RiPPLE

Research-inspired Policy and Practice Learning in Ethiopia and the Nile region

Linkages between Water Supply and Sanitation and Food Security

A case study in four villages of East Hararghe zone, Oromia region

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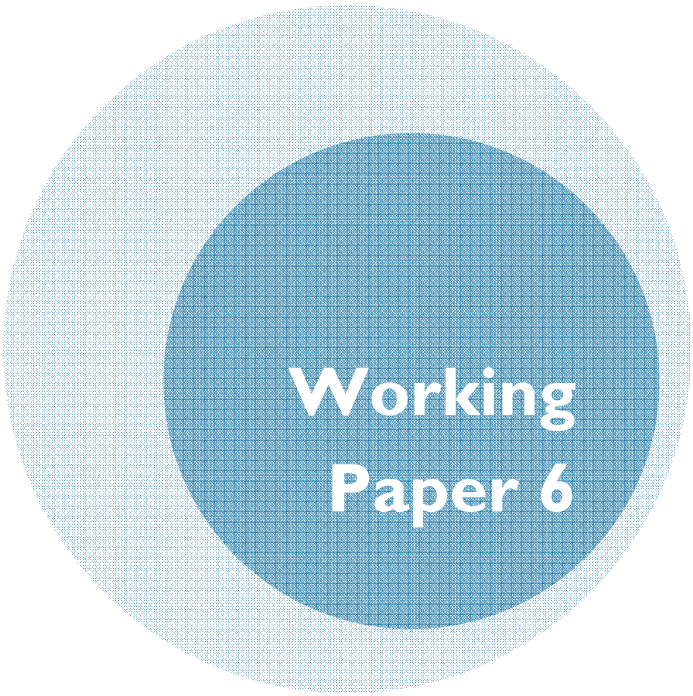

Research-inspired Policy and Practice Learning in Ethiopia and the Nile region (RiPPLE) is a five-year research programme consortium funded by the UK's Department for International Development (DFID). It aims to advance evidence-based learning on water supply and sanitation (WSS) focusing specifically on issues of planning, financing, delivery and sustainability and the links between sector improvements and pro-poor economic growth.

RIPPLE Working Papers contain research questions, methods, preliminary analysis and discussion of research results (from case studies or desk research). They are intended to stimulate debate on policy implications of research findings as well as feed into Long-term Action Research.

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List of acronyms

CSA	Central Statistical Authority
DA	Development Agent
DPPA	Disaster Prevention and Preparedness Agency
FAO	United Nations Food and Agricultural Organization
FGD	Focus Group Discussion
HCS	Hararghe Catholic Secretariat
HH	Household
LPA	Learning Practice Alliance
MDG	Millennium Development Goal
MfM	Menschen für Menschen
NGO	Nongovernmental Organisation
PSNP	Productive Safety Net Programme
RiPPLE	Research-inspired Policy and Practice Learning in Ethiopia and the Nile region
SLF	Sustainable Livelihoods Framework
SPSS	Statistical Package for Social Science
WSS	Water Supply and Sanitation

Executive summary

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 of Oromia region. East Hararghe is characterised by water scarcity and food insecurity.

Food security has a strong relationship with agricultural performance. Physical and socioeconomic services and infrastructure, such as water schemes, are essential elements in improving rural food security. Access to safe drinking water reduces exposure to a variety of diseases that obstruct the intake and utilisation of food, as well as expenses related to health. In addition, easier access to safe water reduces time spent by women hauling water, thereby increasing their productivity.

This study uses an analytical framework that identifies the multiple attributes related to both WSS and food security and offers assumptions as to the nature of their interconnections. The framework assumes two-way relationships between WSS and food security at household level. Access to sufficient and safe water on a sustainable basis will help in the various dimensions of food security, that is, reducing vulnerability to shocks; increasing food availability and access; and enhancing the utilisation components by improving health and sanitation. These dimensions enhance people's well-being and food security status.

The specific objectives of this study were to assess the water supply, access and sanitation situation in the study villages; examine the food security situation at household level; and establish linkages between WSS and food security. The research looked at four kebeles in East Hararghe: Goro Gutu and Ido Jalela in Goro Gutu woreda and Ifa and Shek Abdi in Babile woreda. In each of the woredas, one village with a water scheme (Gaja and Sirba in Ido Jalela and Ifa, respectively) and one village with no water scheme (Keyrata and Burakssa in Shek Abdi and Goro Gutu, respectively) were selected. Two criteria were central to research site selection: 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. The study used the following tools:

- A survey of 32 households in each village, looking at demographic characteristics of households, access to water and sanitation, food security situation and households' perceptions of the link between water supply and food security;
- Focus-group discussions (FGDs) with one male group and one female group in each village;
- Key informant interviews with knowledgeable individuals in the kebeles, and with the elderly, development agents (DAs), health extension workers and NGO representatives;
- In-depth study of and interviews with two households in each of the four study villages, looking at socioeconomic and cultural characteristics and the dynamics of various attributes.

The two villages with water schemes (Gaja and Sirba) have better access to water. In Gaja village, respondents are uncertain of the safety of their water, also complaining that user fees have not been properly utilised to clean up and protect the water site. Sirba residents feel their water is clean and safe but insufficient in quantity, leading to long waiting times, which eats into labour productivity.

Keyrata villagers share water from an unprotected well with livestock; sometimes, residents ask neighbouring villagers if they can use their water. In Burakssa, villagers rely on an unprotected spring,

which they share with livestock and wild animals; distances are long for women to fetch water; and there are no opportunities to share neighbours' water. There is little government or NGO attention.

Lack of safe access to water leads to: sanitation and health problems; livestock diseases; use of a time and labour in fetching water; and inability to irrigate farmland and intensify agricultural production.

Three-quarters of households feel food insecure. Inhabitants in Gaja are better off than those in other villages; people in Keyrata village are in a very bad shape. The majority of respondents in all four villages believe that their inability to produce sufficient grain and rear livestock deters them from becoming food secure. Ranked in terms of importance, the following factors prevent families from becoming food secure: inability to rear sufficient amount of livestock; meagre income from non-farm activities; failure to properly utilise own production and other earnings; and instabilities owing to frequent changes in rural policies. Inability to irrigate farmland is also a factor.

Almost all respondents, both beneficiaries and non-beneficiaries of water schemes, are of the conviction that lack of access to sufficient water adversely affects their household food security: 92% of non-beneficiary households believe that absence of water makes them vulnerable to drought; 93% believe water problems are a factor in their low agricultural production and productivity; and all respondents feel that the search for water consumes their time and energy. About 88% of beneficiary households assert that their food security status and livelihoods have improved following water supply interventions, most particularly in terms of improving the household health situation and diversifying their sources of income.

Respondents equate 'water with life', stating that 'people who have better access to water and irrigation will definitely be food secure'. All respondents underline the significance of water supply for crop production, product diversification, livestock raising, health improvements and food security. The direct impact of water availability or unavailability is also vividly seen in the differential degrees of hygiene and sanitation in the villages.

In conclusion, clear disparity exists between the communities with water schemes and those without in terms of access to and supply of water and food security. The food security situation of the two beneficiary sites is relatively better than that of the sites without access to developed schemes.

Given this relationship between water access and food security, it is suggested that existing water schemes be improved in the beneficiary sites: additional water schemes should be built in Sirba and the spring in Gaja should be improved in terms of supply quality and volume of discharge. Interventions should go beyond household consumption to cover other needs, such as livestock watering, sanitation and irrigation. In Keyrata and Burakssa, improving the sanitation, health and food security of households calls for development interventions in the following areas:

- Introduce schemes for household consumption, sanitation, livestock watering and irrigation.
- Put in place integrated rural development programmes that can improve people's income, education, and skills in saving resources and products.
- Launch development schemes such as the PSNP, which has brought about improvements in people's livelihoods in areas where it is already being implemented.

Villagers suggested the following to improve their food security situation: expansion of irrigated agriculture, construction of large water supply schemes and development of water points for livestock.

1 Introduction

One of the core components of the Research-inspired Policy and Practice Learning in Ethiopia and the Nile region (RiPPLE) project is to assess the contribution of water supply and sanitation (WSS) sector development to wider efforts to promote pro-poor growth in Ethiopia and the Nile region. It is against this backdrop that East Hararghe zone was identified as a research area for the Growth theme, whose main purpose is to look at the interrelations between water, livelihoods and growth. Intensive brainstorming during Learning Practice Alliance (LPA) workshops in Dire Dawa and Harar, as well as observation and discussions with various stakeholders (from nongovernmental organisations – NGOs – and zonal sector offices) in March 2007 suggested that a significant proportion of people in almost all woredas[1] in the zone live in a situation of chronic food insecurity. In fact, there is great variation among the kebeles[2] and among households within the same kebele. According to officials of the zone Disaster Prevention and Preparedness Agency (DPPA), the woredas with severe food deficits include Babile, Goro Gutu, Chinegsa, Gursum, Midaga Tolla and Grawa. It was also learnt that the people in these woredas had been receiving water in the form of a ration. This study was undertaken after a consensus was reached among Growth team members to carry out a case study examining the linkages between WSS and food security.

Food security is affected by a multitude of factors, which can be categorised into six: (i) **environment** (e.g. availability and quality of natural resources, including water); (ii) **demographic** (e.g. rapid population growth and the resultant shrinkage of land); (iii) **economic** (e.g. markets, availability or unavailability of oxen, land size); (iv) **technology and infrastructure** (e.g. access to roads and health facilities); (v) **social** (harmful practices, feeding habits, burden on women); and (vi) **political/policy** (e.g. participation/non-participation in the decision-making process).

Food insecurity has a strong relationship with poor performance of the agricultural sector in general, and smallholder agriculture in particular. Physical and socioeconomic services and infrastructure, such as roads, markets, water schemes, veterinary services, education and health, are essential elements in improving the food security of rural people, through the enhancement of labour and land productivity, commercialisation, reduction of transaction costs and facilitation of trade and exchange.

Access to safe drinking water reduces exposure to a variety of diseases that obstruct the intake and utilisation of food, as well as expenses related to health. In addition, easier access to safe water reduces time spent by women hauling water, thereby increasing their productivity and status.

The central purpose of this study is to assess the linkages between WSS and food security at a micro level by taking a sample of villages with and without water schemes in East Hararghe zone of Oromia region.

[1] The lower administrative structure of the government, or 'district'.

