



# **PARTICIPATORY RURAL APPRAISAL REPORT: BURIE ZURIA DISTRICT**

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## List of abbreviations and acronyms

ACSI	Amhara Credit and Saving Institution
AGP	Agricultural Growth Programme
ARARI	Amhara Regional Agricultural Research Institute
CASCAPE	Capacity Building for Scaling Up of Evidence-Based Best Practices in Agricultural Production in Ethiopia project
DA	Development Agent
ETB	Ethiopian Birr (1 euro = approx. 27 birr at the mid-2014 exchange rate)
FCE	Facilitator for Change in Ethiopia
FTC	Farmers' Training Centre
PA	Peasant Association
PRA	Participatory Rural Appraisal
SLM	Sustainable Land Management Project
WoA	Woreda Office of Agriculture
WUR	Wageningen University and Research Centre



## Executive summary

A Participatory Rural Appraisal (PRA) was conducted in four selected *kebeles* of Burie Zuria *woreda*; Woyanima Ambaye, Wadra Gendeba, Zalma and Arbici Menfesawit. The aims of the Appraisal were to get an insight into, and a clear picture of, the farming system of the area, to identify constraints, potential opportunities and intervention points for the improvement of agricultural production and productivity of the area, and to identify best practices employed to tackle the agricultural problems being addressed. The PRA mainly focused on the environmental, socio-economic and agricultural production conditions, and the actor landscape. The methods used included PRA tools such as resource mapping, soil mapping, social mapping, wealth ranking, Venn diagrams, transect walks and a problem ranking matrix.

The result of resource mapping revealed that all the PRA *kebeles* have identical land use types, namely, cultivated land, forest, grazing land, settlement and institutions. Most of the area is allocated to crop production. None of the available resources in the area are abundant; in fact, all are scarce. Among the available resources, grazing land and irrigation water are problematic and are sources of conflict in the community. There is limited forest cover, and all forests are communally owned. There are three soil colour types with differing fertility status. Red soil is dominant, followed by brown and black. Regarding fertility status, farmers categorised it as fertile "*Kelz*", and "*Bork*" with medium and low fertility. Red soil was preferred by most of the farmers. The main sources of drinking water for both humans and livestock are hand-dug wells, natural springs and rivers. Water collection is the sole responsibility of women and girls, and water shortage problems were reported. The main sources of fuel for burning are forestry plantations, crop residues and cattle dung collected during the dry season. There is no fuel wood shortage in any of the *kebeles*. The main environmental problems were deforestation, depleted soil fertility, soil erosion and irregular rainfall patterns.

Farming is the main source of income or livelihood and farming still follows traditional practices. Sales of crops and livestock are the principal sources of income, with pepper and maize being the main cash crops. In some areas, eucalyptus is also an important cash crop. Farmers market their produce either in local markets or through farmers' cooperatives, but most of the markets are far from their home villages. Amhara Credit and Saving Institute and farmers' cooperatives are the only sources of finance and input supply, respectively. The domination of a few traders in the market, the limited supply of credit, and the late supply of agricultural inputs are the main economic problems that adversely influence the production and productivity of farmers.

Many formal and informal institutions or farmers' groups exist in the area. Most of them work independently but there are some organisations working in close cooperation with the community as well as other institutions. Those institutions which could respond immediately to farmers' problems were identified as most important. A difference was observed between women and men in categorising the most important institutions for farming.

A mixed crop and livestock production system is a characteristic of all of the areas, which are well known for their crop production potential and flat landscapes. Maize, pepper, finger millet, wheat, vegetables and fruit are major crops grown in the area. Cattle and small ruminants are the main livestock types kept. The main problems that hamper agricultural production and productivity are high fertilizer prices, competitive marketing, crop diseases and pests, poor quality and limited supply of improved seed, Poor supplies of agricultural inputs, depleted soil fertility, livestock disease, feed shortages and degradation of grazing areas. Most of the problems create vicious circles that hamper agricultural productivity.

Even though production problems are considerable, farmers have been using different best practices or innovations of their own, or introduced ones such as community grazing area management, participatory community forest management, private nursery site development, indigenous crop disease and pest control mechanisms, compost preparation, livestock fattening, use of improved technologies, community cost sharing for drinking water development, and lime application.



In general, there is a need to further identify available best practices, and to develop a model through validation and demonstration of identified practices. Most of the problems require the involvement of many actors. Some of them are also beyond the mandate and capacity of the project. Joint planning, review and stakeholder partnership are therefore essential.





## 1. Introduction

The Capacity building for scaling up of evidence-based best practices in agricultural production in Ethiopia (CASCAPE) project is a joint project between the governments of Ethiopia and The Netherlands. It is financed by the Ministry of Foreign Affairs in the Netherlands. The project aims to support an effort to enhance agricultural production and productivity in Ethiopia, through support of an Agricultural Growth Programme (AGP). Accordingly, five Ethiopian universities (The universities of Bahir Dar, Haramaya, Hawassa, Jimma and Mekelle), together with Wageningen University and Research Centre (WUR) (Netherlands), and five regional research institutes, cooperate in implementing the project.

The main aims of the CASCAPE project are: to identify current practices and bottlenecks for agricultural productivity, to identify evidence-based best practices, and to better understand the success factors for up-scaling of best practices in the agricultural sector, to enhance agricultural growth and achieve food security.

Participatory Rural Appraisal (PRA) is the most suitable method available to achieve the necessary understanding of the farming system, allowing the intended objectives to be met and making project interventions demand driven and participatory. The appraisal was implemented through a survey, undertaken in four selected rural *kebeles* or peasant associations (PAs) of Burie Zuria *woreda* namely: Woynima Ambaye, Wadra Gendeba, Zalma and Arbici Menfesawit.

### 1.1 Objectives

The Objectives of this PRA survey were as follows:

- To identify constraints, potential opportunities and intervention points for the improvement of agricultural production and productivity of the area;
- To get an insight into, and a clear picture of the farming system of the area;
- To identify best practices employed to tackle the agricultural problems being addressed.

### 1.2 Methodology

#### 1.2.1 Site and Participant Selection Methods

The criteria which were used for selection of *kebeles* were potential of the area for intervention, market accessibility, lack of similar previous interventions, and openness of farmers to innovation and the adoption of new technology. Accordingly, four *kebeles* were selected; Woynima Ambaye, Wadra Gendeba, Zalma and Arbici Menfesawit.

Farmers for participation in focus groups and key informants were selected with the help of Development Agents (DAs). A group of 20-30 farmers was identified to participate in two days of focus group discussions. The group was composed of different categories of people such as young and elderly farmers, male and female heads of households, various wealth categories (rich, medium, poor), model farmers and community elders. Key informants were also identified and interviewed for their additional knowledge. The key informants were DAs, *kebele* officials, and elder people who have detailed information about the *kebele*.



### **1.2.2 Sources of data and Methods of data collection**

Both primary and secondary data types were used. The former were obtained from farming community members selected to participate in the PRA, key informant farmers, DAs and experts. The latter were collected from Farmers Training Centres (FTCs), The *Woreda* Office of Agriculture (WoA) and other stakeholders, official reports and relevant literature. Semi- structured interviews, key informant interviews, focus group discussion and personal observation were the methods of data collection used.

## **1.3 PRA tools used**

### **1.3.1 Resource mapping**

This method was used to assess the availability of natural resources in the area. Farmers were asked to draw a map of their village and mark available resources or land use types using locally available materials (rope, stick, stone, tree leaf, grass, soil and card) on a clean piece of ground. Participant farmers selected one person among them to draw the map with their guidance. The selected farmer first drew the boundaries of the *kebele* using rope. Farmers complemented and corrected each other to draw an accurate boundary.

Following the completion of the boundary, they located available roads (both asphalt and all weather roads) using sticks as a reference points to mark different settlements (*gott*) in the *kebele*. The different villages were located by writing the name of the village on a piece of card. Using the villages and roads already drawn as a reference, seasonal and permanent rivers were then added. Then, the different land use types: grazing land, forest land, crop land were marked using grass, tree leaves and soil respectively. Finally, they marked the area under irrigation. After the map was completed, participant farmers made comments and added the final details.

### **1.3.2 Social mapping**

First, farmers were asked to identify social and economic service giving institutions/organisations and farmers' groups available in the area. Subsequently, using the resource map as a base, farmers marked the identified institutions/organisations and farmers' groups.

### **1.3.3 Soil mapping**

This method was mainly used to summarise details of what soil types are found, where they occur, and how much area each type covers. It was also used to identify the types of crops grown, and the opportunities and constraints associated with each soil type. Using the resource base map, farmers indicated where different soil types are found by marking with tree leaves.



### 1.3.4 Actor landscape

With the facilitation of one of the PRA team members, farmers were asked to identify institutions or organisations working with the community or in the *kebele*. The name of each organisation or institution was recorded on a separate piece of card. Then, farmers identified the most important ones from the comprehensive list and the reason why they considered them important. The note takers wrote down all the information as the farmers' discussions progressed. Following this, a big circle was drawn on the ground with rope to represent the entire farming community of the *kebele*. The facilitator read the name of each institution or organisation written on the cards, and asked participants to place the cards inside the circle, close to the circle or at varying distances from the circle, to show the importance and degree of contact/co-operation of the organisation with the *kebele*. The nearer the distance from the big circle a card was placed, the more important the institution is, and farmers placed institutions which they consider unimportant furthest away from the big circle. The most important institutions were placed inside the circle.

### 1.3.5 Wealth ranking

This tool was used to identify the different categories of wealth and well-being in the community. Farmers were encouraged to discuss and identify wealth strata, the proportion of the community in each stratum, and criteria used to place an individual in such strata.

### 1.3.6 Problem ranking matrix

This important tool was used to identify and prioritise agricultural production problems in the area. The PRA team spent almost a whole day, which was half of time allotted for one *kebele*, conducting this exercise. Firstly, farmers were asked to fully identify agricultural production problems. Then, the PRA team organised the list of problems into a manageable size by merging similar or related ones. The final list was presented to the participant farmers for comment. After getting the farmers' consent, a comparison of the problems was made by presenting them to the farmers two at a time. Scores given to each problem were added and ranked according to their scores. Finally, the rank obtained by each problem was discussed by the farmers to ensure that they agreed with the results.

## 1.4 Methods of data analysis

The data collected from all sources were analysed using both qualitative and quantitative methods of data analysis. Descriptive statistics were employed to analyse the quantitative data. Simple graphs, charts and tables were also used to systematically present the results of the survey.



## 2. Description of the woreda and selected kebeles

### 2.1 Location

Bure Zuria is one of the 15 *woredas* of West Gojam Administrative Zone, and one of 106 in Amhara National Regional State, respectively. It is located between latitude 10° 17'-10° 49' North, and longitude 37° 00' - 37° 11' East. The capital city of the *woreda*, Bure, is 400 km North-west of Addis Ababa and 148 km south-west of the Regional State capital, Bahir Dar. The *woreda* has 15 km of asphalt roads, 84 km of all-weather gravel roads and 103 km of dry weather roads. It is close to, and connected by, the all-weather road to the East Wollega Zone of the Oromia Regional State, and the Metekel Zone of the Benishangul Gumez Regional State. The road density in the *woreda* is 68.5km/1000km<sup>2</sup>, which is relatively high compared to the average road network in Amhara National Regional State which is 36.72 km/1000km<sup>2</sup> (BoFED, 2005 cited in IPMS, 2007).

### 2.2 Demographic characteristics of the *woreda*

The human population of the *woreda* is 101,788 of which 96,239 (94.6%) and 5,565(5.4%) live in rural and urban areas, respectively. Out of the total population 50,487 (49.6%) are male and the remaining 51,317 (50.4%) are female. In rural areas, the population is 47,910 male and 48,329 female, whereas in urban centres it is 2,577 male and 2,988 female (CSA, 2008). In general, the male population is relatively lower than female population in both the urban and rural areas of the *woreda*. Currently, the *woreda* is divided into 22 rural *kebele* or peasant associations (PAs) and two town associations. Bure and Kuchi are the two major towns in the *woreda* (Burie Zuria *Woreda* Office of Agriculture, 2011).

**Table 1: Population, Household size, area and agro-ecology of Kebeles and their distance from the *Woreda* capital**

No.	Name of <i>kebeles</i>	Population			Household			Area	Distance from Burie (km)	Agro-ecology
		Male	Female	Total	Male	Female	Total			
1	Ageni Fereda	3964	3968	7932	1021	132	1153	18.1	18	Highland
2	Weheni Durbatie	4035	4275	8310	1119	145	1264	17.2	16	Highland
3	Jib Gedele	3316	3159	6475	836	183	1019	17.4	10	Highland
4	Arbisi Menfesawite	2581	2673	5254	732	96	828	13.3	15	Mid altitude*
5	Woyema Ambaye	4176	4205	8381	1109	143	1252	19.7	13	Mid altitude*
6	Wundegi	4135	4052	8187	1109	142	1251	38.8	5	Mid altitude
7	Shakwa	3614	3659	7273	938	124	1062	22.1	7	Mid altitude

8	Wangedam	5377	5594	10971	1463	191	1654	19	5	Mid altitude
9	Kebsa Baguna	3636	3672	7308	948	122	1070	28.9	5	Mid altitude
10	TiyaTiya	2311	2264	4575	600	77	677	11.1	7	Mid altitude
11	Tengeha Adel Ageta	2682	2645	5327	718	94	812	24	8	Mid altitude
12	Wadera Gendeba	2695	2631	5326	702	92	794	19.7	6	Mid altitude*
13	Denbun	3585	3722	7307	989	127	1116	22.9	11	Mid altitude
14	Alefa	2849	2714	5563	754	98	852	22.9	8	Mid altitude
15	Gulem	5053	4722	9775	1253	164	1417	24.9	23	Mid altitude
16	Zalema	3664	3359	7023	937	121	1058	42.5	15	Mid altitude*
17	Seretekeze	1993	2114	4107	500	65	565	30.9	32	Mid altitude
18	Fezele	1336	1384	2720	334	43	377	21.3	37	Mid altitude
19	Zeyew Shewen	3667	4008	7675	1176	153	1329	37.1	28	Mid altitude
20	Gedamlejamur	1909	1742	3651	503	64	567	11.1	36	Lowland
21	Fetam Sentom	3934	3713	7647	1052	136	1188	79.6	37	50% low land
22	BekoTabo	1516	1546	3062	433	55	488	175	45	Lowland
	Total Rural Population						21793			
	urban									
23	Bure				1699	1087	2786	9.06	0	Mid altitude
24	Kuchie				-	-	-	0.5	27	Mid altitude

## 2.3 Land use pattern

As shown in table 2, the total area of the *woreda* is 58,795 ha. The larger portion of the district, totalling 52.2% (30,677 ha), is allocated to arable land, followed by 14.1% (8,280 ha) bush and shrubs, 10.3% (6,066 ha) forest, and 5.2% (3,081 ha) grazing land. As computed from total farm household size and area of cultivated land, the average size of a household cultivated land holding is about 1.6 ha. The detailed land use types of the area are presented in Table 2.

**Table 2:** Land use type in Burie Zuria district

Land use type	Amount of area covered (ha)	Proportion (%)
Arable land	30,677	52.2
Annual crops	29,626	(50.4)
Perennial crops	1,051	(1.8)
Grazing land	3,081	5.2
Forest cover	6,066	10.3
Bush and shrubs	8,280	14.1
Construction and settlement area	4,388	7.5
Water bodies	186	0.3
Unusable	6,117	10.4
Total area	58,795	100

## 2.4 Climate and Agro-ecology

Burie Zuria *woreda* receives a minimum annual rainfall of 1,200 mm per season, with a range of 900-1,400mm (Burie Zuria *Woreda* Office of Agriculture, 2011). It has uni-modal type of rain fall distribution which covers the period from May to September which is known as the "Meher" season. The *woreda* is one of the areas which receives a relatively high level of rainfall. According to agricultural experts, DAs and farmers' opinions, however, the rain pattern has become more irregular in recent times. In some years the rain starts and ends early, and in others it starts late and ends early.

Agro-ecologically the *woreda* is classified into moist and wet lowland (10%), wet Woina-Dega (82%) and wet Dega (8%) (IPMS, 2007). Similarly, according to the data obtained from the *Woreda* Office of Agriculture, the *woreda* is classified into Dega (1%), Woinadega (77%) and Kolla (22%). The altitude ranges from 700 to 2,300 metres above sea level (masl). The lowest point is found at the Nile gorge. Annual mean temperature ranges from 17° C to 25° C.

With regard to landscape, the area is dominated by a flat type of landscape which accounts for 76% of the area, and the remaining 10%,7% and 7% constitute mountain, undulating and gorge landscapes respectively. The area is therefore well known and suitable for agricultural production, with good potential especially for crop production.



## 2.5 Soil

According to Burie Zuria *Woreda* Office of Agriculture, (2011), and a diagnostic survey report of the district (IPMS, 2007), three soil types are found in Bure Zuria *woreda*, namely Humic Nitosols or red clay (63%), Eutric Cambisols or brown (20%) and Eutric Vertisols (17%) (Figure 1). Most of the wet Dega agro-ecology areas have Humic Nitosols, while areas with wet Woina-Dega have Humic Nitosols and Eutric Vertisols. On the other hand, the wet and moist lowlands have Eutric Cambisols. The wet Dega agro-ecology areas receive torrential rainfall, have relatively undulating topography and an easily erodible soil type. As a result, soil erosion is a challenge in these areas. In addition to soil erosion, soil acidity is a problem in the wet Dega part of Bure *woreda*.

