

**EASTERN NILE REGIONAL TECHNICAL OFFICE
(ENTRO)**

Integrated Watershed Management (Ethiopia)
Sub-watershed Project of Fast Track Projects
of Eastern Nile Subsidiary Action Programme

PROJECT PREPARATION REPORTS

November 2007

(In Three Volumes)

Volume I – Annex 1



Halcrow

**HALCROW GROUP
LIMITED**



**METAFERIA CONSULTING
ENGINEERS PLC**

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Annex 1. An Analysis of Stakeholders

Halcrow Group Limited

Burderop Park Swindon Wiltshire SN4 0QD
Tel +44 (0)1793 812479 Fax (0)1793 812089
www.halcrow.com

Metaferia Consulting Engineers

Addis Ababa, Ethiopia
Tel +251 (0)11 551 4241 Fax (0) 11 551 4466
aym.mce@ethionet.et

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ACRONYMS

ACSI	Amhara Credit and Savings Institute
AfDB	African Development Bank
AMAREW	Amhara Micro Enterprise, Agricultural Research, Extension and Watershed Management Project
ANRS	Amhara National Regional State
ARARI	Amhara Regional Agricultural Research Institute
BoARD	Regional State Bureaux of Agriculture and Rural Development
BoFED	Bureau of Finance and Economic Development
BoH	Bureau of Health
BoWA	Bureau of Women's Affairs
BoWRD	Bureau of Water Resources Development
CIDA	Canadian International Development Agency
CAP	Community Action Plan
CWC	Community Watershed Committee
DA	Development Agent
EIA	Environmental Impact Assessment
ENSAP	Eastern Nile Strategic Action Plan
ENTRO	Eastern Nile Technical Regional Office
EPA	Environmental Protection Authority
EPLAUA	Environmental Protection, Land Administration and Use Authority
FTC	Farmers' Training Centre
GEF	Global Environment Fund
GIS	Geographic Information System
IDEN	Integrated Development of the Eastern Nile
LFA	Logical Framework Approach
LFM	Logical Framework Matrix
M&E	Monitoring and Evaluation
MCE	Multi-Criteria Evaluation
MERET	Managing Environmental Rehabilitation in Transition to Sustainable Livelihoods
MoARD	Ministry of Agriculture and Rural Development (in Ethiopia)
MoWR	(Federal) Ministry of Water Resources (in Ethiopia)
MSC	Multi-Selection Criteria
NBI	Nile Basin Initiative is a cooperative arrangement between ten Nile countries
NELSAP	Nile Equatorial Lakes SAP
NGO	Non-Government Organization
NILE-COM	Nile Council of Ministers
NRM	Natural Resources Management
NTFPs	Non-Timber Forest Products
OARD	Offices of Agriculture and Rural Development
O&M	Operations and Maintenance
ORDA	Organisation for Rehabilitation and Development in Amhara
OVI	Objectively Verifiable Indicators
P&IWMDP	Participatory and Integrated Watershed Management and Development
PDO	Project Development Objective
PIPs	Project Implementation Plans
PLUP	Participatory Land Use Plan
PRA	Participatory Rural Appraisal or Participant Response Analysis
SAP	Subsidiary Action Plan
SMS	Subject Matter Specialist
SWC	Soil and Water Conservation
SWHISA	Sustainable Water Harvesting and Institutional Strengthening in Amhara
TBIWRDP	Tana Beles Integrated Water Resources Development Project
TOR	Terms of Reference
USAID	United States Agency for International Development
WBISPP	Woody Biomass Inventory and Strategic Planning Project
WFP	World Food Programme
WWT	Wereda Watershed Team

1. Introduction

Institutions, groups and individuals with an interest in the Integrated Watershed Management Project (the Project) are shown in (Table 1). Stakeholders are classified according to whether they are Shareholders (donors), Employees (managers, operators, advisers), Customers (beneficiaries) or Others in the project environment which includes civil society. Among these stakeholders, representatives from the Federal Republic of Ethiopia, multi-lateral, bi-lateral and non-government organizations (NGOs), and the Consultant attended the Inception and Interim Workshops held in Bahir Dar on 09 March 2007 and 27-28 August respectively. There were no representatives from rural communities or the private sector at these Workshops.

2. Federal Democratic Republic of Ethiopia

The Ministry of Water Resources (MoWR) is responsible for the Project in Ethiopia. Within the Ministry, the Ethiopian Nile Watershed Management Project is the coordinator of the Project and is directly responsible for the management of the consultancy. It is assisted by a technical committee comprising representatives from MoWR, the Ministry of Agriculture and Rural Development (MoARD), the Environmental Protection Authority (EPA) and the Bureau of Agriculture and Rural Development (BoARD) in Amhara National Regional State (ANRS)

At regional level, the Bureau of Water Resources Development (BoWRD) is responsible for irrigation, water and hydrological management as well as rural water supply; the construction of potable water supplies is carried out through an enterprise. The Bureau of Agriculture and Rural Development (BoARD) is responsible for watershed management. In addition to soil and water conservation, BoARD has departments which deal with marketing, forestry, input supply and credit.

Another key stakeholder is the Environmental Protection, Land Administration and Use Authority (EPLAUA). Its mandate covers: the regulation and monitoring of environmental protection, including the review of environmental impact assessments (EIAs); the administration of individual land use rights; and land use planning.

The Bureau of Cooperatives is responsible for community cooperatives, including marketing. An important aspect of marketing is transport and communications which have a powerful effect on rural livelihoods. Rural roads are the responsibility of the Rural Roads Authority.

The Bureaux of Health and Education are also important stakeholders in the well-being of rural communities. Supporting their work is the Bureau of Women's Affairs which seeks to improve the situation of rural women, including female-headed households.

The Bureau of Finance and Economic Development (BoFED) is responsible for the preparation of 5-year development plans as well as the monitoring of all ongoing and planned development projects. One of the responsibilities of the Food Security and Disaster Prevention Coordination Office is the coordination of NGOs which operate in ANRS.

At wereda level, the Office of Agriculture and Rural Development (OARD) has overall responsibility for watershed management. Staff of EPLAUA, Water Resources Development and Food Security are stationed in the OARDs. In addition, there are Offices of Health, Education and Women's Affairs in each wereda.

At kebele level, the DAs are responsible for the planning and implementation of watershed management interventions in collaboration with the local communities and individuals at micro-watershed level.

Table 1. Stakeholder analysis

Stakeholders	Multi-lateral organizations	Bi-lateral Agencies	NGOs	FDR of Ethiopia	Others
Shareholders Treasury	World Bank, UNDP, GEF, WFP, FAO, IFAD, UNICEF, ENTRO	Ministry of Foreign Affairs, Finland	SARDP, SWECO, ORDA	Ministry of Economy and Finance, MoWR, MoARD	Investors Financial institutions
Employees Organization and Manning	Staff Consultants (Halcrow and MCE)	Staff Consultants	Staff Consultants Volunteers	MoWR and MoARD staff: central, regional, zonal, weredas, kebeles.	Administrative staff in weredas, kebeles. Village leaders
Customers Marketing	FDR of Ethiopia Nile Basin Council	FDR of Ethiopia MoWR, MoARD	ANRS, Weredas, Zones, Kebeles, Communities Villagers	Rural communities Farm households - with women or men at the head Farmers	Traders in inputs and outputs Consumers
Others	Deprived people Women in development Environmentalists	Deprived people Women in development Environmentalists	Deprived people Environmentalists	Landless people	Civil society in ANRS Consulting firms Contractors

In tertiary education, an Agricultural Faculty has been established recently within the Bahir Dar University which has links with the NBI; it is also involved in GEF-funded watershed studies around Tana Lake.

The Amhara Regional Agricultural Research Institute (ARARI) is responsible for ***agricultural research*** in ANRS. It has five regional centres of which the one in Bahir Dar covers all three Project areas. About 20 km south of Bahir Dar there is a Livestock Research Centre at Andessa which deals with small-scale milk production, perennial pasture improvement, and the preservation and improvement of local cattle and sheep breeds. The Adet Agricultural Research Centre conducts research in crops, agro-forestry and forestry.

3. Multi-lateral Organizations

Agencies of the United Nations (UN) involved in supporting and/or implementing activities in ANRS include WFP, FAO, IFAD and UNICEF. The International Livestock Research Institute (ILRI) is part of the Consultative Group for International Agricultural Research (CGIAR)

WFP supports MERET (Managing Environmental Rehabilitation in Transition to Sustainable Livelihoods). This project is implemented by BoARD in 23 weredas. At farm level, it is concerned with conservation, intensification and expansion of cultivated land and diversification of income opportunities.

WFP's Productive Safety Net Programme is a new programme which replaces existing relief systems. It will operate in 262 food-insecure weredas throughout Ethiopia. In addition to providing relief, it also seeks to protect and build the asset base of beneficiaries through their participation in public works. There are also funds for institutional support to regions and weredas. These included a proposal to train some 8,000 DAs with a target to prepare 5,000 community-based participatory watershed plans.

The African Development Bank (AfDB) also funds activities related to watershed management. The watershed management component of the Koga Irrigation and Watershed Management Project started recently in the Koga watershed in Mecha wereda. A multi-disciplinary team has been formed with office space in the OARD in Merawi. Land use plans have been prepared in consultation with Kebele Councils and DAs at kebele level.

4. Bi-lateral Agencies

USAID, CIDA, SIDA, KfW and the Government of Finland are financing projects related to watershed management and agricultural development in the Project areas.

USAID funds AMAREW (Amhara Micro-Enterprise, Agricultural Research, Extension and Watershed Management Project). It is involved in watershed management in three micro-watersheds in three different weredas, including Sekela Wereda, in accordance with an integrated watershed development approach. It has developed strong linkages with different regional agricultural research centres as well as GTZ. The project is also involved in micro-enterprise development through small groups, including seed production, gabion construction and raising ruminants.

CIDA funds SWHISA (Sustainable Water Harvesting and Institutional Strengthening in Amhara). The project supports capacity building in water harvesting and management in six weredas which are located outside the three Project areas.

SIDA supports about 20 to 25 micro-watershed management projects in 16 weredas under the Amhara Rural Development Programme covering agriculture, natural resources

management (NRM), infrastructure (i.e. roads, health, education and irrigation), micro-income generation, good governance as well as gender and HIV. Funds are made available to weredas to support their own development goals and plans in these sectors.

GTZ has opened an office in Debre Tabor to implement watershed management activities in four weredas, including Farta and Gumara Weredas; it has also introduced a fuel-saving stove. KfW provides the funds.

5. Non-Governmental Organisations

A large number of international, national and regional/local NGOs implement activities in various fields, such as health, education, water supply and sanitation, food security and nutrition, disaster management, agriculture and water development. These include: the international NGOs Oxfam, MSF, COOPI, German Agro Action (GAA), Food for the Hungry International (FHI), Catholic Relief Service (CRS), CONCERN, ActionAid and SOS Sahel. In addition to the Ethiopian Orthodox Church (EOC), regional/local NGOs include the Amhara Development Association (AMA) and Green Horizon.

In watershed management, the regional NGO, Organisation for Rehabilitation and Development in Amhara (ORDA) is the most important: it is involved in four watersheds. Other NGOs which may be involved in watershed management are EOC, GOAL, World Vision, CARE and Save the Children.

6. Financial Institutions

Banks, such as the Commercial Bank of Ethiopia, have branches in the wereda capitals, but it is not clear yet if (small) farmers have access to the credit facilities which they offer. A more-accessible financial institution for farmers and women is the Amhara Savings and Credit Institute (ASCI). It was established in 1995. It has opened branches in all weredas. As a micro-finance institute, ASCI's mission is to improve the economic situation of low-income, productive, poor people in the Amhara region through increased access to lending and saving services. As well, BoARD has received funds (from the Food Security Programme) to be used as a revolving fund to provide inputs, tools and livestock to rural households on credit.