[2] The smallest administrative unit of Ethiopia, similar to a ward or a neighbourhood.

2 Overview of concept and related literature

2.1 Concepts of food security

A large number of definitions have been coined of food security since the issue first arose on the global agenda following the World Food Conference in Rome in 1974. For the purposes of this study, we consider two pertinent definitions: the 'general and comprehensive' definition, which has been adapted by the heads of the world states; and a contextual definition, which addresses the Ethiopian situation.

The first World Food Summit in 1996 defined food security as something which 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). This definition was used as a guiding principle for the Millennium Development Goals (MDGs) with respect to the fight against hunger. Four issues are embedded in the definition:

- **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**, defined as entitlement to produce, purchase or exchange food or receiving it as a gift.
- **Security**, defined as the balance between vulnerability, risk and insurance. Vulnerability has two 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**, referring to the temporal aspect of food security/insecurity. Food insecurity affecting a certain segment of a population can be chronic (where people always live under food shortage) or transitory.

A number of scholars have emphasised the need to think beyond the aforementioned components for a deeper understanding of food security concepts. They raise the important of intra-household factors; the balance between food security and nutritional security; the interrelations between food and livelihood securities; the balance between sensitivity and resilience; people's own perceptions and cultural values; efficiency and cost effectiveness; the right to food; and state obligations to ensure citizens' food security.[3]

The second definition focuses on the situation of food security in rural Ethiopia, and largely underpins this current case study of East Hararghe: 'A household can be described as food secure when its livelihood activities allow it to meet its food requirements and other basic needs, either through its own productions, i.e. crop cultivation and/or livestock rearing (in the context of peasants and pastoralists), or through having opportunities to run own non-farm ventures or to work with somebody else' (Degefa, 2005). Conversely, food insecurity refers to a situation whereby a household is not able to feed its members sufficiently, using either its own production or market purchase. Feelings of being either food secure or food insecure are largely a matter of a household's own perceptions or fears with regard to encountering a food shortage. Broadly, it is possible to

[3] See Blaikie et al (1994); Davies (1996); Devereux (1993); de Waal (1989); Millman and Kates (1990); Maxwell (1996); Maxwell and Smith (1992); Sen (1981).

divide households that live with the anxiety of food shortage into two categories, as in the United Nations Food and Agriculture Organization (FAO) definition for **time** above: (i) those which always live under food shortage crises and subsequent hunger, i.e. the chronically food insecure; and (ii) those which face food shortage problems only when they are hard hit by disasters or shocks, i.e. the acutely or temporarily food insecure.

2.2 Theories of food insecurity

Diverse theories have been formulated to explain the food shortages that can happen on various geographical scales, ranging from global to individual. The most widely cited include: food availability decline (Devereux, 1993; Millman and Kates, 1990); food entitlement decline (Sen, 1981); political economy explanations (Devereux, 1993); food shortage as a disaster (Blaikie et al, 1994); and the sustainable livelihoods framework (SLF), which looks at food insecurity as an outcome of undesirable/vulnerable livelihoods.[4] Detailed discussions on the theories and frameworks have been carried out in the literature (Degefa, 2005; Devereux, 1993; Getachew, 1995). Our interest here is in singling out the appropriate view(s) to underpin theoretically how access to water or lack of water affects food security at the household level. The SLF is the most appropriate approach for the study at hand, and it also captures the central ideas of other food security theories.

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, the overwhelming majority of whom 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, which has direct implications for asset capitals possessed. 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. The local farmers' responses to this have been 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 shock owing to recurrent drought. East Hararghe was among the hardest hit areas during the droughts of 1973-1974 and 1984-1985.

[4] Carney (1998); Davies (1996); Ellis (2000); Pretty (1998); Scoones (1998).

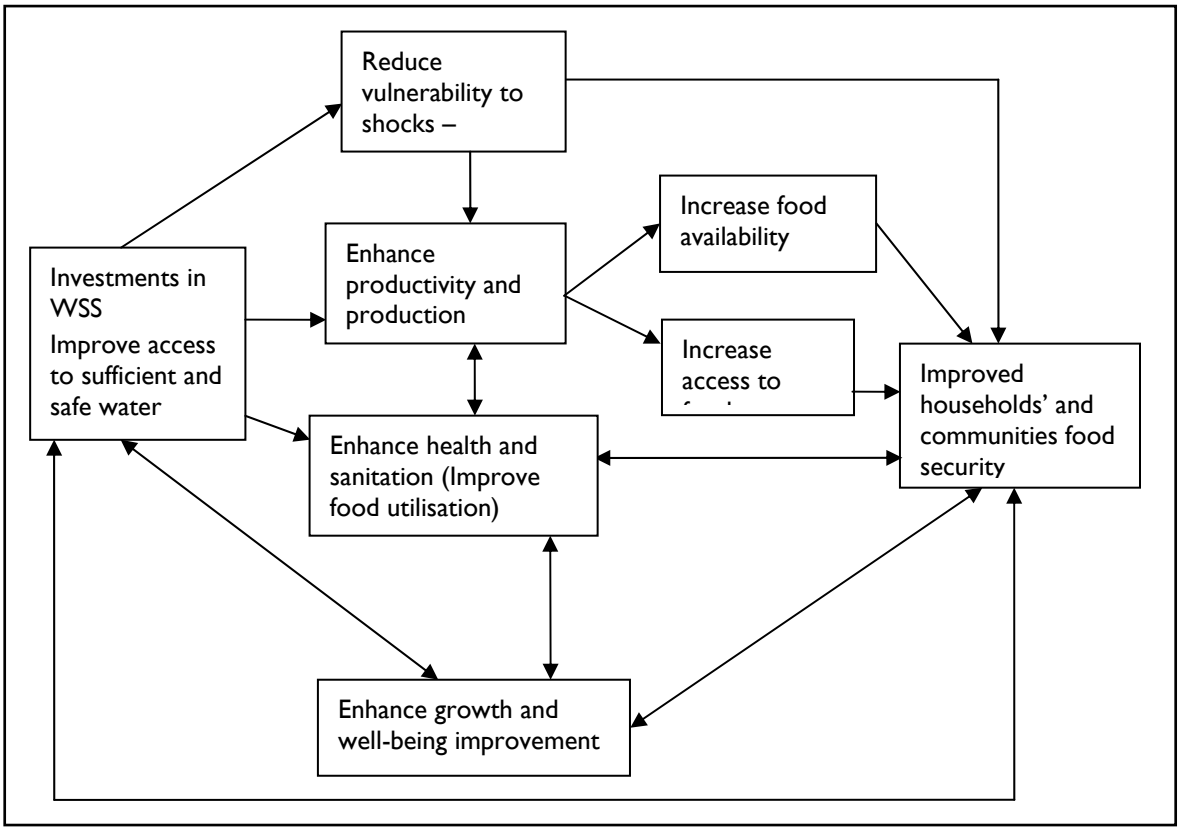
The **mediating processes** means actions by organisations (both informal and formal – government, private and nongovernmental) and institutions (policies, laws, rules and incentives) which define peoples' livelihood options (Carney, 1998). In terms of WSS interventions to improve the overall well-being 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 Programme 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 organisational 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 led us to draw the following hypothesis: 'enabling people access to safe and protected water will reduce vulnerability to shocks, e.g. droughts, thereby improving food availability and direct access to food' (Figure 2.1). The reverse can happen to communities that have no access to safe and reliable water.

2.3 Analytical framework

It is important to identify the multiple attributes related to both WSS and food security, and to come up with assumptions as to the nature of their interconnections. To this end, we employed an analytical framework (shown in Figure 2.1). In this, we assume that there are two-way relationships between WSS and food security at household level. Access to sufficient and safe water on a sustainable basis will support the various dimensions of food security: reducing vulnerability to shocks (drought, erratic rainfall, rainfall variability); increasing food availability and access (by increasing productivity and total production); and enhancing the utilisation components by improving health and sanitation. These dimensions in turn enhance people's well-being and food security status. People with a better standard of living and more secure livelihoods will demand more development in the water sector. Although the focus in this study was on the linkages between access to water and food security, we also look at other biophysical, socio-cultural and political economy explanations for household food security.

Figure 2.1: Analytical framework on the interrelations between WSS and food security



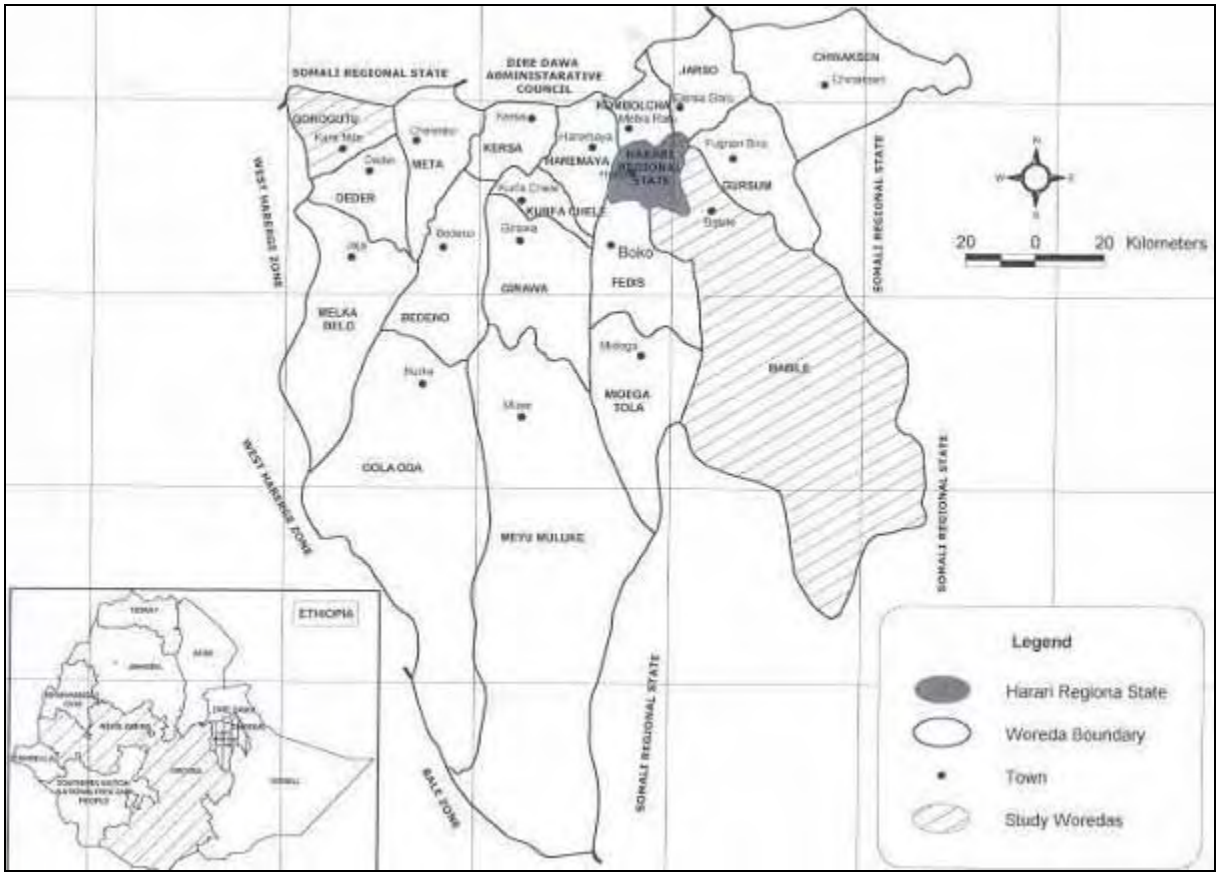
Source: Prepared by the authors.

