Linkages between Water Supply and Sanitation (WSS) and Food Security in Four Case Study Communities of East Hararghe Zone, Oromia Region[1]

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Abstract

The study aims at assessing the relationship between water supply and sanitation and food security. The methods used to obtain the data included household surveys and 'participatory rural appraisal' (PRA) methods. The latter included focus group discussions, case study households, and key informant interviews with the elderly, development agents, health extension workers and NGO representatives. The results of the study revealed that the villagers of Gaja in Ido Jalela Kebele, who have got water schemes, cast doubts on the safeness and cleanliness of the water. The inhabitants of Sirba village in Ifa Kebele, who have also water schemes, feel that the water supply is inadequate to meet household requirements. The other two kebeles that have no access to water schemes, viz. Shek Abdi in Babile Woreda and Burakssa in Goro Gutu, use water from natural sources that are neither clean nor located nearer to their homesteads. Lack of access to safe water has affected sanitation and brought about health problems for humans and livestock, wastage of time and labour power, and inability to intensify agriculture through irrigation. The people in the study villages are food insecure with three-quarters of the households being unable to sustain themselves all year round. Factors that adversely affect crop production, livestock raising, earnings from non-farm activities, and food utilizations explain households' food insecurity. The villagers in both woredas have put forward the following measures to improve their food insecurity situations: expansion of irrigation agriculture, construction of big water supply schemes and development of water points for livestock.

Keywords: water supply, food security/insecurity, East Hararghe Zone, water schemes, irrigation, livestock watering

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Introduction

Food security is affected by a multitude of factors which can be categorized into six: (a) *environment-related factors* (e.g. availability and quality of natural resources, including water), (b) *demographic factors* (e.g. rapid population growth and the resultant land size shrinkage), (c) *economic factors* (e.g. market, availability/unavailability of oxen, land size), (d) *technology and infrastructure-related factors* (e.g. access to road and health facilities), (e) *social factors* (harmful practices, feeding habits, burden on women), and (f) *political/policy related issues* (e.g. participation/non-participation in the decision-making process).

Food insecurity in Africa is closely related to poor performance of the agricultural sector in general and the smallholder agriculture in particular. Physical and socio-economic services and infrastructure such as roads, markets, irrigation and water schemes, veterinary services, education and health are essential elements that contribute to improving the food security of rural people through the enhancement of labour and land productivity, commercialization, reduction of transaction costs and facilitating trade and exchange.

Both chronic and seasonal food insecurities affect a large segment of the population. According to the UNICEF report (2005), 45 % of the rural population in Ethiopia lives below the poverty line. During the 2002/03 food crisis, about 22% of Ethiopians (14.3 million) were in need of food aid. As reported by Ethiopian Disaster Prevention and Preparedness Commission (2004), domestic food production meets on average only about 88 % of the food demand in the country, the remaining being a gap to be covered from various sources like food aid and food imports.

Access to safe drinking water reduces the exposure of people to a variety of diseases that obstruct the intake and utilization of food as well as expenses related to health. In addition, easier access to safe water reduces the time of hauling water by women thereby increasing their productivity and status. At the Sub-Saharan African level, only two to three per cent of the surface and

ground water resources available are used to meet the different needs. Not much progress towards long-term reliable food security can be achieved unless Africa attains a minimum level of capacity to develop and manage its surface and ground water resources (UNDESA, 2006).

The social and economic circumstances prevailing in Ethiopia today have made particular demands upon the country's water resource base and the environment and its sustainability is threatened by human-induced activities. Over the years, these demands have intensified with the increase in population and concurrent growth of economic activities requiring water as an input for irrigated agriculture, hydropower generation, livestock keeping, industries, tourism, mining, domestic use, fisheries, wildlife, and forestry activities. Water scarcity in many places in Ethiopia occurs due to unreliable rainfall, multiplicity of competing uses, degradation of sources and catchments. It threatens food security, energy production, sanitation and environmental integrity. Consequently, there are water-use conflicts between sectors of the economy.

The central purpose of this study is to assess the linkages between water supply and sanitation (WSS) and food security at a micro level by taking a sample of villages with and without water schemes in East Hararghe Zone (EHZ) of Oromia Region. The specific objectives of the study include (a) assess the water supply, access and sanitation situations in the study communities, (b) examine the food security situations at household level, and (c) establish the linkages between water supply and sanitation and food security.

The study has hence addressed the following four research questions:

i) What is the inter-village variation in WSS interventions?

ii) What are the major constraints deterring improvements in WSS?

iii) What are the main reasons for being food insecure?

iv) What kind of relationship is there between WSS and some components of food security?

Conceptual and Analytical Framework

The First World Food Summit in 1996 defines food security as a situation that exists "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO 1996). The definition was also rectified as a guiding principle of the MDG (2000) with respect to the fight against hunger. Four pertinent issues are embedded into the definition of food security. These include:

Sufficiency of food: explained mainly as the calories needed for an active and healthy life. The recommended minimum number of calories per day varies between 2100 and 2600;

Access to food: refers to entitlement to produce, purchase, exchange food, or receive it as a gift;

Security: defined as the balance between vulnerability, risk and insurance. Vulnerability has two important dimensions: (i) exposure to external shock and the resultant stress, and risks; and (ii) lack of means to cope with crisis without damaging loss;

Time: refers to temporal situation of food security/insecurity. Food insecurity affecting a certain segment of a population can be chronic/permanent (where people always live under food shortage crisis), or transitory/seasonal (where people encounter food deficiency during certain season of a year).