7. Private Sector

A number of enterprises are active in Amhara State in the supply of inputs. These include: the Ethiopian Seed Enterprise (ESE) with a seed farm processing plant in Bahir Dar; the Agricultural Input Supply Corporation (AISCO); and Pioneer Hi-Bred Seeds Ethiopia PLC.

In addition to about 400 government-managed nurseries, there are a large number of community-managed and private nurseries selling different species of trees.

For further details on these stakeholders see Halcrow 2007a, b and c.

8. RURAL COMMUNITIES

8.1 Social Environment

8.1.1 Political and institutional stakeholders

Informal Institutions. A number of informal institutions exist in the five micro-watersheds, including religious, economic, social and conflict-resolving institutions. The most prominent institutions to have a stake in the Project are briefly described below.

Name	Type	Main Functions	Potential
Church and Church Committee	Religious	<input type="checkbox"/> Religious services <input type="checkbox"/> Conflict resolution	<input type="checkbox"/> Resource mobilisation <input type="checkbox"/> Promotion of community participation <input type="checkbox"/> Sanctioning of behaviour <input type="checkbox"/> Awareness creation
<i>Mahber</i>	Religious	<input type="checkbox"/> Strengthening of brotherhood and solidarity <input type="checkbox"/> Support of households in distress <input type="checkbox"/> Mutual support	<input type="checkbox"/> Communication <input type="checkbox"/> Solidarity
<i>Senbete</i>	Religious	<input type="checkbox"/> Religious function <input type="checkbox"/> Support of beggars	<input type="checkbox"/> Communication <input type="checkbox"/> Solidarity
<i>Iddir</i>	Social	<input type="checkbox"/> Provision of mourning and burial services	<input type="checkbox"/> Resource mobilisation <input type="checkbox"/> Promotion of community participation <input type="checkbox"/> Communication
<i>Wenfel / Webera</i>	Economic	<input type="checkbox"/> Mutual exchange of labour	<input type="checkbox"/> Promotion of community participation <input type="checkbox"/> Resource mobilisation
Community Elders (<i>Yehager Shimagile</i>)	Conflict resolution	<input type="checkbox"/> Counselling <input type="checkbox"/> Conflict resolution	<input type="checkbox"/> Ability to solve complex problems <input type="checkbox"/> Influencing behaviour, cultural values and attitudes <input type="checkbox"/> Establishment of rules for management of community property <input type="checkbox"/> Mobilisation of community resources

Formal Institutions

Kebele Council. The Kebele Council is the lowest administrative unit, which is established by the government with formal rules and regulations, duties and responsibilities. The Kebele Council is elected democratically by the community members and it usually has 10 executive and 7 judicial members with the following responsibilities: a) administrative management and judicial services; b) implementation of government policies and strategies; c) collection of taxes and registration of population; d) conflict resolution; and e) awareness creation. The Kebele Council takes all decisions related to political, social, economic and security issues. The Kebele Council is accountable to the wereda Council and regularly submit reports. As the Kebele Council has government backing, good understanding of the community and local physical environment as well as strong relations with wereda administration, it makes it a strong and important stakeholder in any watershed development activities. The main weaknesses are its limited institutional and administrative capacity to plan and manage

community-based development activities as well as its inadequate enforcement capacity to protect community properties.

Water Management Committee. The Water Management Committee is usually formed by the Cooperative Promotion section of the wereda Office of Agriculture and Rural Development (ARD) with the objective to operate and maintain one or more potable water supply schemes. This committee usually has 5 to 7 male and female members, who are directly elected by the users. To ensure the proper operation and maintenance (O&M) of the potable water supply scheme, the Water Management Committee has the responsibility to collect (monthly) user fees among all water users, supervise the proper O&M of the scheme, awareness creation and mobilization of community resources. However, most committees do not function properly due to lack of training and commitment among its members to manage the schemes effectively. During the planning, implementation and monitoring of watershed development activities, the Water Management Committee could play a role, but its institutional capacity needs to be strengthened through training and advice.

Women's Association. Reportedly, women's associations have been established in all the Kebeles located in the three Project areas and their purpose is to empower women, to promote participation and to ensure the right of women in decision-making and other areas that affect the life of the household. The majority of (married) women are members. The reality is that the performance of the women's associations is less than satisfactory. In the five surveyed micro-watersheds, women rarely participate in the meeting of the existing women's association and the benefits are reported to be unsatisfactory. However, the existing women's associations could be a channel for awareness creation, mobilisation of resources, promotion of women's participation in decision-making as well as the planning and execution of (women-specific) watershed development activities, such as vegetable production, off-farm income generation, energy- and timesaving technologies.

Cooperative Societies. Cooperative societies are established by the regional government with the support of the Cooperative Promotion section within the Wereda Office ARD. Membership is voluntary and any community member is eligible to become member if (s)he pays a registration fee (Birr 2 to 15) and at least one share. The major objectives of a cooperative are the provision of agricultural inputs and farm equipment, marketing of agricultural produce, operation of flour mill, sale of consumer goods and credit supply. A cooperative is a profit-oriented enterprise and any profit will be distributed among the shareholders in accordance with their number of shares.

The households in Zefie and Kantai are served by the cooperative in Gassay. There is also a cooperative in Maynet Kebele, but its performance is weak and the household in Zefie prefer to use the services of the cooperative located in Gassay. The households in Baskura obtain services from the cooperative located in Debre Tabor as the cooperative in Koley Dongores Kebele does not provide any other services than the sale of basic consumer goods. Lack of funds and poor management qualities are the two most important problems of the two poorly functioning cooperatives in Koley Dongores and Maynet. The households in Enguleobtain services from the cooperative in Gerchich, including the supply of agricultural inputs, marketing and flour mill services. In Enkulal, the households have access to the services of the cooperative in Gelawdiwos, including input supply and marketing, flour mill services, sale of consumer goods and credit.

None of the surveyed households¹ in Kantai is a member of a cooperative. In the other four micro-watersheds, however, 70% to almost 90% of the surveyed households are member of a cooperative. All surveyed households with larger landholdings (> 1 ha) are members of a cooperative against 72% of the poorer households with small landholdings. Only half of the surveyed female-headed households have become a member of a cooperative. In Enguleand Zefie, 80% and 45% of the surveyed households reported that the benefits derived from the cooperative are good. In Baskura and Enkulal, 70% and 75% of the surveyed households rated the benefits of their cooperative as being moderate. In Zefie, 45% of the surveyed households classified the benefits of the cooperative as poor.

As the cooperative play a vital role in the livelihoods of most rural households, it has the potential to support the implementation of integrated watershed development activities, in particular the supply of (improved) inputs and equipment, introduction and distribution of improved technologies, marketing of agricultural produce, provision of short- and medium-term loans, flour mill services and any other services requested by its members.

Land Administration Committee. The Land Administration Committee has been organised in each Kebele to administer, register and certify land use rights. It is a formal institution supported by government rules and regulations. It has the mandate to control land use, environmental conservation, resolution of land-related conflicts, register and certify land use rights as well as relocation and redistribution of land. The members of the Land Administration Committee are 'directly' elected by the community members. Due to its mandate and its strong linkages with the Kebele Council, Development Agents (DAs), Wereda Office ARD as well as local institutions, the Land Administration Committee is a key stakeholder in watershed development, including soil and water conservation. At present, the large majority of the surveyed households in the five micro-watersheds do not have any contact with the Land Administration Committee in their Kebele. They also rate the benefits of this committee as being low or even none.

Forest Protection Committee. The Forest Protection Committee comprises 7 members, including the Chairman of the Kebele Council as head of the committee. The DA responsible for NRM acts as secretary of the committee. Although the committee is responsible for the protection and conservation of the community and state forest located within the boundaries of the Kebele, its functioning is not supported by government rules and regulations required to enforce its mandate. Due to lack of regular meetings and effective enforcement mechanisms as well as weak linkages with government institutions at Wereda level, the performance of the Forest Protection Committees is unsatisfactory. Within the context of integrated watershed development, these committees could play a key role in environmental protection and conservation at Kebele level.

Work Groups. Work groups were formed in the 1990s to perform communal activities at Kebele level, including soil and water conservation (SWC), reforestation and construction of community infrastructure, such as schools and health posts. At present, the work groups have been transformed in Mengistawi Budin (sub-kebele team) and the village leader is the administrator of one sub-kebele team. Each team is sub-divided into two or more groups of 500 to 100 persons. Each group member is obliged to contribute labour and materials for community infrastructure as required. Sanctions and penalties will be imposed if a group member defaults. Although participation is compulsory, the Mengistawi Budin system could be used for the construction of community infrastructure (i.e. potable water supply scheme, access road) as it has the capacity to mobilise labour and materials. The surveyed

¹ The number of surveyed households in the five micro-watersheds is as follows: Engule– 10 (13% of total HHs); Baskura – 10 (9% of total HHs); Kantai – 10 (9% of total HHs); Zefie – 9 (7% of total HHs); and Enkulal – 8 (32% of total HHs)

households rate the benefits of this system to be low as the quality of the community infrastructure often is poor. The involuntary character of participation may also be a reason for households to consider the benefits of these work groups to be low.

Development Agents. In principle, each Kebele should have three Development Agents (DAs) in the fields of agriculture, livestock and NRM. The main activities of the DAs are the provision of extension services on crop and livestock production as well as development and management of natural resources. The qualifications of the employed DAs are good, but they lack equipment and budget required for the effective implementation of their extension and NRM activities. The DAs have developed strong linkages with the Kebele Council and other local institutions as well as the Wereda Office ARD. The DAs would be the focal point for the planning, preparation, supervision and monitoring of integrated watershed development activities.

Non-Governmental Organisation. Green Horizon is a local NGO, which is supporting forestry activities in Baskura. In the other four micro-watersheds, no NGOs are currently working.

Development Programmes and Projects. The GTZ-supported SUN Amhara Project is undertaking SWC activities in Farta Wereda, including gully treatment in Baskura. ILRI is conducting research on animal forage in Zefie. Under the Tana-Beles Integrated Water Resources Development Project, the construction of dams within the Ribb, Gumera and Jema watersheds are planned.

8.1.2 Demography

Population Size. The estimated size of the resident households and non-resident population with land use rights in the five surveyed micro-watersheds ranges from 153 (25 households) in Enkual micro-watershed to 871 (130 households) in Zefie micro-watershed. The proportion of non-resident households with land use rights in the five surveyed micro-watershed varies from only 5% in Zefie to 72% in Baskura and Enkual. The population in all five surveyed micro-watersheds has increased significantly since the 1950s and 1960s due to high fertility rates and migration towards the surveyed micro-watersheds.

Average Household Size. The average size of the households in the five surveyed micro-watersheds is 6.1 members, varying from 5.6 in Enguleto to 6.7 in Zefie. The minimum household size is two and the maximum size is eleven. About one-third of the surveyed households in the five micro-watersheds has 8 or more members. The proportion of small households with less than 5 members ranges from 20% and 25% in Kantai and Enkual to more than one-third in Baskura and Zefie. The average size of female-headed households is 4.3 persons, while male-headed households have an average size of 6.5 members

Sex Ratio. In four of the five surveyed micro-watersheds, about 52% to 58% of the total population is male. Only in Zefie, 58% of the population is female.