This report (IPMS 2007) has also illustrated that vertisol covers 17% of the total area of the *woreda*. Vertisol is prone to waterlogging and farmers use such lands for crop production once per year at the end of the rainy season. Extensive training has been given to farmers in order to efficiently utilise the vertisol areas for double cropping using the broad-bed maker ploughing system.

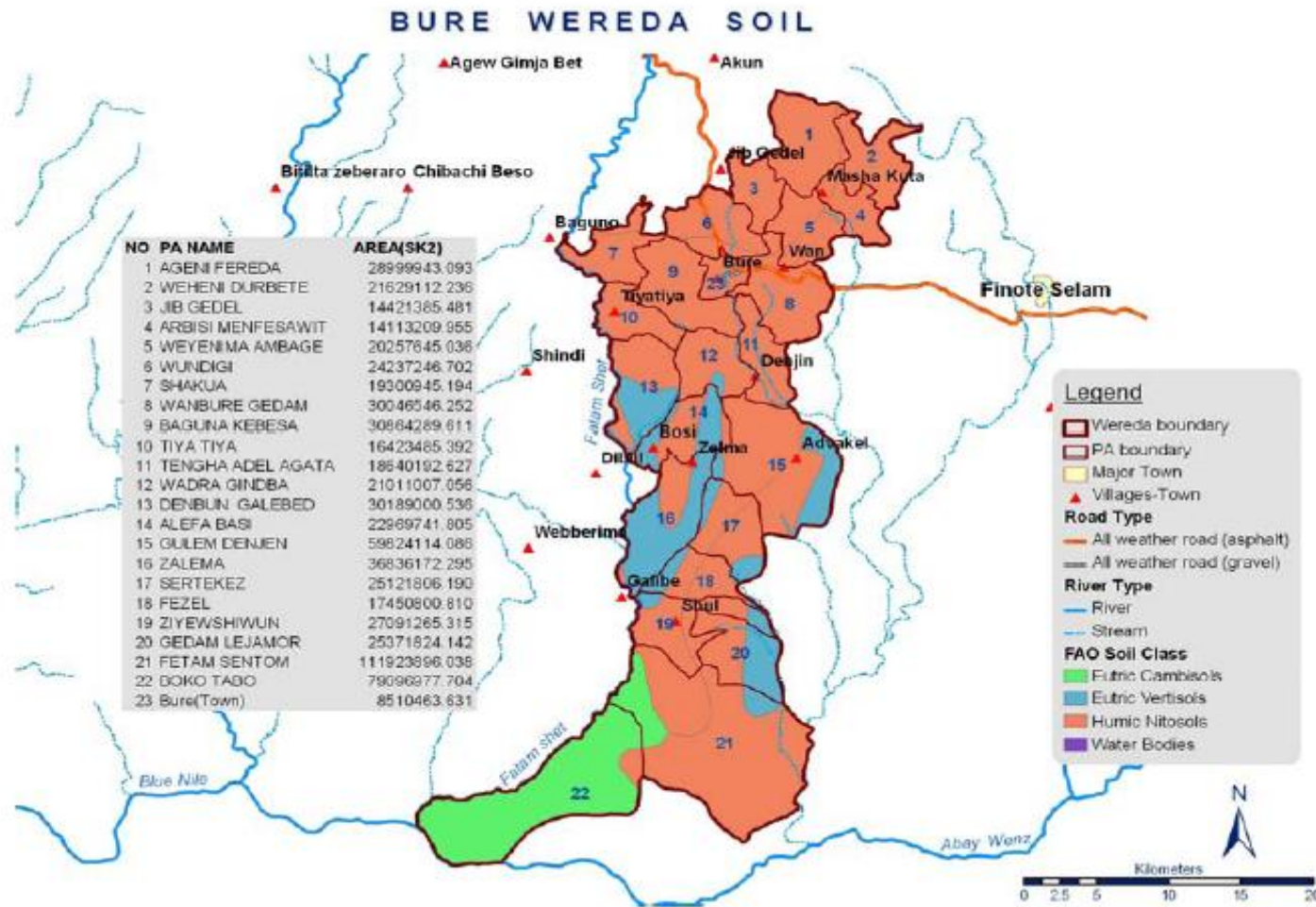


Figure 1: Soil types distribution map of Bure Zuria woreda

Source: IPMS, 2007



### 3. PRA Results

#### 3.1. Woynima Ambaye kebele

Woynima Ambaye *kebele* is one of the 22 *kebeles* of Burie Zuria *woreda*, and is located 10 km north-east of the capital of the district, Burie. According to secondary sources, the total area of the *kebele* is about 1,622 ha. The landscape of the area is characterised by a mix of plain, undulating, hill and mountain features. It is dominated by a flat plain which covers 48% of the land area, followed by 20% hill, 18% mountain and 14% valley landscapes. A simplified classification recognises two main categories: an upper part with high land and mountain and undulating features, and a lower part dominated by a mid-altitude plain. The agro-ecology of the area is mostly of Woyina Dega, which covers 85% of the land area. There are, however, some highland villages with Dega, which covers 15% of the *kebele* land area (Woynima Ambaye *kebele* FTC, 2011).

##### 3.1.1. Environmental conditions

As shown in the community resource mapping (Figure 3), the *kebele* has a variety of natural resources and land use types including crop land, forest land, grazing land, permanent and seasonal rivers, irrigated land and settlement areas. Out of the total 1,622 ha area of the *kebele* 1,229 ha are allocated for crop production, (75.8%), 247 ha (15.2%) for grazing land, 72 ha (4.4%) for settlement areas and 45 ha (2.8%) for forest land. Out the total cultivated land, 822 ha are currently under irrigation. For details, see Figure 2 and Table 3.

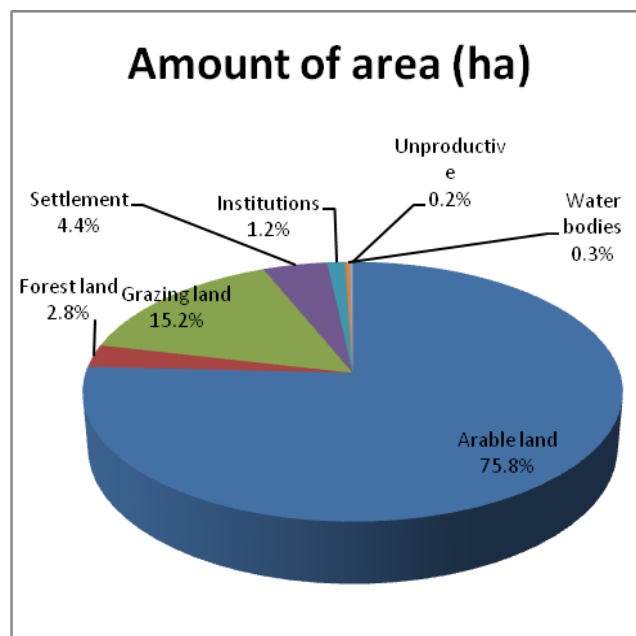


Figure 2: Land use pattern in Woynima Ambaye *kebele*

**Table 3:** Land use type and amount of area allocated in Woynima Ambaye kebele

Land use type	Amount of area (ha)	Proportion (%)
Arable land	1,229	75.8
Irrigated land	822	(50.7)
Potential irrigable land	1,352	(83.4)
Forest land	46	2.8
Natural	27	(1.7)
Artificial	18.5	(1.1)
Grazing land	247	15.2
Communal	223	(13.7)
Individual	23	(1.4)
Settlement	72	4.4
Institutions	20	1.2
Water bodies	5	0.3
Unproductive	3	0.2
Total	1,622	100

During community resource mapping, participant farmers illustrated that the areas of cultivated land, grazing land, forests, irrigation sites and water are not enough for all community groups. Scarcity of cultivated land is a serious problem among young community groups. Scarcity of water for irrigation and grazing land are problematic throughout the area. Causes and effects of these problems are described in the cause-effect relationship matrix table (Table 8).

### 3.1.1.1 Forest

As indicated above in Figure 2 and Table 3, the current forest cover of Woynima Ambaye *kebele* is estimated to be about 46 ha or 2.8% of the total area. Out of the total forest area, 27 ha is natural and the remaining 19 ha is planted forest (Woynima Ambaye *kebele* FTC, 2011). There are five forest areas in the *kebele* (Figure 3). Such forests are found on hillsides, along the rivers and around churches. All these are communally owned forests. In some areas, forests are also found adjacent to grazing areas. Even though the coverage is small, farm forests were also observed within crop lands and homesteads.

According to PRA participant farmers, the trend in forest coverage of the *kebele* has been decreasing. Rapidly increasing population pressure, limited awareness, lack of sense of ownership, uncontrolled settlement, and farmland expansion were some of the causes mentioned for the declining forest cover in the area. However, very



recently, following awareness raising about the consequences of degradation, and the importance of conservation of natural resources, through training and long-term farming experience, farmers mentioned that the community, in collaboration with the *kebele* administration and DAs, are protecting the remaining forest. Nobody is allowed to cut a single tree without the consent of the PA administration and the surrounding community. Permission must first be sought from the community or *kebele* administration for tree cutting, e.g., for house construction and any other social ceremony. The role of the PA administration is to enforce the rules and regulations agreed and accepted by the community.

### 3.1.1.2 Land

Crop lands are individually owned while grazing areas are communal. There are, however, some farmers who allocate some portion of their crop land for grass production. During the resource mapping exercise and focus group discussion, all participants from all groups of the community firmly confirmed an absence of equal access to crop land among young farmers and elders. Currently, many young farmers are landless. According to the farmers, the land redistribution, which was conducted in 1997, was not equitable. The land distribution was conducted by a committee which was selected from the community. Not all the land is equally fertile. Based on fertility status, farmers categorised the land into three types: highly fertile "*kelz*", "*Mehakelegna*" which has medium fertility, and "*Bork*" which is relatively infertile. The distribution was carried out differently from one village "*Gott*" to another. In some villages, the land was not classified into the different fertility categories, and those community members who were eligible to get land were allocated land on the basis of drawing lots. Accordingly, one might get fertile and another might get infertile land. In some other communities, members were allowed to draw a lot from each category based on their family size. Thus, each farmer had a chance to get land from all the fertility categories.

Regarding crop land allocation at the household level, this is mainly decided by men. However, farmers mentioned that women have also started to negotiate with their husbands. At the community level, land allocation is decided by the community, *woreda* and *kebele* land administration experts and committee members.

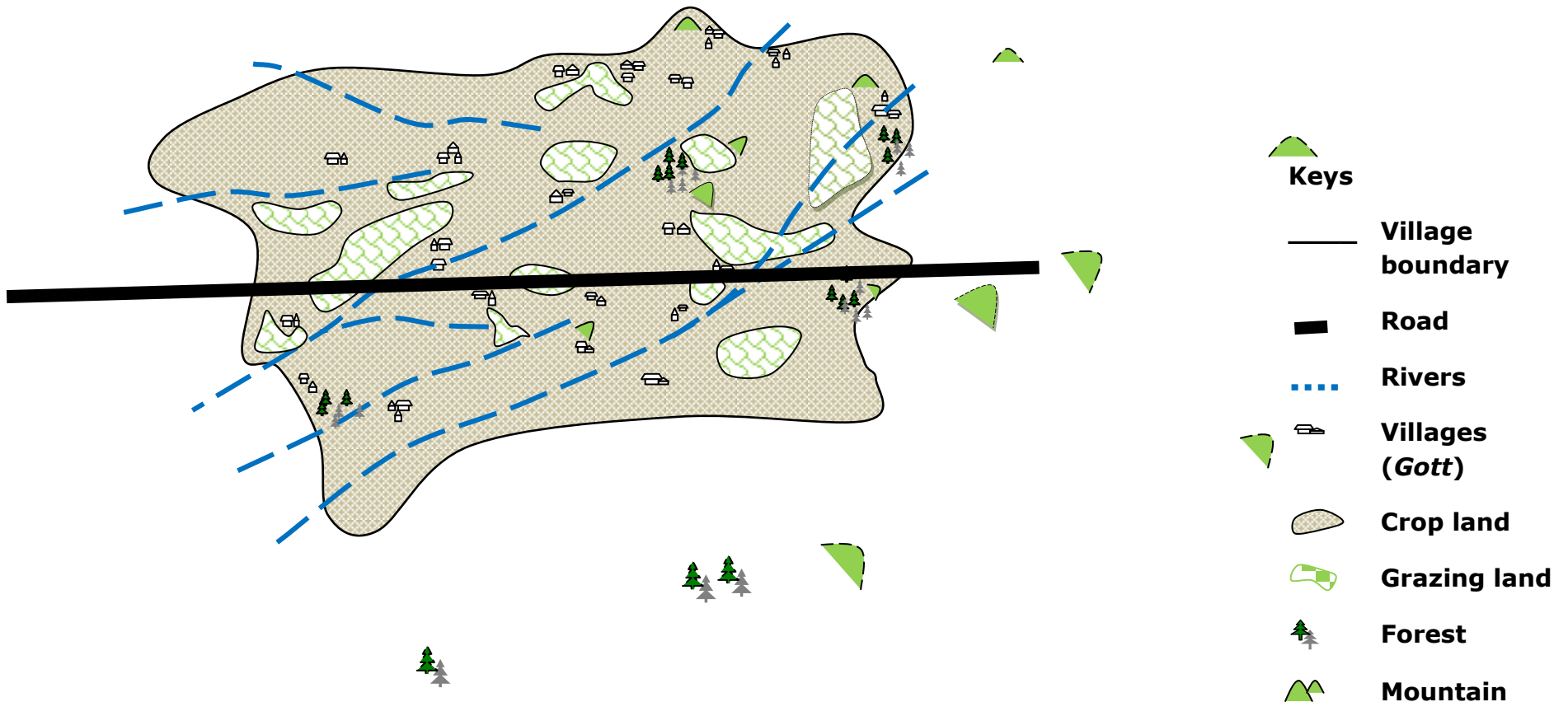


Figure 3: Village and resource mapping in Woyanima Ambaye kebele of Burie Zuria district



### 3.1.1.3 Soil

As depicted in the community soil map (Figure 4) and Table 4, farmers identified three major soil types according to colour. The larger proportion, 97%, is red soil while black and brown types cover 1 and 2 % of the total area respectively. According to farmers, the area of black soil is estimated to be around 60 timad (15 ha) and red 120 timad (10 ha). In addition to the proportion of each soil types, focus group discussion participant farmers also discussed the major crops grown, constraints and opportunities of each soil type (Table 4). Severe soil erosion, especially in the upper part of the *kebele* which has undulating land, was mentioned as a serious problem. Low soil fertility was also a problem for the farmers. The PRA team observed an absence of any soil or water conservation structure in the *kebele*.

**Table 4:** Major soil types, their constraints and opportunities

Major soil types	Proportion (%)	Major crops grown	Constraints	Opportunities
<b>Red "Borebor"</b>	97	Maize, finger millet, teff, wheat, pepper, potato, barley, onion, field pea, faba bean	<ul style="list-style-type: none"> <li>- Low water holding capacity</li> <li>- Drought prone</li> </ul>	<ul style="list-style-type: none"> <li>- Able to grow varied crop types</li> <li>- Easy to plough</li> <li>- Productive</li> </ul>
<b>Brown "Ashewa"</b>	2	Onion, faba bean, wheat, field pea, barley	<ul style="list-style-type: none"> <li>- High Soil acidity</li> <li>- Able to grow limited crops</li> <li>- Susceptible to soil erosion</li> <li>- Drought prone (no yield when there is shortage of rainfall)</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for the production of vegetables and fruit</li> <li>- Not affected with water lodging problem</li> <li>- Able to produce pulses better than other soil types</li> </ul>
<b>Black</b>	1	Teff, chick pea, barley,	<ul style="list-style-type: none"> <li>- Soil erosion (landslides)</li> <li>- High Soil cracking</li> <li>- Ploughing difficulty during excess moisture and dry season</li> <li>- Low productivity</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for double cropping (barley-chick pea or chick pea- onion)</li> </ul>

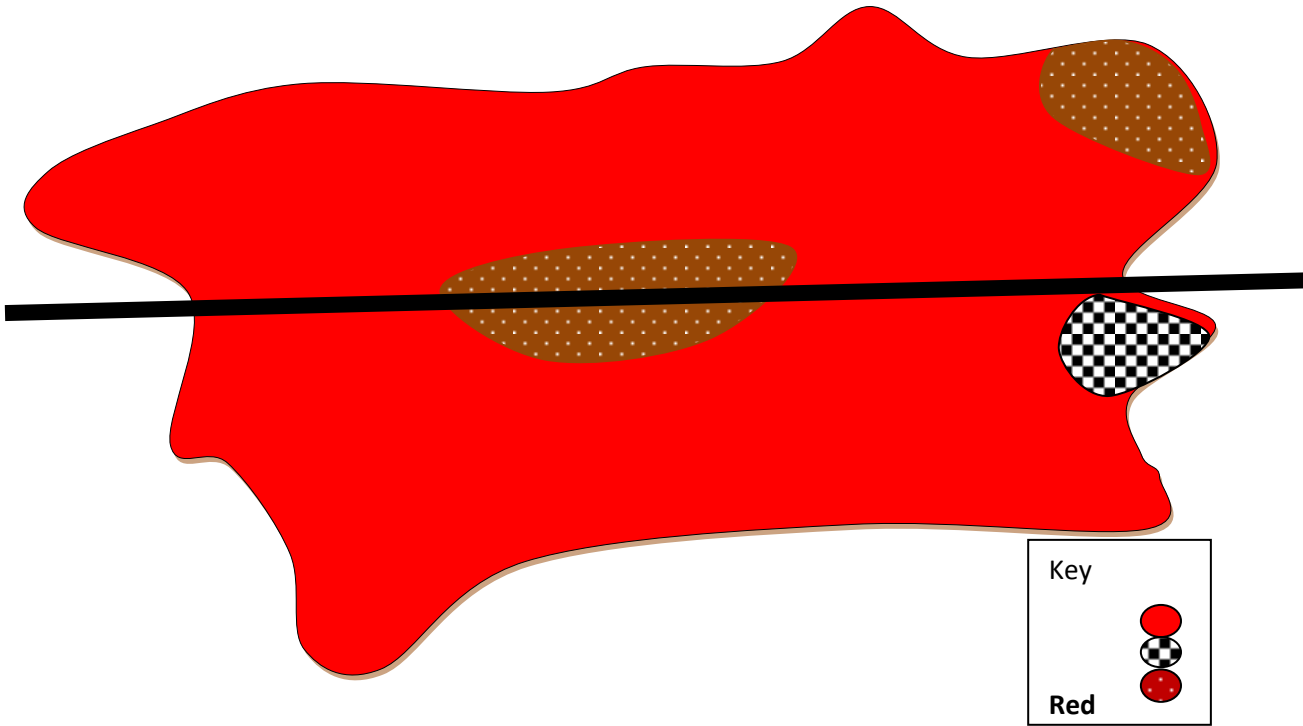


Figure 4: Soil map of Woynima Ambaye kebele

### 3.1.1.4 Water

Drinking water is obtained from different sources which vary from village to village. The main sources of drinking water for both humans and livestock are communal and private hand-dug wells, natural springs and rivers. The former two are the main water sources for people and the latter two for livestock. During the group discussions, farmers mentioned deforestation in upper catchment areas, and eucalyptus plantation above freshwater springs, as the main causes of drying out of natural springs. These issues expose farmers to water shortage throughout the year, and even in areas where there is water, there are problems of quality management. As a result, there is a high incidence of both human and livestock water borne diseases. Water collection is the sole responsibility of women and girls.

