall spent nearly an hour (57 minutes) to retrieve drinking water from it source (round-trip, excluding the queuing and social time spent at the water point). However, the time it takes to fetch drinking water across woredas varies. For instance, the time taken to collect water in Soro, Kucha and Zala woredas is nearly one and one half-hour. The effect of the dry season was relatively hard on everyone in the survey area, but particularly for the population in Soro woreda, which was about 90 minutes. In addition, only 44 percent of the respondents have access to water within half an hour distance, be it protected or not.

Table 12 Mean Time traveled to collect Domestic Water (be it protect or not) by Seasons (Two-way)

	Rainy Season	Dry Season	Both Season Time in minutes	% of HH with average distance less than 30 minutes
	Time in minutes	Time in minutes		
Dandi	41.96	37.36	39.66	58.9
Farta	34.78	39.78	37.28	54.5
Wonchi	51.8	44.58	48.19	46.3
Kucha & Zala	69.08	78.98	74.03	32.5
Sorro	80.78	90.56	85.67	29.8
Total for all woreda	55.68	58.25	56.97	44.4

The survey also collected information on the quantities of water that people consumed, comparing between three periods, namely: the day before the interview; during the rainy season; and during the dry season (see Table 13). The findings are puzzling as people reported collecting larger amounts of water during the dry season than during the rainy season. Although unexpected, this result may be explained by the fact that people may not need to fetch as much water during the rainy season as they do during the dry season. They may also consume less of the retrieved water for cleaning and washing during the dry season.

Table 13 Per capita daily household domestic water consumption in litters by seasons (Average in liters/day/person)

	Farta	Wonchi	Dandi	Soro	Kucha & Zala	Total
Yesterday	10.19	9.89	7.28	3.92	8.56	7.98
Rainy Season	9.72	7.62	4.76	3.14	8.23	6.70
Dry Season	11.57	10.43	9.84	4.88	10.79	9.51
Population securing 15 liter/person/day (% of total population in each woreda)						
Population securing 15 liter/person/day	15.6	19.9	7.4	0.9	11.7	11.1

Table 13 also shows the extent to which the amounts of water that are collected are sufficient to provide the various members of the household with their daily needs. However, it is worthwhile at this point to explain briefly the international standards of daily water consumption requirements to which we can compare our sample. According to Gleick (1996), a reasonable target for per capita consumption in developing countries is 50 liters of water per capita per day (lcd)[7]. The Gleick

[7] For comparative purposes, it is interesting to note that water consumption per capita in the United States is estimated to be between 246 and 295 lcd.

figure includes a minimum of 5 lcd for drinking water, 15 lcd for bathing, 10 lcd for food preparation, and 20 lcd for sanitation. The sum of those quantities is in line with the standard of 20 to 40 lcd set by USAID, the World Bank and the World Health Organization (WHO), who exclude water for cooking and cleaning. According to Billig et al (2001), this standard may need to be adjusted downward based on consideration of the availability, climate and technology used, but it provides a general guideline against which to compare the current situation and/or to establish program goals. On the other hand, UNICEF defined a "sufficient" quantity as an absolute minimum of 15 lcd. The Sphere Project (Oxfam 2000) suggests 15 lcd as well. This is at the low end of the recommendations made by House, Ince, and Shaw (1999), which is 15 to 25 lcd for an individual. In addition, the Ethiopian government also adopted in its water policy the 15 liters per person per day as the minimum standard for domestic water consumption in rural areas (Giovannetti, 2003).

For the hygiene situation in a household to improve, water must not only be accessible, but available in sufficient quantities. However, the quantity of water used per capita across all woredas is very low compared to the absolute minimum water per capita requirement set by the Ethiopian government for rural communities. Only 11.1 percent of the survey population secured the minimum amount of 15 lcd. This figure varies greatly across woredas; Soro and Dandi taking the least amount while Wonchi and Farta take the most. In our sample area, the mean water consumption per day per person during the rainy season was 6.7 lcd; and 9.51 lcd during the dry season. The proportion of needs covered, taking 15 lcd as a reference point, is therefore 56.7 percent in the rainy season and 36.6 percent in the dry season.

5.2. Water transportation and handling

Not everyone in the family collects water. Mostly it is adult women (85.2 percent) and school-aged girls (20.2 percent). Across the woredas, invariably women were responsible for collecting water for household consumption. The burden of collecting water depends a lot on the prevailing social practices concerning the division of labor in the family in different settings. In this case, adult females bear most of the burden of collecting water, followed by school-aged girls. Overall, only 6.8 percent of adult males share the burden of collecting water. This frequency is higher in Kucha and Zala. Male or female children (less than 5 years old) rarely share this responsibility.

People carrying water on their backs accounts for the major means of transporting water for the majority of the households (97.4 percent), while only 2.5 percent use animals. When we look into the data on the amount of time spent collecting water and the means of transporting it, the intensity of the physical effort required by the people responsible for collecting water (in this case, women) is immense.

Table 14 Responsible person for fetching drinking water from its sources and common means of transportation of water (HH)

		Farta	Wonchi	Dandi	Soro	Kucha and Zala	Total
Responsible person for fetching drinking water	Adult women	97.0%	87.9%	69.7%	93.9%	77.8%	85.2%
	School age female children	32.0%	11.3%	27.3%	7.5%	23.0%	20.2%
	Adult men	12.1%	0.0%	5.6%	0.4%	15.7%	6.8%
	Scholl age male children	7.4%	1.7%	2.6%	3.5%	6.5%	4.3%
	Young pre-school age children	0.4%	0.0%	0.0%	0.9%	0.0%	0.3%

Means of water transportation	Human	99.1	98.7	96.5	93.0	99.6	97.4
	Pack animals	0.9	1.3	3.5	7.0	0.0	2.5

While access to safe water is important, it is also necessary for the household to store its water properly so that it remains safe. This means that: water should not be contaminated by exposure to dirt or dust (hence it should be covered); the methods used for transferring water to and from storage containers is safe; the water's access to children should be limited by raising it in containers above ground (to prevent children from putting their hands into the water). Thus, in our survey area, most people (67.6 percent) used narrow-mouthed water containers, while about 17 percent of the sample households used wide-mouth containers to store and collect water. About 50 percent of people removed water from water storage containers by dipping, while 31 percent removed water by pouring. In addition, nearly 80 percent of respondents covered their water at all the times, whereas only 29.9 percent elevated the storage containers. Twenty percent of households allowed school-aged children less than five years old to collect water from the storage containers.