Age: The population in the five surveyed micro-watersheds is relatively young with a median age of approximately 15 years. About 17% of the population is below the age of 5 years, which is a strong indicator for a high fertility rate. Only one-third of the population is older than 18 years, while the economically active population (12 to 64 years) comprises almost two-third of the total population.

Migration. Seasonal/temporary migration has increased in the five surveyed micro-watersheds since the 1980s, mainly due to shortage of land, unemployment, food insecurity and lack of alternative non-farm income generating activities. The estimated proportion of households with one or more seasonal male and female migrants ranges from 10% in Kantai to 40% in Baskura. The proportion of landless and poor households as well as large households engaged in seasonal migration is reportedly four times higher than for other

household categories. Seasonal migration was only reported by 25% and 33% of the surveyed female-headed households in Enguleand Baskura. The annual income from seasonal migration varies from Birr 200 to 3,600. The proportion of households with one or more permanent migrants is estimated at 8% to 20% of all households in four of the five surveyed micro-watersheds. None of the five surveyed micro-watersheds had any immigrants for the last 25 years.

Marital Status. About 70% to 90% of the surveyed households in the five micro-watersheds are married, whereas 10% to 20% is either widowed or divorced. The widowed and divorced households are dominated by female-headed households as they have less chance to remarry than widowed or divorced male-headed households.

Religion and Ethnicity. Almost all households in the five surveyed micro-watersheds are Orthodox Christians. Only a few households in the Enkulal micro-watershed belong to the Muslim community. All households in the five micro-watersheds belong to the Amhara ethnic group and Amharic is their mother tongue.

8.1.3 Gender Issues

Domestic Labour Division. All the activities in and around the homestead is usually the main responsibility of the female household members, including cooking, cleaning of house, washing and repairing of clothes, fetching water and fuel wood, child care, taking care of elder and sick household members and shopping. It is not uncommon that male household members assist with the repair of clothes, fetching fuel wood, taking care of children as well as elder and sick household members, and shopping. The repair of the house and other items is a shared responsibility between both gender groups.

Legal Ownership of Assets: The land use right for arable land is usually owned by both the husband and wife, ranging from 60% in Enguleto 100% in Enkulal. In Baskura and Zefie, about one-third of the land use rights are owned by the husband only, whereas one-third of the land use rights in Enguleis registered in the name of the wife. In Enguli, Kantai and Zefie, the husband is usually the owner of all agricultural equipment and means of transport. In the other two micro-watersheds, these assets are owned by both the husband and wife. The house as well as large and small livestock is often owned by both the husband and wife in Baskura, Zefie and Enkulal, whereas these assets are either owned by the husband, wife or both in the other two micro-watersheds. Jewellery is commonly owned by the wife in Enguli, Kantai and Zefie. Household utensils are normally owned by almost two-third of the women in Zefie and Enkulal and by the wife only in Baskura. The ownership of a radio is rather mixed with two-third of the husband to be the legal owner in Enguleand Kantai, whereas both the husband and wife are considered to be the legal owners in Baskura.

Decision Making Power. In Enguli, Baskura and Kantai, it is usually the husband, who takes the decisions with regard to crop production, whereas these decisions are made by both the husband and wife in Zefie and Enkulal. The decision to purchase assets is normally made by both the husband and wife, whereas the decision to purchase of food items and utensils is either made by the wife or both the husband and wife. The decision to sell assets and cereals is usually made by both the husband and wife. With regard to the sale of cash crops, large and small livestock as well as borrowing money, the decision is either made by the husband or both the husband and wife. Decisions related to health care as well as the education and marriage of children are usually made by both the husband and wife, except in Kantai where the decision concerning the marriage of children is made by two-third of the husbands.

Workloads. The degree of workload for both male and female household members is closely related to the seasonal calendar of agricultural activities. The workload is the highest for

male and female household members from May until February, starting with ploughing and sowing in May and June followed by weeding in August and September, harvesting in November and December and threshing in February. Most agricultural activities are carried out by hand due to the lack of access to (modern) farming and transport equipment. In addition, male and female household members are also daily involved in activities related to livestock. Furthermore, the wife and other female household members also have the responsibility for almost all domestic tasks, including cooking, fetching water and fuel wood, taking care of children, elder and sick persons.

The number of working days is significantly reduced as it is prohibited for Orthodox Christians to work on Sundays as well as the four to six Saint Days that are celebrated each month and other holydays, such as New Year, Eastern and Epiphany.

Access to Land. About 12.5% of the (surveyed) female-headed households are landless and the remaining 87.5% have less than 0.5 ha. About two-third of the female-headed households with land use rights have 3 or 4 different plots. Among the (surveyed) male-headed households, about 55% have less than 0.5 ha, whereas 28% have 0.5 to 1.0. ha and the remaining 17% have more than 1.0 ha. About 50% of the (surveyed) female-headed households with land are unable to cultivate their fields themselves due to lack of oxen, labour and inputs. None of the female-headed households cultivate (additional) land as tenant or sharecropper. Female-headed households face more serious labour shortages during critical stages of the cropping season. The existing mutual labour exchange systems in the micro-watersheds usually are not available for female-headed households due to social-cultural norms. Most female-headed households are not able to hire labour due to lack of money.

Access to Rural Credit. Although rural credit programmes are targeted on rural women, only 25% of the (surveyed) female-headed households in the five micro-watersheds have obtained loans against 43% of the male-headed households. Relatives and saving & credit associations are the main sources of credit for female-headed households. Male-headed households usually obtain loans from micro-finance institutions and banks as well as other sources.

Access to Extension Services. Although health extension services exist in the five micro-watersheds, few women have access to these services. As a result, these services have limited impact on the living conditions and livelihoods of the rural households in the five micro-watersheds.

While 78% of the surveyed male-headed households responded that they have access to extension services from the DAs, the proportion of the female-headed households is only 50%. Similarly, only one-third of the female-headed households have access to veterinary services against two-third of the male-headed households.

About two-third of the surveyed female-headed households have been involved in SWC and have planted trees. Among the surveyed male-headed households, 90% had carried out SWC activities and 82% have planted trees.

Agricultural Production and Food Security. Reportedly, there are no significant differences in the yields for most crops between male- and female-headed households. However, 38% of the surveyed female-headed households have food shortages in years with normal rainfall against 28% of the male-headed households, mainly due to the small land use rights owned by female-headed households and the fact that more female-headed households have their landholdings cultivated by tenants/sharecroppers than male-headed households.

Access to Agricultural Tool and Traction Power. Only 50% of the surveyed female-headed households reported to have access to sufficient traction power (i.e. oxen) compared to 70%

of the surveyed male-headed households. In case of insufficient traction power, 60% of the surveyed female-headed households share oxen with other households against 93% of the surveyed male-headed households. The remaining 40% of the female-headed households have their land cultivated by tenants or sharecroppers, whereas only 7% of the male-headed households have adopted this strategy to cope with shortage of traction power.

Ownership of Livestock. About 13% of the surveyed female-headed households do not own livestock against only 3% of the surveyed male-headed households. About 87% of the female-headed households have less than five animals compared to only 42% of the surveyed male-headed households, mainly due to limited access to animal feed as a result of small landholdings. Female-headed households mainly rear small ruminants and poultry, while none of the surveyed female-headed households are involved in bee-keeping.

Non-Farm Income Generation. About a quarter of the surveyed female-headed households is involved in handicraft against only 8% of the surveyed male-headed households. Female-headed households are more than three times involved in daily labour than male-headed households. Permanent migration is also higher among women than among men.

Education and Health. The overall literacy rate among the male adult members of the surveyed households is 49% against 34.5% for the female adult household members. Among the surveyed households in the five micro-watersheds, 21% of the female household members completed the first cycle primary school against 23% for the male household members. About 12% of the male household members completed the second cycle primary education against only 8% of the female household members. However, the proportion of female household members attending secondary high school education is slightly higher than for the male household members, in particular in Baskura and Enkulal.

The proportion of women with health problems is slightly higher than for men, but malaria reportedly affects female-headed households three times more than male-headed households. Less than 20% of the surveyed households in the five micro-watersheds have access to maternal and child health care. Almost all women give birth at home assisted by female relatives and/or traditional birth attendants. Use of contraceptives is low (20%) and access to family planning services is limited. The existing health posts in the Kebeles are ill-equipped and unable to provide sufficient preventive and curative health services.

Access to Energy. The collection of fuel wood and crop residue is mainly the responsibility of women and girls. The collection of dung and the preparation of cakes for use in the dry season is also the task of the female household members. The most common health problems related to the use of these fuels within the poorly ventilated houses are eye diseases and respiratory infections.

Participation in Local Institutions. Overall, the participation of women in formal and informal institutions at local level is low or even none. The only exception is the participation of women in the Water Management Committees, which are responsible for the O&M of potable water supply schemes.

8.1.4 Settlement pattern and history

Before 1991, clustered settlements were common in the three watersheds. Following the demise of the Derg regime, the existing settlement pattern in the five surveyed micro-watersheds is dominated by individual homesteads and (very) small settlements with only a few households with close blood ties, which are scattered throughout each micro-watershed. The number of settlements in the five surveyed micro-watersheds ranges from 3 in Enkulal to 15 in Zefie. Reportedly, four of the five surveyed micro-watersheds are inhabited for more than 100 years, whereas the first households settled in Enkulal some 70 years ago.

8.1.5 Landholding, tenure and values

Land Use Rights and Administration. All surveyed households in Baskura and Enkual have land use rights in the micro-watershed against 90% and 80% in Enguleand Kantai respectively. One-third of the surveyed households in Zefie do not have the right to cultivate land in the micro-watershed. In Kantai, all surveyed households cultivate their lands for the last 10 to 20 years, whereas 90% and 75% of the surveyed households in Enguleand Enkual have their land use rights for more than 20 years. In Baskura and Zefie, 40% and 30% of the surveyed households only cultivate their fields for less than 10 years.

In Baskura, Kantai and Enkual, 75% to 80% of the surveyed households have their land either in the upper, middle or lower part of the micro-watershed. In Enguleand Zefie, almost 90% and 60% of the surveyed households have plots of land in the upper, middle and/or lower parts of the micro-watershed.

In Enguleand Enkual, the land use rights of all surveyed households have been registered with the Land Administration Department. In Kantai, Baskura and Zefie, the land use rights of 12.5% to 29% of the surveyed households are not registered yet. In Enguli, Kantai and Enkual, two-third to three-quarter of the surveyed households have their land use rights registered in the name of both the husband and wife. In Baskura and Zefie, 50% of the surveyed households have their land use rights registered in the name of the husband only. In Kantai, Enkual and Zefie, the land use rights of 25% to 33% of the surveyed households are registered in the name of a relative.

Land Tenure. Almost all the land within the micro-watersheds has individual land use rights. The size of the communal grazing land in the five surveyed micro-watersheds is very small (less than 5 ha).

Landholding Pattern. The distribution of different landholding sizes among the surveyed households as well as the mean landholding size in the five micro-watersheds are presented in the following table.