In the context of Ethiopia and the study areas, a household can be described as food secure "when its livelihood activities allow to meet its food requirements and other basic needs, either through its own productions, i.e. crop cultivation and/or livestock rearing, or through having other opportunities to run own non-farm ventures or to work with somebody else" (Degefa, 2005:10). Conversely, food insecurity refers to a situation where a household is not capable to sufficiently feed its members from either its own production or market purchase. Thus, the feelings of being either food secure or insecure is a self-reporting of a household on the fear of encountering food shortage or not. Broadly, it is possible to divide households that live with the anxiety of food shortage into two categories:

(a) households that always live under food shortage crises and subsequent hunger, i.e. chronically food insecure, and (b) households that can face food shortage problems only when they are hard hit by disasters and shocks, i.e., acutely or temporarily food insecure.

Diverse theories have been formulated regarding the explanation of food shortage that can happen at various geographical scales ranging from global to individual. The widely cited theories include the Food Availability Decline (FAD) (Millman & Kates, 1990; Devereux, 1993), the 'Food Entitlement Decline' (FED) [Sen 1981], the 'Political Economy Explanations' (Devereux, 1993), a theory that considers food shortage as a disaster (Blaikie *et al.*, 1994), and the 'Sustainable Livelihood Framework' (SLF) that looks at food insecurity as an outcome of undesirable/vulnerable livelihoods (Davies, 1996; Carney, 1998; Pretty, 1998; Scoones, 1998; Ellis, 2000). The authors of this study are of the opinion that sustainable livelihood framework (SLF), which will be explained hereunder, is the most appropriate approach for the study at hand.

A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living (Chambers and Conway, 1992). Four important components of the SLF can be identified: capital assets, existing context, mediating processes and livelihood outcomes and indicators (Carney, 1998; Ellis, 2000). The interaction between these factors determines whether a household pursues a sustainable livelihood strategy or lives under vulnerability (Degefa and Baudouin, 2004).

Livelihood assets are grouped under five types of capitals: natural (natural resource-based assets, including land, water, forests, fish stocks); social (networks, membership of groups, relationships of trust, access to wider institutions of society); human (skills, knowledge, good health, ability to work); physical (production equipment, transport, shelter, water supply, energy and communication); and financial (savings, supplies of credit, regular remittances or pensions) [Carney, 1998; Pretty, 1998; Scoones, 1998]. For inhabitants of East Hararghe, where the overwhelming majority of them draw their livelihoods from agriculture, access to natural capital, specifically land and water, is a decisive factor.

Context refers to the trends, shocks and local cultural practices affecting livelihoods in different ways. It determines the extent to which households are vulnerable to various disasters/risks. Two issues are relevant in East Hararghe. The first is the rapid growth of the population over several decades, which has tremendous implications for the decline of per capita landholdings at household level. Local farmers attributed land shrinkage to a shift from food grain production to cash crops, specifically chat and coffee, and a reduction in the number of livestock kept. The second is a shock that comes as a result of recurrent drought. East Hararghe was included among the hardest hit areas of the country during the droughts of 1973-1974 and 1984-1985 [Carney (1998); Davies (1996); Ellis (2000); Pretty (1998); Scoones (1998)].

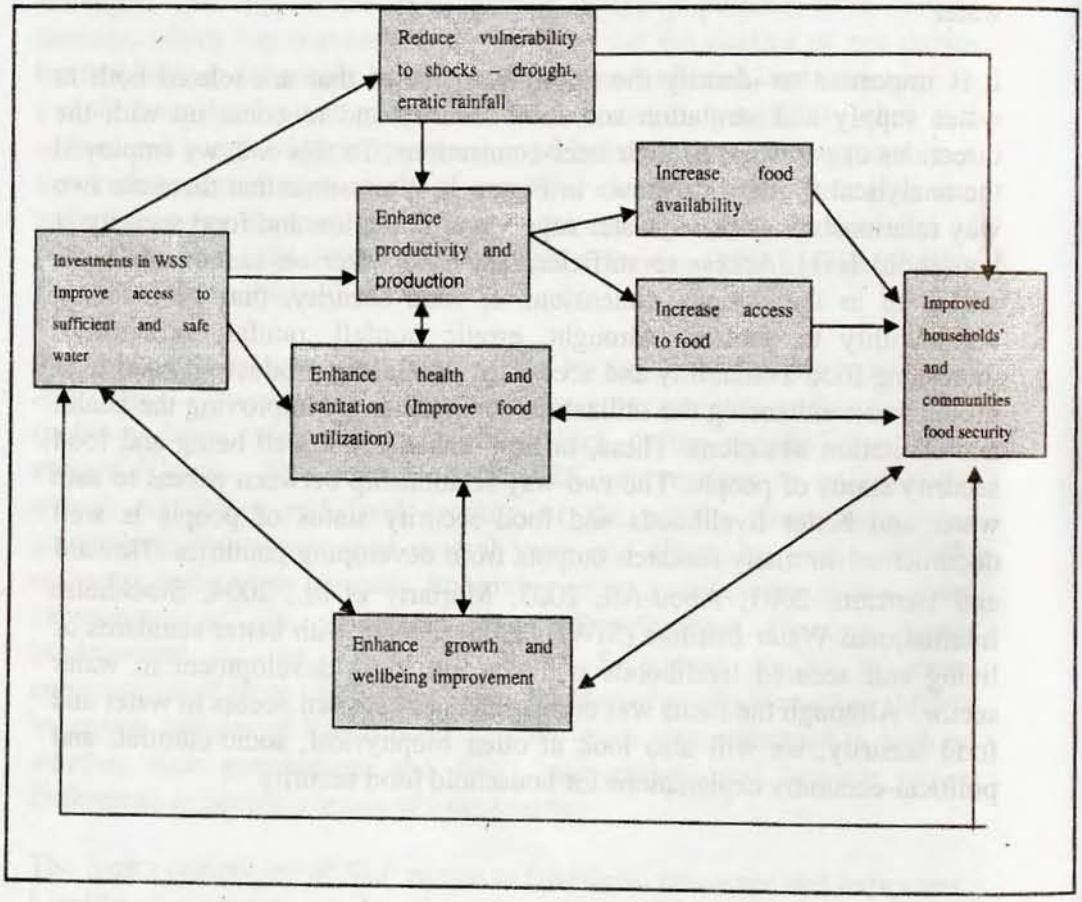
The mediating processes refer to actions by organizations (both informal and formal – government, private and non-governmental) and institutions (policies, laws, rules and incentives) which define peoples' livelihood options (Carney, 1998). In terms of WSS interventions to improve the overall well-being and food security of the people, there have been government endeavours over several years and efforts by various NGOs operating in the study *woredas*. Improving access to safe water is one of the components of the Integrated Rural Development Program being implemented by the Hararghe Catholic Secretariat (HCS) in some communities of Goro Gutu *Woreda* and by Menschen für Menschen (MfM) in certain *Kebeles* of Babile *Woreda*. This study also attempted to look at whether such government and NGO interventions had brought about differences in people's levels of food security.