### 3.1.1.5 Sources of energy

Cattle dung, crop residues, especially the stems and cobs of maize, wood collection from their own farms and eucalyptus from their own plantations were mentioned as the main sources of fuel for cooking. According to farmers, there is no shortage of fuel wood. The collection of firewood is the responsibility of both men and women. Children,



particularly girls, are also involved in collection of cattle dung from communal grazing areas. This will supplement the firewood collected from their own sources. Cattle dung collected from their own houses during winter time is usually used for compost preparation whereas dung collected in the dry season is used for fuel.

### **3.1.1.6 Environmental constraints**

Land degradation and deforestation were mentioned as an environmental constraint. The causes, effects, and suggested solutions are presented in Table 8.

#### **Summary**

In order to get an insight into the environmental conditions of the area, PRA tools were employed including resource mapping, soil mapping, transect walks, focus group discussions, key informant interviews and semi-structured interviews. The results revealed that there are no abundant resources, while there is a scarcity of cultivated land, forests, grazing land, and irrigation water. Among these resources, the latter two are especially problematic. All community groups have equal access to land but there is difference between elderly and young farmers' groups. Accordingly, many young farmers are landless, and others suffer because of variability in soil fertility. Men dominate in decision making about land allocation.

This PRA exercise also showed that shortage of both drinking and irrigation water is a serious problem. Collection of water is the sole responsibility of women and girls, whereas both men and women are involved equally in fuel wood collection. Depleted soil fertility, soil acidity, deforestation, drying out of rivers and natural springs, degradation of grazing areas and expansion of crop land into grazing areas were the main problems or environmental constraints. To alleviate some such problems, farmers have been using innovations/ best practices namely rotational livestock grazing, compost preparation and utilisation, community cost sharing in drinking water source development, a private seedling nursery site, and lime application on acidic soils.

### **3.1.2. Socio-economic Conditions**

#### **3.1.2.1 Demographic characteristics**

Woynima Ambaye *kebele* has a total of 1,244 household heads (1,034 male and 210 female) and a total population of 9,181 out of which 4,054 are male and 5,127 female (Woynima Ambaye *kebele* FTC, 2011). The *kebele* consists of 20 villages (*Gott*) (Figure 5). Currently, the average farm household size of the *kebele* is 7.4. According to the farmers, farm household size has decreased since the health service has been extended to local level. However, the number of farm household heads and the total population is increasing since more young people are getting married. In general, the population trend is increasing. Orthodox Christianity is the only religion and Amhara is the sole ethnicity in the *kebele*. All community members irrespective of their gender and wealth status live together in the same village.

### 3.1.2.2 Sources of income/livelihood

Crop and livestock production are the main sources of livelihood and occupation, and the sale of crops and livestock are the main sources of income for the community. Based on the information obtained from a wealth ranking exercise, three categories of wealth strata and criteria for each stratum were identified (Table 5). As described by farmers, the number of rich and middle income farmers each constitute a quarter, and the remaining half are poor.

Table 5: Wealth categories and criteria in Woynima Ambaye kebele

Wealth criteria	Wealth Category/ Strata		
	Rich	Middle income	Poor
Number of oxen for ploughing	2 - 4	2	<=1
Amount of land	6-8 timad	4-6 timad	<4 timad
Number of other animals	Cow, horse, sheep, donkey, poultry		Small number of small ruminants and poultry
Additional income source	Grain miller, animal pulled cart, house in nearby urban centre	None	None
Home management	Good (separate house for livestock and kitchen )	Medium (separate class or house for livestock)	Poor (both human and livestock live together with small partition)
Size of house (number of corrugated sheets)	>80	40-60	<40

### 3.1.2.3 Sources of finance and input supply

Amhara Credit and Saving Agency (ACSA) and farmers' cooperatives are the main sources of credit. The latter mainly act as sources of credit for agricultural inputs. According to group discussion participants and key informant farmers and experts, the maximum amount of credit allowed to an individual (3000 birr (ETB), equivalent to about 110 euro) is insufficient, especially for those farmers who want to become involved in cattle fattening activities. There are also chronic delays in supplying input credit. Input is often not delivered at the right time and place. The cooperatives initially announce that they will provide input on a cash basis, and after some time they accept taking half in cash and half in credit. During this time, the sowing season has usually passed and the inputs that the farmers have purchased becomes useless.

### 3.1.2.4 Marketing

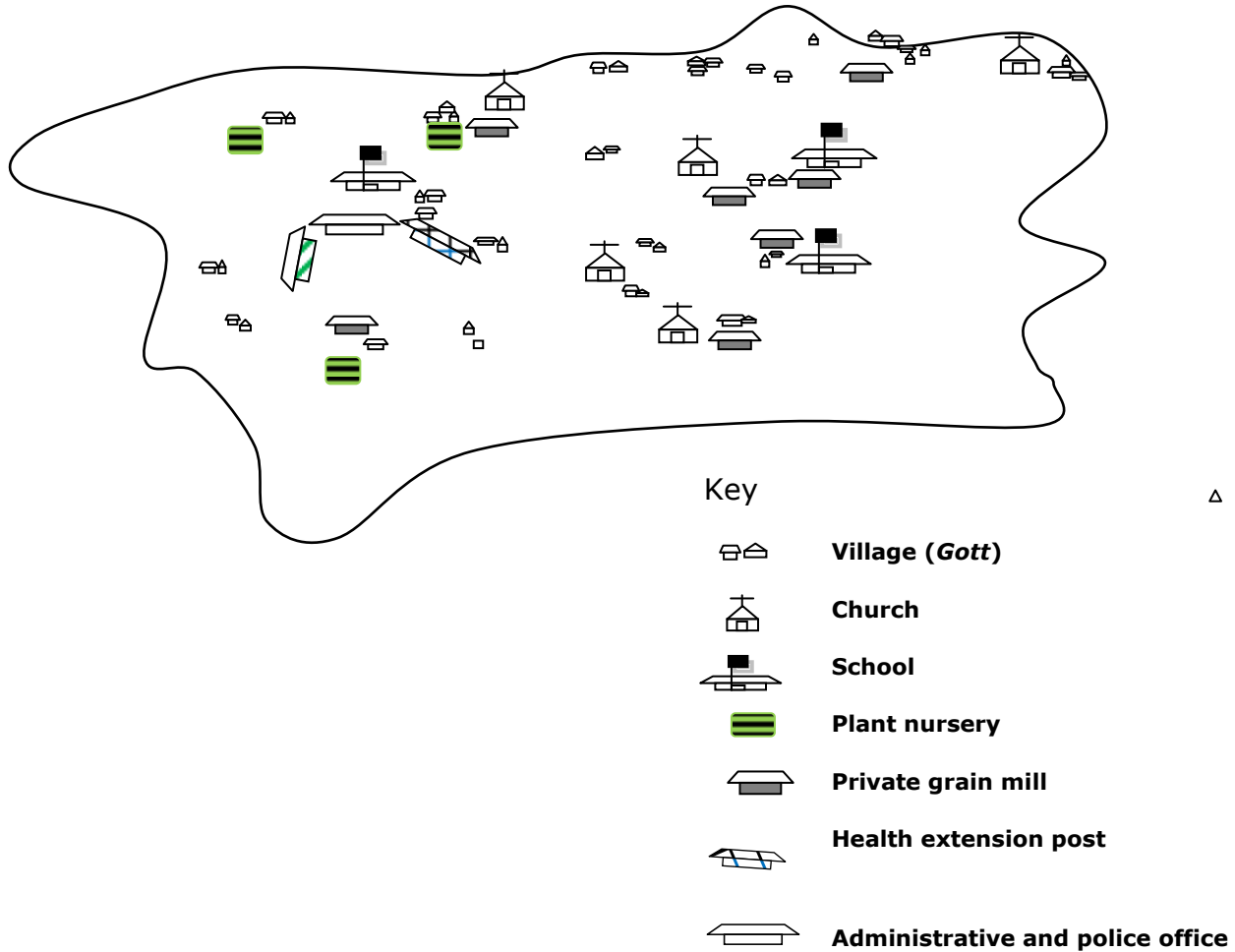




There is no market place in the *kebele*. Farmers sell their produce in a nearby *kebele* (Mankussa and Dereko) or *woreda* town, Burie. On average, two hours are needed to reach one of these market places on foot. Farmers transport produce by carrying it or by using draught animals, since there is no public or private means of transport. According to farmers, competitive marketing is the main production problem in the area.

### **3.1.3. Actor landscape**

Many social services are provided by public or community organisations in the *kebele*. As shown in the community social mapping (Figure 5) most of them appear in clusters, each of which is called a "*kebele* centre". In the area there are three schools, five Ethiopian Orthodox Churches, one farmer cooperative sub office, one primary irrigation cooperative, one health extension post, seven private grain mills, one DA office, one *kebele* administration, three plant nurseries and community police office.



**Figure 5:** Village and social mapping in Woyanima Ambaye kebele

Farmers also identified 18 different formal and informal institutions, organisations or farmers’ groups working with the community (Figure 6). The names, roles and responsibilities of such organisations are presented in Annex 2.. In Figure 6, the large circle represents the farming community in the area. Farmers placed the institutions that were considered as most important inside the circle. The closer to the centre of the big circle, the more important the institution was considered to be. Farmers placed institutions which they did not consider of much importance outside the big circle at varying distances.

Male farmers identified the FTC, church, Amhara Credit and Savings Institute, school, police, cooperatives, kebele administration, community water committee, and community elders as most important. Women identified health extension, church, FTC, police, women’s affairs, cooperatives and Amhara Credit and Savings Institute as most important. The basic reasons for the selection of these organisations as the most important ones by all participants was their problem solving capacity and close contact with the community.



Most of the time, such organisations work independently. However, in some cases there are some organisations/ groups who work in close cooperation with each other. For example, the *kebele* administration works closely with FTC, schools and health extension workers. Similarly, the FTC, *kebele* administration and community water committee are also working together.

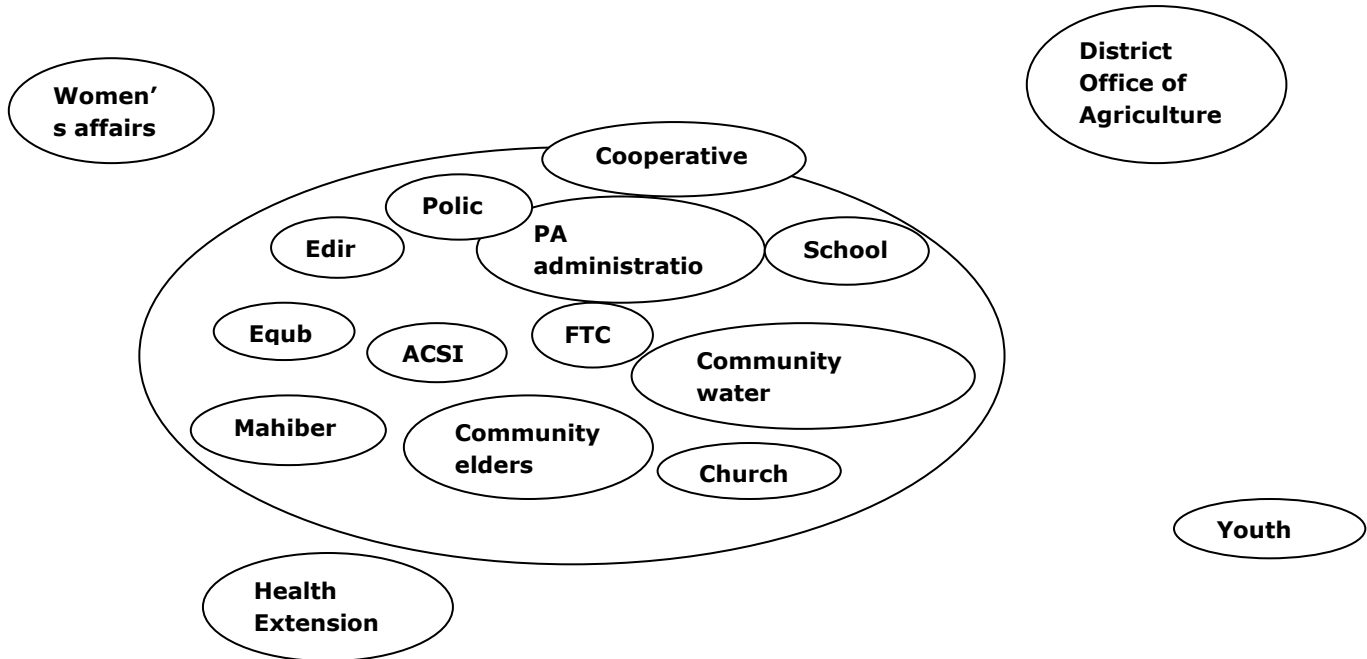


Figure 6: Venn diagram showing perceived importance of institutions to all farmers (men and women combined) in Woynima Ambaye kebele

### 3.1.4. Agricultural production conditions

The area is characterised by its mixed farming system involving both crop and livestock production.

#### 3.1.4.1 Crop production

The total amount of cultivated land in the area is 1,229 ha (Table 3). As computed from total cultivated land and number of farm households, average household cultivated land size is around 1 ha (4). Both rain fed and irrigated crop production is practiced in the area. Information obtained from *kebele* FTC indicates the presence of 821.75 ha of irrigated land area.



The major crops grown in the area include maize, finger millet, pepper, wheat, teff, barley, potato, rapeseed, faba bean, field pea and linseed. Various vegetable and fruit crops have also been produced. Maize and finger millet are described as the main food security crops, and pepper as a cash crop and the main source of income for the purchase of fertilizer and other agricultural inputs. According to information obtained from farmers, different crop diseases and pests, soil erosion and depleted soil fertility are the major crop production problems. More particularly, disease prevalence on pepper is very high, resulting in big losses in yields.

There is, furthermore, an irrigation management problem. This problem emanates from shortage of water, unequal or non-equitable water distribution and water wastage. Even though irrigation water management is governed by the community water management association *yewuha abat*, the type of crop and amount of land cultivated are not considered during water distribution. Causes of the prevalence of irrigation water shortage and wastage are thought to be the traditional, outdated type of irrigation system, soil erosion in irrigation canals, siltation in natural springs and deforestation.

### **3.1.4.2 Livestock production**

Livestock production is also an integral part of the farming system in the area. The number and major types of livestock reared in the area are described in Table 6.

Grazing land management was the second problematic resource in the area, and high livestock numbers, illegal use of land for crop and settlement areas, and poor quality pasture were some of the causes of the problem. According to farmers, such a problem leads to a high incidence of livestock disease, and associated poor productivity and low traction power. For details see the cause-effect relationship matrix in Table 8.