Landholding Size	Distribution among Surveyed Households				
	Enguli	Baskura	Kantai	Zefie	Enkual
0.1 – 0.5 ha	20%	50%	60%	56%	13%
0.5 – 1.0 ha	40%	40%	20%	33%	25%
1.0 – 1.5 ha	20%	-	20%	11%	12%
1.5 – 2.0 ha	-	10%	-	-	37%
> 2.0 ha	20%	-	-	-	13%
Mean Landholding					
Mean Landholding per HH	1.75	0.75	0.72	0.77	1.72
Mean Landholding per capita	0.28	0.13	0.11	0.13	0.34
Mean Landholding per Male-Headed HH	2.25	0.75	0.79	0.73	1.71
Mean Landholding per Female-Headed HH	0.75	0.75	0.50	1.0	1.75
Mean Landholding per Resident HH	1.84	0.75	0.70	0.81	2.06
Mean Landholding per Non-Resident HH	1.00	-	0.75	0.50	1.39

The mean landholding per surveyed household in the five micro-watersheds ranges from 0.72 ha in Kantai to 1.75 ha in Enguli. The landholding pattern in Baskura, Kantai and Zefie is dominated by very small landholdings with 50% to 60% of the surveyed households having less than 0.5 ha of arable land; only 10% to 20% of the surveyed households have between 1.0 and 2.0 ha. The distribution of land use rights is more skewed in Enguleand Enkulal with 20% and 40% have more than 1.5 ha against 60% and 38% have less than 1.0 ha.

Only in Engulethe mean landholding of the surveyed male-headed households is three times larger than for the surveyed female-headed households. In other four micro-watersheds the mean landholding for the surveyed male- and female-headed households are not significantly different.

Land Use Right Fragmentation. The fragmentation of land use rights among the surveyed households in the five micro-watersheds is shown below.

Number of plots	Land Use Right Fragmentation among Surveyed HHs				
	Engule	Baskura	Kantai	Zefie	Enkulal
1	-	10%	50%	14%	-
2	11%	40%	13%	43%	13%
3	22%	20%	12%	14%	37%
4	33%	-	13%	29%	25%
5	33%	30%	12%	-	25%

The land use rights among the surveyed households in the five micro-watersheds are fragmented as 50% to 90% of the surveyed household cultivate 3 to 5 different plots, which is often located in the upper, middle and/or lower parts of the micro-watershed. The fragmentation of land use rights is most serious in Engule with two-third of the surveyed households having 4 or 5 different plots followed by Enkulal where 50% of the surveyed households cultivate 4 or 5 different plots.

Tenancy and Sharecropping. In Enguli, Baskura and Zefie, 40% to 50% of the surveyed households lease or sharecrop land belonging to other households against 12.5% and 20% in Enkulal and Kantai respectively. In four of the five micro-watersheds, 75% to 100% of the leased or sharecropped is smaller than 0.5 ha. Only in Baskura, three-quarter of the leased/sharecropped land is 1.0 to 3.0 ha. The main reasons for the surveyed households to lease or sharecrop land are the lack of arable land or insufficient land to sustain the household. However, surveyed households with more than 1 ha of arable land are more engaged in leasing/sharecropping land than landless households or households with small land use rights. Female-headed households do not cultivate (additional) land as tenant or sharecropper. Surveyed households with their own oxen are more engaged in sharecropping or leasing of additional land.

Except in Zefie, 20% to 45% of the surveyed households in the other four micro-watersheds have (part of) their land cultivated by tenants or sharecroppers, including 50% of the surveyed female-headed households. About 67% to 100% of the land leased or sharecropped is smaller than 0.5 ha. Surveyed households having their land cultivated by tenants or sharecroppers are often too old, ill or too poor to cultivate the land themselves or they do not have oxen or sufficient male labour.

About a quarter of the households engaged in tenancy and sharecropping lease the land, whereby the lease price varies from Birr 100 to 800 per ha depending on the location and fertility of the plot of land. The most common sharecropping arrangement is that the holder of the land use right receives 50% or 67% of the harvested crop, whereby the sharecropper has to provide the oxen, seeds, fertilisers and all necessary labour. However, it is also reported

that the holders of the land use rights in Engule and Baskura only receive 20% or 33% of the harvested crop.

Soil and Water Conservation. About 85% of the surveyed households in the five micro-watersheds reported to have applied different SWC measures, mainly soil and stone bunds in and around their fields as well as (field) drains to avoid excessive erosion of the soils. Most of the soil and stone bunds were constructed in the mid 1990s. Most of the soil conservation structures built on communal grazing lands have been destroyed.

In each Kebele, a formal institution, known as the Mengistawi Budin (sub-kebele group), exists, which is responsible for the execution of community works, including SWC structures, schools and health posts, water source development and tree plantations. Each group has 50 to 100 members and each household is obliged to participate in any activity demanded by the Kebele Council. Following the land redistribution and the allocation of individual land use rights, less communal soil conservation activities are executed. Individual households are responsible to undertake SWC activities on their allocated lands themselves, but they often lack the resources to carry out the required activities.

8.1.6 Common Resource Rights

All households resident within the boundaries of the Kebele have the right to use the communal grazing land in order to feed their animals. They also have the right to use water in streams/rivers as well as springs in order to water their livestock. Similarly, all resident households are entitled to fetch fuel wood in any community forest located within the boundary of the Kebele.

8.1.7 Rural Credit

In the last 10 years, the proportion of surveyed households in the five micro-watersheds having obtained loans ranges from 10% in Engule to 70% in Baskura. ACSI is the sole source of credit for the surveyed households in Engule, Kantai and Enkulal. In the other two micro-watersheds, the surveyed households obtained loans from relatives, bank, saving & credit association, micro-finance institution or another source.

In Engule, Kantai and Enkulal, the surveyed households with loans only obtained a short-term credit (less than 1 year) for the procurement of agricultural inputs (i.e. seeds and fertiliser) and equipment (mainly chemical sprayers) and/or oxen. In the other two micro-watersheds, surveyed households also obtained medium- and long-term loans for the same purposes. The reported annual interest rates range from 2% in Engule to 100% in Baskura. Credits provided through government programme usually have an interest rate of 12.5 and 15% per year, whereas ACSI applies an annual interest rate of 18%. Land use rights, animals and jewellery are normally used as collateral for informal loans that are obtained from relatives and other individuals. Group collateral is used as collateral by ACSI and saving & credit associations. Kebele Councils and cooperatives are responsible for the repayment of loans that they have distributed among the farmers. Between 40% and 50% of the surveyed households having obtained loans in Baskura, Kantai and Zefie reported that they have defaulted due to crop failure or the use of the credit for other purposes.

8.1.8 Domestic Energy and Fuel

About 80% to 100% of the surveyed households in the five micro-watersheds use oil lamps for lighting their homes, whereas 10% and 13% of the surveyed households in Baskura and Enkulal have electricity as they live outside the micro-watersheds. About 10% and 22% of the surveyed households in Kantai and Zefie use crop residue and wood.

Wood and dung are the two most important energy sources for cooking, whereas crop residue is used to a lesser extent. Planted trees (Eucalyptus) around the house is the most

important source of fuel wood followed by fetching. Only a limited number of surveyed households in Kantai and Engulepurchase fuel wood. In case that surveyed households fetch fuel wood, the frequency is usually once or twice per week. In Kantai en Enguli, the community forests are important sources of fuel wood. In Enkual, all fuel wood is either obtained from own trees or purchased. In Enguleand Zefie, 90% and 80% of the surveyed households fetching fuel wood do not have to walk further than 500 metres. In Baskura and Kantai, 60% and 50% of the surveyed households fetching fuel wood have to walk more than 500 metres.

In Enguleand Zefie, none of the surveyed households uses fuel-saving stoves. In Baskura, Kantai and Enkual, 30%, 10% and 13% of the surveyed households reported the use of fuel-saving stoves. Inadequate supply and non-availability of extension services are mentioned as the main reasons for the low adoption rate of fuel-saving stoves.

A declining forest area in combination with increased use of crop residue as animal fodder in combination with a rapidly growing population may result in shortages of fuel wood in the future, especially for households with no or (very) small landholdings.

8.1.9 Domestic Water Supply

None of the households that are resident in the Engulemicro-watershed has access to safe drinking water as the Jema River and an unprotected spring are the only sources. Most of the surveyed households live more than 300 metres from the nearest water source and 70% of the surveyed households spend more than 1 hour each day to fetch water. In Enkual, 50% of the surveyed households fetch water from an unprotected spring, while the other 50% uses a protected spring or a well with hand pump. None of the surveyed households has to spend more than 1 hour per day to fetch sufficient to meet their domestic needs.

In Zefie, almost 90% of the surveyed households fetch drinking water from a local stream, unprotected spring or open well, while the remaining 10% have access to safe water from a protected spring. Two-third of the surveyed households live within 200 metres from the nearest water source, while a quarter has to walk more than 300 metres. About 60% of the surveyed households in Baskura fetch drinking water from a protected well, whereas the other 40% use a local stream and an unprotected spring to satisfy their needs for drinking water. As 80% of the surveyed households do not have to walk further than 200 metres, they do not spend more than 30 minutes daily to fetch water.

In Kantai, 80% of the surveyed households have access to safe drinking water from a well with hand pump, while the other 20% fetches water from a stream. As none of the surveyed households lives further than 300 metres from the nearest water source, almost 90% of them spend less than 30 minutes each day with fetching of water.

Usually, households living closer to a water source fetch water more frequently than households further away. About 80% of the surveyed households fetch water two to three times per day, whereas the remaining households go more than three times per day.

In years with normal rainfall, 45% of the surveyed households in Zefie reported to have shortage of drinking water for one to six months per year as the discharge of the natural springs gradually decreases due to increased use and environmental degradation. In Kantai, about 10% of the surveyed households reported drinking water shortages. In years with less than normal rainfall, about 30% of the surveyed households experience drinking water shortages, in particular in Kantai where two-third of the surveyed households reported water shortages. About 80% of the surveyed households face water shortages for 2 months, while the remaining 20% experience 3 months of water shortages. In dry years, most springs dry up and the volume of water in the streams is reduced. As a result, there is an increasing

pressure on the other water sources with more reliable discharges. In Enguli, households do not experience water shortages as the Jema River never dries up.

All surveyed households in Engule reported that the quality of the fetched drinking water is not good. In the other four micro-watersheds, 20% to 40% of the surveyed households consider the quality of the fetched drinking water as not being safe.

Although Water Management Committees have been formed for potable water supply schemes, the management of these systems is poor due to lack of proper training and the lack of effective monitoring and supervision. As user fees for routine maintenance are not (regularly) collected, many potable water supply schemes are not properly maintained. The lack of fences is a major reason that many schemes are frequently damaged by animals. The lack of ancillary structures, such as washing places and animal drinking troughs, also contribute to the poor functioning and frequent dilapidation of potable water supply schemes.

8.1.10 Sanitation

In Zefie and Enkulal, 100% and 88% of the surveyed households reported the use of latrines, whereas 60% and 70% of the surveyed households in Engule and Baskura reportedly have toilets. In Kantai, only 40% of the surveyed households stated that they use a latrine. The main reason for not having a latrine is the lack of adequate space. In Baskura, the availability of open space is mentioned as a reason for not installing a latrine. In Enguli, lack of awareness and flood-damage are given as a reason for not using a toilet. Organic household waste is usually used for compost making, whereas non-organic waste is dumped in open fields.

8.1.11 Human Health

Health Problems. Except in Kantai, malaria is the most important health problem in the other four micro-watersheds. Cold/flu and dysentery are the second most important health problems followed by typhoid and stomach ailments. Poor hygiene, environmental conditions and unsafe drinking water are considered as the main causes of the reported health problems in the five micro-watersheds. Other health problems include tuberculosis, pregnancy and delivery complications, skin and eye diseases, respiratory infections and sexually transmitted diseases. The incidence of health problems is higher during the rainy season when the work load is high and food shortage is faced.

On average, 36% of the surveyed households in four of the five micro-watersheds reported to have health problems during the last 6 months, ranging from only 13% in Enkulal to 80% in Enguli. Malaria affected almost 30% of the surveyed households in the last 6 months. Malaria prevention and control services are ill-equipped and understaffed. In addition, 88% of the surveyed households reported stomach ailments due to unsafe drinking water fetched from rivers/streams, unprotected springs and open wells.