The fourth component of SLF relates to livelihood outcomes and indicators. Livelihood outcomes can be desirable or undesirable, depending on how households under an existing context combine different forms of capitals and how these combinations are enhanced or constrained by the organizational and institutional frameworks in place. If the outcome is desirable, then feedbacks contribute to building up the five capital assets; where they are undesirable, they reduce the asset base (Pretty, 1998). Although water is one element of natural capital, the fact that it is a versatile component when it comes to rural people's livelihoods leads one to draw the following hypothesis: 'enabling people to have access to safe and

protected water will reduce vulnerability to shocks, e.g. droughts, thereby improving food availability and direct access to food' (Figure 1). The reverse can happen to communities that have no access to safe and reliable water.

It is important to identify the multiple attributes that are related both to water supply and sanitation and food security and to come up with the directions or pathways of their inter-connections. To this end, we employed the analytical framework shown in Figure 1. We assume that there are two way relationships between water supply and sanitation and food security at household level. Access to sufficient and safe water on sustainable basis will help in the various dimensions of food security, that is, reducing vulnerability to shocks (drought, erratic rainfall, rainfall variability); increasing food availability and access (by increasing productivity and total production); enhancing the utilization components by improving the health and sanitation situations. These, in turn, enhance the well-being and food security status of people. The two-way relationship between access to safe water and better livelihoods and food security status of people is well documented in many research outputs from developing countries (Howard and Bartram, 2003; Abou-Ali, 2003; Moriarty *et al.*, 2004; Stockholm International Water Institute (SIWI), 2005). People with better standards of living and secured livelihoods will demand more development in water sector. Although the focus was on the linkages between access to water and food security, we will also look at other biophysical, socio-cultural, and political-economy explanations for household food security.

Figure 1. Analytical framework to examine the interrelations between WSS and food security



Source: Authors' Own Construction, 2007

Data Sources and Methodology

The case study research considered two *woredas* from East Hararghe Zone (EHZ), namely, Goro Gutu and Babile, and two *kebeles* from each *woreda,* viz. Goro Gutu and Ido Jalela from Goro Gutu *Woreda* and Ifa and Shek Abdi from Babile *Woreda.* Following that, we have selected one village from each of the two *kebeles* that have water schemes (Gaja from Ido Jalela and Sirba from Ifa *kebeles*) and two villages from the *kebeles* that have got no water schemes (Keyrata from Shek Abdi and Burakssa from Goro Gutu *kebeles*). Two criteria have been used while selecting the *woredas*, i.e., the prevailing food insecurity problem among the larger proportion of the population and the availability of government and NGO interventions in the areas of water sector development. Menschen für Menschen (MfM) works on Integrated Rural Development activities in Babile *Woreda,* while the Hararghe Catholic Secretariat (HCS) undertakes various development interventions in Goro Gutu *Woreda.* However, this does not mean that all the *kebeles* in the two project *woredas* have been the beneficiaries of water sector development interventions. Intra-*kebele* variation is evident since some villages may have access to improved water schemes, while others may not have access to safe water.

The household survey covered 32 households in each of the study villages. Thus, a total of 128 households comprising 87.5% male-headed and 12.5% female-headed households have been studied. In each of the four communities, two focus group discussions (FGDs), one with a male group and the other with a female group, were held. Case study interviews and observations were conducted with two households in each of the four study villages. Lastly, community elders, development agents (DAs), health extension workers and NGO representatives were used as key informants for the study. The quantitative data were analyzed using various techniques such as frequency tables, cross-tabulations, and various descriptive statistical techniques, while the qualitative data were transcribed, grouped and analyzed in the light of the set research objectives.