Table 15 Water storage and handling (% of HHs)

	Farta	Wonchi	Dandi	Soro	Kucha & Zala	Total
Type of water storage						
Narrow mouthed	61.8	82.1	53.8	65.6	74.8	67.6
Wide mouthed	29.2	10.7	11.8	12.9	20.4	17.0
Of both type	9.0	7.1	34.4	21.5	4.8	15.4
Way of removing water from storage						
Dipping	82.5	28.6	16.3	82.8	40.0	50.0
Pouring	16.0	42.9	59.3	9.7	27.0	31.0
Both dipping and poring	1.4	28.6	24.4	3.2	33.0	18.1
Container used as spigot or tap	0.0	0.0	0.0	4.3	0.0	0.9
HH who have covered the stored water all the time	95.8	95.2	70.6	71.7	66.4	79.9
HHs who have placed water container on elevated floor	65.1	8.3	13.6	38.5	23.9	29.9
Responsible persons for taking drinking water from storage within the household						
Adult person	58.5	88.0	80.1	49.5	66.4	68.3
All household member	38.7	1.2	5.0	20.9	22.3	19.6
School age children	33.5	15.7	19.0	26.4	14.4	21.9
Children under five	0.5	1.2	0.5	3.3	0.0	0.7

When asked about their perception of the cleanliness of their water container, the majority of respondents (96 percent) believed that their water containers were clean and free of contamination. However, a significant number of people did not clean their water storage containers regularly. About 14.4 percent clean their water containers once a week, and about 2.4 percent said they never clean their containers at all. In addition, the majority of the population (87.7 percent in Wonchi, 84.8 percent in Soro and 47 percent in Dandi) in the survey area cleaned their water containers with water only. The exception to this was in Farat woreda where the majority of the respondents (97.2 percent) used different types of local cleaning materials; for example, tree leaves (Girwa, Hareg and Woyera). Overall, about 81.4 percent of households cleaned their water container everyday, regardless of the cleaning method.

In most woredas, the practice of using soap and detergent to clean water containers does not exist, except in Dandi where 11.5 percent of respondents used soap and other detergents for cleaning

their water containers[8]. Again, the use of sand with water as cleaning materials seemed more popular in Dandi (36.4 percent) than in other woredas (Soro, 15.2 percent, and Wonchi, 11.1 percent).

Table 16 Percentage of HHs clean water containers and materials used for cleaning

	Farta	Wonchi	Dandi	Soro	Kucha & Zala	Total
HHs perceived the water container as clean	97.6	96.4	95.9	97.7	92.2	96.0
Frequency of water containers cleaning						
Today or yesterday	79.2	95.2	71.8	89.2	71.7	81.4
One week ago	18.4	1.2	24.1	2.2	26.1	14.4
Several weeks ago	1.4	1.2	1.8	0.0	0.4	1.0
Don't remember	0.9	0.0	0.9	2.2	0.0	0.8
Never	0.0	2.4	1.4	6.5	1.8	2.4
Materials used for cleaning water container						
Rinse with water only	0.9	87.7	47	84.8	7.2	45.5
Use sand and water	1.9	11.1	36.4	15.2	14	15.7
Use soap and other detergent	0	1.2	11.5	0	5.9	3.7
Use leaves (Girawa, Hareg, Woyra)	97.2	0	5.1	0	72.9	35.0

5.3. Water Purification

When a water source cannot be considered safe, households should treat their drinking water to remove pathogens. Water treatment at the household level is referred to as "point-of-use" treatment. Effective water treatment includes using a chlorine solution, filtering, solar disinfection, and boiling to purify water from an unsafe source and prevent it from becoming contaminated. However, improving hygienic behavior and practicing safe water management are predicated on knowledge and to some extent on access to the appropriate technology. However, the result from the survey shows that only 12 percent of the population treated water after it arrived in the home to make it safe for drinking. Of all households who said they purify or treat their water in the home, nearly 60 percent of them used a cloth filter, one fourth of them uses sedimentation to clean their water, about 13 percent of them boil water, and about 10 percent used water filter systems such as ceramic or sand composite, and 5.2 percent used chlorine or bleach.

Table 17 Method of water purification

		Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
HH treat their water to make it safer for drinking		4.3	7.4	17.3	27.6	3.9	12.1
Water treatment methods used by HH	Sieve it through cloth	0	76.5	60	68.3	33.3	47.6
	Sedimentation	90	11.8	0	9.5	11.1	24.5
	Boil	10	0	25	20.6	11.1	13.3
	Water filter(ceramic, sand composite)	0	0	2.5	0	44.4	9.4
	Add bleach/chlorine	0	11.8	12.5	1.6	0	5.2

[8] The Dandi result may have been influenced by the data from urban respondents. (See project level data in the Annex).

5.4. Water Supply System Sustainability Issues

5.4.1. Recurrent cost recovery and financial management system

Water supply systems can only remain functional for long periods when they are regularly maintained. In urban centers households with piped connections or public water points usually pay a fee that might cover the maintenance of the water supply systems, as is the case for the town of Dandi. Insufficient cost recovery, due to the non- or incomplete payment of fees and tariffs, and the absence of public subsidies usually leads to a lack of sufficient funds to maintain the water system. Thus, knowing what proportion of households pays the required water tariff is essential for planning the maintenance of supply systems.

In our survey area, based on self-declared information, only 21.7 percent of households paid their water fees regularly. Of all households who did pay their water fees regularly, the majority (84.8 percent) paid monthly. Although the amounts of water fees vary across woredas, overall the fee was minimal at about five cents per 20 liters of water.

Table 18 Percent of household who pays water fee

		Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
HHs pay for water use		7.4	20	38.5	1.8	40.7	21.7
Method of water fee payment	By time (monthly)	94.1	84.8	95.5	75	73.4	84.8
	By volume	5.9	0	0	0	4.3	2
	By load	0	15.2	4.5	25	22.3	13.2

In order for water supply and sanitation systems to function effectively and be sustained longer for period, the community must take responsibility in the form of community organization or water and sanitation committee that has specific responsibilities to manage the operation and upkeep of the water system. The most important responsibilities of such a group are to collect fees and manage a financial system for maintenance and repair.

For a water and sanitation committee to be financially secure, it needs to have a reliable financial system that provides system managers and the community with an accurate picture of its financial situation. Financial management systems refer to an account of revenues and expenditures that is maintained by a trained finance person. The accuracy and transparency of the accounts is critical.

Financial management system of water system in our sample area was reviewed and was judged by community members. The community member was asked if they have confidence in the existing financial systems of the water/sanitation committee and asked to rate system as 1) weak – in need of strengthening, 2) generally good, or 3) excellent.

Based on these premise the majority (60%) the community, where there is water and sanitation committee already established, has confidence in the financial system of the water and sanitation committee and rated as generally good.

The survey also collected information from households about their knowledge of where to seek help for water system problems and their awareness of the presence of a group or person within the community responsible for maintaining water sources. This person may be someone sitting on the committee or appointed by the committee representing a neighborhood. It is important to not

only have such a person, but to ensure that everyone in the community knows who this person is. If the water/sanitation committee is to be effective, it should be widely known in the community and be familiar with its roles and responsibilities.