**Table 6:** Major types and number of livestock in Woynma Abaye kebele as of 2008

<b>Breed type</b>	<b>Animal type</b>	<b>Animal numbers</b>
<b>Cattle</b>	<b>Ox</b>	<b>2,418</b>
	<b>Cow</b>	<b>1,050</b>
	<b>Heifer</b>	<b>524</b>
	<b>Bull</b>	<b>1,650</b>
	<b>Calf</b>	<b>430</b>
<b>Equines</b>	<b>Horse</b>	<b>15</b>
	<b>Mule</b>	<b>18</b>
	<b>Donkey</b>	<b>250</b>
<b>Sheep and goats</b>	<b>Sheep</b>	<b>4,455</b>
	<b>Goat</b>	<b>463</b>
<b>Poultry</b>	<b>Local chicken</b>	<b>12,500</b>
<b>Bees</b>	<b>Modern bee colony</b>	<b>74</b>
	<b>Transitional colony</b>	<b>51</b>
	<b>Traditional colony</b>	<b>1,190</b>

### **3.1.4.3 Agricultural production constraints**

Agricultural production constraints of the *kebele* were identified by focus group discussions among participant farmers. The identified problems were prioritised using a pair wise ranking matrix to identify the most critical ones. Accordingly, as shown in Table 7, crop diseases and pests, the decline in soil fertility and increasing fertilizer prices were the priority problems of the area, in that order. The causes, effects, and possible solutions or best practices as perceived by the community are illustrated in Table 8.



Table 7: Pair wise matrix ranking of farmers’ agricultural problems in the Woyynima

See 1.3.6 for methodology

No.	List of Problems	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Score	Rank
1	Poor quality seed		2	1	4	5	6	7	8	1	10	11	12	13	14	15	16	2	16
2	Crop diseases and pests			2	2	2	2	2	2	2	2	2	2	2	2	2	2	15	1
3	Animal diseases				4	5	3	3	3	3	3	3	12	3	14	15	16	8+1	7
4	Unstable seed prices					5	6	7	8	9	10	11	12	13	14	15	16	2+1+1	14
5	Low productivity of local animal breeds						6	7	8	9	10	11	12	13	14	15	16	2+1	15
6	Shortage of improved animal breeds							6	8	6	10	11	12	13	14	15	16	5	12
7	Animal feed shortage								8	9	10	11	12	13	14	15	16	3	13
8	Decline in Soil fertility									8	8	8	8	8	8	8	8	13+1	2
9	Deforestation										10	9	12	9	14	9	9	7	9
10	Shortage of credit											10	12	10	14	15	16	8	8
11	Shortage of labour saving machinery												12	13	14	15	16	5+1	11
12	High fertilizer price													12	12	12	12	13	3
13	Marketing restrictions														14	15	16	6	10
14	Land shortage															14	14	12	4
15	Irrigation problems																15	10	5
16	Drinking water shortage																	9	6



**Table 8:** Agricultural production problems, causes, effects and suggested possible solutions or best practices in Woynima Ambaye *kebele*

No.	Problem	Causes	Effect	Possible solutions/ best practices
1	Poor quality seed	<ul style="list-style-type: none"> <li>- Poor quality seed supply, especially maize (affected by pest, mix of male and female, much damage)</li> <li>- Supply of locally un-adapted varieties</li> <li>- Absence of quality control</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction or total loss</li> </ul>	<ul style="list-style-type: none"> <li>- Develop seed quality control mechanisms for all of private, community and government suppliers</li> <li>- Increase community awareness in areas where community level seed multiplication is undertaken</li> <li>- Facilitate local level community seed multiplication and distribution</li> </ul>
2	Crop diseases and pests	<ul style="list-style-type: none"> <li>- Unknown</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction or total loss (pepper, potato, finger millet, wheat, teff and coffee)</li> </ul>	<ul style="list-style-type: none"> <li>- Technical support and monitoring from experts (undertake research work)</li> <li>- Supply of appropriate chemicals</li> <li>- Plantation of pepper in water drained soil *</li> <li>- Late planting (for wheat)*</li> <li>- Keep crop rotation (planting potato in a plot after 3 years of rotation )*</li> </ul>
3	Animal diseases	<ul style="list-style-type: none"> <li>- Absence of animal health post in the <i>kebele</i></li> <li>- Poor quality and shortage of livestock drinking water</li> </ul>	<ul style="list-style-type: none"> <li>- Increased animal mortality</li> <li>- Low productivity</li> </ul>	<ul style="list-style-type: none"> <li>- Assign permanent animal health technician for the <i>kebele</i></li> <li>- Production of sufficient feed for the animals</li> <li>- Decrease in number of herds</li> <li>- Maintain quality of water sources through</li> </ul>



No.	Problem	Causes	Effect	Possible solutions/ best practices
				community mobilisation
4	Unstable seed prices	<ul style="list-style-type: none"> <li>- Limited suppliers</li> <li>- High demand for improved seed due to decreasing farmers' practice of maintaining seed from their own plots</li> <li>- Absence of price regulation system (most of the time, seeds are provided by private suppliers who fix prices)</li> <li>- Government not involved in price regulation</li> </ul>	<ul style="list-style-type: none"> <li>- Poor and medium farmers cannot afford to buy and use improved seeds</li> </ul>	<ul style="list-style-type: none"> <li>- Local seed maintenance*</li> <li>- Government involvement in supply and price regulation</li> </ul>
5	Low productivity of local animal breeds	<ul style="list-style-type: none"> <li>- Poor husbandry system</li> <li>- Feed shortage</li> <li>- Lack of proper grazing land management</li> <li>- Diseases and parasites</li> </ul>	<ul style="list-style-type: none"> <li>- Low productivity</li> <li>- Low household income</li> </ul>	<ul style="list-style-type: none"> <li>- Enhance animal feed collection practice</li> <li>- Improve the management system</li> <li>- Keep improved animals(breeds)</li> <li>- Reduce the number of herds</li> </ul>
6	Shortage of improved animal breeds	Lack of supply (there is high demand but no response yet from suppliers)	<ul style="list-style-type: none"> <li>- Low animal productivity and household income</li> </ul>	<ul style="list-style-type: none"> <li>- Supply of improved animals by the government</li> </ul>
7	Animal feed shortage	<ul style="list-style-type: none"> <li>- Shortage of grazing land since former grazing areas are currently used for crop production and settlement</li> <li>- Native pasture species are not productive</li> <li>- Poor grazing land management practices (free grazing)</li> </ul>	<ul style="list-style-type: none"> <li>- Low productivity of animals</li> </ul>	<ul style="list-style-type: none"> <li>- Reduce free grazing</li> <li>- Improve management and use of communal grazing areas using rotation system***</li> <li>- Improve collection and storage of animal feed</li> </ul>





No.	Problem	Causes	Effect	Possible solutions/ best practices
		<ul style="list-style-type: none"> <li>- Increasing livestock population</li> <li>- Low crop residues (for animal feed) since crop yield and productivity decreased</li> <li>- Unavailability of industrial by-products for animal feed</li> </ul>		
8	Decline in soil fertility	<ul style="list-style-type: none"> <li>- Soil erosion (erosion control measures are not well practiced)</li> <li>- Nutrient cycling has decreased because crop residues and weeds are used for animal feed</li> <li>- Continuous use of inorganic fertilizer</li> <li>- Landslides and gully formation</li> </ul>	<ul style="list-style-type: none"> <li>- Low crop productivity</li> <li>- Natural springs dried out due to siltation</li> </ul>	<ul style="list-style-type: none"> <li>- Doing NRM practices every year (afforestation programme on damaged and marginal lands),</li> <li>- Enhance compost preparation and use</li> <li>- Terracing and production of forage crops on the terraces***</li> </ul>
9	Deforestation	<ul style="list-style-type: none"> <li>- Use of natural forests for charcoal, fuel wood and crop land</li> <li>- Absence of sense of ownership (individuals give priority to personal benefit not for community and long term effect)</li> <li>- Shortage of crop land due to high population pressure</li> <li>- Lack of awareness</li> </ul>	<ul style="list-style-type: none"> <li>- Climate change</li> <li>- Drying out of natural springs</li> <li>- Decline in soil fertility</li> <li>- Low productivity of grazing pasture areas</li> </ul>	<ul style="list-style-type: none"> <li>- Enhance natural resource management practices through community mobilisation (hire guard for the protected area and use cut and carry system, selling off grass for the community at minimum price and pay salary to the guard)*</li> <li>- Enhance community awareness</li> <li>- Facilitate diffusion and use of fuel wood saving technologies</li> </ul>
10	Shortage of credit	<ul style="list-style-type: none"> <li>- The maximum amount of credit supplied is too small</li> </ul>	<ul style="list-style-type: none"> <li>- No involvement in profitable activities</li> </ul>	<ul style="list-style-type: none"> <li>- Improve upper limit of amount of credit given</li> </ul>



No.	Problem	Causes	Effect	Possible solutions/ best practices
		- Short repayment periods		- Provide long term credit
11	Shortage of labour saving machinery	- Lack of supply	- Waste of time and effort	- Supply of machinery by the government
12	Fertilizer price increased	- Not produced in Ethiopia - Long marketing chain	- Unable to use the recommended amount - Low crop productivity - Female headed households could not give their land in the form of shared in land	- Government should decrease its price - Use of compost - Reduce the amount of fertilizer used
13	Marketing restrictions	- High commodity price - Low agricultural product price - Low bargaining power of farmers - Selling of produce during harvesting time for loan repayment - Market restriction	- Low product price and household income (low profit margin) - Over exploited by traders	- Government involvement in crop price determination
14	Land shortage (especially for young farmers)	- High population pressure - Absence of periodic land distribution mechanism (some people have high amount of land obtained from their relatives who leave the area or die) - Inability of young farmers to work in groups	- Poverty - Social crisis (young farmers need a piece of land from their family, highly dependent on their family, leave their wives and children and move to low land investment areas where they may be exposed to malaria)	- Re-distribute low land investment areas from unproductive investors to young farmers - Shares in/ rented in land from female headed and other households - Engage in livestock fattening practice - Production of market oriented commodities



No.	Problem	Causes	Effect	Possible solutions/ best practices
				<ul style="list-style-type: none"> <li>- Government should identify resettlement areas for landless youth</li> </ul>
15	Irrigation problems	<ul style="list-style-type: none"> <li>- Shortage of water (farmers plant eucalyptus beside irrigation infrastructure)</li> <li>- Improper water use (overflow, over use)</li> <li>- Inadequate traditional irrigation system</li> <li>- Poor water management and administration system</li> </ul>	<ul style="list-style-type: none"> <li>- Low productivity</li> <li>- Wastage of water</li> </ul>	<ul style="list-style-type: none"> <li>- Natural resource management</li> <li>- Capacity building for water association members</li> <li>- Construction of modern irrigation system</li> </ul>
16	Drinking water shortage	<ul style="list-style-type: none"> <li>- Availability of limited water points</li> <li>- High population</li> <li>- Drying out of natural springs</li> <li>- Poor management and pollution of water sources</li> <li>- Inability to dig out underground water manually due to deep water table and rocky substrate</li> </ul>	<ul style="list-style-type: none"> <li>- Prevalence of water borne diseases</li> <li>- Waste of women's time in water collection</li> </ul>	<ul style="list-style-type: none"> <li>- -</li> </ul>

\*Best practice



### 3.2. Wadra kebele

Wadra Gendeba *kebele* is the second target or intervention area in Burie Zuria *woreda*, located 6 km south-west of Burie, the capital of the district. It has total area of 1,968 ha and 729 household heads. The average cultivated land holding size per household is thus 2.7 ha. Most of the topography of the area is a relatively flat plain which covers 90% of the area, and the remaining 10% is mountainous. Agro-ecologically, the area is mid altitude or *weyna dega*.

#### 3.2.1. Environmental Conditions

As in other rural areas, the major land use types of the area are crop land, forest land, grazing land, and institution and settlement areas. By far the highest proportion of the area, 1,662 ha (84.5%), is allocated to cultivated land (crop production). Grazing land covers 228 ha (11.6%). For details see table 9 and figure 7.

Table 9: Land use types, amount of area and proportion in Wadra Gendeba kebele

Land use type	Amount of area (ha)	Proportion (%)
Arable land	1,662	84.5
Grazing land	228	11.6
Forest	21	1.1
Natural	1	(0.1)
Artificial	20	(1.0)
Bush land	32	1.6
Settlement and institutions	20	1.0
Unproductive	5	0.3

<b>Total</b>	<b>1,968</b>	<b>100</b>
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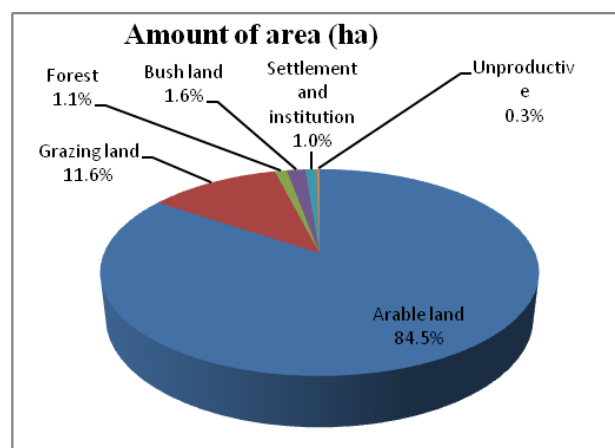


Figure 7: land use types in Wadra Gendeba kebele

There is a variety of different resources in the area including arable land, grazing land, forestry plantations, seasonal and permanent rivers and natural springs (Figure 8). Although there is a problem of inefficient land use and management, grazing land was mentioned as an abundant resource in the area. The reverse was reported to be true of all other resources. As in the other *kebeles*, scarcity of cultivated land is especially severe among young farmers. Arable land and irrigation water were pointed out as problematic resources whose scarcity causes conflict in the community. Illegal expansion of crop land is also a continuing problem.

According to the information obtained from PRA participant farmers, there is no equal access to land in the area. Elder farm householders have better land access than young people. Land redistribution was implemented in 1997



but there has been no redistribution since. During the distribution period, cultivated land was distributed on the basis of family size. Young farmers without families did not get land, and as a result many young people are landless. They are trying to base their livelihoods on rented land, on sharing land with female headed households, and on working for farmers who are short of labour. There is, however, no difference among different gender and wealth groups in access to land. All the land is not equally fertile. A land distribution committee was organised by the community, facilitated by *woreda* experts. The land was categorised on the basis of its fertility status as very fertile *kelz* and less fertile *bork*. Then, those eligible to have land were allowed to draw lots from each category.

### **3.2.1.1 Forest**

During the community resource mapping exercise, farmers identified nine natural and plantation forests. As shown on the map, forests are located on hillsides, along river banks, adjacent to grazing areas and around churches. Farmers mentioned deforestation as a cause of the soil erosion, gully formation and decreasing soil fertility problems they are suffering. They also identified illegal charcoal production, expansion of crop land, limited sense of ownership and lack of awareness as causes of forest degradation in their locality. Community forest management and *kebele* administration involvement in conservation of such forests is very weak, and farmers recommended strengthening of community natural resource management through awareness raising and benefit sharing.

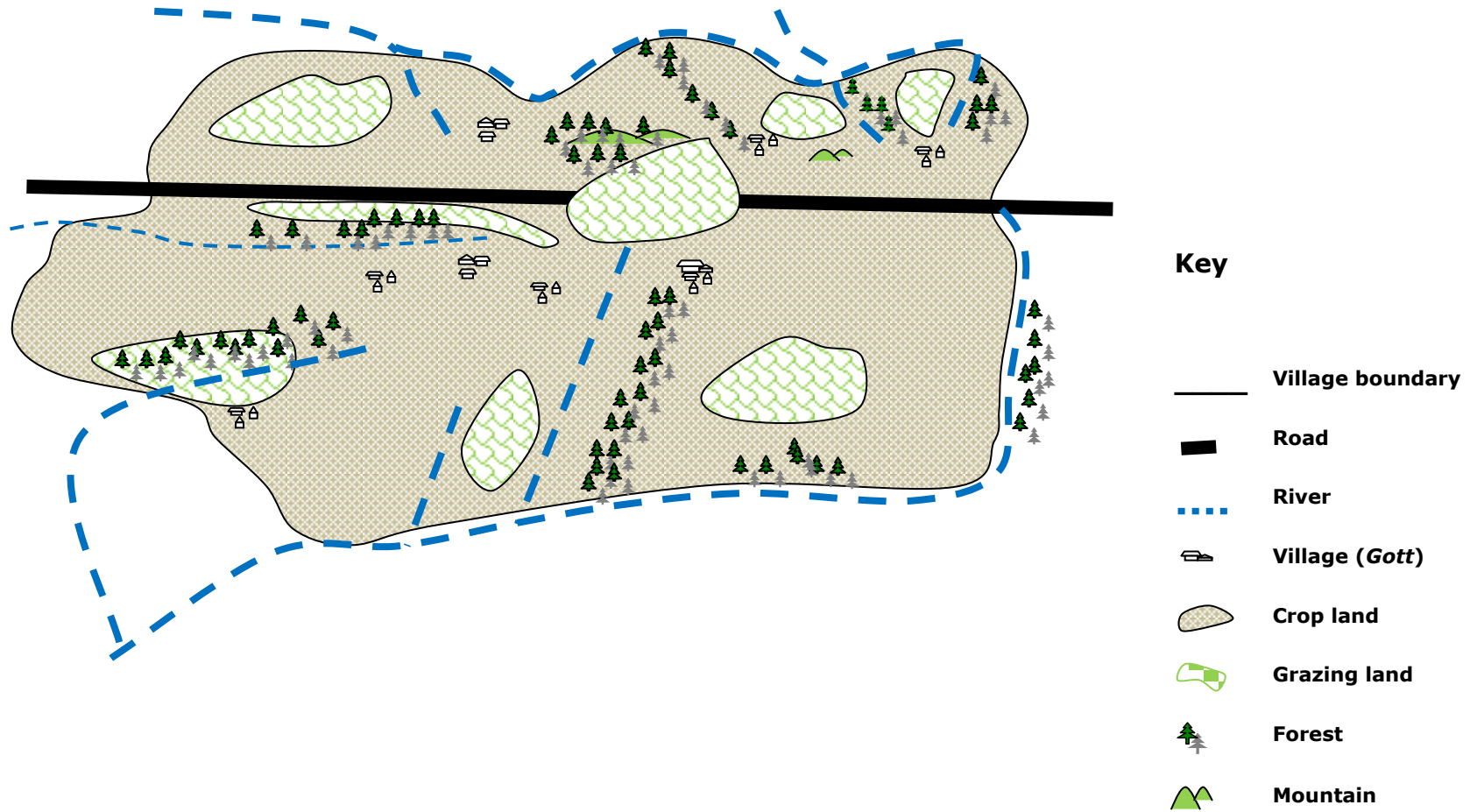


Figure 8: Wadra kebele resource mapping



### 3.2.1.2 Soil

Three major soil types were identified; red, brown and black (Figure 9). The major crops grown, constraints and opportunities associated with each soil type are presented in table 10. Black soil covers the highest land area which consists of 50% followed by 40% red and 10% brown. Focus group discussion participant farmers indicated that red soil is highly preferred with its potential to grow varied types of crops, ease of ploughing, high productivity and relative fertility compared with the other types.