We relied on the household heads' self-reporting approach for assessing household level food security status instead of undertaking the measurement of the per capita food available for consumption. Various recent works witnessed the effectiveness of the self-reporting method, which is in line with a shift in methodological approach from 'objective indicators' to 'subjective perceptions'. What matters most is to let the informant of the survey know about the distinction between 'food security' and 'food insecurity'.

Setting of the Study Areas

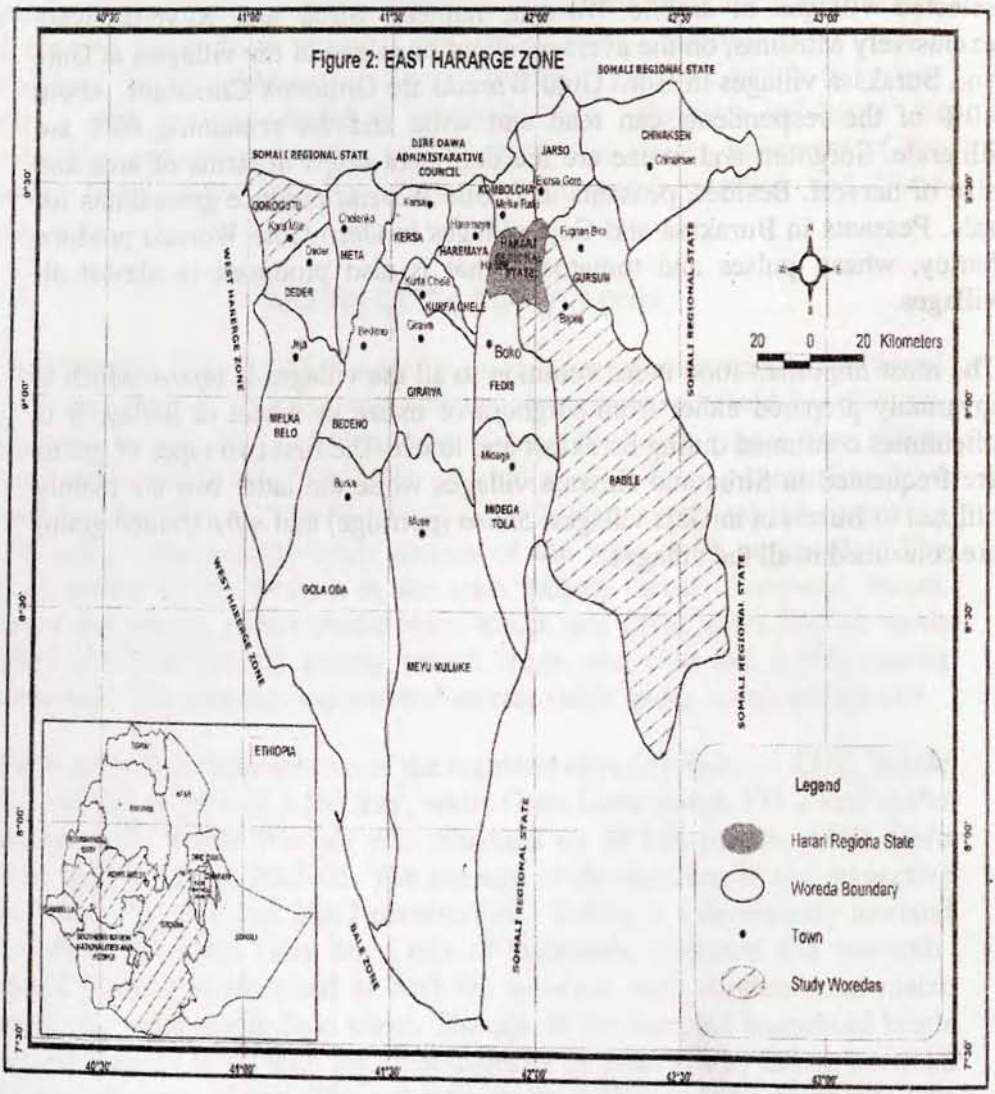
East Hararghe Zone (EHZ) is one of the seventeen administrative zones found in Oromia Region. The landscape of the zone is characterized by plateaus, rugged mountains, deep gorges and flat plains. Its altitude ranges from 500 to 3400 meters above sea level. The population of EHZ is projected to have reached 2,524,811 in 2005/06 of which 87% were rural and the remaining 13% urban. The average crude density of the zone is 95 persons/km^2.The crops grown by the farmers in the zone include cereals (sorghum, maize, barley and wheat), pulses (horse bean, lentils, and chick peas), and oil seeds (groundnut and linseed) among annual crops, and *chat* and coffee among perennials. The peasants and pastoralists rear cattle, goats, sheep and camels.