About 75% of the surveyed households in four of the five micro-watersheds visit the local health post in case of serious illness, whereas the remaining 25% of the surveyed households consult traditional healers or stay at home. In Enkulal, however, none of the surveyed households reported to visit the local health post. Child delivery always takes place at home and the pregnant women are assisted by either traditional birth attendants or female relatives. The level of ante and post natal care is low as the local health posts do not have the equipment or staff with the necessary skills and experience.

According to the focus group discussions, less than 25% to 50% of the population in the reproductive age use modern contraceptives, such as the pill and condom. The relatively low use of contraceptives is due to cultural norms and values, social pressure of relatives and

friends as well as lack of access to health services as the average walking distance to the nearest health centre is 2 hours.

Almost 85% of the surveyed households in four of the five micro-watersheds reported that their children were vaccinated. In Enkulal, however, 25% of the surveyed households stated that their children were not vaccinated. Child malnutrition seems to be moderate, but it could become critical at time of food shortages.

Health Infrastructure. All the five Kebeles, in which the five surveyed micro-watersheds are located, have a health post. As the health posts have been constructed through community participation, their physical state is poor. The main tasks of these local health facilities include the provision of family planning, child and maternal health care, disease prevention, environmental hygiene and sanitation activities. The health posts are staffed with health extension workers. Except the procurement of drugs and the payment of salaries, all other operating costs must be paid by the community. The result is that the health posts lack operating funds and the level of service is not satisfactory. The health centres at Wereda level are often not better than the local health posts.

8.1.12 Human Nutrition

About 85% of the surveyed households reported that they never eat meat, ranging from 100% in Baskura, Kantai and Enkulal to 50% in Enguli. Milk and other dairy products are never consumed by 37% of the surveyed households, varying from 11% in Kantai to 67% in Zefie. About three-quarter of the surveyed households never eat eggs, whereas pulses are never consumed by about 70% of the surveyed households in Baskura, Kantai and Enkulal. Vegetables are not part of the weekly menu for three-quarter of the surveyed households, ranging from 100% in Kantai and Enkulal to 40% in Baskura. Only 10% of the surveyed households in Baskura and Kantai reportedly consume fruit one to three times per week.

8.1.13 Education and Literacy

On average, 42% of the adult members of the surveyed households in the five micro-watersheds are literate, ranging from 32% in Enguleto 67% in Enkulal. The overall literacy rate among the male adult members of the surveyed households is 49% against 34.5% for the female adult household members. The literacy rates for the surveyed households in the five micro-watersheds are presented below.

	Literacy Rates for Adult Members of Surveyed HHs				
	Engule	Baskura	Kantai	Zefie	Enkulal
Total	32%	41%	42%	36%	67%
Male HH members	37%	36%	59%	42%	74%
Female HH members	26%	31%	30%	31%	59%

Among the surveyed households in the five micro-watersheds, 21% of the female household members completed the first cycle primary school against 23% for the male household members. About 12% of the male household members completed the second cycle primary education against only 8% of the female household members. However, the proportion of female household members attending secondary high school education is slightly higher than for the male household members, in particular in Baskura and Enkulal.

About 11% of the surveyed households in the five micro-watersheds do not send their children in the age group of 6 to 13 years to primary school due to lack of money and shortage of labour. However, one-third of the girls aged 6 to 13 years do not attend primary education as they have to work at home or they are ready to marry. Another problem is that school-going children stay at home due to labour shortage, seasonal migration, illness or lack of interest. The number of days that school-going children among the surveyed households in the five micro-watersheds do not attend school ranges from 15 to 120 days, in particular during the cropping season.

None of the five surveyed micro-watersheds has a primary school, but there is a primary school in the same Kebele where the children go to. In four of the five micro-watersheds, the walking distance to the nearest primary school is less than 1 hour. In Enguli, however, most children have to walk for 2 hours to the nearest primary school.

The quality of the primary school buildings is poor as they are usually built through community participation using local construction materials. Most schools are unsafe and unhygienic and they have insufficient furniture and operating budget. They usually depend on their incomes generated through the sale of crops and grasses grown within the school compound. There is also a critical shortage of qualified teachers and books. The schools are managed by a parent-teacher school management committee and it is formally responsible for overlooking the management of the school, organising community contributions for maintenance, supporting children from poor households, promoting enrolment, ensuring security as well as monitoring and supervising the performance of teachers and students. In most schools, however, the role of this committee is limited to mobilise contributions for the salaries of the guards.

Most households in the five micro-watersheds do not send their children to secondary school as the distance to the nearest secondary school is too far (more than 3 to 5 hours) and the costs to sustain students in the nearest town are too high. Therefore, education for the large majority of children ends in Grade 8.

8.1.14 Archaeological and Cultural Sites

Although all five micro-watersheds are inhabited for more than 70 years, they do not have any sites of historical significance. The Gelowdiwos Kebele has a 500-year old orthodox church and mosques constructed in the 16th century. A church from the 15th century is located in the Engulemicro-watershed. These historical sites are more or less well protected by the community and the government.

8.1.15 Landscape Aesthetics

The Enkulal micro-watershed has the remnant of the Nifara natural forest with a significant bio-diversity. The other four surveyed micro-watersheds do not have any important natural sites.

8.2 Socio-Economic Environment

8.2.1 Livelihoods

Crops

Cropping pattern. The cropping pattern of the five surveyed micro-watersheds is dominated by the cultivation of cereals on more than 90% of the cultivated land. In order to satisfy the need for more food and cash income for a rapidly growing population, the cultivated area has increased considerably in the last two to three decades by converting forests and grazing

lands into crop land. The existing cropping patterns for the five surveyed micro-watersheds as proportion of the total estimated cultivated area are presented in the table below.

Crop	Proportion of Total Estimated Cultivated Area				
	Engule	Baskura	Kantai	Zefie	Enkual
Teff	6%	19%	11%	-	39%
Barley	5%	19%	30%	1%	8%
Wheat	2%	19%	26%	10%	20%
Millet	20%	6%	-	-	2%
Sorghum	-	15%	-	-	-
Maize	56%	5%	-	-	12%
Beans	6%	13%	2%	1%	-
Oil seeds	4%	1%	-	-	14%
Potato	-	3%	32%	1%	6%
Vegetables	-	-	-	-	-
Pepper	-	-	-	-	-

Climatic and altitudinal conditions, influence of extension services, market conditions, soil fertility, access to improved seeds and fertiliser as well as plant diseases and pests are factors that influence the prevailing cropping patterns in the five surveyed micro-watersheds. The proportion of households in the five surveyed households cultivating various crops is shown in the following table

Crop	Proportion of Households Cultivating Crop				
	Engule	Baskura	Kantai	Zefie	Enkual
Teff	30%	80%	50%	-	100%
Barley	60%	90%	70%	89%	63%
Wheat	10%	70%	60%	100%	75%
Millet	50%	30%	-	-	13%
Sorghum	-	60%	-	-	-
Maize	100%	80%	-	-	100%
Beans	40%	70%	10%	78%	-
Oil seeds	20%	10%	-	-	63%
Potato	10%	60%	70%	89%	50%
Vegetables	-	-	-	11%	-
Pepper	-	-	-	11%	-

As the area used for the cultivation of pulses is small compared with cereals, the significance of pulses as an input to crop rotation in order to restore soil fertility is minimal. The production of vegetables is very limited and only a limited number of households use small-scale irrigation. Fruit crops are not produced in the five surveyed micro-watersheds. However, there may be significant potential for growing highland fruits, such as apple, as well as warm climate fruits, such as mangos and papaya, around homesteads and around the fields as a soil conservation measure.

Crop yields. The reported yields for the various crops cultivated in the five surveyed micro-watersheds are given below.

Crop	Reported and Potential Yields (t/ha)					
	Engule	Baskura	Kantai	Zefie	Enkual	Potential Yield ^a
Teff	2.67	0.95	1.60	-	0.56	1.8
Barley	3.85	2.04	1.75	1.25	1.00	2.8
Wheat	1.20	1.02	2.29	0.43	0.81	3.0
Millet	0.64	0.51	-	-	0.80	n.a.
Sorghum	-	0.82	-	-	-	n.a.
Maize	1.38	1.73	-	-	1.43	6.0
Pulses	1.04	1.11	0.77	0.90	-	n.a.
Oil seeds	0.40	0.08	-	-	0.29	n.a.
Potato	8.33	19.80	9.39	4.36	3.70	9.0
Vegetables	-	-	-	3.33	-	n.a.
Pepper	-	-	-	1.67	-	n.a.

^a Source: Interim Report (Final), p.37

The reported crop yields in the five surveyed micro-watersheds vary considerably. The reported yields for teff and barley in Engule micro-watershed seem to very high compared with the potential yield. Similarly, the reported yield for potato in Baskura is significantly higher than the potential yield (this could be an error in reporting). Overall, the reported yields for the major crops are (much) lower than their potential yields.

Agronomic Practices: The main issues with regard to the existing agronomic practices in the five surveyed micro-watersheds are as follows:

- None of the surveyed households reported to have improved ploughs;
- Sowing is usually done by hand/broadcasting after four to five times of ploughing;
- Row planting of maize, sorghum and potato is not commonly practiced;
- Over-sowing of sorghum and maize is used to control weed growth as well as have animal feeds through thinning;
- Most crops require three to four weeding, which is carried out manually and consumes more than one-third of the labour required for crop production;
- Herbicides are not used due to high prices and shortage of supply;
- Traditional support systems, such as *wenfel*, are commonly used to cope with labour shortage during the cropping season, in particular the harvesting season;
- Harvesting is normally carried out with a sickle;
- Harvested crops are immediately stored near the homestead to free the land for animal grazing;
- Cattle and pack animals are used for threshing of cereals on circular grounds prepared near the homesteads;
- Cereals are usually stored in *gotera/gota* made of sticks and/or mud in the residential houses and storage losses are significant due to insects, rodents and fungal diseases; and

Most households do not have access to modern equipment, such as chemical sprayers, in particular female-headed and poor households.

Irrigated agriculture is limited to a very small proportion of the total estimated cultivated area and almost all crop production in the five micro-watersheds is rainfed. Except in years with an extreme drought, crop failure due to climatic vagaries is not common. Intercropping of maize and millet with potato is becoming an adaptive strategy to cope with increasing land shortage and food insecurity, in particular in Baskura and Zefie. Increasing scarcity of arable

land and low crop yields make it impossible for the majority of farmers to leave part of their land fallow for at least one year.

Use of improved seeds. In four of the five surveyed micro-watersheds, 80% to 100% of the households reported the use of improved seeds, mainly for the cultivation of teff, wheat, maize and potato. In Enkual, 37.5% of the households do not use improved seeds. The large majority of surveyed households (70% to 100%) in the five micro-watersheds only started to use improved seeds during the last 10 years. The local cooperative is the major supplier of improved seeds. Higher prices and supply shortages are the two main problems with regard to the use of improved seeds. The supply of improved vegetable seeds and planting materials is very limited.