**Table 10:** Major soil types, their constraints and opportunities

Major soil types	Proportion (%)	Major crops grown	Constraints	Opportunities
<b>Red</b>	40	Maize, finger millet, teff, wheat, pepper, potato, barley, faba bean	<ul style="list-style-type: none"> <li>- Less water holding capacity</li> <li>- Easily eroded by runoff</li> </ul>	<ul style="list-style-type: none"> <li>- Able to grow varied crop types</li> <li>- Easy to plough</li> <li>- Productive</li> </ul>
<b>Brown</b>	10	Onion, faba bean, wheat, field pea, barley	<ul style="list-style-type: none"> <li>- Soil acidity</li> <li>- Able to grow limited crops</li> <li>- Susceptible to soil erosion</li> <li>- Drought prone (No yield when there is shortage of rainfall)</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for the production of vegetables and fruit</li> <li>- Not affected by water lodging problem</li> <li>- Good for pulse production</li> </ul>
<b>Black</b>	50	Teff, chick pea, grass pea, wheat, Niger seed	<ul style="list-style-type: none"> <li>- Soil erosion (landslides)</li> <li>- High Soil cracking</li> <li>- Ploughing difficulty during excess moisture and dry season</li> <li>- Low productivity</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable for double cropping (barley-chick pea or chick pea- onion)</li> </ul>

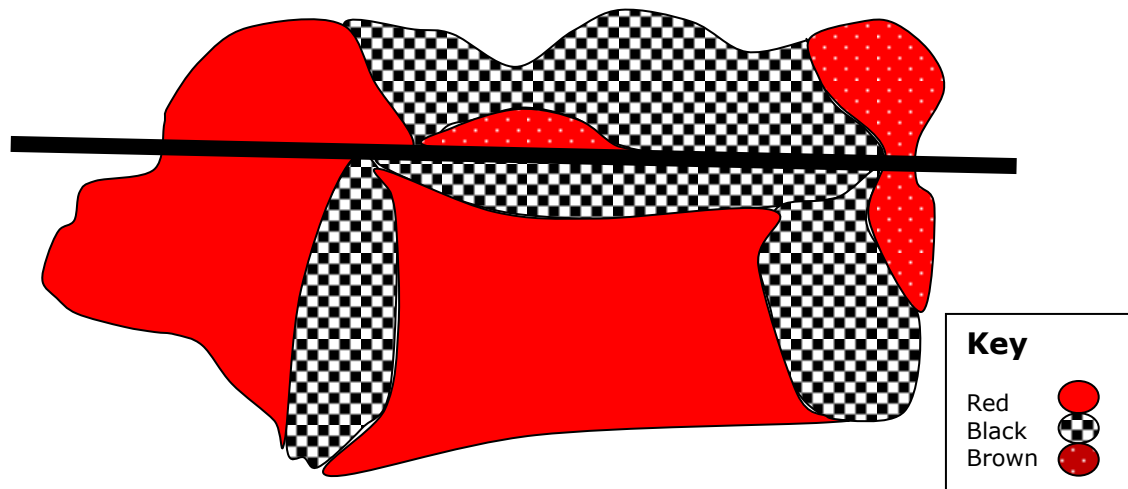


Figure 9: Soil map of Wadra kebele

### 3.2.1.3 Water

The information collected was similar to data presented for Woynima Ambaye kebele (above).

### 3.2.1.4 Fuel wood

Source and collection responsibility of fuel wood is identical to Woynima Ambaye kebele.

### 3.2.1.5 Environmental constraints

Climate change, illegal charcoal production, the inability to replant trees to substitute those that have been cut, and free grazing were mentioned as environmental constraints. Farmers expressed their perception of climate change from the prevailing irregular rainfall pattern and high temperatures. Farmers also mentioned that pulses were out of production, and this is a clear climate change indicator.





### **3.2.2. Socio-economic conditions**

#### **3.2.2.1 Demographic characteristics**

Wadra Gendeba *kebele* has a total of 794 households (702 male and 92 female headed) and a total population of 5,326 out of which 2,695 are male and 2,631 female (Wadra Gendeba *kebele* FTC, 2011). It consists of 8 villages (*Gott*) (Figure 10). Currently, average farm household size of the *kebele* is 6.7. Focus group discussion participant farmers clearly indicated during social mapping that the trend in population is increasing. Many reasons were identified for the increasing trend. These are increasing number of young people, and limited awareness and misperceptions about contraceptives. Many women stopped using contraceptive methods when the medicine they took caused health complications. The number of farm households is thus also increasing. Orthodox Christianity is the only religion and Amhara is the sole ethnicity in the *kebele*. All community members live together in the same area irrespective of their gender and wealth status.

#### **3.2.2.2 Sources of income**

Crop and livestock production are the main sources of livelihood and occupation, and sales of crops and livestock are the main source of income. According to the information obtained from the wealth ranking exercise, there are few farmers who have additional income sources. Three categories of wealth strata and criteria for each stratum were identified (Table 11).



Table 11: Wealth category and criteria in Wadra Gendeba kebele

Wealth criteria	Wealth Category/ Strata		
	Rich	Medium	Poor
<b>Number of plough oxen</b>	2 - 4	2	<=1
<b>Amount of land</b>	6-12 timad	4-6 timad	<4 timad
<b>Number of animals</b>	Cow, horse, sheep, donkey, horse poultry	May have similar types of animals as rich groups	Small number of sheep and poultry
<b>Additional income source</b>	Grain miller, animal pulled cart, house in nearby urban centre, livestock fattening	Sometimes animal pulled cart	None
<b>Type and size of house</b>	>80 corrugated sheet house with separate human and livestock house	40-60  The same house but there is partition for human and livestock	<40  Both human and livestock live together
<b>Credit</b>	Do not borrow	Borrow	Borrow
<b>Time of loan repayment</b>		Pay on time	Delayed for sometime

### 3.2.2.3 Sources of finance and supply of inputs

Amhara Credit and Saving Institution and primary farmers' cooperatives were mentioned as the main sources of credit. The former has been providing credit in the form of cash using group assets as collateral. The cash obtained is mainly used for purchasing of inputs such as fertilizer, herbicide and pesticide, improved seed and sometimes for the wages of daily labour. Farmers consider the organisation as the most important in solving their financial deficits. However, farmers need some improvements in interest rates, timing of loan repayments, the upper credit limit and group collateral. According to farmers, the interest rate is currently 18% and they are obliged to repay the loan during harvest time. The upper limit of credit given to an individual farmer is 3000 Birr (112 euro), which is considered inadequate. Farmers who do not own land, especially young farmers and those who have fewer resources, have a lower chance of getting into a group to claim credit, since group members will not trust their potential to repay the loan.

Farmers' cooperatives are the main source of varied input types, on the basis of both cash and credit. Farmers obtain fertilizer on the basis of both cash and half credit. Farmers strongly consider delayed supply of input, particularly fertilizer, both in time and place, to be a chronic problem.

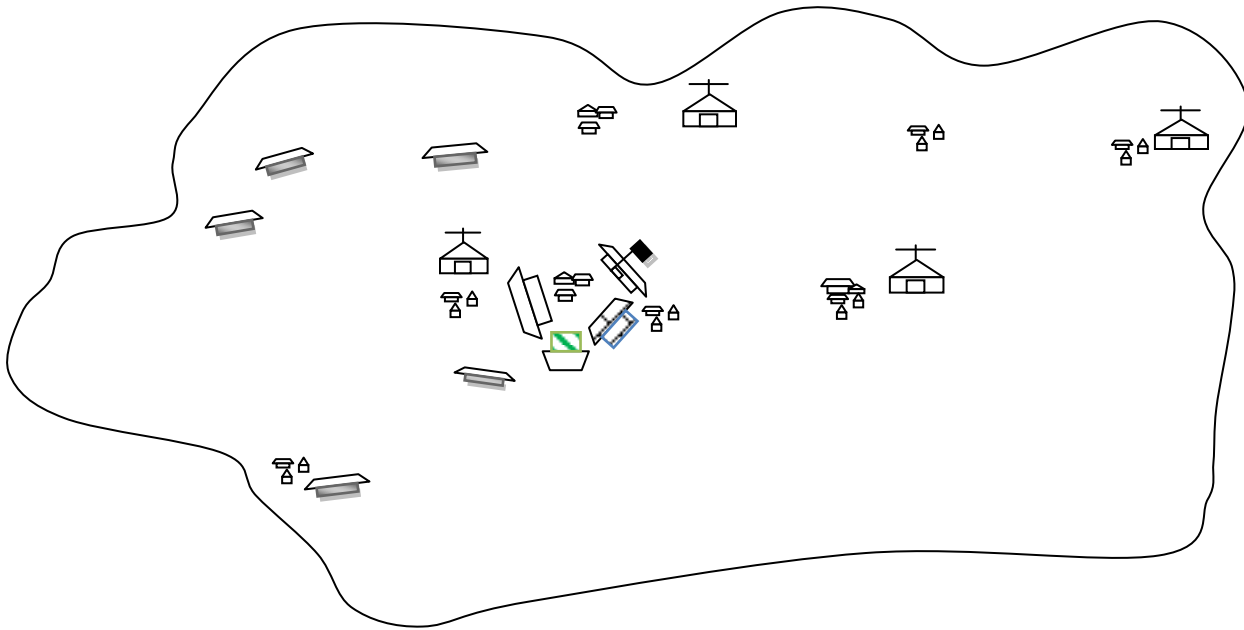


### 3.2.2.4 Marketing

According to farmers, there is no market place in the *kebele*. The market is located in another nearby *kebele* and *woreda* capital, Burie. The average amount of time required to reach the market place is estimated to be 40-80 minutes on foot. Even though there is an all-weather road that crosses and connects the *kebele* to both market places, there is no access to transport. Farmers transport produce by carrying it themselves or by using draught animals. Farmers also described the absence of any responsible body who supplied market information. Farmers get information from other farmers who have access to mobile telephones or who live in those market areas.

### 3.2.3. Actor landscape

Many public or community organisations were identified as providing social services in the *kebele*. As shown in the community social map (Figure 10) most of them are clustered in a single location. All are concentrated in one place, and adjacent to the main all-weather roads that cross the *kebele*. In the area there are two schools, four Ethiopian Orthodox Churches, one health extension post, five private grain mills, one private nursery site, the FTC, a *kebele* administration, and a community police office. However, there is no farmers' cooperative, animal health centre or market place in the *kebele*. Farmers explained that they get these services from a nearby *kebele*. The reason is that, according to the government cooperative or market place establishment, the number of farm households is not sufficient to support these services in the *kebele* itself.










Key	
	<b>Village (Gott)</b>
	<b>Church</b>
	<b>School</b>
	<b>Plant nursery</b>
	<b>Private grain mill</b>
	<b>Health extension post</b>
	<b>Administrative and police office</b>

Figure 10: Wadra kebele social mapping

Altogether, 21 formal and informal institutions or farmers groups working in or with the community were identified by farmers. All community groups are beneficiaries of services rendered by these institutions. However, women’s affairs and the youth club are serving only women and young peopel respectively. A full list of organisations with the role and responsibility they play is presented. By using a Venn diagram (Figure 11), a group of both men and women farmers showed the importance of these institutions by placing them inside or outside a big circle representing the community, at varying distances from the centre. The most important ones were placed inside the big circle, and the closer the institution is placed to the centre, the more important it is.

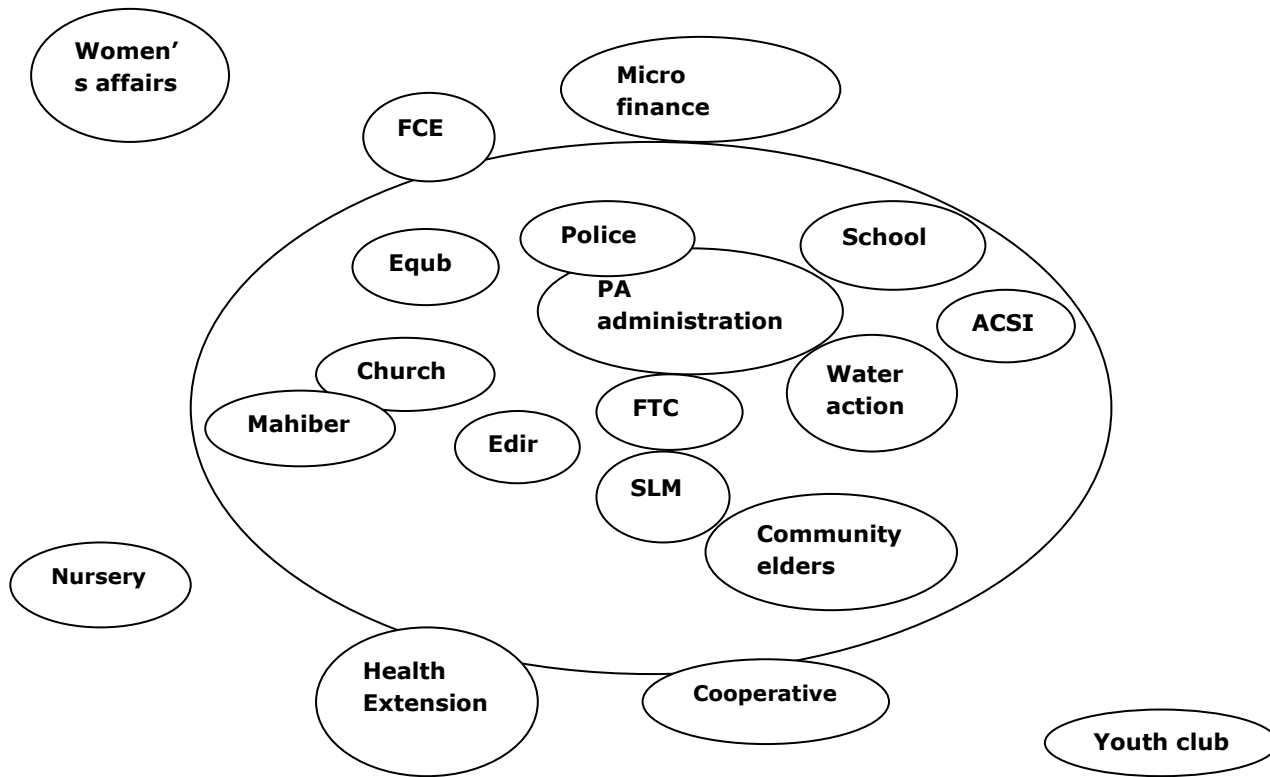


Figure 11: Venn diagram of institutions in Wadra Gendeba kebele

Most of the institutions work in collaboration with the *kebele* administration. For example, the community police, schools, FTC, water action, FCE, cooperatives, ACSI and SLM (sustainable land management) project work closely with PA administration. FTC also works together with the SLM project, cooperative and church. *Woreda* offices of agriculture, FTC, FCE and the water action project have been working directly or indirectly to address household food security and nutrition issues.

### 3.2.4. Agricultural production conditions

Like the other *kebeles*, farmers in the area have been practicing a mixed crop-livestock farming system. Crop production is the main means of livelihood, where a majority of the households allocated most of their land to crops and the rest to livestock.

#### 3.2.4.1 Crop production



Maize, bread wheat, teff, pepper, finger millet, potato, haricot bean, vegetables and fruit are grown in this area. Maize is the principal crop and it covers the highest portion of the total crop land. Farmers mainly grow it for household consumption. Information obtained from farmers shows that among the crops grown in the area, pepper and bread wheat serve as the major cash crops to the community. However, such cash crops have very recently been devastated by various diseases and pests. Farmers particularly emphasised the pepper disease and pest problem, and described high fertilizer prices and the rising cost of seed, poor seed quality, soil erosion, and declining soil fertility as the main problems affecting their crop production and productivity (Tables 13 and 14).