Babile and Goro Gutu are two of the eighteen *woredas* found in EHZ. Babile *Woreda* has an area of 3,169 km^2, while Goro Gutu covers 531.2 km^2 (refer to Figure 2). Babile *Woreda* was inhabited by 88,158 people, while Goro Gutu by 136,119 in 2005/06. The average crude densities in the respective *woredas* were 27.8 and 256.2 persons/km^2. Babile is a dominantly lowland *woreda,* while Goro Gutu has a mix of highlands, midlands and lowlands. Mixed farming is practiced in both the *weredas*, with sorghum and maize being the major staple food crops. The age of the sampled household heads ranged from 19 to 80 with the great majority of them (78%) falling between 21 and 50 years of age. The sex ratio in the 128 sampled households was 100:105, with the number of males being 361 and females 379. About 119 sampled respondents (78.9%) were married and had one or more children, 17 respondents (13.3%) were single, 9 of them were either divorced or widowed and 1 respondent was found to be polygamous. More than three-quarters of the sampled respondents were Oromo Muslims with the rest being Amhara

and followers of Orthodox Christianity. Whereas the respondents in the two selected villages of Babile *Woreda*, namely, Sirba and Keyrata, were exclusively Muslims, on the average, about one-third of the villagers at Gaja and Burakssa villages in Goro Gutu *Woreda* are Orthodox Christians. About 40% of the respondents can read and write and the remaining 60% are illiterate. Sorghum and maize are the dominant crops in terms of area and size of harvest. Besides, peasants in Babile *Woreda* produce groundnuts for sale. Peasants in Burakssa and Gaja villages in Goro Gotu *Woreda* produce barley, wheat, pulses and tomatoes. Chat is also produced in almost all villages.

The most important food items common to all the villages is *injera*, which is invariably prepared either from sorghum or maize or wheat or barley. It is oftentimes consumed during breakfast and lunch. The first two types of grains are frequented in Sirba and Keyrata villages while the latter two are mainly utilized in Burakssa in Gaja villages. *Shuro* (porridge) and *nifro* (boiled grain) are consumed in all the villages.

Figure 2. East Hararghe Zone



Source: Authors' Own Construction, 2007

Results and Discussion

Access to Water Supply

Access to water supply will be analyzed by grouping the sampled villages into two – those having water schemes and those that do not.

(a) **Villages that have access to water schemes**: households in Gaja village used to fetch water from a developed spring that was put in place during the *Derg* era (the 1974-1991 period that saw the ascendance and rule of a military-cum-socialist regime in Ethiopia). No tap has been fixed until the completion of our fieldwork. So, the water eventually flows through pipe and the villagers fetch it according to their turn and needs. The FGD participants in the women group have aired their concern, showing doubts about the safeness of the water they use. The people in Gaja village rely on the same source all year round.

Villagers at Sirba village fetch water from protected hand pump wells that were built by the government. Informants in individual interview and group discussion sessions unanimously agreed about the cleanliness and safeness of the water they fetch for household consumption. The major problem of the water scheme at Sirba village is related to the quantity of water that fails to adequately support the rapidly growing population in the village.

(b) Villages that have no access to water schemes: this refers to Keyrata village in in Shek Abdi *kebele* and Burakssa in Goro Gutu. People living in Keyrata village had a relatively better access to safe water up until 2002. Bonki River, which used to be the main source of water for the villagers, was flowing all year round. The government also developed a hand dug well nearer to the river from where households used to fetch water. However, by the time of our fieldwork neither the river nor the well were the sources of water for the inhabitants of the village. The river almost dried up and the inhabitants reported that it contains water only during wet seasons. The hand pump is no more functional.

Asked about the reasons for not having access to safe water, the great majority (78%) attributed it to the 'high pressure on water points'. Similarly, about three-fourth of the respondents ascribed it to 'lack of financial resources to improve water points. About one-third of the households (31.3%) mentioned 'lack of natural water source to be developed' as the reason for not having access to safe water, while half of them attributed it to the 'aridity of the area' (refer to Table 1). Thus, the villagers are compelled to share water with livestock from unprotected well. The women FGD participants also disclosed that occasionally they might ask the permission of other villagers in the same *kebele* or in the neighbouring areas to share water from their scheme.

Table 1. Reasons for not having access to safe water, by village (N= 64)

Reasons	Keyrata village		Burakssa village		Both villages	
	N	%	N	%	N	%
Lack of natural water sources to be developed	10	31.3	13	40.6	23	35.9
Aridity of the climate of the area	17	53.1	6	18.8	23	35.9
Lack of financial resources and supports to improve water points	24	75.0	28	87.5	52	81.3
Inadequate government support for water development	2	6.3	12	37.5	14	21.9
High pressure on existing water points	25	78.1	27	84.4	52	81.3
Distance from passable road	0	0.0	10	31.3	10	15.9

Source: Field Survey, November 2007

The situation at Burakssa village was found to be worse than at Keyrata village. First, the villagers still rely on natural and unprotected spring, which they share with livestock and wild animals. Second, women have to travel long distances across steep slopes to fetch water. Unsurprisingly, about 31.3% of the households complained about the distance between home and water points. Third, unlike the situation at Keyrata village where there are some chances of sharing water with other neighbouring villages, the inhabitants in Burakssa village are handicapped of other options. People living in Goro Gutu *kebele* in general and Burakssa village in particular have so far received little attention by the government and NGOs with regards to water sector development in their area.

With respect to the dire water situations described above, we can cite what the participants of the FGD had stated:

> *The hitherto existing interventions bypassed our kebele for a number of reasons. Firstly, we do not have our representatives at woreda office who could call attentions towards our community. Secondly, the highland nature of the area and its greenness has been elusive for people visiting our community. The availability of very big and evergreen trees apparently deceives visitors as if the area is 'fertile'. Thirdly, our proximity to the Kara Mile town worked against us. However, the living situation of most of households in the village is miserable, to say the least.*

Impacts of Lack of Access to Safe Water

Lack of access to safe water has affected the livelihoods of the people in the study area in a number of ways. Water problems brought about illness to family members and livestock; waste of time and labour for fetching water; and failure to irrigate farms and intensify agriculture. Hereunder, the impacts of lack of water in general and potable water in particular on human and livestock health, sanitation, expended labour and irrigation practices will be discussed.