Based on this premise, the survey collected data from households about their knowledge of where to seek help in case of problems with their water. The results show that the majority (63.5 percent) has no idea whom to contact when they have a problem with their water system. Only 1.8 percent of respondents said they would contact someone in the community who was responsible for maintaining the water system. In addition, only 16.3 percent of respondents acknowledged the existence of a responsible group or person within the community for maintaining water sources. However, about 45 percent of those who know of the existence of a responsible person in their community had contacted this person or group in the past to solve a water-related problem. In addition, 76.8 percent of those who said they had contacted the responsible group or person, believed that their water problem was solved as a result of their contact.

Table 19 Knowledge of HHs about the existence of responsible body for water system maintenance

		Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
Knowledge of HHs where to go for help for water system maintenance	Nobody	81.4	76.2	75.3	24.6	59.7	63.5
	Kebele chair person	9.5	10	3	41.7	14.3	15.6
	Water management committee	6.9	8.7	5.2	27.2	14.7	12.5
	Person in the community responsible for maintenance	1.3	0.9	0	1.8	5.2	1.8
	Local government (woreda water office)	0.9	4.3	13	4.8	6.1	5.8
	Maintenance worker outside the community	0	0	3.5	0	0	0.7
HHs ever contacted responsible the person/body for water related issues		81.4	32.7	24.6	29.1	75.3	44.5
HHs responded the problem was solved		80.0	66.8	78.6	77.6	76.8	76.8
HHs who acknowledge the presence of responsible group or person within the community for maintenance and up keep of water sources.		3	8.7	21.6	23.7	24.7	16.3

5.4.2. Level of community participation in water development activities

Community mobilization is very important in generating local commitment and support, and problem identification and resolution are integral parts of that process. Once community members understand the nature of the hygiene-related problems and what can be done to solve them, they are more willing to commit themselves and their resources to improving the situation.

About 26.6 percent of respondents had participated in the water development activity of their area, regardless of the level of participation. Among those who said they participated in the water development activity, the majority (81.9 percent) participated in labor and material contribution, while only 9.5 percent participated in all stages of the water development process. Another 6.3 percent participated in forming the WATSAN committee, and less than one percent participated in information sharing and problem identification.

Table 20 Participation level of the community in water point development activities

	Farta	Wonchi	Dandi	Soro	Kucha & Zala	Total

HHs participate in water development activities		40.8	7.5	20.3	29.8	34.6	26.6
Participation level of the HHs in the water development activities	Labor and material contribution	79.6	100	100	54.4	93.8	81.9
	In all stage of the project cycle	0	0	0	41.2	1.3	9.5
	WATSAN committee forming	17.2	0	0	1.5	2.5	6.3
	Site selection	3.2	0	0	2.9	0	1.6
	Information sharing/problem identification	0	0	0	0	2.5	0.7

6. Sanitation and Hygiene

6.1. Access/availability, utilization and management of toilet facilities

In order to improve the hygiene situation of a household, it must have easy access to functioning and hygienic toilet facilities. Access means that all members of the household should be allowed to use the facility at any time (day or night, and in all weather conditions) and that family members must consistently use them to achieve hygiene improvement. Access should also consider the following:

- Whether the facility is shared, public, or private
- The distance of the facility from the dwelling (in meters[9])

Safe disposal of feces requires a private latrine (one facility per family) or a well-maintained shared facility (private or publicly owned). Facilities shared among several users that are not cleaned regularly may discourage their use because of unhygienic conditions. In addition, to be considered accessible it must have an appropriate superstructure (at least an enclosure that provides privacy inside the latrine) whatever the type of facility.

Based on the above hypothesis, the survey collected data about accessibility and utilization of toilet facilities by the household members in the survey. About 36 percent of respondents said they used toilet facilities regardless of the type, while the remaining 64 percent did not use toilet facilities at all. The majority (69 percent) of those who said that they do not use latrines said they use the nearby bush for defecation, while 22 percent used their back yards, and 8.4 percent used a gully or stream for defecation. In addition, among those who had latrines, more than half (56 percent) used open (no superstructure) rudimentary pit latrines, while 35.8 percent used ventilated pit latrines, 7.8 percent of those having shelter from the sun.

Sharing toilet facilities among the community is common, with about 16.8 percent of respondents sharing their toilet facilities. However, people in Soro woreda rarely shared toilet facilities (4.8 percent).

The existence of a toilet facility does not necessarily indicate its use. One important determinant of use is the distance of the facility from the house and a proper superstructure that provides privacy and shade from the sun, and easy access regardless of the weather (rain or sunshine). About 48.7 percent of toilet facilities were situated within 10 meters of the residence, 44.4 percent

[9] A toilet facility should be located within a convenient distance from the user's dwelling—30 meters or less (WHO standards—bearing in mind use during the night and by children and the elderly).

were located within 10 to 50 meters, and 7 percent were located more than fifty meters from the residence (see Table 21).

Table 21 Access to latrine and usage by woreda (% of the HHs)

		Farta	Wonchi	Dandi	Soro	Kucha & Zala	Total
HHs using toilet		29	22.9	25.1	36.8	67.1	36.2
Type of latrine used by the HHs	Open rudimentary pit latrine	62.5	71.4	89.7	75.3	25.7	56.4
	Ventilated pit latrine with shade	15.6	10.2	8.6	22.4	70.4	35.8
	Pit latrine with shade	21.9	18.4	1.7	2.4	3.9	7.8
HHs share latrine with other		10.4	41.5	17.2	4.8	17.4	16.8
Distance of the toilet facility from living quarters of the HHs	Less than 10 meters	52.2	64.2	70.7	52.4	31.6	48.7
	10 - 50 meters	44.8	32.1	25.9	22.6	67.1	44.4
	Over 50 meters	3	3.8	3.4	34.1	1.3	6.9
Condition of superstructure of the toilet facility	Has walls only	34.3	50	46.6	20.2	75	50.4
	Has a roof and walls	40.3	13.5	34.5	2.4	60.3	36
	No super structure	40.3	44.2	27.6	75	11.5	35.3
	Has door(s)	9	11.5	17.2	2.4	17.9	12.5
	Superstructure damaged	13.4	5.8	3.4	2.4	10.3	7.7
Defecation place of HHs who do not use latrine	In the backyard	85.4	2.2	11	2.1	0	22.6
	In the nearby bush	10.4	95.5	68.6	88.9	96.1	69
	Gully/stream	4.3	2.2	20.3	9	3.9	8.4

In addition, observation of the toilet facilities revealed that about 50.4 percent of the toilet facilities had walls and 36 percent of the toilet has roofs and walls, while about 7.7 percent had damaged superstructures. Only 12.5 percent had doors, and 35.3 percent had no superstructure at all (see Table 21).