3 Research background and methodology

3.1 Background to the study area

Oromia regional state is subdivided into 17 administrative zones. As Figure 3.1 shows, East Hararghe zone is to be found in the eastern part of Ethiopia and is bounded by Dire Dawa administrative council to the north; Somali regional state to the north, east and southeast; Bale zone to the south and southwest; and West Hararghe zone to the west. Harari regional state is entirely surrounded by East Hararghe zone. The zone capital is Harar, located 510km to the east of the Ethiopian capital, Addis Ababa.

Figure 3.1: East Hararghe zone



East Hararghe is characterised by plateaus, rugged mountains, deep gorges and flat plains. The altitude ranges from 500 to 3,400 metres above sea level. One of the study woredas, Goro Gutu, contains two mountains – Dadaro and Gangilo – with elevations over 2,500m. The zone contains three agro-ecological zones, *dega* (highlands – elevations above 2,300m), *woina dega* (midlands – elevations between 1,500 and 2,300m) and *kolla* (lowlands – below 1,500m). Area, rainfall and temperature of the three agro-climatic zones are shown in Table 3.1. The kolla (lowlands) occupies the largest area (62.2%), followed by woina dega (26.4%) and dega (11.4%). There is a direct relationship between rainfall amount and altitude and an inverse relationship between altitude and temperature.

Table 3.1: Agro-climatic classifications of East Hararghe zone

Agro-climatic zone	Altitude (metres)	Area		Rainfall (mm)	Temperature (°c)
		km^2	%		
Dega or bada	Above 2,300	2,764.2	11.4	1,200-2,000	10-15
Woina dega or bada dare	1,500-2,300	6,401.4	26.4	600-2,000	15-20
Kolla or gammoji	Below 1,500	15,082.1	62.2	400-820	20-25
Total	-	24,247.7	100.0	-	-

Source: Zonal Finance and Economic Development Office.

Based on the 1994 Population and Housing Census Report (Government of Ethiopia, 1995), the population of the zone is projected to have reached 2,524,811 in 2005-2006. Of this, 87% is rural, with the remaining 13% urban. According to 2006 data from the zonal Finance and Economic Development Office, the average density of the zone is estimated at 95 persons/km^2, ranging between 10 in Gola Oda woreda and 325 in Meta woreda.

In terms of land use patterns, 19% of the total area in the zone (460,706 hectares) was cultivated in 2005-2006 (zonal Rural Development Office data for 2006). Other types of major land uses include: cultivable land (58,194 hectares, or 2.4%); pasture land (99,415 ha, or 4.1%); shrub and bush land (470,405 ha, or 19.4%); and forest and woodland (53,345 ha, or 2.2%). Farmers produce different types of crops and raise a variety of types of livestock. According to data obtained from the zonal Agricultural Development Department (for 2006), in the 2005-2006 harvest year, farmers were able to produce 2,891,606 quintals of cereals from 300,798 ha of land; 356,416 quintals of pulses from 89,312 hectares; and 267,282 quintals of oil seeds from 19,434 hectares.[5] In the same year, chat and coffee took up 75,525 hectares of cultivated land. The livestock population in the same year was estimated at 3.5 million, of which cattle accounted for 55.8%, goats 20%, sheep 13% and camels 4.5%.

According to data from the zonal Water Resource Development Office (for 2006), there are 510 hand pumps, 92 motorised bore holes, 337 springs and 167 other water schemes in East Hararghe. There were two hospitals, 20 health centres, 63 health clinics and 83 health posts in 2005-2006. According to Health Department data (for 2006), health coverage in the zone grew from 39% in 2001-2002 to 61% in 2005-2006.

The study woredas, Babile and Goro Gutu, are two of the 18 woredas to be found in East Hararghe zone. The former is situated in the eastern corner of the zone, bounded by Gursum woreda and Harari regional state to the north; Fedis and Midaga Tolla woredas to the west; and Somali regional state to the south and east. The latter is bounded by Somali regional state to the north; West Hararghe zone to the west; and Deder and Meta woredas to the south and east respectively (see Figure 3.1).

Babile woreda covers 3,169km^2 and Goro Gutu 531.2km^2. Based on Central Statistical Authority's (CSA) projections for 2005-2006, Babile holds 88,158 people and Goro Gutu 136,119. This puts the average density in the two woredas at 27.8 and 256.2 persons/km^2, respectively. In terms of agro-

[5] One quintile is equivalent to 100kg.

ecology, Babile is predominantly lowland, whereas Goro Gutu has a mix of highlands, midlands and lowlands.

3.2 Objectives of the study and research questions

The overall objective of this study was to assess the relationship between water supply and sanitation and food security. The specific objectives of the study include the following:

- Assess the water supply, access and sanitation situation in the study communities;
- Examine the food security situation at household level;
- Establish the linkages between water supply and sanitation and food security.

The following research questions were posited:

- What is the inter-village variation in WSS interventions?
- What are the major constraints deterring improvements in WSS?
- What are the main reasons for being food insecure?
- What is the relationship between WSS and some components of food security (e.g. food availability, access to food and food utilisation)?

3.3 Sampling

In the case study research, we considered two woredas from East Hararghe zone, Goro Gutu and Babile, with two kebeles from each woreda: Goro Gutu and Ido Jalela from Goro Gutu woreda and Ifa and Shek Abdi from Babile woreda. From each of the two kebeles, we selected one village with a water scheme (Gaja and Sirba from Ido Jalela and Ifa kebeles, respectively) and one village with no water scheme (Keyrata and Burakssa from Shek Abdi and Goro Gutu kebeles, respectively). Table 3.2 gives the summary of the samples, the study approaches and the specific research tools used to generate primary data.

Table 3.2: Distribution of kebeles, research methods and sample size

Woreda	Kebele, village	Household survey	Qualitative tools and number of individual/group interviews					
		Sample size	FGD	Elderly int.	HH heads	DA int.	NGO rep int.	Health ext. int.
Babile	Ifa, Sirba	32 HH (29M 3F)	1M group 1F group	1	2 (1M 1F)	1	1 (MfM)	1
	Shek Abdi, Keyrata	32 HH (27M 5F)	1M group 1F group	1	2 (1M 1F)	1	1 (MfM)	1
Goro Gutu	Ido Jalela, Gaja	32 HH (28M 4F)	1M group 1F group	1	2 (1M 1F)	1	1 (HCS)	-
	Goro Gutu, Burakssa	32 HH (28M 4F)	1M group 1F group	1	2 (1M 1F)	1	-	-

Source: Field survey, 2007.

RiPPLE's selection of East Hararghe zone and the two woredas was purposive. East Hararghe is one of the zones in Oromia region characterised by water scarcity and food insecurity, despite a long period of interventions by government and NGOs. The selection of Babile and Goro Gutu woredas was also purposive. Two criteria were central: 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. As we have seen, MfM works on integrated rural development in Babile woreda whereas HCS undertakes various development interventions in Goro Gutu woreda.

This does not mean that all the kebeles in the two project woredas have been the beneficiaries of development with respect to water sector development schemes. Intra-kebele variation is also evident, as some villages have access to improved water schemes while others do not. Our selection of villages for detailed study took into account variations with regard to access to safe drinking water. As noted above, Gaja village in Ido Jalela kebele (in Goro Gutu woreda) and Sirba village in Ifa kebele (in Babile woreda) were chosen as inhabitants have access to improved water schemes. In contrast, the inhabitants of Burakssa village in Goro Gutu kebele (in Goro Gutu woreda) and Keyrata village in Shek Abdi kebele (in Babile woreda) still rely on water from natural, unimproved and unreliable sources.

3.4 Fieldwork and dataset

For the household survey 32 households were interviewed in each of the study villages using a structured questionnaire: a total of 128 households, comprising 87.5% male-headed and 12.5% female-headed households, were covered in the study. The survey was performed by eight trained field enumerators and four supervisors. Among other things, the household questionnaire addressed issues such as demographic characteristics of households, access to water and sanitation, food security situation and households' perceptions of the link between water supply and food security (see questionnaire in Annex 1).

The qualitative fieldwork was carried out by the two principal investigators based on pre-designed interview guides and checklists (see Annex 2), and all interviews conducted with individuals and groups were recorded. In each of the four villages, two focus-group discussions (FGDs) were held, one with a male group and one with a female group. The investigators also undertook case study interviews and observations of the farms and dwelling units of two households in each of the four study villages. The key informant interviews dealt with knowledgeable individuals either living in or working for the kebeles under study. Interviews were also held with the elderly, development agents (DAs), health extension workers and NGO representatives. The checklist for the interviews covered socioeconomic and cultural characteristics and the dynamics of various household attributes.

The household survey questionnaire was coded for data entry into Statistical Package for Social Science (SPSS) software. The data were then analysed using various techniques, such as frequency tables, cross-tabulations and descriptive statistics. Qualitative data were transcribed, grouped and analysed in the light of the research objectives to be met.

3.5 Socioeconomic characteristics of sampled households

The age of the sampled household heads ranged from 19 to 80, with the great majority (78%) between 21 and 50 years of age. The other members of the sampled households fell into different age brackets, with children 10 years and below comprising the largest group (43%), followed by those in the 10-20 years age bracket (27%) (see Table 3.3).