Sanitation and Health Problems for People and Livestock

With regard to the household perception of sanitation and hygiene in the study communities, the respondents who rated it as 'very good' were 14.8%, 'good' (39%), and 'not good' (45.3%). The distribution clearly shows the prevalence of poor hygiene and sanitation situations in the communities. The largest number of the respondents (36.2 %) attributed the poor sanitary and hygiene situation to scarcity of water in the area for other uses apart from drinking. Other factors with large number of respondents included 'lack of hygiene and sanitation practices in every day routine' (22.4%), 'long distances between homesteads and water points' (18.9%), and 'lack of necessary supplies to keep the families' sanitation and hygiene' (15.5%). Based on these findings, it is possible to deduce that water problem is among the determinant factors that adversely affect the health of the villagers and livestock population in the study communities.

The major human diseases that are identified by the respondents include diarrhoea (56 HHS), stomach cramp (27 HHs), Amoeba (25 HHs), vomiting (19 HHs), and intestinal worms (12 HHs). The prevalence of such diseases would show how problems related to drinking unsafe water and poor sanitation at individual and community levels becomes the cause of ill health of the population in the studied villages. By implication, the ill health of the household head or any of the able-bodied persons in the family deters their active participation in productive activities.

When it comes to livestock diseases, it was found that among the studied villages it was only in Gaja village that livestock and humans share protected water from developed spring. In the remaining three villages, there is a serious problem of access to sufficient water. During rainy seasons, flood water and seasonal gullies serve as major sources for watering livestock.

In dry season water sources for livestock in Keyrata and Burakssa villages are not only inaccessible to the villagers but also very dirty and unsafe in terms of health. Ponds and wells that are located in deep gorges and between big stones, which the people locally call *ella,* are the sources of water. As a result, livestock are very susceptible to various diseases. Among the diseases

reported by a larger number of households, which in a way are water related diseases, are *alkit* (*Dullan Dulla*) and frequent diarrhoea.

Waste of Time and Labour in Fetching Water

The survey data show that 85.9% of the sampled households in the villages that have got no water schemes, namely Keyrata and Burakssa, complained about spending much of their time and energy to fetch water. The average one-way walking time between homesteads and water points during dry seasons is 71 and 31 minutes for the inhabitants of Keyrata and Burakssa villages, respectively. One villager in Keyrata had the following to say: "The time and energy spent in fetching water by my family members is immense. This, in turn, may have impact on the household production, productivity and chores." In almost all the study villages, women are responsible for fetching water, and hence the long distance they have to cover puts tremendous stress on their health.

Failure to Irrigate Farms and Intensify Agriculture

Although a few households in Gaja village (Ido Jelala *kebele*) and Sirba village (Ifa *kebele*) make use of irrigation for crop production, none of the case study villagers have started to irrigate their farms. Basically, water schemes are usually developed by NGOs and the government solely for household consumption. The inhabitants have expressed their interest to support and diversify their livelihood earnings by using irrigation. In the other two villages where there are no water schemes, viz. Keyrata and Burakssa, the people considered our inquiry about the usage of irrigation on their farms as a 'luxury' issue. An elderly at Keyrata village responded to our query by stating: "why do you ask us whether we use irrigation or not when we are telling you that the inhabitants of our community have no safe drinking water to safeguard our family members from various water related diseases?" This, however, does not demonstrate a lower demand for irrigation. However, such kinds of assertions do not demonstrate the existence of a lower demand for irrigation. For instance, Babile *Woreda* is among the areas characterized by arid and semi-arid climate and thus prone to drought. In order to minimize peoples' vulnerability to drought and erratic rainfall, as well as to have multiple harvests each year, the introduction of irrigation scheme becomes imperative.

Food Security Situations and Its Determinants

In this section, the food security status of the sampled households will be discussed.

Food Security Status

The status of household food security was assessed through self-reporting method in which they were directly asked whether they can meet food and other basic needs all year round, from own production or by deploying own assets and purchasing from market. We made attempts to clearly explain what *the attainment of food security by households* means. The response of the sampled population is depicted in Table 2 below.

Table 2. Self-assessment of households' food security status by village

Village	Level of food security					
	Food secure		Food insecure		Varies from one year to another	
	N	%	N	%	N	%
Burakssa	5	15.6	24	75.0	3	9.4
Gaja	5	15.6	22	68.8	5	15.6
Sirba	13	40.6	19	59.4	-	-
Keyrata	1	3.1	31	96.8	-	-
Total	24	18.8	96	75.0	8	6.3

Source: Field Survey, November 2007

The findings show that three-quarters (75%) of the households investigated have felt that they are 'food insecure'. The remaining 18.8% and 6.3% claimed to be 'food secure' and that 'their food supply situations vary from one year to another', respectively. The results revealed that 16 households (66.7% of the food secure households) depend on own production, while the remaining 8 households who claimed to be food secure said they bridge additional food gaps by purchasing them from the market. Be that as it may, the authors have learned that the overwhelming majority of the population in the study areas lives under situations of food shortage. Inhabitants in Sirba village where food secure households account 40.6% are by far better than those in other villages. In contrast, people in Keyrata village are in a very bad condition since only a single household reported to be food secure. Extreme situations were depicted within the same *woreda*, with about 15.6% of the respondents in Gaja village and 9.4% of those who live in Burakssa reporting about the variations and instability of food security situations from season to season.