The respondents were also asked how often they cleaned their toilet facilities, among those who had them. More than half (53 percent) had never cleaned their toilet facilities, while 18 percent cleaned their toilet facilities more than one week ago. Only 27.5 percent cleaned their toilet regularly (at list once per week). Based on the observation of the collected data, 44.3 percent of toilet facilities had clear signs of current usage and was clean. Another 44% had clear signs of current usage but was dirty, and the remaining 5.3 percent could not be observed due to the respondents not willing to show them to the data collectors.

Regarding the use of toilet facilities by all household members, only 12.3 percent of respondents acknowledged that children below five years of age used them. The remaining 87.7 percent did not allow children below five years to use the toilet facilities. The survey also collected data on the presence of child-friendly features within the toilet. Only 5 percent of toilets were equipped with potties, 29 percent of them having a small hole, and 10 percent having a low seat, while the remaining 5.3 percent could not be identified. In addition, 81.5 percent of toilets did not have covered holes, 18.8 percent of these having clear signs of the pit filling up. Toilets containing hand-washing facilities were very scant in the survey area. Only 4.1 percent contained hand-washing facilities, with Wonchi, Kuch and Zala accounting for 3.8 percent each, and Soro accounting for 10.7 percent, while Farta and Dandi had none. See Table 22.

Table 22 Availability of toilet accessories and proper management of toilet facilities

		Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
HHs said children under 5 use the toilet facility		24.6	10	5.3	9.5	12.4	12.3
Presence of child friendly features in the latrine	Pit latrine with small hole	56.7	43.4	25.9	45.2	3.2	28.5
	Lower seat	26.9	13.2	10.3	11.9	0.6	10
	Can not identify	0	20.8	8.6	13.1	1.9	7.2
	Potty available	0	9.4	19	0	1.9	4.5
HHs having pit latrine with covered hole		38.8	7.5	19.0	14.6	15.4	18.5
HHs having toilet facilities show the sign of filling in the pit		1.5	17.3	31.0	13.1	25.3	18.8
HHs having toilet facility with hand washing structure		0	3.8	0	10.7	3.9	4.1
Frequency of toilet facility cleaned (when was the last time the toilet cleaned)	Never	79.1	34.6	48.3	40.5	56.4	53
	Several weeks ago	6	17.3	24.1	16.7	21.8	18
	Less than one week ago	4.5	25	22.4	22.6	16.7	17.7
	Yesterday	1.5	9.6	5.2	13.1	3.8	6.2
	Today	9	1.9	0	7.1	1.3	3.6
	Don't remember	0	11.5	0	0	0	1.4
Condition of the latrine when observed	Clear signs of current usage and clean	53.7	37.3	19	30.1	59.6	44.3
	Clear signs of current usage but dirty	25.4	41.2	55.2	59	40.4	43.9
	Not currently used	20.9	3.9	10.3	6	0	6.5
	Could not observe	0	17.6	15.5	4.8	0	5.3

7. Hygienic behaviors and Knowledge

7.1. Hand washing at the critical time

Hand-washing behavior is strongly influenced by access to water, knowledge about critical hand-washing occasions (after defecation, after handling a child's feces or cleaning a child's bottom, before preparing food, before feeding a child, before eating) as well as access to a properly equipped hand-washing area. To be optimally effective, the hand-washing area should be located in close proximity to the toilet facility so that child caregivers can conveniently clean their hands after defecation. Thus, about 67.8 percent of child caregivers knew about least two critical hand-washing occasions, while 25.3 percent knew of at least four critical hand-washing occasions. However, none of the respondent, across all the woredas knew, all critical hand-washing occasions.

The survey also collected data about child caregiver's knowledge of the importance of using soap during hand washing. The results indicate that the majority (93.6 percent) knew that washing their hands with water and soap was better than washing without soap, while 5.4 percent though that washing their hands with water only was as good as washing them with water and soap. About one percent did not know the difference between washing their hands with or without soap. However, 62 percent of child caregivers had soap in their house the day of the interview. In addition, 72.3 percent of those who had soap used it on the day, and the day before the interview

Table 23 Knowledge of child caretaker about proper hand washing and hand washing practices at critical time

		Farta	Wonchi	Dandi	Sorro	Zala & Kucha	Total
Knowledge of	Before preparing food of cooking	68.1	72.7	92.0	86.8	68.8	77.6

		Farta	Wonchi	Dandi	Sorro	Zala & Kucha	Total
under 5 child caretakers about critical time for hand washing	Before eating	86.6	87.6	72.3	28.9	77.1	70.8
	Before feeding children	38.7	38.8	30.4	8.8	52.3	33.7
	After cleaning/changing baby	2.5	31.4	12.5	1.8	32.1	16.0
	after defecating	11.8	14.9	11.6	4.4	19.3	12.3
	After eating	44.5	0.0	16.1	10.5	41.3	22.3
	At least two critical time	84.3	66.1	83.0	23.7	81.7	67.8
	At list four critical time	19.8	31.4	12.5	3.5	45.9	22.5
	All critical time	0	0	0	0	0	0
Knowledge of caretakers about using soap for washing hands	Water with soap is better	100	86.8	92	89.5	100	93.6
	Water with out soap is as good as water with soap	0	13.2	5.4	7.9	0	5.4
	Don't know	0	0	2.7	2.6	0	1
Under 5 children care takers having soap		71.1	31.4	93.8	43.0	73.4	62.0
Under 5 children care used soap today or yesterday		45.3	73.7	79.0	81.6	86.3	72.3

7.2. Sources of sanitation and hygiene information

A comprehensive communication strategy raises awareness about hygiene facilities and practices, shares information, and promotes behavior change by highlighting benefits that are important to the target audience.

Respondents in the sample area mentioned receiving sanitation and hygiene information from a variety of information sources. The most frequently cited sources of information on sanitation and hygiene came from health clinic staff (32.2 percent), followed by health outreach workers (32 percent) and radio/TV (18.1 percent). However, a substantial proportion (15.3 percent) did not hear any sanitation and hygiene messages from anyone.

Table 24 Main source of information about personal Hygiene

	Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
Health clinic staff	56.3	19.8	25	31.6	27.5	32.2
Health outreach worker	31.1	13.2	13.4	49.1	55	32
Radio of TV	10.9	30.6	42	3.5	2.8	18.1
Nobody	10.9	20.7	18.8	8.8	17.4	15.3
School	3.4	9.1	3.6	9.6	3.7	5.9
Community committee (health, development, agriculture)	5	4.1	0.9	2.6	11.9	4.9
Mosque/church	16.8	0	0	0	4.6	4.3
Other friends of family	2.5	1.7	3.6	4.4	0.9	2.6
Don't know	3.4	5	0.9	0	0	1.9
At work	0	2.5	0.9	0.9	1.8	1.2
Social worker	0	1.7	0.9	0.9	0.9	0.9

7.3. Sanitation and hygiene information type and adoption/ practicing rate

Practicing improved water and sanitation behaviors depends on effective communication strategies. In addition, understanding messages and developing the necessary knowledge are just

steps towards trying out and adopting essential hygiene behaviors. Thus, child caregivers were asked about the type of hygiene promotion message they heard and recalled, without prompting them about what the hygiene message contained. Additional survey questions attempted to measure whether people followed up on the messages they heard and tried out and adopted the recommended hygiene practices.