The male to female ratio in the 127 sampled households was 100:105, with 361 males and 379 females. At the time of survey, marital status distribution was almost the same across all the four villages. About 119 respondents (78.9%) were married and had one or more children, 17 (13.3%) were single and nine were either divorced or widowed. Only one respondent was engaged in a polygamous relationship (this is a predominantly Muslim society). More than three-quarters of the sampled respondents were Oromo Muslims, with the rest Amhara and Orthodox Christian. The respondents in the two selected villages of Babile woreda (Sirba and Keyrata) were exclusively Muslim; all respondents but one were Oromo Muslim. On average, about one-third of the residents of midland and highland villages in Goro Gutu woreda (Gaja and Burakssa) were Orthodox Christians, and about one-third of the sampled residents in Goro Gutu woreda were Amhara.

Table 3.3: Age distribution of other household members, excluding household heads

Age range	Number of family members	% of total
Less than 10 years	269	43.0
10-20	173	27.7
21-30	93	14.9
31-60	77	12.3
Above 60	13	2.1
Total	625	100.0

Source: Field survey, 2007.

The great majority of the sampled household heads (93%) were born in the village where they currently live; the remainder (only six respondents) were born outside the present locality, mainly within Oromia region. The main reason for settling in the study village is marriage. Other reasons include displacement owing to drought and destitution back home, which acted as 'push' factors. The literacy rate is high in the study villages compared with other rural areas in Ethiopia. About 40% of respondents claimed to have the ability to read and write.

About 91% of the respondents were physically and mentally able-bodied, and engaged in agricultural activities. The remainder were not involved in production for reasons of age, health or permanent disability. The productive labour force in all the villages is engaged in crop production and livestock raising. The bulk of the agricultural land is taken up with the production of staple crops (sorghum and maize) and peasants in Babile woreda produce groundnuts for sale. In Sirba village, it was found that a single peasant can earn up to 2,000 Birr a year from the sale of groundnuts. Peasants in Burakssa and Gaja villages in Goro Gotu woreda produce barley, wheat, pulses and tomatoes. The narcotic leaf, chat, is also produced in almost all villages, mainly for households' own consumption. At times residents sell a small amount of chat to buy basic necessities such as salt, sugar and soap.

The most important food item common to all the villages is *injera*, prepared from sorghum, maize, wheat or barley. Injera is often consumed at breakfast or lunch. Sorghum or maize injera is common in Sirba and Keyrata villages; wheat or barley injera is mostly found in Burakssa village but also to some extent in Gaja village. In addition to injera, *shuro* (porridge) and *nifro* are consumed in all the villages.

Under the assumption that house roofing indicates wealth of community members, Gaja residents are by far better off than those in the other three villages: 27 respondents (84%) have corrugated iron houses. In the other three sampled villages, 47% of respondents on average live in such houses and the rest live in thatch-roofed *tukuls*. This may partially be explained by the intervention of the government food security scheme, the Productive Safety Net Programme (PSNP), in Gaja village, which brought money that enabled households to buy corrugated iron sheets. This money was seldom used to invest in productive enterprise and was instead used for capital assets.

4 Access to water supply and implications for household sanitation and health

4.1 Access to water supply

As indicated above, the study looked at villages with better access and with no access to safe water. The households studied in Sirba and Gaja villages were those with access to safe water and the households in Keyrata and Burakssa villages were without access to safe and protected water. In what follows, we briefly present the situations of the two groups of villages separately.

4.1.1 Situation in Gaja and Sirba

Households in Gaja village fetch water from a developed spring, a scheme put in place during the Derg era. The scheme has once broken down and inhabitants reverted to using the traditional spring for several years. Since then, HCS has taken on the responsibility of maintaining and improving the structure of the scheme, although no tap had been fixed by the completion of the fieldwork (see Figure 4.1). The water eventually flows through a pipe and villagers fetch it according to their needs. The FGD participants in the women's group aired their concerns, underlining the difficulty of being sure of the safeness of the water they use: 'To claim that our water is safe and clean we need to at least see it is fixed with a tap and protected from any kind of external adverse factors'. They also said that the money they contribute on a monthly basis to the local water committee had not been properly utilised to clean up the water site, and the site was not well protected by surrounding fencing or a regular guard. The people in Gaja rely on the same source all year round (both wet and dry seasons).

Households in Sirba village fetch water from protected hand pump wells (Figure 4.2). This water scheme was developed by the government. Informants in individual interviews and group discussion sessions unanimously agreed on the cleanliness and safeness of the water they fetch for household consumption. The major problem of the water scheme in Sirba village relates to the low quantity of water, which fails to adequately support the rapidly growing population in the village. The research team observed that only two of the three hand pump wells in the village were functional. Moreover, villagers reported that the volume of water discharge varies considerably from day to day and by season. As a result, it is common to see long queues at the water point throughout the day, with some households being compelled to postpone water fetching to night hours.

Figure 4.1: Piped water, Gaja village

Figure 4.2: Protected hand pump well, Sirba village

Spending a long time fetching water may have considerable implications for labour productivity in livelihood activities (for details refer to Section 4.2.3).

4.1.2 Situation in Keyrata and Burakssa

People in Keyrata had relatively better access to safe water up until 2002. Bonki River, which used to be the main source of water for the villagers, flowed all year round, and the government developed a hand dug well near the river where households used to fetch water. But at the time of fieldwork, neither the river nor the well were acting as water sources for village residents. The river had almost dried up and the inhabitants reported that it contained water only during the wet season (Figure 4.3), and the hand pump well is no longer functional. About one-third of the households (31.3%) mentioned 'the lack of a natural water source to be developed' as a reason for not having access to safe water. According to the survey findings, 78.1% of the respondents in Keyrata village considered high pressure on existing water points to be a cause of the lack of safe water (Table 4.1).

Table 4.1: Reasons for not having access to safe water, by village (N=64)

		Lack of natural water sources to be developed	Aridity of climate	Lack of financial resources and support to improve points	Inadequate government support	High pressure on existing water points	Distance from passable road
Keyrata	Freq.	10	17	24	2	25	0
	HHs with no access to safe water (%)	31.3	53.1	75.0	6.3	78.1	0.0
Burakssa	Freq.	13	6	28	12	27	10
	HHs with no access to safe water (%)	40.6	18.8	87.5	37.5	84.4	31.3
Overall	Freq.	23	23	52	14	52	10
	HHs with no access to safe water (%)	35.9	35.9	81.3	21.9	81.3	15.9

Source: Field survey, 2007.

Figure 4.3: Dry water bed (left) and dysfunctional hand dug well (right), Keyrata village

Villagers are now compelled to share water with livestock from an unprotected well (see Figure 4.3). The female FGD participants also disclosed that occasionally they might ask the permission of other villagers in neighbouring areas to share water from their scheme, but that neighbours are often unwilling to allow them to fetch water from their water sources on regular basis.

The situation at Burakssa village was found to be worse than elsewhere. First, villagers still rely on a 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; about 31.3% of the households complained about the distance between home and the water points. Third, unlike in Keyrata village, where there is some chance of sharing the water sources of neighbouring villages, inhabitants of Burakssa village are without other options. The people in Burakssa village and the whole of Goro Gutu kebele have received little attention from the government and NGOs with regard to water sector development. This is evidenced by the responses of 87.5% of households, who blamed lack of financial resources and lack of support to construct a protected and potable water source for their situation. FGD participants said:

> *"The existing interventions bypassed our kebele for a number of reasons. First, we do not have representatives at the woreda office who could call attention towards our community. Second, the highland nature of the area and its greenness deceive people visiting our community. The presence of large evergreen trees apparently makes visitors feel that the area is 'fertile'. Third, our proximity to Kara Mile town works against us. However, the living situation of most households in the village is miserable, to say the least."*

4.2 Impacts of lack of safe access to water

Lack of access to safe water has affected the livelihoods of the people in the study area in a number of ways. According to the perceptions of the local people, water problems have brought illness to family members and livestock, have wasted time and labour spent in fetching water and have led to problems with irrigating farms and intensifying agriculture (Table 4.2).

Table 4.2: Problems households face because of reliance on unprotected water

		Health problems for family members	Health problems for livestock	Too much time fetching water	Inability to intensify agricultural production
Keyrata	Freq.	30	25	30	22
	HHs with no access to safe water (%)	93.8	78.1	93.8	68.8
Burakssa	Freq.	30	18	25	27
	HHs with no access to safe water (%)	93.8	56.3	78.1	84.4
Overall	Freq.	60	43	55	49
	HHs with no access to safe water (%)	93.8	67.2	85.9	76.6

Source: Field survey, 2007.

4.2.1 Sanitation and health problems for people and livestock

With regard to household perceptions of sanitation and hygiene in the study villages, 14.8% of respondents rated this as 'very good', 39% as 'good' and 45.3% as 'not good'. By any standard, the distribution clearly shows the prevalence of poor hygiene and sanitation in the villages. Many factors were identified to explain this at household level (Table 4.3). The largest number of respondents (36.2%) attributed the poor sanitary and hygiene situation to scarcity of water in the area for any other uses apart from drinking. Other factors included 'lack of hygiene and sanitation practices in everyday routine' (22.4% of respondents), 'long distances between homesteads and water points' (18.9%) and 'lack of necessary supplies to maintain families' sanitation and hygiene' (15.5%). Based on these findings, it can be deduced that water problems are among the determinant factors adversely affecting the health of the population and livestock in the study villages.

One of the case study female household heads in Burakssa village faced a serious health problem owing to the consumption of water from an unprotected source. A worm, known locally as *alkit*, lodged in her throat and had to be removed under intensive medical treatment at Dire Dawa Hospital. The main human diseases identified by respondents included diarrhoea (56 respondents), stomach cramps (27), amoebae (25), vomiting (19) and intestinal worms (12).

The prevalence of such diseases shows how problems related to drinking unsafe water and poor sanitation at individual and community levels have led to 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.