Causes of Food Insecurity

The reasons for food shortage at household level are concurrent with the existing thoughts on food security. The combinations of factors that adversely affect crop production, livestock raising, earnings from non-farm activities, and food utilizations explain why households are food insecure (Table 3).

Table 3. Reasons for becoming food insecure, by villages

Reasons	Villages									
	Sirba		Keyrata		Burakssa		Gaja		Total	
	N	%	N	%	N	%	N	%	N	%
Inability to produce sufficient grains	16	84.2	25	80.6	24	100.0	22	100.0	87	90.6
Inability to rear sufficient number of livestock	6	31.6	17	54.8	24	100.0	22	100.0	69	71.9
Meagre non-farm income	5	26.3	16	51.6	18	75.0	18	81.8	57	59.4
Failure to properly utilize own production and other earnings	2	10.5	6	19.4	22	91.7	13	59.1	43	44.8
Instability due to frequent changes in rural policies	1	5.3	3	9.7	13	54.2	4	18.2	21	21.9

Source: Field Survey, November 2007

In what follows, about four causes of food insecurity, in the context of the study villages, will be discussed. These include constraints to crop production, constraints to livestock raising, limitations to non-farm engagements and management problems.

(a) Constraints to crop production

Various adverse factors hindering the expansion of crop production clearly affect food security at household level. The survey results identified a number of constraints: small/tiny land holdings (63 HHs), inadequate rain (62 HHs), shortage of selected seed supply (20 HHs), problem of water supply (17 HHs), shortage of organic fertilizers (15 HHs), and lack of money to purchase inorganic fertilizers (14 HHs). It appears that problems related to natural capital (land and water) are preponderant over the other factors. Technological constraints, such as improved seeds and fertilizers, are also given a good weight. In this regard, the farmers complained about lack of purchasing powers (demand side) as well as supply problems.

(b) Constraints to livestock raising

The peasants have identified multiple factors that interact in a complex way to cause food shortages, the most pressing of which include scarcity of grazing land (51 HHs), lack of forage for livestock (47 HHs), shortage of money (41 HHs), scarcity of water (25 HHs), and lack of improved livestock hybrids.

(c) Limitations to non-farm engagements

Although about four out of ten households have reported their engagement in non-farm activities, the income drawn from such ventures are not sufficient and viable to support households. There are many reasons for the low contribution of non-farm incomes, the principal of which include shortage of start up capital to begin off-farm activities (46 HHs), the relatively low income that one can make from such works (18 HHs), lack of work skills (18 HHs), lack of knowledge to conduct non-farm activities (13 HHs), and low level of awareness about non-farm activities on the part of the community members (9 HHs).

(d) Management problems

Resources and food wastage also contribute to the prevalence of food insecurity at household levels. Resource wastages happen due to a large number of factors such as unnecessary expenses for festival and holyday ceremony (27 HHs), lack of knowledge to properly utilize resources (19 HHs), lack of saving culture (17HHs), traditional malpractices, i.e. over-spending during wedding and other celebrations (12 HHs), and shortage of appropriate storage facilities (7 HHs).

Linkage between Access to Water Supply and Food Security

Although the degree varies from one village to another, there are food insecure households in all the study villages. Seasonal shortage in food items, namely, *injera*, *Shiro* (porridge) and *nifro* (boiled grains) is evident in the months of June, July and August (Table 4). Food insecurity situation is reported by three-fourths of the surveyed households with only 12.5% of them claiming to fulfil their all-year round requirements from own production (refer to Table 4).

Inter-village variations in seasonal food shortages between those that have water schemes and those without are considerable. About 64% of the beneficiaries and 86% of the non-beneficiaries face shortages in food items for a specified time of the year. Although the majority of the villagers face food shortage during the summer, some villagers in Keyrata face shortages for half a year or more.

Table 4. The number of months food insecure households cover food consumption (N=96)

Duration	Frequency	Percent of food insecure hhs
1 to 3 months	3	3.1
4 to 6 months	32	33.3
7 to 8 months	19	19.8
9 to 10 months	42	43.8
Total	96	100.0

Source: Field Survey, November 2007

In order to attain food security in all the villages, mechanisms should be sought by which (a) the water schemes in Sirba and Gaja villages could render multiple use services, including irrigation and sanitation, (b) the pressure on the single water scheme containing three hand pumps in Sirba village, which currently serves about 800 households on the average, should be eased, and (c) the spring at Gaja village could further be developed in order to offer multiple use services.

It should also be known that the role of water in food security attainment is subsumed in others, such as agricultural production and productivity and livestock raising. As shown earlier, this could be demonstrated by the fact that 68% of the sampled respondents believe that their food insecurity is related to their inability to produce sufficient grains, 54% due to their inability to raise sufficient number of livestock and 45% due to the meagre income they obtain from non-farm activities.