Use of fertiliser. In Engule and Enkual micro-watersheds, all surveyed households reported the use of chemical fertilisers against 60% to 80% of the surveyed households in the other three micro-watersheds. Chemical fertilisers are mainly used for maize, teff, wheat, barley and potato. About two-third of the households uses fertiliser for the cultivation of only one single crop, while the remaining on-third apply fertiliser to two or more crops. High costs and/or use of compost are the main reasons for households not to use chemical fertilisers. About two-third of the households with smaller landholdings (less than 0.5 ha) use chemical fertilisers, whereas all households with more than 1 ha of arable land use chemical fertilisers. About 70% to 100% of all surveyed households in the five micro-watersheds use DAP and Urea, whereas the other households only use DAP. About two-third of the households uses fertiliser for less than 10 years. The cooperative societies are the main source for obtaining fertiliser for almost all surveyed households in the five micro-watersheds. About 80% to 100% of the surveyed households reported that they have easy access to information on fertiliser application. The DAs are the most important source of information and advice for the households in four micro-watersheds, while 50% of the households in Engule received advice from the input supplier. Due to higher prices of fertiliser, most households have reportedly reduced the rate of application in recent years. The reported fertiliser application rates for the five micro-watersheds are presented in the table below.

Application Rate	Reported Fertiliser Application Rates				
	Engule	Baskura	Kantai	Zefie	Enkual
< 50 kg/ha	40%	-	13%	29%	-
50-100 kg/ha	50%	83%	87%	29%	-
100-150 kg/ha	10%	17%	-	43%	100%

The majority of households in the five micro-watersheds applies more than 50 kg of fertiliser per hectare and the application rate of households with small landholdings (less than 0.5 ha) is lower than for households with larger landholdings.

Application Rate (kg/ha) by Size of Landholding	Reported Fertiliser Application Rates (kg/ha)				
	Engule	Baskura	Kantai	Zefie	Enkual
< 0.5 ha	43	100	88	90	150
0.5 – 1.0 ha	69	117	100	100	150
1.0 – 1.5 ha	125	-	100	150	150
1.5 – 2.0 ha	-	100	-	-	150
> 2.0 ha	100	-	-	-	150

Weeds, pests and diseases. Almost all households have problems with weeds (i.e. adayo, metch, serdo, muja, wajima, lambut and almua) as well as crop diseases (i.e. shibshiba, wag, mitch, rust and blight) and pests (i.e. stalk borer, weevil, aphids, cut worms and rodents), which reduce the yields by 25% to 50% in the five surveyed micro-watersheds. Information and advice on effective methods for crop protection could be easily obtained from Wereda staff and DAs, but the impact of these extension services is often (very) limited as the large majority of households do not have access to the necessary inputs due to high costs or non-availability.

Use of agro-chemicals. About 60% to 90% of the surveyed households in four of the five micro-watersheds use chemicals to control weeds, pests and diseases, whereas only 20% of the surveyed households in Kantai reported the use agro-chemicals. The cooperative is the sole supplier of agro-chemicals in Baskura, Kantai and Enkulal. In Enguleand Zefie, the surveyed households obtain their agro-chemicals (mainly) from private suppliers. The most important reason for not using agro-chemicals is the lack of experience, too costly or not available in the (local) market.

Labour shortage. During the cropping season, 30% to 60% of the surveyed households in the five micro-watersheds reported a shortage of labour, particularly during planting, weeding and harvesting. One adopted strategy to cope with labour shortage is the mutual exchange of labour, locally known as wenfel or webera. In four of the five surveyed micro-watersheds, 50% to 90% of the households are reportedly involved in the mutual exchange of labour, while only 25% of the surveyed households in Enkulal have adopted this strategy. Usually, less than 5 labour days are exchanged per cropping season. Other strategies used to cope with labour shortages are the employment of children and sharecropping of land. Only wealthier households in the five micro-watersheds hire labour at critical stages of the cropping season, ranging from only 10% of the surveyed households in Baskura to 40% and 50% in Kantai and Engulerespectively. In addition to the provision of food and shelter, the daily wages of hired labour varies from Birr 6 to 15, whereby more 80% of the households pay Birr 10 or more per day. In Enguli, Baskura and Enkulal, 70% to 90% of the surveyed households reported that it is difficult to hire daily labourers.

Agricultural labour division. The most adopted strategy of households to cope with labour shortage is to mobilise as many household members as possible during the cropping season, including children. Land preparation, ploughing, seed selection, sowing, fertilising, weeding, application of chemicals, harvesting, threshing and transport are agricultural activities for which the male household members have the main responsibility. However, female household members are usually assisting the male household during the execution of the field activities. Female household members are mainly responsible for cleaning and storing the harvested crops together with male household members. Marketing seems to be a shared responsibility between male and female household members. Sharecropping or leasing of the land is the most preferred strategy for female-headed households in order to solve the shortage of male labour as well as to obey cultural norms and values.

Crop marketing. Overall, two-third of the cereal production in the five surveyed micro-watersheds is used for home consumption and the remaining one-third is sold. The proportion of the harvested grain crops marketed in the five micro-watersheds is presented in the table below.

Crop	Proportion of Crops Marketed				
	Engule	Baskura	Kantai	Zefie	Enkulal
Teff	38%	-	-	-	-
Barley	39%	12%	-	7%	-
Wheat	22%	6%	12%	13%	24%
Millet	25%	-	-	-	-
Maize	27%	11%	-	-	1%
Vetch/Chick Pea	38%	48%	-	20%	-
Oil seeds	100%	-	-	-	100%
Potato	-	21%	43%	5%	33%

Compared with the other four surveyed micro-watersheds, households in Engule sell significantly more of their harvested grain crops, ranging from 22% of their wheat crop to 39% of their barley crop. Vetch/chick pea and oil seeds and to a lesser extent wheat and potato are the major cash crops for the farming households in the five micro-watersheds. In four of the five surveyed micro-watersheds, 30% to 40% of the households sell their agricultural produce immediately after the harvest. In Enkulal, however, 83% of the surveyed households reported to market their crops immediately after the harvest. The main reason for selling the agricultural produce immediately after the harvest is to have money for urgent social and economic obligations, such as the payment of taxes or the repayment of loans. If the produce is not sold immediately after the harvest, 80% to 100% of the households market their crops more than 3 months after the harvest, mainly to benefit from higher prices. In Engule and Zefie, 80% to 90% of the produce is sold to local retailers, whereas 44% and 57% of the marketable crops are directly sold to consumers in Baskura and Enkulal respectively. In Kantai, cereals are sold to local retailers, middle men, wholesalers and consumers. There are (weekly) markets within a distance of one to three hour walk from the five micro-watersheds, where households could sell their agricultural produce.

Livestock

Livestock population. About 95% of the surveyed households in the five micro-watersheds own one or more animals. On average, one household has 2.8 heads of cattle, 0.6 head of equines and 2.7 heads of sheep and goat. About 81% of the households in the five micro-watersheds own at least one ox, whereas 85% have at least one cow and 70% also have poultry. Sheep are raised by 62% of the households and 25% also produce honey. The reported number of livestock in the five surveyed micro-watersheds is presented in the following table.

Type of Animal	Reported Number of Animals by Surveyed HHs					
	Enguli	Baskura	Kantai	Zefie	Enkulal	% of HHs
Oxen	12	17	14	12	11	81%
Cow	24	11	10	11	10	85%
Sheep	12	27	28	47	6	62%
Goat	1	5	0	2	2	13%
Donkey	0	0	1	3	0	9%
Mule	3	6	8	5	2	38%
Horse	0	0	0	2	0	4%
Poultry	42	16	20	20	20	70%
Beehive	2	6	4	14	9	25%

Oxen are mainly used for traction in order to plough the land, whereas cows are raised for dairy production. The main purpose of raising sheep is to sell them alive when the household needs money. Mules, donkeys and horses are mainly used for transport of goods and humans as well as for traction power.

Livestock feed and water. Communal grazing land, weeds and crop residue are the main sources of animal feed. Most of the existing communal grazing lands were crop lands before they were converted in grazing land during the Derg regime. The management of communal grazing lands is weak and they are often seriously degraded due to uncontrolled use leading to overgrazing. Crop residues are mainly used to feed cattle, but they are also an important source of energy for most households in the five micro-watersheds. The cultivation of fodder crops (i.e. grasses, alfalfa) and trees is not widely practiced in the five surveyed micro-watersheds.

Between 25% and 45% of the surveyed households in four of the five surveyed micro-watersheds reported that there is insufficient animal feed in years with normal rainfall, whereas 78% of the surveyed households in Zefie face shortages in normal years. Most households only have a shortage of animal feed for less than 3 months in years with normal rainfall, although 20% to 66% of the households in four of the five micro-watersheds also reported shortages of more than 3 months. The most common strategy to cope with animal feed shortages is to use weed from the cropped fields, while households in Engule usually use stored crop residues. In years with less than normal rainfall, households in Baskura and Kentia reported to have serious shortages of animal feed and water. Sale of animals and using weeds are the most common strategies to cope with water and animal feed shortage in years with less than normal rainfall.

Labour division. Grazing and watering of animals, fetching fodder, slaughter of animals, skin preparation, marketing of live animals and processing of honey are the main responsibilities of the male household members. Women usually assist the male members with fetching fodder. Female household members have the main responsibility for cleaning the shed, collection of manure, preparation of dairy products, poultry keeping and marketing of animal products. The care of sick animals, processing of meat and processing of wool are shared responsibilities.

Livestock products and utilisation. In the five surveyed micro-watersheds, 80% to 100% of the dairy products and meat is used for home consumption. In four of the five micro-watersheds, 47% to 70% of the skins and eggs are consumed by households themselves. In Kantai, however, more than 80% of the skins and eggs are sold. In Engule and Baskura, all honey is sold, whereas 33% to 50% is used for home consumption in the other three micro-watersheds.

Access to veterinary services. In Engule and Kantai, 88% and 100% of the households reported that they do not have access to veterinary services, whereas 80% to 100% of the surveyed households in the other three micro-watersheds reportedly have access. The DAs and/or wereda staff are the only sources for veterinary services. In Zefie and Enkulal, 67% and 75% of the surveyed households stated that it is easy to purchase veterinary drugs against 50% and 38% in Baskura and Engule respectively. In Kantai, all surveyed households reported that it is not easy to procure the necessary veterinary drugs. Private suppliers are the only source for procuring veterinary drugs.

Marketing. In Baskura and Zefie, 70% and 100% of the surveyed households reported the sale of live animals (i.e. sheep and poultry) against 11%, 22% and 50% in Kantai, Engule and Enkulal respectively. The main reasons for selling live animals are the procurement of agricultural inputs, payment of taxes and other (urgent) needs. The majority of households

sell live animals to other livestock owners and to a lesser extent to middlemen. Animal products, such as skins, eggs and honey, are mainly sold to local retailers and consumers. There are (weekly) markets within a distance of one to three hour walk from the five micro-watersheds, where households could sell their live animals and livestock products. Lack of information on market prices and low prices are the main problems with regard to the marketing of live animals and livestock products.

Off-Farm income generation

Only in Engule and Enkulal, 25% and 30% of the surveyed households are involved in handicraft, in particular pottery, beer brewing, blacksmithing and carpentry. Handicraft is predominantly undertaken by the poor households and the monthly incomes from handicraft range from Birr 10 to 100. Only in Enkulal, one or more surveyed households derive an income from running a shop and transport business, while one surveyed household in Engule have a government job. The monthly incomes from the existing off-farm incomes vary from Birr 10 to 200. Between 10% and 33% of the surveyed households in the five micro-watersheds have one or more members are working as daily labourers, ranging from 5 days per year in Baskura, 20 days per year in Kantai to 300 and more days in Engule. About one-quarter of the surveyed households engaged in daily labour obtain less than Birr 100 per month, whereas another 56% earns between Birr 100 and 300 per month.

Brewing and selling of local beer as well as the sale of roasted cereals and boiled pulses are off-farm income-generating activities that are mainly undertaken by women and girls.