Table 4.3: Reasons for the prevalence of bad sanitation and hygiene

Reasons	Respondents	
	N	% of HHs with bad sanitation
Scarcity of water in the area for other uses apart from drinking	21	36.2
Lack of actual practice in everyday routine	13	22.4
Long distances between sources of water and homesteads	11	18.9
Lack of necessary supplies to maintain sanitation and hygiene	9	15.5
Most of time wasted in search of scarce water and food	7	12.1
Other members of the community pollute the surroundings	6	10.3
Short of time as farmers have to toil everyday	3	5.2
Carelessness on the part of farmers in the area	3	5.2
Members of the household do not maintain personal hygiene	3	5.2
Surroundings get polluted for unknown reasons	3	5.2
Logs of wood used to construct pit latrines infected by termites	2	3.5

Source: Field survey, 2007.

4.2.2 Livestock diseases

Among the studied villages, only in Gaja village do livestock and humans share protected water from a developed spring (see Figure 4.4). In the rest of the studied villages, there is a serious problem of access to sufficient water. During the rainy season, floodwater and seasonal gullies serve as major sources for watering livestock. The dry season 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 located in deep gorges and between big stones, which the people call *ella*, are the sources of water. As a result, livestock are susceptible to various diseases. Among the diseases reported by a large number of households are water-related diseases: *alkit* (*dullan dulla*) and frequent diarrhoea.

Figure 4.4: Natural spring for both human consumption and livestock watering, Burakssa village

Figure 4.5: Protected water source shared by livestock and humans, Gaja village

4.2.3 Time and labour spent fetching water

The survey data show that 85.9% of the sample households in Keyrata and Burakssa villages complained about fetching water taking too much time and energy. The average one-way walking times between homesteads and water points during the dry season are 71 and 31 minutes for the inhabitants at Keyrata and Burakssa villages, respectively. Households in the most distant locations have to walk about three hours to fetch water during the dry season. This reveals the adverse time and energy impacts of fetching water on the livelihood activities of the people. One villager in Keyrata had the following to say: 'The time and energy spent fetching water for my family members are immense. These, in turn, have impacts on household production, productivity and chores'. As indicated above, in the context of East Hararghe, the women are solely responsible for collecting water; the long distance they have to travel puts tremendous stress on them. In this regard, lack of access to safe water not only results in health problems but also has effects on the physical well-being of women.

4.2.4 Inability to irrigate farmland (intensifying agriculture)

Although a few households in Gaja village (Ido Jalela kebele) and Sirba village (Ifa kebele) make use of irrigation for crop production (Figure 4.6), none of the case study villagers had started to irrigate. Water schemes have been developed solely for household consumption. Inhabitants have expressed their interest in supporting their livelihood earnings by irrigating land.

Figure 4.6: Irrigation practices by peasants in Gaja village

In the other two villages under study, Keyrata and Burakssa, the people considered the use of irrigation on their farms as a 'luxury' issue. An elderly man in Keyrata village reacted to questions about irrigation by saying: '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?' He was highlighting that drinking water must be the priority and that the issue of intensifying agriculture through developed water schemes should come later. Nevertheless, this does not demonstrate a low demand for irrigation. For instance, Babile woreda is an area characterised by an arid/semi-arid climate and thus is prone to drought.

5 Food security situation and determinants

5.1 Food security status

Quantitative measurement of food security indicators at household level was not carried out under this study. Rather, the study relied on a self-reporting method for examining household food security. The team attempted to ensure that respondents understood clearly what was meant by a household attaining food security. Households were asked whether they could meet food and other basic needs all year round from their own production and could afford to purchase from the market by deploying their own assets. Accordingly, the sampled households in the four villages were asked to carry out self-reporting using the three categories as shown in Table 5.1.

Table 5.1: Self-assessment by households of 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, 2007.

The findings show that three-quarters (75%) of households felt that they were food insecure. The remaining 18.8% and 6.3% claimed to be 'food secure' or that 'food supply situation varies from one year to another', respectively. It is intriguing to learn that the overwhelming majority of the population lives under a situation of food shortage. Quite a significant disparity was seen among the villages under study. Inhabitants in Gaja village, where food secure households accounted for 40.6% of respondents, were by far better off than those in other villages. In contrast, people in Keyrata village were in a very bad shape: only one household reported being food secure. Extreme situations were depicted within the same woreda. About 15% of respondents in Gaja village and 9.4% of those in Burakssa reported variations and instability of food security from season to season. An elderly informant in Gaja village said:

> *"When natural factors – rainfall amount and distribution – in a season are quite normal and crops are not hit by kora (frost), we can produce crops that can cover our food needs for most of the time in the year. In bad years, however, we suffer a lot in getting access to food for our family."*

Enquiries as to what proportion of households was self-sufficient from their own production (livestock, crop production and non-farm income) revealed that 16 households (66.7% of the food secure households) depended on their own production. This suggests that eight out of the 24 households that claimed to be food secure can bridge additional food gaps by purchasing in the market. Two households gave survey responses that raise a number of questions. One household

head claimed to be self-sufficient but did not feel food secure. Another claimed to be self-sufficient but did not hide the fact that food security varied from one year to another.

It was also found that 40.6% of the households in the study villages were engaged in certain non-farm activities (see Table 5.2). Slight variations existed between the two study woredas with regard to types of non-farm activity. Some households in Babile woreda were engaged in wage labour in the nearby town, mainly in construction-related work (house construction and plastering), selling firewood, making and selling charcoal and petty trading.

We also learnt that some community members living in Keyrata village migrated to towns in Ethiopia and Somalia, most notably Hargessa, to engage in wage labour. Non-farm activities undertaken by some households in Goro Gutu woreda included petty trading, livestock raising and wage labour. Households in areas where the government food security scheme, the PSNP, is operational were found to have better opportunities to work in non-farm activities and to accumulate assets. One household head in Gaja had recently graduated from the PSNP; before becoming a PSNP beneficiary, the household had almost nothing in terms of livestock and other assets and by the time of graduation (summer 2007), it was able to accumulate three oxen, three milk cows, and a small petty trading shop worth about 7,000 Birr (Figures 5.1 and 5.2).

Table 5.2: Households drawing income from non-farm activities, by village

Village	Number of respondents	% of total households
Burakssa	18	56.0
Gaja	17	53.0
Sirba	13	40.6
Keyrata	4	12.5
Total/average	52	40.6

Source: Field survey, 2007.

Figure 5.1: Chat and coffee farms of PSNP beneficiary (case study household), Gaja village

Figure 5.2: Small shop owned by PSNP beneficiary (case study household), Gaja village

5.2 Causes of food insecurity

The reasons for food shortage at household level are concurrent with existing concepts of food security. A combination of factors, which adversely affect crop production, livestock raising, earnings from non-farm activities and food utilisation, explain household food insecurity (Table 5.3). The majority of respondents in all four villages believed that their inability to produce sufficient grain and to rear livestock prevented them from becoming food secure. Similarly, ranked in terms of importance, the following factors prevented families from becoming food secure: inability to rear sufficient amount of livestock; meagre income from non-farm activities; failure to properly utilise own production and other earnings; and instabilities owing to frequent changes in rural policies.

Table 5.3: Reasons for households becoming food insecure, by village

Reason	Village									
	Sirba		Keyrata		Burakssa		Gaja		Total	
	N	%	N	%	N	%	N	%	N	%
Inability to produce sufficient grain and to rear livestock	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 income from non-farm	5	26.3	16	51.6	18	75.0	18	81.8	57	59.4
Failure to properly utilise own production and other earnings	2	10.5	6	19.4	22	91.7	13	59.1	43	44.8
Instability owing to frequent changes in rural policies	1	5.3	3	9.7	13	54.2	4	18.2	21	21.9

Source: Field survey, 2007.

In the following sections, four causes of food insecurity in the context of the study areas are discussed. These cases cover constraints to crop production, constraints to livestock raising, limitations to non-farm activities and management problems.

5.2.1 Inability to irrigate farmland (intensifying agriculture)

The inhabitants in the four villages draw their sources of livelihood largely from crop production. Various adverse factors hinder the expansion of crop production, and this clearly affects food security at household level. Data from the survey identify a number of constraints. Some of these constraints, based on the importance attached to them by respondents, were: small/tiny land holdings (63 households); inadequate rain (62 households); shortage of selected seed supply (20 households); problems of water supply (17 households); shortage of organic fertilisers (15 households); and lack of money to purchase inorganic fertilisers (14 households). It appears that problems related to natural capital (land and water) are more significant than other factors. Technological constraints, such as lack of improved seeds and fertilisers, are also given weight. In this regard, farmers complained about lack of purchasing power (demand side) as well as supply problems on the side of service providers.

5.2.2 Constraints to livestock raising

Households identified multiple factors interacting in a complex way to cause food shortages, the most pressing of which include scarcity of grazing land (51 households); lack of foraging for livestock (47 households); shortage of money (41 households); scarcity of water (25 households); and lack of improved livestock hybrids.

5.2.3 Limitations to non-farm activities

Although about 4 out of 10 households reported working in non-farm activities, the income drawn from such ventures is not sufficient to support households. According to informants, there are many reasons for this, mainly shortage of start-up capital to begin off-farm activities (46 households); the relatively low income that one can make from such work (18 households); lack of work skills (18 households); lack of knowledge to conduct non-farm activities (13 households); and low level of awareness about non-farm activities on the part of the community members (9 households).

5.2.4 Management problems

Resources and food wastage also contribute to the prevalence of food insecurity at household level. Resource wastage happens as a result of a large number of factors, such as expenses for festivals and ceremonies (27 households); lack of knowledge on properly utilising resources (19 households); lack of saving culture (17 households); traditional malpractices, i.e. overspending during weddings and other celebrations (12 households); and shortage of appropriate storage (7 households).

6 Linkages between access to water and food security

Although the degree varies from one village to another, there are food insecure households in all the study villages. Seasonal shortages in staple food items, namely, injera, porridge and nifro, are evident in the months of June, July and August. Food insecurity was reported by three-quarters of the surveyed households, with only 12.5% claiming that they could fulfil their all-year round requirements from their own production (refer to Table 6.1).

Inter-village variations in seasonal food shortages between those with water schemes and those without are considerable. Abut 64% of beneficiaries and 86% of non-beneficiaries face shortages in food items at a specified time of the year. Although the majority of villagers face food shortage during the summer, some villagers in Keyrata face shortages for half a year. In short, summer time food scarcity is visible across the board in all the villages.

Table 6.1: Number of months food insecure households cover food consumption from own production (N=96)

Duration	Frequency	% of all food insecure households
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, 2007.