### 3.2.4.2 Livestock production

According to secondary information obtained from Wadra Gendeba *kebele* FTC, 2011, 2,886 cattle, 160 goats, 1,640 sheep, 1,376 poultry, and 364 donkeys, are available in the *kebele* (Table 12). Cattle and sheep are the principal livestock types in the area. Even though livestock production is an integral part of the farming system, farmers are not benefiting from their livestock resources. Many problems were described by the farmers, the worst of which is livestock disease. There is no veterinary service centre in the area and they have to go to other *kebeles* to get the service. In such service centres there is a shortage of drugs and insufficient manpower to deliver an efficient service. Farmers also described how the shortage and poor quality of livestock drinking water aggravates the prevailing animal disease in the area. Feed shortage was mentioned as a second problem. All the areas where livestock are reared are over-grazed. The amount of crop residue available as animal food has decreased following the decline in soil fertility, so that it is not sufficient to feed the increasing livestock population. Finally, an absence of improved animal breeds was also a problem in the area.

**Table 12: Livestock number of Wadra kebele as of 2011**

Breed type	Animal type	Number
Cattle	Ox	1,165
	Cow	695
	Heifer	290
	Bull	264
	Calf	472
Equines	Horse	-
	Mule	2
	Donkey	364
Sheep and goats	Sheep	1,640
	Goat	160
Poultry	Local chicken	1,376
Bees	Modern bee colony	85
	Transitional colony	-
	Traditional colony	670

### 3.2.4.3 Agricultural production constraints

During the problem ranking matrix exercise, many problems were identified and prioritised by farmers (Table 13). Declining soil fertility, shortage of land (especially for young people), high fertilizer prices, deforestation, and crop diseases and pests were the major problems ranked top in their order of priority. The causes, effects and suggested solutions or best practices are presented in Table 14.



Table 13: Pair wise matrix ranking of farmers’ agricultural problems in Wadra

No.	Problem list	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Score	Rank
1	Marketing problem		2	3	4	5	1	7	1	1	1	1	1	13	14	15	1	1	8+1	8
2	High fertilizer price			2	2	2	2	2	2	2	2	2	2	13	14	2	2	2	14+1	3
3	Soil erosion /Gully formation				3	3	3	7	3	3	3	3	3	13	14	15	3	3	11	6
4	Drinking water problem					4	4	7	4	4	4	4	4	13	14	15	4	4	10	7
5	Irrigation problem						6	7	8	5	10	11	12	13	14	15	5	5	4+1	13
6	Poor seed quality and high price							7	6	6	6	11	6	13	14	15	6	6	7	10
7	Crop diseases and pests								7	7	7	7	7	13	14	15	7	7	12	5
8	Shortage of farm machinery									8	8	11	12	13	14	15	8	8	5	12
9	Input supply problems										9	11	12	13	14	15	16	9	2+1	15
10	Animal diseases											11	12	13	14	15	16	10	2	16
11	Poor grazing pasture management and use												11	13	14	15	11	11	8	9
12	Shortage of improved animal breeds													13	14	15	16	12	5+1	11
13	Shortage of land (young farmers)														14	15	13	13	14+1+1	2
14	Declining soil fertility															14	14	14	16	1
15	Deforestation																15	15	14	4
16	Women’s work overload																	16	4	14
17	Shortage of credit																		0	17





**Table 14:** Agricultural production problems, causes, effects and suggested solutions or best practices in Wadra Gendeba kebele

<b>No.</b>	<b>Problem</b>	<b>Causes</b>	<b>Effects</b>	<b>Suggested solution (best practices)</b>
1	Marketing problem	<ul style="list-style-type: none"> <li>- Loan repayment period is during harvest time</li> <li>- The rural market is monopolised by few traders (few traders fix market price)</li> <li>- Low market price</li> <li>- High industrial commodity price</li> <li>- Absence and weakness of cooperatives</li> <li>- Increased exchange rate and fuel price</li> <li>- Market restriction</li> </ul>	<ul style="list-style-type: none"> <li>- Low income</li> <li>- Exposed to high credit since the price of fertilizer is increased</li> <li>- High poverty</li> </ul>	<ul style="list-style-type: none"> <li>- Strengthening primary farmers cooperatives</li> <li>- Enhance agricultural product export</li> <li>- Avoid market restriction</li> </ul>
2	Increased fertilizer price	<ul style="list-style-type: none"> <li>- High exchange rate</li> <li>- Absence of domestic production</li> <li>- High variable cost due to long market chain</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction</li> </ul>	<ul style="list-style-type: none"> <li>- Domestic production</li> <li>- Use of compost</li> <li>- Subsidy</li> </ul>
3	Gully formation / soil erosion	<ul style="list-style-type: none"> <li>- Free grazing</li> <li>- Method of ploughing (ploughing along the slope)</li> <li>- Mismanagement of natural resources</li> </ul>	<ul style="list-style-type: none"> <li>- Degradation of crop lands</li> <li>- Low crop productivity</li> <li>- Complicates movement of both people and livestock</li> </ul>	<ul style="list-style-type: none"> <li>- Natural resource management (soil and water conservation structures)</li> <li>- Follow proper ploughing technique</li> </ul>
4	Drinking water shortage	<ul style="list-style-type: none"> <li>- Deforestation</li> </ul>	<ul style="list-style-type: none"> <li>- Water shortage</li> </ul>	<ul style="list-style-type: none"> <li>- Forest conservation and management</li> </ul>



No.	Problem	Causes	Effects	Suggested solution (best practices)
		<ul style="list-style-type: none"> <li>- Drying out of natural springs and rivers</li> <li>- Shortage of rainfall</li> <li>- Lack of proper management(use of drinking water for irrigation in the upper catchment)</li> <li>- Shortage of drinking water</li> </ul>	<ul style="list-style-type: none"> <li>- Poor drinking water quality</li> <li>- Prevalence of water borne disease</li> <li>- Wastage of women's time and effort due to longer travelling distance</li> </ul>	<ul style="list-style-type: none"> <li>- Government intervention in developing clean water points</li> </ul>
5	Irrigation problem	<ul style="list-style-type: none"> <li>- Water shortage</li> <li>- Traditional irrigation scheme</li> <li>- Landslide (since the soil is clay)</li> </ul>	<ul style="list-style-type: none"> <li>- Low household income</li> </ul>	<ul style="list-style-type: none"> <li>- Build modern irrigation scheme</li> <li>- Use of groundwater</li> </ul>
6	Poor quality and high price of seed	<ul style="list-style-type: none"> <li>- supplying poor quality seed</li> <li>- High seed price</li> <li>- Lack of quality control on seed supply enterprises</li> <li>- Lack of locally adaptive and highly productive varieties</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction</li> </ul>	<ul style="list-style-type: none"> <li>- Demonstrate new improved varieties</li> <li>- Facilitate supply of certified seeds only</li> <li>- Set quality control mechanism</li> </ul>
7	Crop disease and pest	<ul style="list-style-type: none"> <li>- Decreased soil fertility</li> <li>- Low crop rotation due to shortage of crop land</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction and total loss</li> </ul>	<ul style="list-style-type: none"> <li>- Soil testing (research)</li> <li>- Crop rotation</li> <li>- Site cleaning and management</li> <li>- Follow appropriate time and frequency of ploughing</li> <li>- Use of chemical spray</li> </ul>



No.	Problem	Causes	Effects	Suggested solution (best practices)
8	Shortage of improved farm machinery	<ul style="list-style-type: none"> <li>- Absence of supply</li> </ul>	<ul style="list-style-type: none"> <li>- Wastage of time and effort (compost preparation and application)</li> <li>- High labour requirement</li> </ul>	<ul style="list-style-type: none"> <li>- Facilitate the supply through cooperatives</li> </ul>
9	Input supply problems	<ul style="list-style-type: none"> <li>- Absence of cooperative (located far from the <i>kebele</i>)</li> <li>- Absence of timely supply</li> <li>- Cooperative workers are not cooperative or responsible (lack competency)</li> </ul>	<ul style="list-style-type: none"> <li>- Late planting and application of fertilizer</li> <li>- Yield reduction</li> </ul>	<ul style="list-style-type: none"> <li>- Organise farmers primary cooperatives</li> </ul>
10	Animal diseases	<ul style="list-style-type: none"> <li>- Free grazing</li> <li>- Poor feed and drinking water quality</li> <li>- Lack of proper grazing land management</li> <li>- High livestock population</li> <li>- Shortage of grazing land (used for crop land)</li> </ul>	<ul style="list-style-type: none"> <li>- Low animal productivity</li> <li>- Increased calving interval</li> <li>- Animal mortality</li> </ul>	<ul style="list-style-type: none"> <li>- Reducing number of animals per household</li> <li>- Improve management practice</li> <li>- Use improved animal breeds</li> <li>- Enhance feed collection and storage</li> </ul>
11	Poor grazing pasture management and use	<ul style="list-style-type: none"> <li>- Competition of grazing land for cultivation</li> <li>- Free grazing and high stocking rate</li> <li>- Lack of community awareness and sense of ownership</li> <li>- Poor utilization and management</li> </ul>	<ul style="list-style-type: none"> <li>- Shortage of feed</li> <li>- Low pasture yield and animal productivity</li> <li>- Prevalence of animal disease</li> </ul>	<ul style="list-style-type: none"> <li>- Minimise free grazing and expand crop land</li> <li>- Destocking</li> <li>- Use grazing areas in rotation*</li> <li>- Close grazing areas and use cut and carry system</li> </ul>



No.	Problem	Causes	Effects	Suggested solution (best practices)
12	Shortage of improved animal breeds	<ul style="list-style-type: none"> <li>- Lack of supply</li> <li>- High price</li> </ul>	<ul style="list-style-type: none"> <li>- Low income</li> </ul>	<ul style="list-style-type: none"> <li>- Use of AI and breeding bulls</li> </ul>
13	Shortage of cultivated land (young farmers)	<ul style="list-style-type: none"> <li>- Shortage of cultivated land</li> <li>- High population pressure</li> </ul>	<ul style="list-style-type: none"> <li>- High vulnerability</li> <li>- Unemployment</li> <li>- Migration</li> <li>- Poverty</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of low land investment areas to young farmers</li> <li>- Organise landless youth and create jobs</li> </ul>
14	Declining soil fertility	<ul style="list-style-type: none"> <li>- Deforestation</li> <li>- Soil erosion</li> </ul>	<ul style="list-style-type: none"> <li>- Low crop yield</li> </ul>	<ul style="list-style-type: none"> <li>- Use of compost</li> <li>- Afforestation</li> <li>- Terracing</li> </ul>
15	Deforestation	<ul style="list-style-type: none"> <li>- Expansion of crop land</li> <li>- Illegal charcoal production</li> <li>- Shortage of fuel wood</li> </ul>	<ul style="list-style-type: none"> <li>- Climate change</li> <li>- Declining soil fertility and soil erosion</li> </ul>	<ul style="list-style-type: none"> <li>- Afforestation</li> </ul>
16	Workload of women	<ul style="list-style-type: none"> <li>- Bad culture</li> <li>- Lack of community awareness on gender division of labour</li> </ul>	<ul style="list-style-type: none"> <li>- Health problems</li> </ul>	<ul style="list-style-type: none"> <li>- Awareness raising and attitudinal change</li> </ul>
17	Shortage of Credit	<ul style="list-style-type: none"> <li>- The amount of credit supplied is inadequate for livestock production and fattening</li> <li>- Short loan repayment periods</li> </ul>	<ul style="list-style-type: none"> <li>- Low income</li> <li>- Inability to be involved in off farm activities</li> </ul>	<ul style="list-style-type: none"> <li>- Increasing the amount of credit delivered</li> <li>- Long repayment period</li> </ul>



### 3.3 Zalma kebele

Zalma *kebele* is located 15 km away from the capital of the *woreda*, Burie, in a south-westerly direction along the Burie-Wolega main road. It has flat (98%) and undulating (2%) landscapes. The area is well known for its crop production potential. The agro-ecology is fully mid altitude or *Woyna Dega*.

#### 3.3.1 Environmental conditions

The total area is around 4,250 ha, out of which the larger proportion, 64.7% (2,750ha) is allocated for both annual and perennial crop production (Table 15). The remaining area, as shown in figure 12, is shared between grazing land, forest, irrigation, and institutions and settlement.

Table 15: Land use pattern in Zalma kebele

Land use type	Amount of area(ha)	Proportion (%)
<b>Cultivated land</b>	2,750	64.7
<b>Forest land</b>	11	0.3
<b>Grazing land</b>	1,200	28.2
<b>Irrigation area</b>	20	0.5
<b>Institutions</b>	247	5.8
<b>Uncultivated</b>	22	0.5
<b>Total</b>	4,250	100

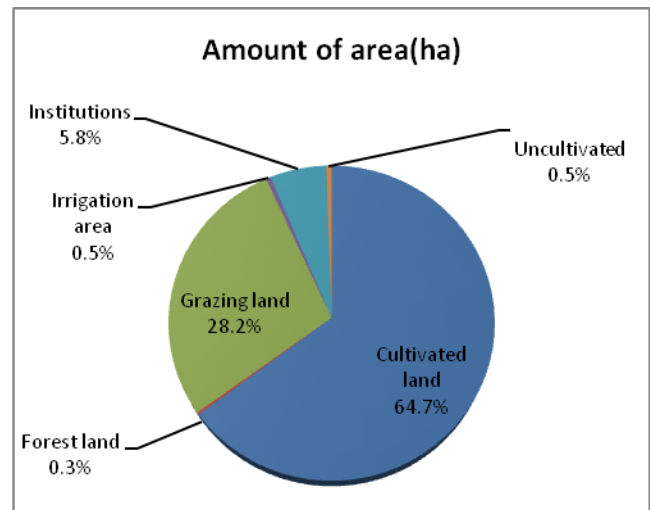


Figure 12: Land use type and proportion

Like the other *kebeles*, Zalma *kebele* is endowed with various natural resources, including crop land, forests, grazing land, and seasonal and permanent rivers (Figure 13). During the resource mapping exercise, farmers described scarcities of all the mentioned resources. Except for crop land, all the other resources are owned communally. Grazing land is a resource that creates conflict among the community. The conflict arises from expansion and mismanagement of crop land. The existing grazing areas are highly degraded and gullies have formed.

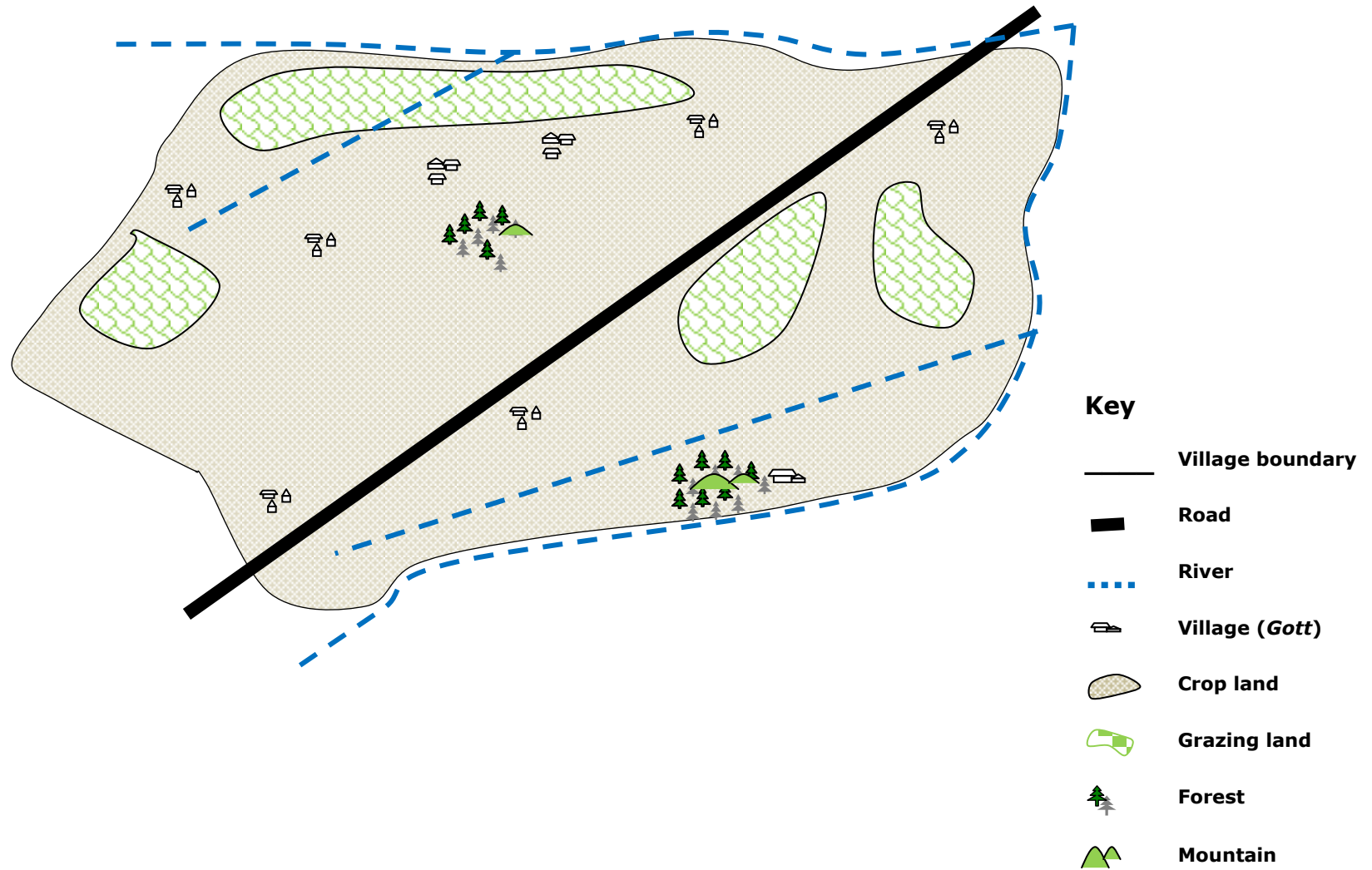


Figure 13: Zalma kebele resource mapping

### 3.3.1.1 Forests

As indicated in Table 15, there are 11 ha of forest areas which amount to only 0.3% of the total area. Such forests are located around churches and on hillsides. There is also farm forestry, although the type and number of species are limited.