Both the beneficiaries and non-beneficiaries of water schemes believe in the pivotal role water plays in their livelihoods. Almost all of them are of the conviction that lack of access to sufficient water adversely affects the food security status of their households. By the same token, 92% of the non-beneficiary households believe that the absence of water makes them vulnerable to drought; 93% think water is a major factor in lowering their agricultural production and productivity and all of them think that the dire search for water consumes a lot of their time and energy. Conversely, about 88% of the beneficiary households assert that their food security status and livelihood has improved following water supply interventions, most particularly in terms of improving the household health situations and in diversifying their sources of income. There were, however, divided responses when it comes to the role of water supply intervention in income increments and improvements in livestock productivity.

The importance of water in attaining food security has been underlined by the peasants, development agents and health workers in both woredas. In Sirba village, the FGD panellists (men) equated 'water with life'. They stated that "people who will have better access to water and irrigation will definitely be food secure". Another informant from the same village stated that "proper land management is unthinkable without the availability of water". Similarly, a development agent from the nearby NGO, namely, Menschen für Menschen (MfM), working in Babile *Woreda* affirmed that "the availability of water, most particularly for irrigation, and the attainment of food security are closely intertwined". One elderly informant from Gaja village in Goro Gutu *Woreda* also noted: "if NGOs and/or GOs develop water sources for irrigation use, we can produce three to four times a year. Consequently, we will become not only food secure but net exporters of agricultural products". Similarly, all the informants, including the development agent (DA) in Keyrata village, ascertained the significance of water supply on crop production, product diversification, livestock raising, health improvements and food security.

The opinions of the key informants, development agents and FGD discussants concur with what Start *et al.* (2005) had to say about East Hararge Zone:

> Water is the number one constraint to improved, higher productivity farming in this area. It is by far the most cost-effective and sustainable method to transform livelihoods, make changes in poverty reduction and stem the need for resettlement and out-migration. Without addressing needs for 'assured water' or water scarcity, agricultural programs are merely tinkering at the edges of household economic development. No other livelihood intervention currently exists which comes nearer to the potential of water to create such broad-based growth and development.

A good number of the villagers in both *woredas* suggest the following measures to improve their food insecurity situations: expansion of irrigation agriculture, construction of big water supply schemes and the development of water points for livestock.

The direct impact of water availability or unavailability in the study areas is vividly seen in the differential degree of hygiene and sanitation in the communities. More than half of the sampled respondents, who have no access to water scheme, attributed the health problems for humans as well as livestock to the utilization of unprotected water. The most frequent diseases in the study areas include diarrhoea, amoeba, scabies and various intestinal problems for humans and *Alkit (Dullan Dulla)*, skin diseases and intestinal parasites for livestock. In fact, the health worker in Sirba village attributed 80% of the disease occurrences to poor sanitation, which is partially related to water availability. The hygiene and sanitation situations of the villagers living in water intervention areas are relatively better than the villagers who have no water schemes. Some, if not all, of the respondents living in Gaja and Sirba keep their personal hygiene, use latrines and dump garbage in the nearby holes. On the contrary, for peasants in Keyrata and Burakssa villages, given the situation in which they live, 'hygiene and sanitation' are considered more of a luxury.

Conclusions and Policy Implications

Clear disparity exists between communities with water schemes - Gaja and Sirba – and with non-water schemes – Burakssa and Keyrata – with respect to access and supply of water, and food security. In Gaja and Sirba villages, people fetch water from developed schemes within the village, with the former getting water from developed spring and the latter from hand pump wells. The main problem facing the inhabitants of Sirba is the inadequacy of water. Inhabitants at Gaja village complained about the lack of cleanliness of the water due to a variety of problems exhibited in and around the site of the spring. Eventually, the developed schemes at both sites are meant for drinking. The utilization of water for other purposes, such as livestock watering, irrigation, and washing clothes is quite limited. People at Gaja village have no other option for watering livestock and are hence compelled to share the water with their livestock.

The food security situations at the two beneficiary sites (28.1% of households feel food secure) are relatively better than the communities without access to developed schemes (only 9.4% of the households feel food secure). Given such a relationship, additional water schemes should be built for the inhabitants of Sirba village, and the spring at Gaja village should be improved in terms of quality of water supply and size of water discharge. The water development interventions should go beyond household consumption by including other purposes such as livestock watering, sanitation and irrigation. This has to be put in place to improve the overall livelihoods and food security status of the villagers.

The people in Keyrata and Burakssa villages are still depending on natural water sources for drinking. Households at Burakssa village get water from unprotected spring located far away from the village, while those in Keyrata get water from unprotected and unreliable wells. The reliance on such unsafe water has adversely affected the health of people and their livestock. The people also invest much time and energy to get water. Although there are other important factors that affect food security at household level (such as scarcity of land, lack of access and capacity to pay for new technological inputs, shortage of livestock feed, shortage of start up capital for non-farm activities),

drought and lack of access to irrigation agriculture hinders people to expand crop and livestock production.

By way of policy implication, it can be stated that improving the sanitation, health, and food security of households at Keyrata (Shek Abdi *kebele*) and Burakssa villages (Goro Gutu *kebele*) calls for development intervention in various areas. First, water schemes for household consumption, sanitation, livestock watering and irrigation should be introduced. Second, integrated rural development programs that can improve people's income, education, and knowledge and skills of saving resources and products need to be put in place. Third, some development schemes such as the Productive Safety Net Program (PSNP), the intervention which has brought about differences with respect to improving peoples' livelihood in the other areas where it is already implemented, should be launched.

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Endnote

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