In order to attain food security in the villages with existing access to an improved water supply, mechanisms should be sought by which: (i) the water schemes in Sirba and Gaja could render multiple use services, including irrigation and sanitation; (ii) the pressure on the single water scheme containing three hand pumps in Sirba village, which currently serves about 800 households on average, is eased; and (iii) the spring in Gaja village is further developed in order to offer multiple use services.

It should also be noted that the role of water in food security is subsumed in other activities, such as agricultural production and productivity and livestock raising. As shown earlier, these are key factors in food security: 68% of sampled respondents believed that their food insecurity was related to their inability to produce sufficient grain, 54% felt it owed to their inability to raise a sufficient amount of livestock and 45% thought it was a result of the meagre income they obtained from non-farm activities.

Both the beneficiaries and non-beneficiaries of water schemes believed that water played a pivotal role in their livelihoods. Almost all were of the conviction that lack of access to sufficient water adversely affected the food security of their household. By the same token, 92% of non-beneficiary households believed that the absence of water made them vulnerable to drought; 93% believed water problems were a factor in their low agricultural production and productivity; and all respondents felt that the search for water consumed their time and energy. Conversely, about 88% of beneficiary households asserted that their food security status and livelihoods had improved following water supply interventions, most particularly in terms of improving the household health situation and

diversifying their sources of income. There were, however, divided responses when it came to the role of water supply interventions in income increments, improvements in livestock productivity and the intensification of agriculture.

The importance of water in the attainment of food security and improvements in livelihoods was underlined by residents, DAs and health workers in both woredas. In Sirba village, FGD panellists (men) equated 'water with life'. They stated that 'people who have better access to water and irrigation will definitely be food secure'. Another informant in the same village said 'proper land management is unthinkable without the availability of water'. Similarly, a development agent from 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 noted: "If NGOs and/or government develop water sources for irrigation use, we can produce three to four times a year. Consequently, we will become not only food secure but also net exporters of agricultural products'. All informants, including the DA in Keyrata village, underlined the significance of water supply related to crop production, product diversification, livestock raising, health improvements and food security.

The opinions of key informants, DAs and FGD discussants concur with what Start et al. (2005) have to say about East Hararghe 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 step changes in poverty reduction and stem the need for resettlement and out-migration. Without addressing needs for 'assured water' or water scarcity, agricultural programmes 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."*

Given this state of affairs, a number of the villagers in both woredas suggested the following measures to improve their food security situation: expansion of irrigated agriculture, construction of large water supply schemes and 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 had no access to a water scheme attributed both human and livestock health problems to the utilisation of unprotected water. The most frequent diseases in the study areas included diarrhoea, amoebae, 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 disease occurrences to poor sanitation, which is partially related to water availability. The hygiene and sanitation situation of the villagers living in water intervention areas is relatively better than that of the villagers who have no water schemes. Some, if not all, of the respondents living in Gaja and Sirba maintain their personal hygiene, use latrines and dump garbage in nearby holes. For those in Keyrata and Burakssa villages, given the situation in which they live, 'hygiene and sanitation' are considered more of a luxury.

7 Conclusions and suggestions for action

These case studies have attempted to look at the situation of access to and supply of water and food security at household level, and to examine the interrelations between water development interventions and food security in four villages in East Hararghe zone. Data were generated by employing quantitative (household survey) and qualitative tools (FGDs, key informant interviews and in-depth case studies of households). We now summarise the major findings and give suggestions for practical interventions.

Clear disparity exists between the communities with water schemes – Gaja and Sirba – and those without – Burakssa and Keyrata – with respect to access to and supply of water and food security. In Gaja and Sirba, people fetch water from developed schemes within the village, with the former getting water from a developed spring and the latter from hand pump wells. The main problem facing the inhabitants of Sirba is inadequacy of water. Inhabitants of Gaja complained about the lack of cleanliness of the water owing to a variety of problems in and around the spring site. In reality, the developed schemes at both sites are meant for drinking. The utilisation of water for other purposes, such as livestock watering, irrigation and washing clothes, is quite limited. People in Gaja have no other options for watering livestock and are therefore compelled to share water with their livestock.

The food security situation of the two beneficiary sites (28.1% of households feel food secure) is relatively better than that of the villages without access to developed schemes (only 9.4% of households feel food secure). Given this relationship between water access and food security, it is suggested that existing water schemes be improved. Additional water schemes should be built for the inhabitants of Sirba, and the spring in Gaja should be improved in terms of quality of supply and volume of discharge. Water development interventions should go beyond household consumption to cover other needs, such as livestock watering, sanitation and irrigation. Such interventions are necessary to improve livelihoods and food security of the villagers.

The people in Keyrata and Burakssa villages still depend on natural water sources for drinking. Households in Burakssa get water from an unprotected spring located far from the village. Unprotected and unreliable wells are the source of water for Keyrata villagers. Reliance on such unsafe water has adversely affected the health of people and their livestock. The people also invest much time and energy in getting water, and have no opportunity to use water for irrigation. Although other important factors affect food security at household level, such as scarcity of land, lack of access to and capacity to pay for new technological inputs, shortage of livestock feed and shortage of start-up capital for non-farm activities, drought and lack of ability to irrigate prevent people from expanding crop and livestock production. Improving the sanitation, health and food security of households in Keyrata and Burakssa calls for development interventions in the following areas:

- Introduce water schemes for household consumption, sanitation, livestock watering and irrigation.
- Put in place integrated rural development programmes that can improve people's income, education, and skills in saving resources and products.
- Launch development schemes such as the PSNP, which has brought about improvements in people's livelihoods in areas where it is already being implemented.

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Annex 1: Household survey questionnaire

Survey objective: To examine the relationships between water supply and sanitation interventions and food security at household level. We cordially request that you provide information to the best of your knowledge and assure you that no information will be processed using names of informants.

Note: Respondents to this questionnaire should be household heads or his/her partner.

Part I: Background information of household head and other family members

1	Household identification number		
2	Date of interview		
	Name of interviewer		
	Name of supervisor		
3	Woreda	1. Babile 2. Goro Gutu	
4	Kebele		
5	Got		
6	Name of household head		
7	Sex of household head	1. Male 2. Female	
8	Age of household head		
9	Household type (in relation to water sector development intervention)	1. Beneficiary 2. Non-beneficiary	
10	Religion of household head	1. Muslim 2. Christian (Orthodox) 3. Christian (Protestant) 4. Christian (Catholic) 99. Other (specify)_____	
11	Ethnicity of household head	1. Oromo 4. Issa 2. Amhara 5. Harari 3. Somali 6. Afar 99. Other (specify) _____	
12	Marital status of household head	1. Single 4. Widowed 2. Married 5. Separated 3. Divorced 6. Polygamous	
13	Place of birth of household head	1. Current place of residence 2. Other place (specify) Region _____ Zone _____ Woreda _____	
14	Continuous duration of stay at current place of residence (year)		
15	If your place of birth is different from the current location, reason for coming here	1. Marriage 5. To get access to land 2. Join relative 6. Divorce 3. Drought displacement 7. War/conflict 4. Poverty/destitution 8. Resettlement 99. Other (specify) _____	

16	Educational status attained by head	1. Illiterate 2. Read and write 3. Religious school (Church, Kuran) 99. Other (specify)_____	
17	Head is capable of work/economically active	1. Yes => Q19 2. No	
18	If inactive, why?	1. Sick 4. Aged and sick 2. Aged 99. Other (specify)_____ 3. Disabled	
19	Number of permanent household members at time of survey including household head.	Male	
		Female	
		Total	
20	Age distribution of other members of household	Under 10 years	
		Between 10 and 20	
		Between 21 and 30	
		Between 31 and 60	
		Above 60	
21	Roof of house of the household is made of:	1. Grass/straw 2. Corrugated iron sheets 99. Other (specify)_____	

Part II: Water-related issues: Access, supply and sanitation (hygiene)

1. Do you have access to sufficient and safe water?

   a. Yes b. No => Q7

2. If yes to Q1, identify your sources of water for different purposes during dry and wet seasons, and the distance from your homestead in terms of walking time.

	Type of water use	A. Sources during wet season (Code*)	B. Walking distance one way (hour/minute = 00:00)	C. Sources during dry season (Code*)	D. Walking distance one way (hour/minute = 00:00)
2.1	Drinking				
2.2	Washing clothes				
2.3	Watering livestock				
2.4	Growing crops (irrigation)				
2.5	Other (specify) _____				
2.6	Other (specify) _____				
		1. Protected spring 2. Protected well 3. Tap water 4. Protected pond 99. Other (specify) _____			

3. If the sources of water are mainly from protected spring, protected well, protected pond, tap water, and other developed schemes, indicate who developed the infrastructure, and since when you have started to use it?

	Source	A. Organisation that developed the source (Code*)	B. Since when (E.C.)	C. Remarks
3.1	Tap water			
3.2	Protected spring			
3.3	Protected well			
3.4	Other scheme (specify) _____			
3.5	Other scheme (specify) _____			
		1. Government _____ 2. NGO (specify)_____ 3. Government and NGO 4. Contribution from community 5. Government and community 6. NGO and community 99. Other (specify) _____		

4. What happened to water related costs and household expenditure when you started utilising water from improved sources?

   a. Increased b. Decreased =>Q6 c. Remained the same d. Difficult to tell the change

5. If increased for Q4, what do you think was the reason? _____

6. If decreased for Q4, why? _____

7. If 'No' for Q1, what are the reasons for not having access to safe water?

   a. Lack of natural water sources to be improved

   b. Aridity of climate of area

   c. Lack of financial resources and support to improve water points

   d. Inadequate government support for water development

   e. High pressure on existing water points

   f. Distance from passable road

   99. Other (specify) _____

8. If 'No' for Q1, what are your sources of water during different seasons of the year?

	Type of water use	A. Sources during wet season (Code*)	B. Walking distance one way (hour/minute = 00:00)	C. Sources during dry season (Code*)	D. Walking distance one way (hour/minute = 00:00)
8.1	Drinking				
8.2	Washing clothes				
8.3	Watering livestock				
8.4	Growing crops (irrigation)				
8.5	Other (specify) _____				

8.6	Other (specify) _____				
		1. River/stream 2. Floods in gully 3. Unprotected pond 99. Other (specify)_____		4. Unprotected spring 5. Direct rain harvesting 6. Unprotected well	