### 3.3.1.2 Soil

As shown in community soil mapping, farmers identified two types of soil by colour (Figure 14). These are red (90%) and black (10%). All the areas with black soil are currently used as grazing areas and there is no crop land on black soil. Secondary information obtained from the *kebele* FTC differed from that of the farmers in showing the presence of three types of soil. According to them, the majority of the area has brown soil (95%) followed by black (3%) and red (2%). Declining soil fertility is a critical problem raised by the farmers. They consider that the fertility of their soil decreased after they started to use inorganic fertilizer.

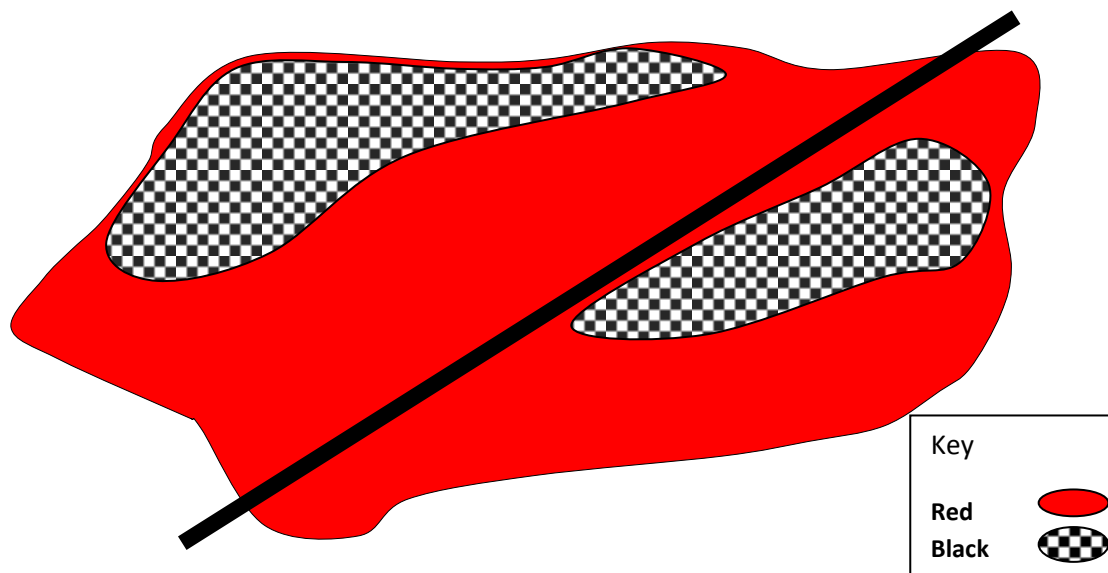


Figure 14: Zalma *kebele* soil map

### 3.3.1.3 Water

The sources of drinking water for people are communal hand-dug wells and natural springs. Springs and rivers are the main sources for livestock. Shortage of water during the dry season is a frequently occurring problem. At such times, the quality of water deteriorates and the occurrence of water borne disease is high. Even though the problem is serious, there is no community water management practice in the area. Water collection for household consumption is the responsibility of women and children. Farmers explained that in some villages of the *kebele*, women are expected to walk more than one and a half hours to fetch one pot of water. In some other villages, even though there is water very near to homesteads, they have to wait for more than 50 minutes to get water due to high population pressure.



#### **3.3.1.4 Fuel wood**

Fuel wood is collected or obtained from farmers' own plantations, including eucalyptus, and farm forests. Crop residues, particularly maize straw, are also used. The upper part of the stem is used for cattle feed and the lower part is collected for use as fuel. Both men and women are equally responsible in collection and transportation. At a small scale, children also participate in collection of cattle dung for fuel from communal grazing lands. Cattle dung collected from the homestead is mostly used for compost making.

### **3.3.2 Socio-economic conditions**

#### **3.3.2.1 Demographic characteristics**

Zalma *kebele* has a total population of 8,104 (4,093 male and 4,011 female) and 1,052 heads of households (914 male and 138 female). As can be seen from the community social map, there are eight different villages. The settlement pattern is a bit dispersed and following water sources and main road routes. Information obtained from farmers during the social mapping indicates an increasing population trend. The average household size is 7.7. The number of young people who get married and have children is increasing with time. There are misperceptions about contraceptives and women stop using them because of perceived health complications. Participant women farmers explained that women suffer from high work overload. Both the ethnicity and religion of the *kebele* is similar to the previous two *kebeles*.

#### **3.3.2.2 Sources of income and livelihood**

Farming is the main means of livelihood and farmers practice a mixed crop and livestock production system. Young farmers also work as daily labourers in nearby agricultural areas during the cropping season. Three wealth strata were identified (Table 16).





Table 16: Wealth category and criteria in Zalma kebele

Criteria for each Wealth category	Wealth category		
	Rich	Medium	Poor
Number of oxen plough	≥4	2	≤1
Amount of land	8-12 timad	6-8 timad	<4 timad
Size of house (No. of corrugated iron sheets)	80	50	30-40
Grain for household consumption	Own production	Will purchase occasionally	Will purchase
Credit	No	Will take but repay on time	Will take with delayed repayment time
Time of selling	When prices high (Aug- Sep)	Sell at all times	Sell at harvest time
Availability of additional assets	Animal pooled cart, house in nearby town, grain mill, perennial crops and fruits, water pump, large number of herds	Perennial crops and fruits, medium number of herds	Low number of small ruminants and poultry
Labour	Able to have hired labour	Family	Hired on other’s farm

### 3.3.2.3 Sources of finance and supply of inputs

The sources of finance and supply of agricultural inputs, and the problems in accessing such services are similar to the two *kebeles* described above.

### 3.3.2.4 Marketing

According to the farmers there is market place in the *kebele*. There is also an all-weather road that crosses and connects the *kebele* to other market places. Farmers carry their produce themselves, or use draught animals as a means of transport. Farmers described the absence of any responsible body who supplied market information. They get their information from other farmers who have access to mobile telephones, or live in those market areas. In general, marketing produce is a serious problem in the area because of the monopolistic nature of the market. Merchants and traders in the market places negotiate with each other to fix market prices. The farmers have no power to negotiate or keep track of high market prices.

### 3.3.3 Actor landscape

The community social map (figure 15) indicates the presence of many organisations providing social services. These are 4 public schools, 3 Ethiopian Orthodox Churches, and one each of health extension post, FTC, *kebele* administration, farmers’ cooperative, community police and market place. There is no animal health service centre in the area. All such organisations exist in one place *kebele* centre.

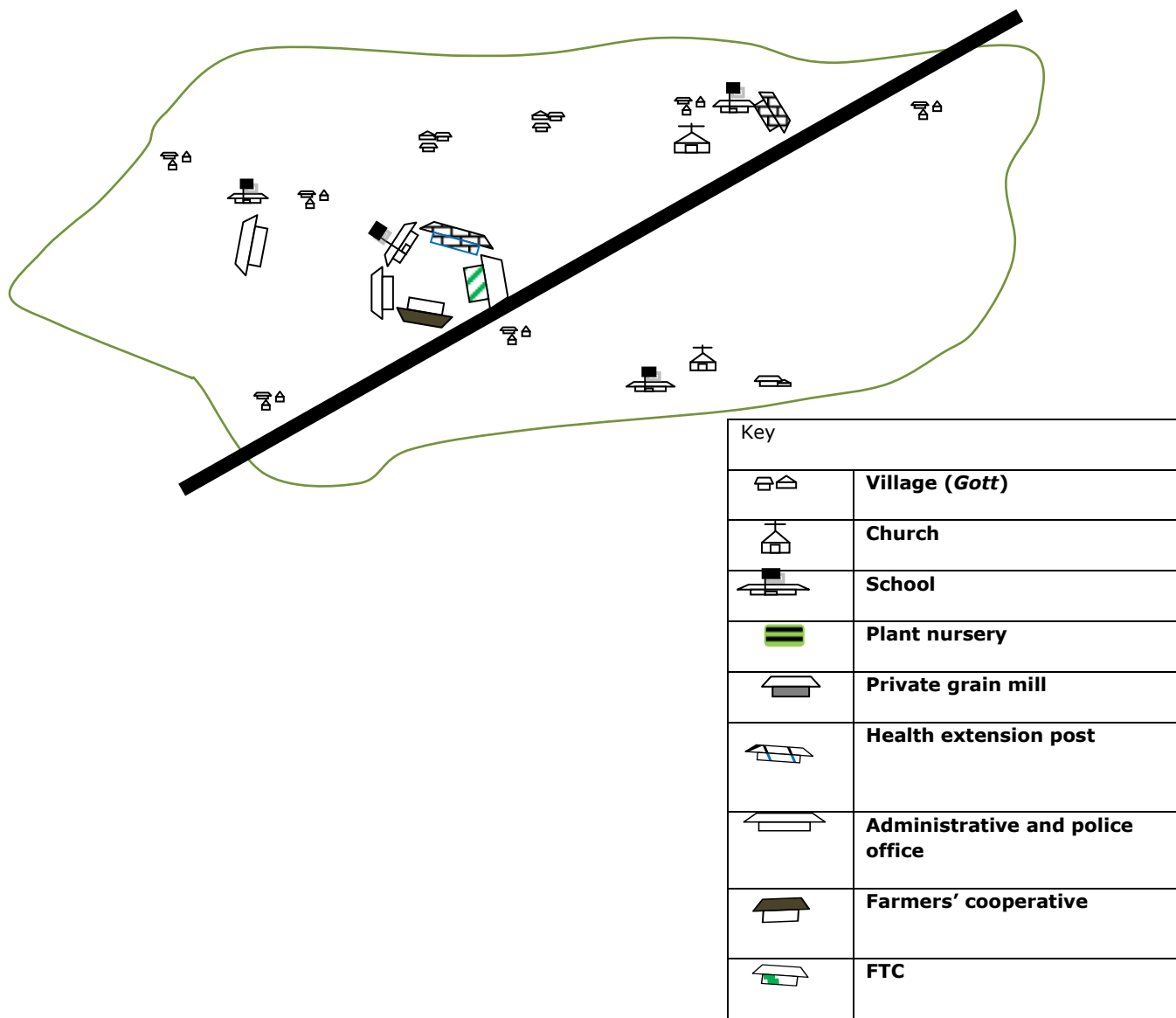


Figure 15: Zalma *kebele* social mapping

As indicated in the following Venn diagram (Figure 16), there are 14 formal and informal institutions and farmers’ groups working within the community. Except for womens’ affairs and the youth club all the other institutions are rendering service to all groups of the community. No one is excluded from receiving services from these organisations. As in the previous *kebeles*, the *woreda* office of agriculture, FTC and FCE project are meant to ensure food security of the area.



As for the other *kebeles*, farmers placed institutions that they consider important inside the circle and others outside the circle at various distances based on their perceived importance. The greater the distance from the circle, the less important the institution is considered to be. Among the identified institutions, the FTC, schools, ACSI, police, cooperative, FCE and SLM projects work closely with PA administration. Again, FTC has been working in cooperation with FCE and SLM projects and cooperatives.

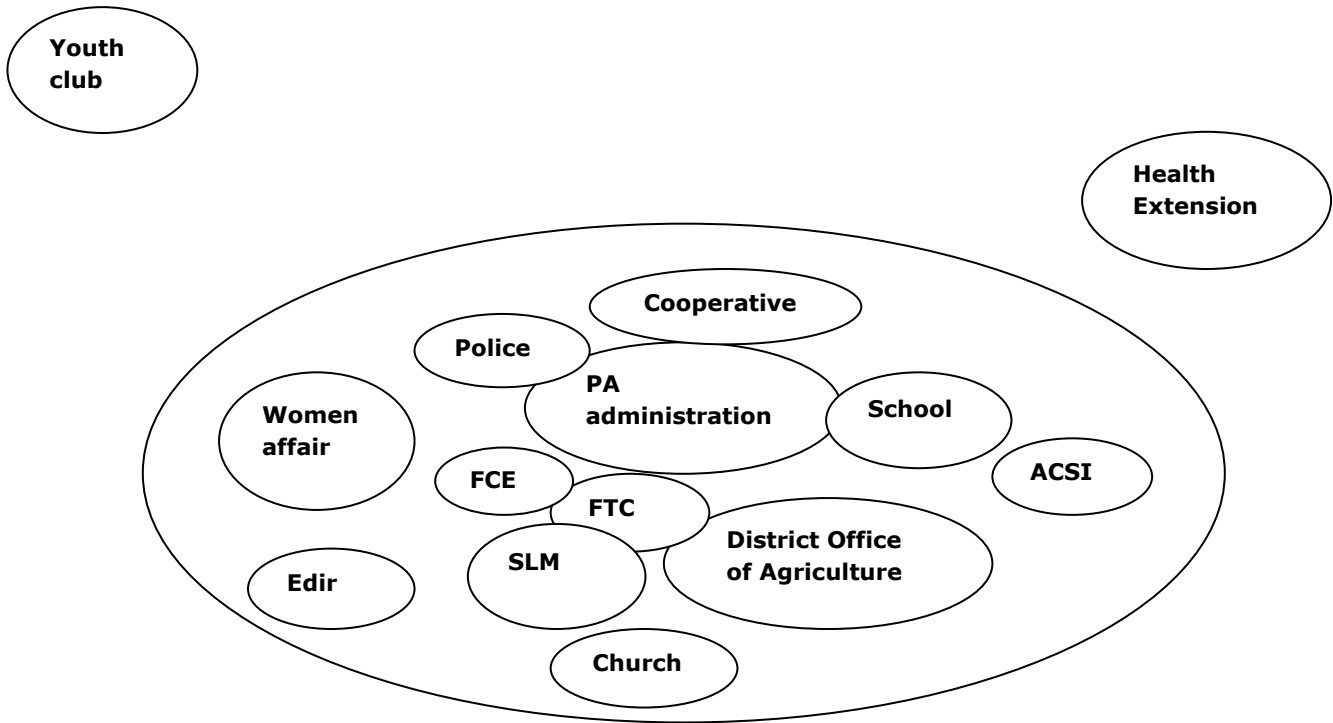


Figure 16: Actor landscape for Zalma kebele



### **3.3.4 Agricultural production conditions**

The area is characterised by its mixed crop-livestock production system.

#### **3.3.4.1 Crop production**

Major crops grown in the area include maize, wheat, pepper, finger millet and teff. Pepper and maize are the main cash crops. However, as farmers indicated, serious problems that affect production and productivity include crop diseases and pests, especially on pepper, maize and wheat, the limited supply of improved wheat and pepper seeds, irregular rainfall distribution (starts late and ends early), high fertilizer prices and low soil fertility (Tables 18 and 19). According to DAs in the *kebele*, the major crop diseases and pests include yellow rust, root rot, stem wilt, cut worm, stem borer and mites.

#### **3.3.4.2 Livestock production**

The livestock population was estimated to be 4,250 oxen, 2,359 cows, 968 donkeys, 1,585 sheep, and 2,300 local chickens (Table 17). The production system is traditional. Animals are kept for multiple purposes, supplying draught power, milk, meat, skin and hides. The manure from animals, particularly from cattle, serves as fuel and can also be used as fertilizer in the form of compost.

Natural pastures and crop residues are the major feed sources. Most natural pasture lands are overgrazed, degraded and suffer gully erosion. In addition to this, due to population growth, grazing pasture lands have been converted to crop land. Existing communal pasture lands are used by the community to produce animal feed, but no one is responsible for management of grazing on pasture lands. Due to these problems, animal feed supply from natural pastures is low in terms of quantity and quality throughout the year. Animal health (internal parasites and contagious diseases) is also a serious problem in the area. As a whole, feed shortage, grazing pasture problems, animal diseases, lack of improved animals and AI, and water supply problems are major difficulties associated with livestock production in the area (Tables 18 and 19).