Respondents mentioned more than 20 different sanitation and hygiene messages they had heard on different occasions, except Dandi. However, the one most frequently cited messages were: use of toilet facilities to defecate (25.4 percent), vaccination for measles (24.6 percent), proper hand washing (23.7 percent), using soap (18.6 percent), health in general (18.6 percent), safe drinking water (17.8 percent) and safe water storage (16.1 percent). Among the child caregivers that said they had heard one or more sanitation and hygiene messages, about 78.8 percent had tried one or more of the recommendations made in the messages. Respondents mentioned that they had tried about ten out of 20 different recommendations. The child caregivers had tried out hand washing with soap (52.1 percent), the safe storage of drinking water (27.7 percent), beast feeding (18.1 percent), hygienic food preparation and disposal of child feces into toilets (about 20 percent) each, safe disposal of garbage and giving more fluids to children with diarrhea (12.8 percent) each.

Table 25 Information type and adoption/ practicing rate

		Farta	Wonchi	Dandi	Soro	Zala & Kucha	Total
HHs visited by community volunteer on water, hygiene and sanitation		26.4	5.0	0.0	28.9	43.1	20.5
Type of message heard by the community	use toilet facility to defecate	15.6	50	0	24.2	29.8	25.4
	Measles vaccination	43.8	16.7	0	9.1	23.4	24.6
	Wash hands	62.5	33.3	0	12.1	4.3	23.7
	Use soap	21.9	33.3	0	15.2	17	18.6
	Health in general	3.1	0	0	15.2	34	18.6
	Drink clean water	12.5	33.3	0	12.1	23.4	17.8
	Store water safely	6.3	0	0	30.3	14.9	16.1
	Dispose of garbage in pit	25	0	0	12.1	6.4	12.7
	Prepare food hygienically protect	9.4	0	0	9.1	14.9	11
HHs tried out any of the recommendations in the message		81.3	33.3	0.0	72.7	87.2	78.8
Type of messages tried by the HH	Wash hands with soap	76	100	0	42.3	41.5	52.1
	Store drinking water safely	12	50	0	34.6	31.7	27.7
	dispose of children's feces	8	50	0	23.1	26.8	21.3
	Protect food	16	0	0	15.4	26.8	20.2
	Breastfeed	8	0	0	19.2	24.4	18.1
	Dispose of garbage properly	20	0	0	0	17.1	12.8
	Give more fluid to child with diarrhea	0	0	0	19.2	17.1	12.8
	Treat drinking water	4	0	0	11.5	7.3	7.4
	Give ORS	0	0	0	0	4.9	2.1
	Measles vaccination	4	0	0	0	0	1.1

Water is not the only source of contamination. Much of the transmission of diarrhea pathogens occurs through the fecal contamination of food. Hygienic preparation, storage, and retrieval of food are essential components of hygiene practice.

Food preparers and child caregivers are people who prepare most of the food in the household and provide most of the care for young children, who were adult females (51.3 percent) and mothers (46.6 percent) in our sample area.

Based on self-declared practices, 81.9 percent of the main food preparers washed their hand before preparing food, 59.9 percent of them washed utensils and containers before preparing food, 15.1 percent washed and cooked food thoroughly, and less than two percent of them did not mention any hygienic food preparation methods.

Table 26 Responsible people for food preparation in the household and preparation of food hygienically

		Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
Main food preparer in the households	Mother	61.2	36.4	40.2	28.1	67.9	46.6
	Other adult female	38.0	62.0	56.3	68.4	31.2	51.3
	Grand mother	0.8	0.0	0.0	0.9	0.9	0.5
	School age girl	0.0	1.7	3.6	2.6	0.0	1.6
Steps followed the last time they prepared food	Wash hands before preparation	83.5	86.8	79.5	91.2	67.9	81.9
	Wash utensils and containers before preparation	71.1	67.8	67.0	23.0	69.7	59.9
	Wash food thoroughly	33.9	38.0	46.4	18.6	67.0	40.5
	Cook food thoroughly	24.0	6.6	17.0	5.3	22.9	15.1
	Don't know	0.0	0.0	0.0	5.3	2.8	1.6
Under 5 child care takers	Wash their breast with soap before feeding	10.3	5.2	22.5	47.7	42.6	23.4

7.4. Prevalence and management of diarrhea

Diarrhea is an important cause of death of children under five and a burdensome disease in many regards. It can be prevented if one knows the causes and what to do about it. Data on the period prevalence of diarrhea, based on the two-week recall of the child's primary caretaker, was collected from the sample area. Thus the data should be interpreted as the proportion of children in our sample who have had diarrhea at anytime in the two preceding weeks of data collection time. In addition, diarrhea prevalence is influenced by season and rainfall, which may change the type of water source used by households and the level of contamination. Therefore, follow-up surveys must occur in the same season to be comparable.

In order to evaluate the current situation, sample households included in this study were asked if any of their children under five have had diarrhea in the past two weeks. Analysis of these responses, as presented in Table 27 below, indicates that about 20.6% of the households have child had diarrhea in the last two weeks, with Soro woreda taking the lead with 40.4% followed by Wonchi and Zala and Kucha 22.3% and 18.3%, respectively.

Table 27 Prevalence and management of diarrhea

		Farta	Wonchi	Dandi	Soro	Zala & Kucha	Total
HHs having a child had diarrhea in the last 2 weeks		11.6	22.3	10.7	40.4	18.3	20.6
Amount of fluid the child drunk during the diarrhea	Somewhat less	42.9	51.9	25	21.7	35	33.6
	More than the usual one	21.4	18.5	0	32.6	30	24.4
	Much less	0	14.8	8.3	34.8	5	18.5
	About the same	7.1	3.7	58.3	8.7	15	13.4
	Not at all	28.6	11.1	8.3	0	10	8.4
	Don't know	0	0	0	2.2	5	1.7
Amount of food the child ate during the diarrhea	Somewhat less	35.7	25.9	50	28.3	40	32.8
	Much less	28.6	40.7	16.7	39.1	15	31.9
	More than the usual one	7.1	18.5	0	30.4	15	19.3
	About the same	7.1	14.8	33.3	0	20	10.9
	Not at all	21.4	0	0	0	10	4.2
	Don't know	0	0	0	2.2	0	0.8

Appropriate treatment of diarrhea depends, in part, on the type of diarrhea present. There are three main types of diarrhea that affect children in developing countries: 1) acute watery diarrhea, 2) dysentery, and 3) persistent diarrhea. A child affected with any of these types of diarrhea should receive Oral Rehydration Salts (ORS) to prevent and treat dehydration. It is important also that continued feeding and increased fluid intake are provided during any type of diarrhea. In addition, a course of antibiotics may be required for dysentery, and dietary adjustments, such as reduced lactose intake, may be helpful in the case of persistent diarrhea (USAID 2000).