9. What problems have you faced because of reliance on water from unprotected and unreliable sources? (Multiple responses are possible)

   a. Health problem for family members

   b. Health problem for livestock

   c. Too much time fetching water

   d. Inability to intensify agricultural production

   99. Other (specify)_____

10. Would you tell us the health problems that your family and livestock have faced over the past several years?

    a. Diseases that affected household members _____

    b. Livestock diseases _____

11. What do you think are the appropriate solutions to overcome water-related problems?

    a. _____

    b. _____

    c. _____

12. How do you evaluate the sanitation and hygiene in your family?

    a. Very good b. Good c. Not good

13. If your answer to Q12 is either 'Very good' or 'Good', explain to us how and why _____

14. If your answer to Q12 is 'Not good', tell us why it is so _____

15. How do you evaluate the sanitation and hygiene in your community?

    a. Very good b. Good c. Not good

16. If your answer to Q15 is either 'Very good' or 'Good', explain to us how and why _____

17. If your answer to Q15 is 'Not good', tell us why it is so _____

18. In your opinion, what should be done to improve the hygiene and sanitation situation in the community in general and in your household in particular? _____

Part III: Food security situation at household level

1. The staple foods that your household consumes are:

	Crop type	A. 1. Yes 2. No	B. three most important crops (in rank order)
1.1	Sorghum		1st _____
1.2	Maize		2nd _____
1.3	Teff		3rd _____

1.4	Barley		
1.5	Wheat		
1.6	Pulses (horse beans, peas…)		
1.7	Oilseeds (linseed, sesame…)		
1.8	Fruits (papaya, banana, mango…)		
1.9	Potato		

2. Which foodstuff(s) are consumed at home?

	Foodstuff	A. How many times has it been consumed in your home during the past seven days? (number)	B. Is there a time of a year when you encounter shortage of specific foods? 1. Yes 2. No => Q3	C. Which months are shortage periods? (Code*)
2.1	Injera (sorghum, maize, teff…)			
2.2	Bread (dabbo)			
2.3	Wat (pulses)			
2.4	Cooking oil (oil seeds)			
2.5	Meat (beef, lamb, goat)			
2.6	Chicken and/or eggs			
2.7	Milk and/or cheese			
2.8	Butter			
2.9	Potatoes			
2.10	Vegetables (cabbage, carrot, tomato…)			
2.11	Fruits (papaya, banana, mango…)			
	1. Whole year 2. Nine months (March – November) 3. Six months (May – November) 4. Six months (December – May) 99. Other (specify) _____		5. Six months (March – August) 6. Three months (June – August) 7. Three months (March – May) 8. Three months (December – February)	

3. Would you tell us the amount of grain and other foodstuff that covers the annual consumption food requirements of your household members?

	Grain type	A. Amount (per year)	B. Unit (Code*)	C. Estimated value in cash (birr)
3.1	Cereals			
3.2	Pulses			
3.3	Oilseeds (Linseed, sesame…)			
3.4	Vegetables (cabbage, carrot, tomato…)			
3.5	Fruits (papaya, banana, mango…)			
			1. Quintal 2. Kilogram	

4. Do you meet all-year round food requirements of your household members from own production?

a. Yes => Q6 b. No

5. If you are not self-sufficient, for how many months do you produce to cover the food requirement at home? (State the number of months) _____

6. Do you or any member of your household engage in non-farm activities?

   a. Yes 2. No => Q8

7. If 'Yes' to Q6, does the income you earn from non-farm activities enable you to buy food to bridge the deficiency?

   a. Yes 2. No

8. According to your own self-assessment, is your household:

   a. Food secure c. Varies from one year to another

   b. Food insecure d. Varies from season to season

   e. Do not know

9. If the response for Q8 is 'Food insecure', what do you think are the main reasons for being food insecure?

	Reason for food insecurity	A. 1. Yes 2. No
9.1	Inability to produce sufficient grain and to rear livestock	
9.2	Inability to rear sufficient amount of livestock	
9.3	Meagre income from non-farm activities	
9.4	Instability owing to frequent changes in rural policies	
9.5	Failure to properly utilise own production and other earnings	

10. What have been the five main constraints to expanding your crop production, as well as to keeping sufficient amount of stock in order to become self-sufficient in food all year round?

	10.1 Main bottlenecks for crop production		10.2 Major constraints for livestock rearing
1		1	
2		2	
3		3	
4		4	
5		5	

11. What are the three principal reasons for lack of sufficient and viable income from non-farm activities to become food secure at household level?

    a. _____

    b. _____

    c. _____

12. Mention two main problems responsible for the failure to properly use food and other resources

    a. _____

    b. _____

13. How do you cope with the problem of food shortage?

	Coping strategy	A. 1. Yes 2. No	B. Use a strategy when food shortage is: (Code*)
13.1	Livestock dispersal or de-stocking		
13.2	Changing cropping patterns		
13.3	Migration to nearby towns for wage labour		
13.4	Consuming famine period or less preferred foods		
13.5	Borrow grains from relatives		
13.6	Borrow grain or cash from money lenders		
13.7	Migrate to other rural areas for wage labour		
13.8	Sell off small animals		
13.9	Firewood and charcoal selling		
13.10	Rely on relief grains		
13.11	Sell off farm oxen		
13.12	Lease out land		
13.13	Sell off land		
13.14	Distress migration		
	1. Less severe 2. Moderately severe 3. Severe		

Part IV: Linkages between access to water supply and food security

I. Section for response by non-beneficiaries of water sector development interventions

1. Do you think lack of access to safe and sufficient water adversely affects household food security?

   a. Yes b. No

2. If yes for Q1, in what ways?

	Response	A. 1. Agree 2. Disagree
2.1	Vulnerability to drought and erratic rainfall distribution	
2.2	Low agricultural productivity and production	
2.3	Taking too much time and energy in fetching water	
2.4	Induced conflict over water use	
2.5	Affecting health of household members and food utilisation	

3. If no for Q1, what do you think are the determinant factors for your household food supply/security?

   a. _____

   b. _____

   c. _____

II. Section for response by beneficiaries of water sector development interventions

1. How do you compare the livelihood and food security of your household during pre- and post-intervention periods of water sector development?

   a. Improved following interventions => Q2

   b. Deteriorated since intervention => Q4

   c. No changes recognised

2. If the response to Q1 is 'Improved since intervention', in what ways?

	Improvement in terms of	A. 1. Yes 2. No
2.1	Diversified sources of income	
2.2	Increased income in absolute terms	
2.3	Allowed agricultural intensification through irrigation	
2.4	Improved health for family members	
2.5	Improved livestock productivity	
2.6	Other (specify) _____	
2.7	Other (specify) _____	

3. If the water development intervention did not bring changes in livelihood and food security what do you think are the reasons?

	Reason	A. 1. Agree 2. Disagree
3.1	Water intervention did not address other constraints of food security	
3.2	The environment is arid and harsh	
3.3	Severe problem of land scarcity	
3.4	Lack of farm oxen	
3.5	Inability to purchase other technological inputs	
3.6	Other (specify) _____	
3.7	Other (specify) _____	

4. If the response to Q1 is 'Deteriorated', what are the explanations?

   a. _____

   b. _____

   c. _____

5. What do you suggest to be integrated with water sector development interventions so as to bring significant improvements in the living standard and food security of your household?

Annex 2: Interview checklists

16 key informant interviews – four types of checklists (interview guides), sharing some questions for each group

- **1 elderly in each village**: Focuses very much on perceptions of changes and continuities at community level in terms of environment, people's livelihoods, state–society interactions, constraints and development of water sector and its effects on food security, etc.
- **1 DA:** Issues pertaining to major activities of the government in the area of water, and people's responses to the development of water infrastructure, constraints in enhancing local people's awareness and understanding.
- **1 health worker:** The checklist for these informants should emphasise the perceived health problems in the case study villages, and specific diseases directly related to the consumption of unsafe water, poor hygiene and sanitation, and measures taken to address the problem, etc.
- **1 NGO representative working in the area:** We need to explore which activities are meant to directly improve water and sanitation and which of them contribute indirectly. Local people responses to the NGO interventions and what the NGOs saw as major changes.

Eight focus group discussions, two in each kebele. Tentatively, the two groups in each village will be: one for men and the other for women, composed of different age brackets (youth, adults and aged people)

- **Women's group (the main actors in household water supply):** The checklist for this group will involve a number of things related to water transportation, budgeting, consumption, problems related to unsafe water, hygiene and sanitation, etc.
- **Men's group:** Changes and continuities in water availability, access and use, explanations for changes, water development interventions and contributions to livelihood improvements, future needs, etc.

In-depth study of households

Eight case study households, two (one male-headed and one female-headed) in each study village, and thus four beneficiaries and four non-beneficiaries will be considered. It is also useful to look deeply into households with regard to contrasts in well-being status.

NB. Interview guides/checklists will be mostly open-ended in view of giving the respondents the opportunity to probe into the matters under discussion.

I: Interview checklist for elderly

Well known individuals to be identified by the DA and the kebele administrators

1. Background: name, age, sex, place of birth
2. When and why did you come to this *kebele*?
3. Perception regarding changes in landscape and biodiversity of the area
4. Perception regarding changes in population increase

5. Perception regarding changes in local institutions
6. Perception regarding changes in government institutions (comparison between different governments)
7. Perception regarding state–society relations
8. Hygiene behaviour and sanitation facilities
9. Water sources and supply by community members
10. Sources in the past
11. Perceived problems related to previous sources
12. Actions taken by community members to address the problem
13. Solutions of other concerned bodies: government and NGO development actors
14. Who has put in place the current water and sanitation infrastructure in your community?
15. Perceived changes with respect to relations among community inhabitants
16. Perceived changes in relation to impact on natural environment
17. Perceived changes in terms of affecting ritual places
18. Which NGOs operate in your community and which operate in water point development/provisions?
19. How do you assess their impacts?
20. What are the major problems of water supply since the new infrastructure was put in place?
21. How do you assess the adverse effects of water scarcity on crop production, livestock rearing, health of the people, food security, etc?
22. Are there water-related conflicts among community members?
23. How are the problems of conflict being addressed?
24. What is the role of formal and informal institutions in water-related conflict management?
25. Do you perceive wealth differences among the inhabitants of your kebele? How do you categorise the people?
26. What are the explaining factors for wealth categories?