Forestry and agro-forestry

About 80% to 100% of all surveyed households in the four of the five micro-watersheds have planted trees around their houses and/or fields. In Zefie, however, only 40% of the surveyed households have planted trees. The actual number of trees planted by the surveyed households varies considerably. In Engule and Zefie, 75% and 45% of the surveyed households have planted more than 1,000 trees. In Baskura and Kantai, 56% and 50% of the surveyed households have planted less than 100 trees, whereas the remaining surveyed households have planted 100 to 1,000 trees. In Enkulal, about 65% of the households have planted 100 to 1,000 trees.

Eucalyptus is the most common planted tree followed by *Cordia*, *Bisana*, *Olea* and *Acacia*. Bamboo is also grown in Zefie. Planted trees are mainly used as fuel wood and timber. They are often an important source of cash income for the households in the project areas. However, tree planting is restricted due to the lack of seedlings for the most needed trees. In Baskura, a group of households have developed individual nurseries with the support of a local NGO and the seedlings are sold to other households.

Fisheries

No information has been collected about fisheries in the five micro-watersheds. However, none of the surveyed households have indicated that they derive an income from fisheries.

Industry

No industrial activities take place in the five micro-watersheds.

Household incomes and expenditures

The sources of cash income as well as the average annual cash income for the surveyed households in four of the five micro-watersheds are shown in the table below.

Source	Proportion of Cash Income for Surveyed Households				
	Engule	Baskura	Kantai	Zefie	Enkual
Sale of crops	43%	13%	24%	36%	n.a.
Sale of livestock products	11%	5%	19%	3%	n.a.
Sale of live animals	16%	62%	25%	44%	n.a.
Handicraft	8%	-	-	-	n.a.
Business/petty trade	7%	-	31%	8%	n.a.
Daily labour	12%	20%	1%	5%	n.a.
Other (i.e. government job)	2%	-	-	4%	n.a.
Average Annual Cash Income (Birr)	3,247	997	1,429	1,583	n.a.
- Male-headed household	3,704	1,060	3,000	2,058	n.a.
- Female-headed household	1,650	500	545	200	n.a.

In Engule, the sale of crops is the most important source of cash income for the surveyed households with 43% of their total annual cash income. In the other three micro-watersheds, the sale of live animals forms the most significant source of cash income, ranging from 25% in Kantai to 62% in Baskura. In Kantai, cash income from business/petty trade is the most important source, whereas daily labour is the second most important source of cash income in Baskura. Honey is an important source of cash income for some of the surveyed households. Petty trade and daily labour are important sources of cash income for (female-headed) households with small or no landholdings. Households with larger land use rights derive more cash income from the sale of crops than households with (very) small landholdings. None of the households with more than 2.5 ha of land generates cash incomes from off-farm activities and seasonal migration.

The average cash income for the surveyed households is the highest in Engule with Birr 3,247 per year, whereas the average annual cash income in Baskura is only Birr 997. In Kantai and Zefie, the average annual cash incomes are Birr 1,429 and Birr 2,058 respectively. In all four micro-watersheds, the average annual cash income of the surveyed female-headed households is significantly lower than for the surveyed male-headed households, varying from Birr 1,650 (45% of male-headed household) in Engule to only Birr 200 (10% of male-headed household) in Zefie. Reportedly, 10% of the surveyed households receive remittances from household members and/or relatives, who are employed elsewhere. The overall average cash income per capita is less than Birr 100 per year for about 25% of the surveyed households in four of the five surveyed micro-watersheds. The largest proportion of surveyed households with an annual cash income per capita of less than Birr 100 can be found in Baskura (33%) and Zefie (56%).

In the five micro-watersheds, the surveyed households spent on average 25% of their cash on purchasing food items, such as coffee, tea, salt, sugar, spices and cooking oil, ranging from 21% in Engule to 32% in Enkual. On average, 22% of the cash expenditures of the surveyed households are used for the procurement of agricultural inputs, varying from 12% in Baskura to 46% in Enkual. Surveyed households in Engule, Baskura and Kantai also spent 22% to 26% of their cash expenditures on the purchase of live animals. Expenditures on clothes ranged from 9% in Engule to as much as 30% in Zefie. The average expenditures on health care and education were 4.2% and 3.8% of the total cash expenditures respectively. The average cash expenditures for the surveyed households in the five micro-watersheds are Birr 2,196, ranging from Birr 3,224 in Engule to Birr 1,407 in Zefie.

Asset Ownership

The ownership of agricultural and non-agricultural assets for the surveyed households in the five micro-watersheds is summarized in the following table.

Asset	Asset Ownership for Surveyed Households				
	Engule	Baskura	Kantai	Zefie	Enkulal
Average Land Use Right (ha)	1.8	0.8	0.7	0.8	1.7
Average Number of Trees	3,280	205	284	1,638	1,619
Average Number of Livestock	5.2	6.6	6.1	9.1	3.9
Average Number of Traction Animals	2.0	1.7	1.8	1.8	1.8
Households with Livestock	40%	50%	80%	88%	38%
Households with Agricultural Equipment	70%	70%	60%	100%	100%
Households with Radio	50%	60%	10%	45%	38%
Average Land per Capita (ha)	0.3	0.1	0.1	0.1	0.3

In the last 5 years, 59% of the surveyed households in the five micro-watersheds have purchased livestock and 61% have procured (traditional) agricultural equipment, whereas 20% had purchased a radio and 11% had obtained other assets.

8.2.2 Infrastructure and Communications

Roads. Baskura, Kantai, Zefie and Enkulal are located along or in the vicinity of an all-weather road. The existing road along Baskura and Kantai will become an asphalt road and the construction works have started at the beginning of 2007. The lack of a bridge across the Kantai River limits the accessibility of Kantai in the rainy season. Enguleis connected with the Kebele centre by a track, which is only accessible in the dry season. Due to the lack of a bridge over the Engule River, the micro-watershed can only be reached by walking about two kilometres.

Railways. No railways are located in the five micro-watersheds and their Kebeles

Navigation. None of the water ways located within the boundaries of the five micro-watersheds and their Kebeles is used for navigation.

Energy and Power. None of the five micro-watersheds is linked to the electricity grid. The only energy sources for lighting are lamp oil and crop residue. Fuel wood, dung and crop residue are used for cooking. Water energy is not used to run water mills in any of the five surveyed micro-watersheds.

There are no flour mills located in the five micro-watersheds. In Enguli, households use a private flour mill that is situated in an adjacent micro-watershed or the Kebele centre at a distance of 9 km. In Baskura, households have access to a private flour mill in the Kebele centre at a distance of 3 km, whereas Debre Tabor at a distance of 10 km is another option. Households in Kantai and Zefie are served by a private and a cooperative flour mill in the town of Gassay at a distance of 3 and 10 km respectively. A private and a cooperative flour mill are located in Gelawdiwos at a walking distance of 15 minutes. Long waiting time and regular breakdown as well as high service prices are the main problems with the flour mills encountered by the surveyed households in the five micro-watersheds.

Telecommunications. Only Zefie has a (wireless) telecommunication service, which was established at the end of 2006 in the Kebele office. However, the other four micro-watersheds have a telecommunication service at a distance of 3 to 6 km.

8.2.3 Social Risks and Hazards

Erosion. Soil erosion, including declining soil fertility, is a major problem for all landholding households in the five micro-watersheds. In combination with limited or no use of chemical and organic fertilisers, households with small landholdings (less than 1 ha) increasingly face food shortages in years with normal rainfall as the agricultural production from their fields is insufficient to satisfy the food requirement of the household throughout the entire year. Another major problem is the serious degradation of the communal grazing land, which has resulted in reduced availability of animal feed for the households in the five micro-watersheds.

Low Rainfall/Drought. The five micro-watersheds are not located in drought-prone areas. In years with less than normal rainfall, the number of households with food shortages is two to three times higher in three of the five micro-watersheds than in years with normal rainfall.

Famine/Food Security. According to the focus group discussions, a household is considered to be food insecure if it faces at least four months of food shortage. The proportion of surveyed households facing food shortages in years with normal rainfall and less than normal rainfall is presented in the following table.

	Proportion of Surveyed Households with Food Shortages				
	Engule	Baskura	Kantai	Zefie	Enkulal
Normal Rainfall	20%	30%	30%	45%	25%
2 months	100%	-	-	-	-
3 months	-	-	100%	-	50%
4 months	-	29%	-	67%	50%
5 months	-	71%	-	33%	-
Less Rainfall	20%	50%	90%	45%	88%
< 4 months	100%	67%	100%	20%	71%
4 – 8 months	-	33%	-	20%	29%
> 8 months	-	-	-	60%	-

In years with normal rainfall, 25% to 45% of the surveyed households in the four micro-watersheds reported to have food shortages for four to five months (May to September). In Engule, 20% of the surveyed households face food shortages for 2 months in normal years. Landless and female-headed households, households with very small landholdings as well as households with many members are more likely to face food shortages than male-headed households with more than 1 ha of arable land.

In years with less than normal rainfall, the proportion of surveyed households with reported food shortages increases significantly in Baskura (20%), Kantai (60%) and Enkulal (63%), whereas the proportion of surveyed households with food shortages in Engule and Zefie remains the same. The proportion of surveyed households with at least 4 months of food shortages is high in Zefie (80%) followed by Baskura (33%) and Enkulal (29%). In Engule and Kantai, none of the surveyed households faces food shortages of more than 3 months in years with less than normal rainfall.

The main cause for the reported food shortage is shortage of land followed by declining soil fertility due to lack of access to fertilisers as well as lack of access to off-farm income opportunities. The most common strategies to cope with food shortages include the sale of animals, food aid, obtaining loan and seasonal migration.

Only in Baskura and Kantai, 90% of the surveyed households with food shortages received food aid once or three times in the last 25 years. Except in Engule, 22% to 90% of the surveyed households in the other four micro-watersheds have participated in food-for-work programmes in 1999 and 2000 following severe floods in the Gumera and Ribb watersheds. In Baskura and Kantai, 90% of the surveyed households reported to have participated in food-for-work programmes in the last 25 years, of which 78% and 67% have participated three times. In Zefie and Enkulal, 22% and 38% of the surveyed households participated once or twice in food-for-work programmes.

Disease. Epidemics of malaria and typhoid are reported in Zefie and Engule micro-watersheds.

Floods. In 1999 and 2000, floods caused significant damage to crops, land, livestock and other assets of most households in Baskura, Enguli, Kantai and Zefie micro-watersheds.

Storms. Hail storms are quite common and they cause damage to standing crops, in particular fruit crops and vegetables.

Earthquakes. Not mentioned as a hazard.

Pollution. Not mentioned as a risk.

Social Instability/Conflict. Based on information collected during the baseline surveys in the five micro-watersheds, there are no (serious) social conflicts between groups within the Kebeles or between Kebeles.

Economic Instability.

Political Instability/War. The last political event that caused political instability was the civil war between the EPRDF and the Derg regime during the 1980s and early 1990s, during which many households lost their livestock and other assets, in particular in the Gumera and Ribb watersheds. Since the demise of the Derg regime, there is political stability in the Amhara National Regional State.

8.2.4 Impacts on Livelihoods

Social Services.

The major socio-economic impact of the construction and/or rehabilitation of potable water supply schemes would be improved health due to (better) access to safe drinking water for the most if not all resident households in the micro-watersheds. Together with the implementation of an awareness campaign on hygiene and sanitation, the incidences of water-borne diseases, such as dysentery, typhoid and stomach problems, could be significantly reduced. The introduction of impregnated bed nets and other preventive measures during the health awareness campaigns could result in a significant reduction of malaria cases in micro-watersheds where it is a major problem.