Since the type of diarrhea does not substantially influence the type of water and sanitation intervention, data on the type of diarrhea experienced was not collected during this survey. Diarrhea management data in Table 29, therefore, is for non-specific cases of diarrhea. The data indicate that among children below five years of age, 37.8 percent received increased fluid intake[10], and 30.2 percent received continued feeding[11] during a recent diarrhea episode.

7.5. Knowledge about the cause of diarrhea

Hygiene improvement projects are most concerned with changing behavior involving water use and sanitation. Such behavioral changes cannot be expected, however, until the target population knows what must be done to improve the hygiene situation in the household and the surrounding community (i.e., proper protection of drinking water and hand washing). Household hygiene improvement depends on more than just the family's actions. It is also a collective action, at community level, that brings a substantial improvement in the sanitation and hygiene conditions of the society.

The survey, therefore, collected information about caregiver's knowledge of the causes of diarrhea, prevention methods, and their attitude about the community's ability to prevent diarrhea. The community's ability to **"**do something**"** refers to any activity a caregiver cited that he/she and the community can perform together, and that would have a positive impact on hygiene or diarrhea prevention in their community.

Household's perception of the causes of diarrhea in young children was high, about 98.6 percent of child caregivers mentioning the knowledge of at least one cause of diarrhea. The most

[10] "Increased fluid intake" is defined here as giving the child more liquid during the diarrhea episode.
[11] "Continued feeding" is defined here as giving the child about the same quantity or more to eat during the diarrhea episode.

frequently mentioned cause of diarrhea was dirty water (53.3 percent), bad/dirty food (45.7 percent) and poor hygienic practices (37.3 percent). In addition, 60.4 percent of child caregivers said that diarrhea can be prevented, and 61.0 percent believed that the community as a whole could do something to prevent it. The most frequently mentioned means of prevention were providing clean water (71.6 percent), help construct latrine (43.8 percent), clean-village campaigns (29.5 percent) and make water disinfectant available at the low cost (11.6 percent).

Table 28 child caretaker knowledge about the cause and prevention of diarrhea

		Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
Perception of the HHs with regards to cause diarrhea in young children	Bad/ dirty water	38.0	65.8	66.1	33.3	63.8	53.3
	Bad/dirty food	40.5	55.0	58.0	19.8	55.2	45.7
	Poor hygiene	20.7	37.5	33.0	39.6	58.1	37.3
	Feces/defecating in the open	3.3	8.3	8.9	19.8	30.5	13.7
	Dirty hands	3.3	15.0	5.4	11.7	18.1	10.5
	Germs	1.7	7.5	1.8	1.8	5.7	3.7
	Flies	5.8	10.8	13.4	3.6	7.6	8.3
	Develop milk teeth	0.0	0.8	0.0	0.0	1.0	0.4
	Don't know	33.9	20.8	7.1	0.0	3.8	13.7
HHs perceive that diarrhea can be prevented		62.0	45.5	83.8	38.6	74.3	60.4
Methods perceived by the HHs diarrhea can be prevented	Prepare food hygienically/protect	57.3	61.4	44.1	37	30.9	45.7
	Wash hand	53.3	52.6	61.3	21.7	18.5	43.2
	Drink clean water	28	22.8	48.4	17.4	30.9	31.8
	Use soap for cleaning	20	33.3	32.3	4.3	42	28.4
	Use toilet facility to defecate	5.3	22.8	19.4	15.2	18.5	16.2
	Dispose children's feces in toilet facility	4	21.1	10.8	4.3	22.2	12.8
	Measles vaccination	22.7	10.5	0	19.6	9.9	11.4
	Store water safely	5.3	14	6.5	13	14.8	10.2
	Dispose of garbage in a pit	9.3	5.3	2.2	6.5	13.6	7.4
	Treat water(boil, filter, chlorinate)	2.7	3.5	12.9	0	3.7	5.4
	Breast feeding in general	1.3	0	0	10.9	12.3	4.5
	Bury feces	4	1.8	3.2	0	3.7	2.8
	Traditional practice	0	0	0	2.2	9.9	2.6
	No other food/drink before 6 months, other than breast feed	0	3.5	0	0	7.4	2.3
	Good nutrition	2.7	3.5	1.1	0	3.7	2.3
	Don't know	1.3	0	0	2.2	2.5	1.1
	Vitamin A	0	0	0	4.3	0	0.6
Suggestions of HHs that the community as whole can do something to prevent diarrhea	Provide clean water	66.3	68.9	90.5	41.3	74.1	71.6
	Help to construct latrines	20	49.2	56.8	26.1	58	43.8
	Clean village campaigns	40	6.6	5.3	47.8	54.3	29.5
	Make water disinfectant available at low cost	2.5	29.5	16.8	2.2	6.2	11.6
	Make materials for latrine construction available at low cost	2.5	16.4	16.8	0	14.8	11
	Make soap available at low cost	8.8	14.8	10.5	2.2	7.4	9.1
	Don't know	11.3	16.4	2.1	8.7	6.2	8.3
	Train promoters/animators	1.3	4.9	2.1	4.3	0	2.2
	to get nutritional food	3.8	0	0	0	0	0.8

7.6. Infant feces disposal practices in relation to toilet availability

With exposure to feces being a primary source of diarrhea, it is essential for hygiene improvement that households safely dispose of both adult and child fecal matter. Disposing of the feces of children, especially those under 5 years of age, is crucial because young children are more likely to contaminate the household environment; they are less likely to use a toilet, and their feces may contain more pathogens than that of adults.

The majority (81.2 percent) of households in the sample area did not use proper defection methods for children under five years old. In addition, 45 percent of the child caregivers disposed of children's feces in unsafe ways: either by tossing it out into the yard and then discarding the water used for cleaning the yard, or leaving the feces where the child excreted it outside the premises.