II: Interview checklist for DAs

1. Background: name, age, sex, education, etc.
2. How long has it been since you started to serve as a DA, in other places and at the current site?
3. Major tasks and responsibilities of DA
4. What development activities are going on to improve water supply for domestic consumption, livestock and irrigation in the kebele you work for?
5. What do you think are the main constraints to improving water supply and sanitation?
6. Have you recognised any problems caused by unsafe water consumption?
7. Are there competition and conflicts over water by the kebele inhabitants?
8. Are there NGOs working on water development activities?
9. How do the activities by the government and the NGOs synchronise?

10. Do the government and NGOs attempt to promote public participation in water-related development activities, and in what ways?
11. How do you differentiate households in the kebele according to their wealth?
12. Which group are most vulnerable to water-related crises, and why?

III: Interview checklist for health workers

1. Background: name, age, sex, education, etc.
2. Year of service, in other place and current kebele
3. Major activities of health extension worker
4. Do you believe that the training you have had allows you to address most problems you encounter at community level?
5. Do you contribute to creating awareness about using safe water?
6. Do you advise and train community members to take care in preventive actions?
7. Support that health workers provide when they come across water-related illness
8. What are the perceived health problems owing to reliance on unsafe water?
9. Which types of diseases are the most prevalent – water-borne, water washed or water-related?
10. Preventive and curative interventions by health worker
11. Major bottlenecks hindering health worker duties
12. Integration of health workers duties with community administration, DAs and NGOs operating in the community under investigation
13. How do you create the linkage between quantity and quality of food to be consumed with the health of community members?
14. What are the perceived health problems because of poor nutrition – malnutrition for children and under-nutrition for adults?
15. What types of households are most susceptible to water-related diseases?
16. Health worker suggestion to improve the health of the people – in terms of water supply, hygiene and sanitation, attaining sufficient and quality food, and in general improving living standards

IV: Interview checklist for NGO representative

1. Brief historical account of the NGO: a) foundation, b) objectives, c) specific activities in the kebele under study and d) whether WSS is one of the agendas of the NGO
2. Intervention since when in the current area?
3. How was the kebele selected for intervention, and what were the criteria for identifying kebeles?
4. What are the major activities of the NGO in the kebele under consideration?
5. Water sector development and food security activities so far
6. Is the NGO involved in hygiene and sanitation work, and what?
7. Modality of implementation of projects: NGO's self implementation and/or work with government
8. Mechanisms of identifying beneficiary households
9. Did you observe clear wealth differentiation among the kebele inhabitants?

10. How does the NGO contribute to water sector development in the kebele under consideration?
11. How does the NGO contribute to enhancing household food security?
12. How does the NGO contribute to enhancing the health situation of the people?
13. In what ways does the NGO attempt to relate water development and improvements in households' food security?
14. What have been the local people's responses to the NGO intervention?
15. How does the NGO assess the impact for the improvement of the standard of the people in its area of intervention?
16. Perceived constraints for enhancing interventions so far
17. Relationship with local administrators and government offices at different administrative tiers (federal, regional, zonal, woreda and kebele)
18. Suggestions for improving future interventions and bringing about significant impacts with respect to improving people's standard of living
19. How does the NGO perceive WSS and food security linkages?

V: FGD checklist for men's groups (beneficiaries and non-beneficiaries)

Composition of the group to be of aged, youth, relatively well off and poor

1. Name of participants and other identifiers (e.g. age and well-being status)
2. How do you assess your community's water situations? a) major sources, b) accessibility in terms of distance, cost and rules surrounding use, c) water sufficiency (amount) and reliability, d) water quality – safe/unsafe, (e) relationship between various users of same sources and (d) hygiene and sanitation
3. Have you recognised any changes in the water supply over the years?
4. If yes, what contributed to the changes: natural processes, government interventions, NGO interventions, other factors?
5. What kind of relationship do you establish between water supply and health?
6. Do you observe any wealth differences among the households in your community?
7. What are the main factors/criteria for differentiating households?
8. How do you explain the concepts of food security and food insecurity?
9. Which type of households in your community can be considered food secure and food insecure?
10. Do you think that water scarcity can cause food shortage at community/household level?
11. How do you see water sector development by government and NGOs?
12. Have the changes in water development been influential in terms of expanding agricultural production and enhancing food supply?
13. Do you think that the impact has been significant in terms of enhancing food security?
14. What are the major problems in relation to water supply?
15. Your suggestions for improving water and sanitation, and thereby improving food security, health and overall standard of living

VI: FGD checklist for women's groups (beneficiaries and non-beneficiaries)

Composition of the group to be of older women, youth and women-headed households

1. Name of participants and other identifiers (e.g. age and headship status)
2. How do you assess your community's water situations? a) major sources, b) accessibility in terms of distance, cost and rules surrounding use, c) water sufficiency (amount) and reliability, d) water quality – safe/unsafe, (e) relationship between various users of same sources and (d) hygiene and sanitation
3. Which member of households are often responsible for fetching water, and why?
4. What do you think should be done to balance the responsibilities of water transportation and rationing among male and female members of households?
5. Have you recognised any changes in the water supply over the years?
6. If yes, what contributed to the changes: natural processes, government interventions, NGO interventions, other factors?
7. Do you observe any wealth differences among the households in your community?
8. What are the main factors/criteria for differentiating households?
9. Regarding male and female headed households, which are better in terms of well-being status?
10. What kind of relationship do you establish between water supply and health?
11. How can a household in your community be labelled food secure or not?
12. To whom do you give the priority of feeding among household members (children, aged, ill member, male or female), and why?
13. Do you think water scarcity has a main cause of food shortage at community/household level?
14. What are the other explanations for the current status of household food security?
15. How do you see water sector development by government and NGOs in your community?
16. Have the changes in water development been influential in terms of expanding agricultural production and enhancing food supply?
17. Do you think that the impact has been significant in terms of enhancing food security?
18. What are the major problems in relation to the current water supply in your village?
19. Your suggestions for improving water supply and thereby improving food security, health and overall standard of living

VII: Checklist for in-depth study of households

Section 1: Demography and life history narrative and conditions of human capital

- Name, age
- Family size, sex
- Perceptions of large family size
- Place of birth and migration history
- Marriage history
- Mortality history

- Labour demand and supply (who can work and who cannot among family members)
- Literacy and participation in formal education
- Main health problems in the community
- Health problems experienced by household members
- Are there any disabled persons among the household members?

Section 2: Access to natural capital

- Land holding size
- Ways of getting access to land in different times
- Own use or sharecropping in/out
- Change in holding size over the past few years
- Perceived status of farmland in terms of suitability for farming and soil fertility
- Main problems of farmland
- Land management practices
- Access to water for humans, livestock and irrigation
- Changes of access to safe water
- Problems of water use
- Access to natural vegetation
- How to use and perceptions of its removal/depletion
- Problems in relation to the exploitation of natural vegetation
- Interest in planting trees
- Perceptions of resource use conflict between various land users/stakeholders in community
- Perceptions of recurrent drought and erratic rainfall distribution

Section 3: Financial capital

- Main annual crops grown and size of harvests during the past two seasons
- Trends in production (increase/decrease/no change – why)
- Perennial crops such as chat and coffee, grown (size and income from sale per year)
- Types of technological inputs under use
- Livestock owned (types and size)
- Constraints to livestock raising
- Non-farm activities that the head and other members undertake
- Income from non-farm activities and purposes for which the money is used
- Reserve money (in cash)

- Main expenditures (tax, purchase consumer items, contributions to formal and non-formal institutions)
- Housing situation and home utensils
- Possession of farm equipment and other assets

Section 4: Social capital (social relations and networking)

- Participation in informal institutions (CBOs – *kire*, *hiqub*, *wedeja*, *kamma*, neighbourhood coffee drinking, attending mosque ceremonies – for prayer, weddings, etc.)
- Participation in labour organisations
- Labour support from neighbours, relatives
- Obtaining/giving out crops through *zekka* during harvest
- Support in kind from kin/relatives
- Draft power assistance to/from neighbours
- Raise stock for someone through *ribi* or *kaya* arrangement
- Grain and loan during deficit period
- Cash loan in times of need
- Donation of milk to/from somebody else in the community
- Remittance from/to individuals/institutions
- Benefits from safety net schemes (government PSNP or NGO): FFW or free relief food distribution

Section 5: Physical capital (availability and access to rural infrastructure)

- Health service
- School
- Potable and safe water source
- Credit
- Irrigation
- Market and fair price (for both selling and purchasing)
- Technological inputs (fertilisers, herbicides, insecticides, etc.)
- Agricultural extension
- Veterinary service
- Access and affordability of medicines for human use
- Access to medicines for livestock

Section 6: Government intervention (rural policies)

- Imperial period experiences

- Land reform and PA formations
- Land redistributions
- Villagisation
- Resettlement
- Change of government in 1966 E.C. (1974) and 1983 E.C. (1991)
- How do you compare the current rural policies with these of the imperial and Derg periods?
- Membership in the kebele
- Involvement in the election of the kebele administration
- Do you know the tasks and responsibilities of the kebele administrators?
- Perceptions of kebele administrators
- Are the kebele administrators helpful and responsible for the kebele inhabitants?
- Participation in various agricultural extension programmes
- Participation in *ye-lemmat sirra* (development activities)
- Participation in land resource conservation activities
- Perceptions of the new state resettlement programme

Section 7: NGO intervention

- What are the NGOs working in your community?
- Main development activities by the NGOs in your community
- Development activities that directly or indirectly contribute to water sector
- Other direct benefits you and your household members have received from NGO projects
- Do you think that NGOs have been fair in targeting households and individuals in your community?
- How do the NGO influence people's life?
- How do you feel the impacts?

Section 8: Food security

- Main staple food crops of the households
- Type of meal eaten most frequently at home
- Average number of months you are able to feed your household from own production
- What are the main bottlenecks to producing enough crops and raising stock to enable you to be self-sufficient in food?
- Does the income you earn from non-farm activities allow you to buy food during shortages?
- How do you cope with shortage?
- What are your survival strategies?

- Are there less preferred famine foods that are consumed by your household during food shortages seasons?

Section 9: Perceptions of poverty

- How do you perceive poverty?
- What causes poverty at household level?
- How do you characterise poor people?
- What should be done to alleviate poverty?
- Whose responsibility is it to reduce poverty?
- How do you characterise the rich people in your community?
- Comment on the relationships between poor and rich people at community level

Section 10: Prospects of the household

- Household plan
- How do you think your household livelihood (standard of living) will improve?
- What do you expect from government, NGOs and the people at large?