The major socio-economic benefits of the construction of new access roads and river crossings would be better accessibility of the micro-watersheds/Kebeles, so that it would be possible/easier to bring necessary inputs and extension services to the households as well as to transport agricultural and livestock products to the local and regional markets. The construction and/or improvement of the warehouses of the cooperatives in the Kebeles

would improve the storage capacity in the Kebeles for agricultural inputs and agricultural produce, which would contribute to a reduction of storage losses.

The installation of a flour mill in Kebeles without (sufficient) access to this service, which would be either managed by the local cooperative or a women's association, would contribute to a significant reduction in the workload of women.

Improved access to credit would improve the opportunities of (poor) households in the micro-watersheds, in particular (female-headed) households with small or no landholdings, to enhance their (cash) incomes through the development of their (irrigated) agriculture (i.e. cultivation of high-value crops), livestock (i.e. animal fattening), handicraft, business and petty trade.

Crop Production

The expected socio-economic benefits of the provision of effective extension services, including trials, demonstrations and farmer training, as well as improved supply of agricultural inputs, such as improved seeds, fertiliser and agro-chemicals, would be a significant improvement of the food security of the households in the micro-watersheds, in particular the households with small landholdings and female-headed households, due to an higher productivity and profitability of the production of the major staple crops, such as teff, wheat, barley and maize.

The development of small-scale irrigation schemes (i.e. small check dams with pedal pumps) would enable (small) farmers to grow high-value crops, such as vegetables and fruit crops. This would not only significantly enhance the cash incomes of the farming households, but it would also improve the health of the household members, especially children and pregnant women, due to a more balanced diet.

The promotion of the use of organic fertiliser (i.e. manure/dung and compost) and integrated pest management would not only increase the agricultural productivity due to improved soil fertility, but it would make agriculture also more profitable as farming households have to rely less on expensive chemical fertilisers and agro-chemicals. The use of less agro-chemicals would also reduce the potential of water pollution and health risks related to their application.

The expected socio-economic impact of the strengthening of the existing cooperatives in terms of improved management capacity and physical infrastructure (i.e. warehouse) would be improved supply of agricultural inputs, marketing and provision of services, such as the sale of consumer goods and grinding of cereals. With access to improved cooperative storage facilities, farmers would be able to reduce the losses of stored cereals, which are caused by insects, rodents and fungal diseases.

Livestock Production

The impact of improved access to veterinary extension services as well as improved supply of veterinary drugs would improve the (cash) incomes from livestock activities due to better health and productivity of the animals raised by the households in the micro-watersheds.

The expected socio-economic benefits of improved management of the communal grazing lands, including the introduction of cut-and-carry system, as well as the promotion of the cultivation of fodder and the planting of forage trees would improve the access to animal feed for the households in the micro-watersheds, in particular the (female-headed) households with small or no landholdings.

In combination with improved access to rural credit facilities, the promotion of animal fattening based on stall feeding and bee-keeping could provide an opportunity for landless and small landholding households to enhance their (cash) incomes.

Non-Farm Income Generation

The development of non-farm income-generating activities, such as handicraft, small business and petty trade, through the provision of training/skill development, technical support and credit would provide opportunities for (female-headed) households with small or no landholdings to improve their cash incomes. The socio-economic impact would not only be a reduction in poverty and food insecurity, but the need for (seasonal) migration would also be less.

8.2.5 Impacts on Natural Resources

Soil and Water Management

One of the major social impacts of the preparation of a practical Participatory Land Use Plan (PLUP) would be less risk of conflicts between different social groups within the micro-watershed as they have agreed upon the sustainable use and management of the existing natural resources located within the boundaries of a micro-watershed.

The major benefit of the reclamation of eroded arable land is that the users of this natural resource would be able to increase their (cash) incomes as a result of improved agricultural productivity as well as reduction of the population pressure on cultivable land. The reclamation of the communal grazing land would not only improve the access to animal feed for all households having livestock but also the access to fuel wood for households with small or no landholdings.

The construction of water harvesting structures, such as individual and communal ponds, would not only improve the access to water for domestic purposes and watering animals, but it would also allow households with very small or no landholdings to cultivate irrigated, high-value crops around their houses (i.e. kitchen gardens) by using water-saving technologies, such as drip irrigation.

Forestry and Agro-Forestry

As part of the agreed PLUP, the expected socio-economic benefits of protecting, conserving and managing existing community and state forest within the boundaries of the micro-watersheds, including the selected harvesting of trees, would ensure that households, especially those with small or no landholdings, would have access to fuel wood and fodder (cut-and carry).

One of the envisaged socio-economic benefits of planting of trees around the homesteads and the fields is that households would have improved access to fuel wood and fodder. Especially for households with small or no land use rights, the planting of trees could also become an important source of cash income through the sale of fuel wood, timber, fodder and fruit. Another important socio-economic benefit would be that households have to purchase less chemical fertiliser as they would use dung and composted crop residue as organic fertiliser on their arable land instead of using them as fuel for cooking.

The planting of fruit crops could also have a positive impact on the health of households, especially children and pregnant women, as they would have access to a more balanced diet, including essential vitamins.

The major socio-economic benefit of the introduction of fuel-saving stoves would be a reduction of the workload of female household members as they have to fetch fuel wood less frequently. The use of fuel-efficient stoves would reduce the cash expenditures for household that have to purchase fuel wood.

8.2.6 Socio-Economic Impact Monitoring

The socio-economic impacts of the aforementioned interventions aimed at the improvement of the livelihoods of (poor) households and sustainable management of the existing natural resources in the micro-watersheds should be monitored by using the following means of verification:

- Socio-economic surveys and transect walks, whereby the results are compared with baseline data;
- Group and individual interviews with (sampled) representatives of different social groups;
- Review of statistics on crop and livestock production as collected by the DAs;
- Review of health records;
- Review of records of cooperatives; and
- Interviews with (private) service suppliers (i.e. input supply, marketing, credit).

8.2.7 Institutional Arrangement for Socio-Economic and Environmental Management Programme

The Planning Section within each Wereda OARD is formally responsible for monitoring and evaluation (M&E) of all activities that are undertaken by this office within the boundaries of the wereda. The collection of data and information at kebele level should be organized through the DAs, whereby the Supervisor would have overall responsibility to coordinate and supervise the data collection activities.

At least once a year the Planning Section of the wereda OARD has to prepare a report, in which the results of the M&E of the activities undertaken are presented and analysed. During an annual workshop, the Planning Section will present and discuss the analysed M&E data with the subject matter specialists of the wereda OARD and any Project consultants as well as other stakeholders, including the wereda Office of Health, Wereda Office of Women's Affairs, local NGOs and (micro-) finance institutions.

Following the annual workshop, the Planning Section should prepare the final version of the M&E report, in which the observations and comments made during the workshop are incorporated. Ultimately, the Head of the wereda OARD should submit the final version of the M&E report to the Planning, Finance and Human Resource Development Department of BoARD.

References

- Halcrow. 2007a.** Mission and institutional assessment report of the International Sociologist. June 2007.
- Halcrow. 2007b.** Social and agro-economic baseline survey report for Engule micro-watershed, Lehulum Salem kebele. June 2007.
- Halcrow. 2007c.** Social and agro-economic baseline survey of report of Engule, Baskura, Kantai, Zefie and Enkulal micro-watersheds in the Jema,
- Halcrow. 2007d.** Participatory problem identification and ranking in Engule, Baskura, Kantai Zefie and Enkulal micro-watersheds of the Jema, Ribb and Gumera watersheds. July, 2007.
- Halcrow. 2007e.** Report on gender issues in Engule, Baskura, Kantai Zefie and Enkulal micro-watersheds of the Jema, Ribb and Gumera watersheds. July, 2007.

9. A Communications Strategy

A detailed institutional framework for the Project is shown in Figure 9.1. It comprises people, institutions and organizations each with different responsibilities. These are shown in the Table 9.1. There are three major responsibilities—oversight, implementation and finance—which have different reporting requirements. These determine the structure and process of a communications strategy which should try to keep reporting to a minimum of essential information which people must read and maintain for the record.

9.1 Oversight

At federal level, there needs to be an Annual Report covering technical and financial details of project implementation. After review by MoWR and MoFED, this would be presented to a stakeholders workshop in Bahir Dar and would form the basis for reporting to donors according to their requirements.

9.2 Planning, Management and Implementation

At regional level, the Annual Report will be constructed from 6-monthly reports on implementation and expenditure prepared by the Bureau of Agriculture and Rural Development and the Bureau of Finance and Economic Development in Bahir Dar. The six-monthly reports will be reviewed by the Project Steering Committee and its Technical Sub-Committee.

At wereda level, quarterly reports will be prepared by the Wereda Cabinet on implementation progress and any technical issues will be raised. These will be sent to BoARD after review by Wereda Council.

Partner institutions and organizations will be informed on progress by quarterly newsletters. prepared by wereda project coordinators.

Communities in the micro-watersheds and kebeles will be informed on project progress by posters in public places and other notices as well as at meetings to discuss plans, management issues and implementation successes and failures. Briefing notes prepared by the DAs for these meetings will be used by the Kebele Council to report to the wereda project coordinators for constructing quarterly reports and newsletters.

9.3 Finance

At kebele level, monthly reports of income and expenditure with necessary documentation will be prepared by the Kebele Council and sent to the wereda Finance Officers for consolidation into a monthly statement of monies received from BoFED, expenditure by the project, and cash at bank. These will be consolidated further into quarterly reports to BoFed which will prepare six-monthly accounts for reporting to MoFED.

Table 9.1

Principal roles and responsibilities

Level	Key institution	Summary role and responsibilities
Sub-kebele	Village groups (informal) <i>comprising social/interest groups</i>	Participation in PLUP and CAP preparation (<i>facilitated by District Agents</i>) Participation in investment planning (<i>facilitated by District Agents</i>) User group formation (<i>facilitated by District Agents</i>)
	User groups (informal)	Implement project programmes Management and maintenance of community assets improved under project
	Water management committees	As above for water supply
	Water user groups (informal)	As above for small scale communal irrigation
	Cooperatives	Input supply, processing and marketing
Kebele	Kebele Council	Review and recommendation of CAPs Review and recommendation of detailed project investment plans Management of project funds Mobilisation of mengistawi budin (work teams)
	Kebele Watershed Cabinet <i>supported by WWT and Development Agents</i>	Preparation of CAPs Preparation of detailed investment proposals Coordination and reporting on project activities
Wereda	Wereda Council	Approval of Community action plans Monitoring and review of CAP implementation
	Wereda Cabinet <i>supported by Wereda administration office, technical offices and Wereda watershed coordination teams</i>	Review and recommendation of CAPs Prepare and recommend of project annual work plans (incl budgets) Approval of kebele investment proposals under project (within AWP) Technical support to kebele watershed committee and teams (incl. DAs) Coordination and reporting on project activities
	Wereda Finance Officer	Disbursement of project funds in accordance with agreed plans
Regional	Project steering committee <i>supported by project technical subcommittee</i>	Oversight and compliance with project agreement Approval of mandates and funding criteria Approval of project annual work plans and reports Coordination between Bureaux
	Bureau of Agriculture and Rural Development <i>supported by project coordination team</i>	Overall project coordination and reporting Establishment of planning, implementation and expenditure guidelines Technical guidance and quality assurance Compilation of overall workplans and budgets Approval of Wereda annual work plans (incl budgets) Monitoring, evaluation and assessment Addressing replicability issues
	Bureau of Finance & Economic Development	Allocation/disbursement of Government funds Disbursement of donor funds
Federal	Ministry of Water Resources	Coordination with other Ministries, ENTRO etc
	Ministry of Finance & Economic Development	Financial oversight Allocation/disbursement of Government funds

Figure 9.1

Detailed institutional framework