Table 39 Infant feces disposal mechanism in relation to toilet availability

		Farta	Wonchi	Dandi	Soro	Zala & Kucha	Total
Places of defecation for under 5 child last time	Went in house/Yard	73.6	38.0	39.3	14.9	49.5	43.3
	Went out side the premises	13.2	23.1	15.2	32.5	8.3	18.5
	Went in His/Her cloths	12.4	23.1	19.6	14.9	12.8	16.6
	Used sanitation facility	0.8	6.6	1.8	18.4	16.5	8.7
	Used potty	0.0	4.1	20.5	2.6	5.5	6.4
	Used washable diapers	0.0	0.8	3.6	1.8	4.6	2.1
	Used disposable diapers	0.0	0.0	0.0	5.3	2.8	1.6
	Don't Know	0.0	4.1	0.0	9.6	0.0	2.8
Places the feces disposed off last time child defecate	Dropped into toilet facility	14	14	11.6	13.2	42.2	18.7
	Some where in yard	9.9	30.6	16.1	25.4	10.1	18.5
	Disposed into solid waste/trash	15.7	24	17	6.1	12.8	15.3
	Water discarded outside	9.9	14	21.4	5.3	3.7	10.9
	Rinsed/washed away	13.2	8.3	9.8	5.3	11	9.5
	Buried	14.9	0.8	15.2	6.1	2.8	8
	Connected to drainage system	18.2	0.8	3.6	7	9.2	7.8
	Water discarded into toilet facility	0.8	2.5	4.5	9.6	7.3	4.9
	Don't know	0	4.1	0	15.8	0	4
	Outside premises	1.7	0	0	5.3	0.9	1.6
	Did nothing/left it there	1.7	0	0.9	0	0	0.5
	Water discarded into sink of tub	0	0.8	0	0.9	0	0.3

Garbage disposal practices of the communities are also an issue in the survey area. About 79.4% of the households just throw their garbage out in the nature, whether close to the home or far away. In addition, based on the data collector observation, 44% of the household's yards or house were seen littered with garbage lying open in their houses or yards during the interview time. Simple methods of garbage disposal, such as burring or burning could be promoted to reduce the risk of contaminating the environment**.**

Table 30 Garbage disposal mechanisms (%HH)

	Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
HHs with garbage lying open in their house or yard	40.3	33.3	53.5	35.5	57.6	44.0

Type of garbage disposal mechanism of the HHs	Throws it out far from home	14.3	62.3	48.7	57.7	43	45.2
	Throws it out close to home	32.9	25.1	33	36.6	27.8	31.1
	Bury it	37.2	1.3	1.7	0	4	8.9
	Burn it	0.4	6.1	13	1.8	13.9	7
	Use it for compost	4.8	0	0	0	8.1	2.6
	No garbage produced	0.4	4.8	0.4	4	0.9	2.1
	In the back yard	8.2	0.4	0	0	0	1.7
	Use community dump	1.7	0	3	0	2.2	1.4

8. Availability of sanitation and hygiene facilities at schools and health centers

Safe water, basic sanitation and hygiene are not only important at the household and community levels; it is essential that institutions adhere to minimum standards for at least two reasons:

- Institutions such as schools and health facilities should provide a safe environment for the public
- Public and private institutions should serve as models for hygiene improvement and set a positive example for households and communities.

Schools are especially important in this respect because they contribute to the knowledge of future parents and help in changing their behavior.

In the sample area, excluding the woreda who did not provide the information, only 35.1% of the health facilities and 6% of the schools have water supply system. Hand washing structures are in existence in all health centers. By contrast, about 5% of the school has hand washing facilities. In almost all cases (100%) of the health facilities equipped with toilet while about 65.2% of schools has latrine, out of which 58.8% of them has segregated latrine for boy and girl.

Table 31 sanitation and hygiene facilities in key institutions (% of institutions)

	Farta	Wonchi	Dandi	Sorro	Kucha & Zala	Total
Health facilities with water supply system	-	42.9	-	27.3	-	35.1
Schools with water supply system	-	10.7	2.2	3.9	8.6	6.4
Health facilities with latrine	-	100	-	100		100
Schools with latrine	-	32.1	100	64.7	63.8	65.2
Schools with boy and girl segregated laterins	-	57.7	48.9	64.7	63.8	58.8
Health facilities with hand washing facilities	-	0	-	0	-	0
Schools with hand washing facilities	-	7.1	0	11.8	1.7	5.2

Part III

Key Findings and Possible Program Implications

9. Key Findings and Possible Program Implications

This baseline study was conducted to set the basis for measuring progress made towards project objectives through a number of key indicators that will be useful for future monitoring and evaluation of program. The study was not designed as an evaluation study, but some observations about programmatic implications and potential priorities for action are appropriate to set forth in this section.

9.1 Household Demography

- The average family size among the sample households is 5.7 persons per household and is regarded as high and is a demographic factor contributing to the prevalence of poverty at large. In addition, it was found that nearly half (49.7%) of the population is not economically active, and a higher dependence rate was observed on those economically active persons. Large family size, coupled with a high proportion of economically dependant household members need for interventions focused on reducing the dependency ratios within households.

- In relative terms, the proportion of female household heads is high in the survey area. Of all household heads participating in the survey, 16.4% of household heads are females. This shows that that there are a large number of vulnerable female headed household in the survey area, which needs project specific intervention tailored to support this and other vulnerable groups in the area.

- As in the case in most parts of the country, the survey area also, in general, has limited access to educational services. As a result, nearly 37% of the population above age seven is illiterate. The illiteracy rate is more pronounced among female community members. Girls are less likely to access education, which is shown by at 60% illiteracy rate among girls, as compared to boys with only 40% illiteracy rate.

  Ensuring equity in education will be an important strategy to emphasize in education focused development activities, as the percentage of girls enrolled in school is lower than boys. Because overall enrolment is poor across the board in formal institutions, focus on developing new alternative basic education centers in the area may be a strategy that can have a high impact for remote and marginalized populations.

- The majority (97.8%) of the population uses firewood for cooking and about 10.9% of them use lantern (Kuraze) as lighting in homes. Thus, Forest resources are a major source of household energy requirement for lighting and cooking. The application of such non-renewable resource for household use contributes greatly to the debilitating effects of meager resources in the survey area. This process will increase runoff and hamper the infiltration of rain water into the ground and limit the ground water recharging process. Thus, promotion of the use of alternative energy sources and use of fuel efficient stoves should gain priority attention as part of environmental protection interventions as well as increase the ground water table by enhancing the infiltration rate through catchments area protection. In addition such interventions would have potential contributions in reducing the work burden of women in collecting fire wood.

- Residential infrastructure is poor, about 66.6% of the households cooks the same room they live and more than half of the population (53.3%) shares the same room with animals. These

practices could result in the acute childhood illnesses. Promoting habitat improvements will also be an important sanitation and hygiene intervention.

9.2 Hygiene, Water and Sanitation

- In many ways access to domestic water is below the standards set by the government of Ethiopia for rural areas (15lcd). Only 11.1% of the survey population secured the minimum water daily requirement per person, 15lcd. The average daily water consumption, in the survey area, during the rainy season was 6.7 lcd while during the dry season 9.51 lcd. The proportion of needs covered, taking 15 lcd as reference point, is therefore 56.7% in the rainy season and 36.6% in the dry season. In addition, regardless of the season, people overall spend nearly an hour (57 minutes) to fetch (round trip excluding the queuing and social time at the water point) drinking water from it sources.

- The burden of fetching water is a lot depends on the prevailing division of labor in the family and social practices that are prevalent in different settings, in this cases the burden of fetching water seems to be greater on adult female and school age girl and therefore, access to water is directly affecting the well-being of girls and women. In over all, only 5.3% of adult males share the burden of fetching water. In addition, for the majority of the households (97.4%) means of water transportation is human back while only 2.5% of the respondent use animal to transport water.

- Time spent fetching water and caring for sick children is lost to more productive activities, and girls often stay out of school because of such duties. Girls' enrollment and attendance in school are negatively affected by poor sanitary conditions. When attention to gender is incorporated into development projects, the outcome should not be assumed to be projects specifically designed for women beneficiaries. Rather, the emphasis should be on ensuring that projects are not targeted towards activities predominantly affecting men; in these cases, gender analysis can ensure that women are not left out of the equation for the equitable allocation of water resources.

- The result from the survey shows that only 12% of the population threats water after it arrives home to make safer for drinking. Of all household who said they purify or treats their water in home, about half of them use cloth filter, one fourth of them uses sedimentation to clean their water, about 13 percent of them boil water, and about 10 percent used water filter systems such as ceramic or sand composite, and 5.2 percent used chlorine or bleach.

- The importance of water quality must be weighed not only against the diseases prevalent in the area but also- against other factors such as cost, quantity, and reliability (e.g., the ability of a system to operate continuously, during reasonable periods every day, throughout the year). Thus, water treatment should be introduced where needed to improve water quality, especially for drinking, cooking, and food preparation. Simple household treatment may be sufficient to assure adequate quality for domestic use. Education (particularly for mothers and school age children) can help ensure maintenance of the water's quality during its storage and transportation from point of collection to point of use.

- In our survey area, based on self declared information, only 21.7% of the households pays water fee regularly to cover the recurrent cost of the water system. In order to up keep and maintain the water supply system for longer period, revenues for operation and maintenance should be generated and controlled by the local community, which has a vested interest in

maintaining the system, so that they are readily available when breakdowns occur. Thus, program intervention that strengthen and encourage the recurrent cost recovery mechanism would have a greater impact on the sustainability of the water system.

- The result shows that the majority (63.5%) said has no idea whom to contact when they have a problem with their water system. Only 1.8% of the respondent said they will contact person in the community who is responsible for maintenance of the water system. Long-term success of water systems depends on the availability of supplies, parts, equipment, and the trained people needed to monitor, maintain, and repair the systems. It is important to not only have trained person, but to ensure that everyone in the community knows who this person is. If the water/sanitation committee is to be effective, it should be widely known in the community and be familiar with its roles and responsibilities.

- About 26.6% of the respondent has been participated in the water development activity, regardless of the level of participation. Among those respondent who said they participated in the water development activity, the majority (81.9%) of the respondent were participated in labor and material contribution only, about 9.5% of them participated in all stage of the water development process. In order for water supply and sanitation systems to function effectively and be sustained for longer period of time, the community must involve in all stage of the water development activities including site selection, information sharing/problem identification and labor and material contribution, and should not be limited to labor and material contribution only.

- Implemented properly, and with sufficient levels of community participation, water and sanitation programs have immediate positive impact on the lives of women and would improve the overall health of a household. Communities must feel “ownership” for the water sites and for sanitation facilities and this can be built through strong community participation and contribution from the beginning of program implementation.

- Use of latrines in the sample area is not common. About 64% of households do not use toilet facilities at all. Among those who don’t use latrine, the majority (69%) of them use the nearby bush for defection while 22% uses their back yard and 8.4% uses gully or stream for defecation. In addition, based on the observation of the latrine, only 44% of the households who have latrines are appropriately using the latrines. More than half of the respondent (53%) of them has never clean their toilet facilities at all. about 18% of them cleans their toilet facilities more than one week ago. The remaining 87.7% of the respondent, who uses toilet facilities, do not allow the use of toilet facilities by children under five.

- A toilet facility with hand washing is very scant in the survey area. Only 4.1% of the toilet facilities had equipped with hand washing structure, only 25.3% of the child caretaker knows at least two critical hand washing while 22.5 percent of the child caretaker knows about hand washing at all the critical time. Thus, interventions in this area should focus on improving proper hygiene and sanitation knowledge and practices at the household level. Reduction in the incidence of communicable diseases and an overall improvement in hygienic practices, such as hand washing at appropriate times, should be highlighted. The focus will be primarily related to increasing knowledge and changing common behaviors that are ultimately aimed at improving the overall health of the household. Focus should be placed on training and working with women, as they are the primary users of water and ultimately responsible for sanitation and hygiene in the household.

PRA Sub-teams
Sub Team 1
Sub Team 2
Sub Team 3
Sub Team 4

- To improve household hygiene, it is important that child caregivers and those responsible for food preparation wash their hands after using the toilet facilities, after handling a child's feces, and/or before preparing food. This behavior is associated with their knowledge about proper hand washing behaviors (when and how) as well as access to safe water and hand washing facilities.

- The majority (81.2%) of the household in the sample area do not use proper defection methods for child under five years of olds. In addition, about 45% of the child caretaker disposed the child feces in unsafe way, either they toss out in the yard, or discarded the water used for cleaning in the yard, or left the feces where the child excreted or dispose the feces outside the premises.

- Safe disposal practices benefit not only the immediate household but also the community at large, because feces from one household can easily be carried, for example, through flies, or washed into the environment of neighboring households. The provision of basic sanitation and a reliable supply of safe, convenient water is not sufficient to guarantee improved health. A variety of social and cultural attitudes affect the pattern of usage of water and sanitation facilities: people must use facilities and use them properly to discourage environmental contamination (particularly with fecal material) and disease transmission. In our sample areas, for instance, children are not encouraged to use the latrines, because children's feces are considered harmless. Thus, program interventions that focus in mothers and child caretaker should be a main target of hygiene education programs, since they are primarily responsible for the health and training of their children.

- About 79.4% of the households just throw their garbage out in the nature, whether close to the home or far away. In addition, based on the data collector observation, 44% of the household's yards or house were seen littered with garbage lying open in their houses or yards during the interview time. Negligence on better sanitation has been unique feature all over the survey area. The open defecation, haphazard disposal of domestic garbage and carelessness on health and hygiene is a common scenario in almost all the villages. Animal waste in the villages and human waste near by the streams and open fields affects the water quality. All this ultimately results in recurrent epidemics as well as the long lasting diseases.

- Water supply and sanitation interventions can be most effective in improving health when they are coordinated with other primary health care activities, especially health and hygiene education, and maternal and child health services. Examples of user education which seem obvious but which are often overlooked include: advice on the protection of stored household water from microbial contamination; promotion of proper hand washing technical at the critical time; promotion of hygienic food preparation, including the proper use of water for cleaning utensils; promotion of breastfeeding, especially during the first six months of life; promotion of safe excreta disposal by all family members; and instruction on preparing water for use in oral rehydration therapy.