Table 17: Type and number of livestock in Zalma kebele as of 2010

<b>Breed type</b>	<b>Animal type</b>	<b>Local breed</b>	<b>Cross breed</b>
<b>Cattle</b>	<b>Ox</b>	4,250	-
	<b>Cow</b>	2,359	1
	<b>Heifer</b>	600	-
	<b>Bull</b>	541	1
	<b>Calf</b>	891	1
<b>Equines</b>	<b>Horse</b>	-	
	<b>Mule</b>	170	
	<b>Donkey</b>	968	
<b>Sheep and goats</b>	<b>Sheep</b>	1,585	
	<b>Goat</b>	12	
<b>Poultry</b>	<b>Local chicken</b>	2,300	41
<b>Bees</b>	<b>Modern bee colony</b>	154	
	<b>Transitional colony</b>	8	
	<b>Traditional colony</b>	367	



**Table 18:** Pair wise matrix ranking of agricultural problems in Zalma kebele

No.	Problem	1	2	3	4	5	6	7	8	9	10	11	12	Score	Rank
1	Drinking water problem		2	1	4	1	1	1	1	9	10	11	1	6	6
2	Landless young farmers			2	2	2	2	2	2	2	2	2	2	11	1
3	Marketing problem				4	3	3	3	3	9	10	11	3	5	7
4	High fertilizer price					4	4	4	4	9	4	4	4	9	3
5	Grazing land problem						5	5	8	9	10	11	5	3	9
6	Limited credit supply for young farmers							6	8	9	10	11	6	2	10
7	Livestock feed shortage								8	9	10	11	7	1	11
8	Declining soil fertility									9	10	11	8	4	8
9	Crop diseases and pests										9	9	9	10	2
10	Animal diseases and veterinary shortage											10	10	8	4
11	Shortage of grain mills												11	7	5
12	Shortage of labour saving technology													0	12



**Table 19:** Agricultural production problems, causes, effects and suggested possible solutions or best practices in Zalma kebele

<b>No.</b>	<b>Problem</b>	<b>Causes</b>	<b>Effects</b>	<b>Suggested solutions</b>
<b>1</b>	<b>Drinking water</b>	<ul style="list-style-type: none"> <li>- Deforestation</li> <li>- Drying out of water sources</li> <li>- High human and livestock population</li> <li>- Absence of potable water</li> <li>- Poor water quality</li> <li>- Mismanagement of water sources</li> </ul>	<ul style="list-style-type: none"> <li>- High incidence of water borne disease</li> <li>- High medical costs</li> </ul>	<ul style="list-style-type: none"> <li>- Clean water supply</li> <li>- Supply of water treatment chemicals</li> <li>- Creation of community awareness</li> <li>- Community cost sharing to exploit groundwater *</li> </ul>
<b>2</b>	<b>Land shortage</b>	<ul style="list-style-type: none"> <li>- Absence of periodic land redistribution</li> <li>- Absence of employment opportunities in their locality</li> <li>- Inability to organise in groups</li> </ul>	<ul style="list-style-type: none"> <li>- Poverty</li> <li>- Migration</li> <li>- Joblessness</li> <li>- High dependency</li> </ul>	<ul style="list-style-type: none"> <li>- Abundant low land areas should be distributed to landless young farmers</li> </ul>
<b>3</b>	<b>Marketing problem</b>	<ul style="list-style-type: none"> <li>- High industrial commodity prices</li> <li>- Low agricultural commodity prices</li> </ul>	<ul style="list-style-type: none"> <li>- Less profitable agriculture</li> <li>- High household expenditure</li> </ul>	<ul style="list-style-type: none"> <li>- Government intervention in market stabilization</li> <li>- Facilitate supply of commodity through cooperatives</li> </ul>
<b>4</b>	<b>High fertilizer price</b>	<ul style="list-style-type: none"> <li>- Fertilizer imported from abroad</li> <li>- Absence of domestic production</li> <li>- High cost of transport and labour</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction</li> <li>- Low income</li> <li>- Necessity to sell high proportion of production</li> <li>- High expenditure</li> </ul>	<ul style="list-style-type: none"> <li>- Reduction in fertilizer price</li> <li>- Increases in prices of produce</li> </ul>



No.	Problem	Causes	Effects	Suggested solutions
5	<b>Grazing area problem</b>	<ul style="list-style-type: none"> <li>- Poor management</li> <li>- Conflict with nearby <i>kebeles</i> and <i>gott</i></li> <li>- Pushing grazing land for crop production</li> <li>- Provision of part of grazing land for landless youth</li> </ul>	<ul style="list-style-type: none"> <li>- Shortage of grazing land</li> <li>- Shortage of animal feed</li> <li>- Prolonged gestation period</li> <li>- Low productivity of animals</li> </ul>	<ul style="list-style-type: none"> <li>- Rotation of grazing*</li> <li>- Strong legal punishment on those who push grazing land</li> </ul>
6	<b>Credit problem for young farmers</b>	<ul style="list-style-type: none"> <li>- Need for collateral</li> </ul>	<ul style="list-style-type: none"> <li>- Joblessness</li> </ul>	<ul style="list-style-type: none"> <li>- Special system should be designed for landless young farmers</li> </ul>
7	<b>Animal feed shortage</b>	<ul style="list-style-type: none"> <li>- Degradation of grazing areas</li> <li>- Narrow</li> <li>- Pushing grazing areas for crop production (given to young farmers)</li> </ul>	<ul style="list-style-type: none"> <li>- Low animal productivity</li> </ul>	<ul style="list-style-type: none"> <li>- Strong legal act</li> </ul>
8	<b>Depleted soil fertility</b>	<ul style="list-style-type: none"> <li>- Deforestation</li> <li>- Absence of soil and conservation structures</li> </ul>	<ul style="list-style-type: none"> <li>- Amount of fertilizer used increased</li> <li>- Low productivity</li> </ul>	<ul style="list-style-type: none"> <li>- Natural resource management</li> <li>- Use of compost</li> </ul>
9	<b>Crop diseases and pests</b>	<ul style="list-style-type: none"> <li>- Depleted soil fertility</li> <li>- Inability to identify pest and diseases</li> <li>- Shortage of chemical supply</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction</li> </ul>	<ul style="list-style-type: none"> <li>- Undertake research to identify problem</li> <li>- Supply of chemicals</li> </ul>
10	<b>Animal diseases and veterinary shortage</b>	<ul style="list-style-type: none"> <li>- Absence of animal health centre and efficient service in their locality</li> <li>- Poor quality drinking water for</li> </ul>	<ul style="list-style-type: none"> <li>- Unable to get immediate service in nearby area</li> <li>- Low productivity</li> </ul>	<ul style="list-style-type: none"> <li>- Control free grazing, assign full time animal health worker at <i>kebele</i> level</li> </ul>





No.	Problem	Causes	Effects	Suggested solutions
		livestock	- Animal mortality	
<b>11</b>	<b>Shortage of grain mills</b>	<ul style="list-style-type: none"> <li>- High service price due to increasing fuel price</li> <li>- Absence of electric power supply</li> </ul>	- High expenditure	- Provide electric power supply
<b>12</b>	<b>Shortage of labour saving technologies</b>	- Absence of supply	- Wastage of time and labour	- Demonstrate and supply available technologies

\*Best practice



### 3.4. Arbici Menfesawit kebele

#### 3.4.1. Environmental conditions

As shown in Figure 17 and Table 20, the total area of the *kebele* is estimated to be 1,053 ha out of which 963 ha are used for crop cultivation. The *kebele* has huge potential for irrigation and currently 580 ha of land is cultivated under irrigation. There is one big irrigation dam constructed by a project funded by the International Fund for Agricultural Development (IFAD). Beneficiaries of this project include 613 heads of households (528 male and 85 female) who have recently started using both modern and traditional irrigation schemes. The area is characterised by its flat landscape which covers 91.4% of the area. Even though the total area is small, the upper part of the *kebele* also has mountain and undulating features which cover 5 and 3.6% of the area respectively. The Agro-ecology of the area is fully middle altitude "*woynadega*".

Table 20: Land use pattern in Arbici Menfesawit kebele

Land use type	Amount of area (ha )	Proportion (%)
Arable land	963	91.5
Irrigation land	580	(55.1)
Grazing land	40	3.8
Forest	30	2.8
Settlement	20	1.9
Total	1,053	100

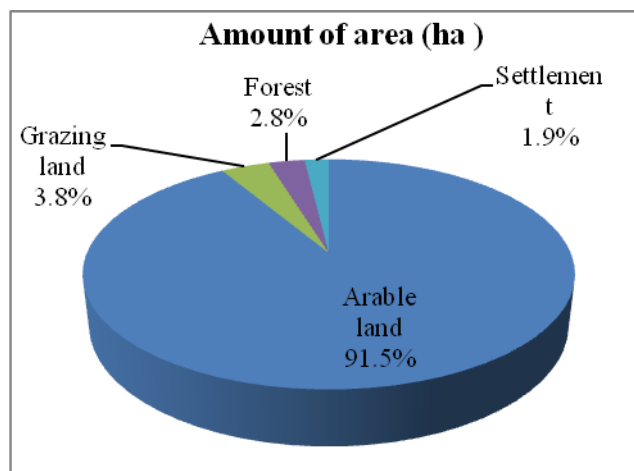


Figure 17: Land use type and proportion of Arbici Menfesawit kebele

According to focus group discussion participant community members, there are scarcities of all the available resources such as crop land, grazing, forest and irrigated areas. Grazing land was mentioned as a very problematic resource in the area. The illegal conversion of grazing land for crops and settlement were mentioned as a cause of existing conflict among the community members. According to the farmers, this problem in turn emanates from a reduced sense of ownership of communal resources, a shortage of crop land and high population pressure.

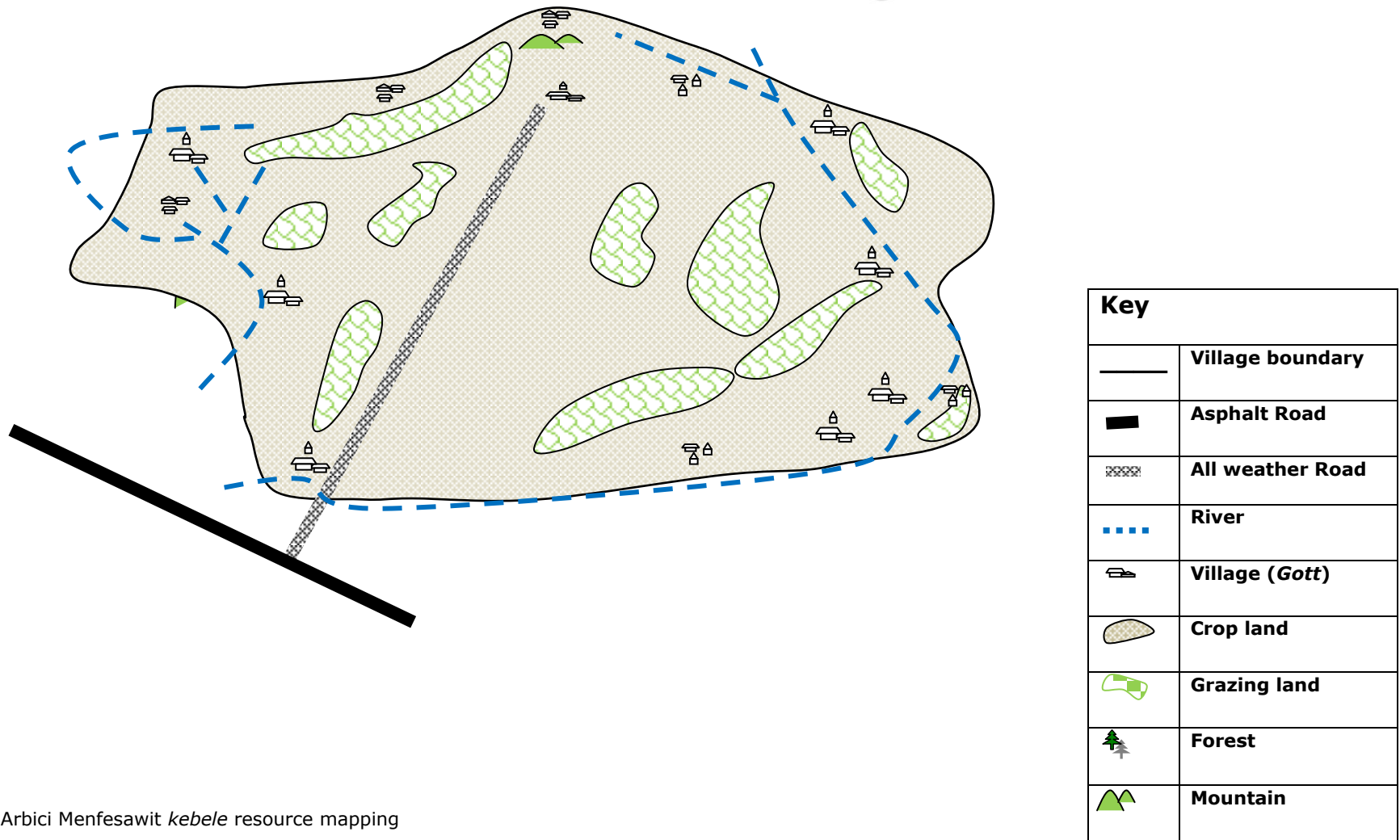


Figure 18: Arbici Menfesawit kebele resource mapping



Shortage of crop land is serious problem. The growing numbers of young farmers are mostly landless. The average household land holding size is estimated to be around 1ha (4 timad). Elder farmers have better access to land than young people. Most rural youth do not have land because there has been no land redistribution since 1997. The fertility of soil on land distributed to households is not similar. During the time of distribution, a distribution committee was first selected and organised by the community with the facilitation of the *kebele* and *woreda* administrative bodies. The committee identified available land and categorised it into two fertility levels as fertile "*lem*" and infertile "*bork*". Ultimately, households selected as eligible to have land drew lots from each category based on their family size. Other factors such as gender and wealth status were not considered when the land was redistributed. However, rich farmers had big areas of land to begin with, since they had 12 timad (2.4 ha) of land. Land was taken from bureaucrats and people with more than 12 timad and distributed to people who had no land. Whatever family size they had, unless they were bureaucrats, every household was given 12 timad of land. This created differences in the amount of land available to each individual.

#### **3.4.1.1 Water**

Natural springs, and private and communal hand-dug wells are the sources of human drinking water. Rivers and natural springs were also mentioned as water sources for livestock. In some villages or '*got*', people and livestock share the same source. The available communal modern hand-dug wells are limited in number and are not sufficient for the number of households. These water sources are also located very far away from most homes. According to women participants, in some villages one woman is expected to spend an average of two hours per day collecting water. Women and children are responsible for collecting drinking water. The water appears to be highly polluted, and no chemicals are available to maintain the necessary quality of water in every water source.

#### **3.4.1.2 Fuel wood**

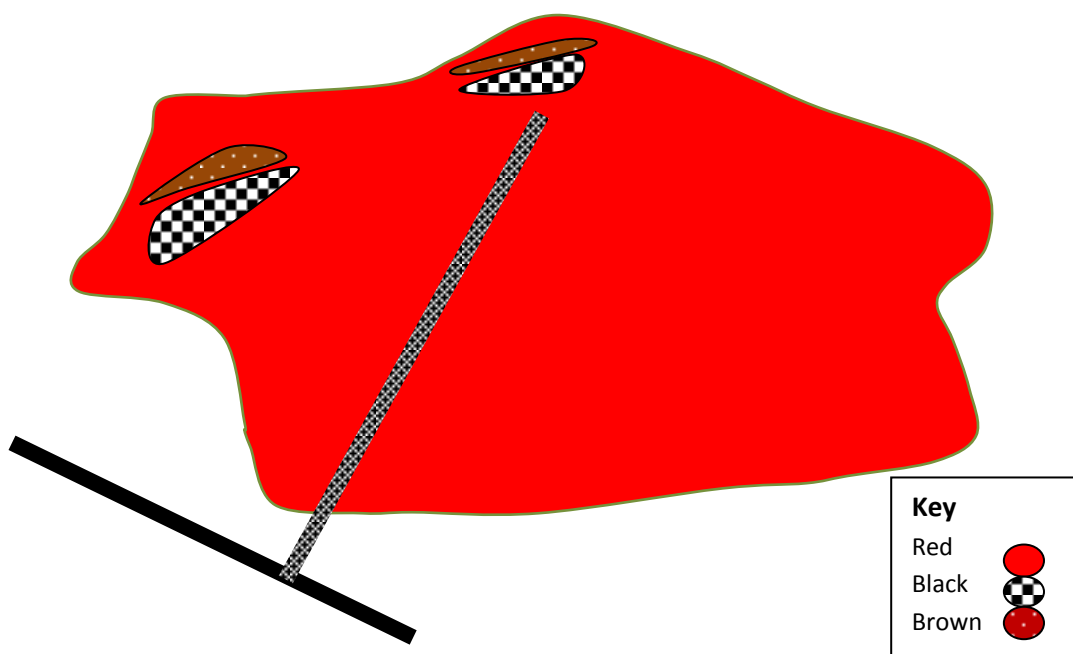
The major sources of fuel wood are Eucalyptus plantations in the homesteads, crop residues, particularly the lower stems of maize, and cattle dung collected from home and communal grazing areas during the dry season. Collection of fuel wood is the responsibility of both men and women except for differences in who does what. Men are mainly involved in collection from the former two sources whereas women are involved in transportation of collected wood to the home. Currently, fuel wood availability is not a major problem, but landless young farmers suffer from a fuel wood shortage.

#### **3.4.1.3 Soil**

During the transect walk, the innovation team observed red soil as the dominant soil type. Farmers also confirmed that it covers more than 90% of the area, and is the preferred soil type due to its high fertility and its potential for growing varied crop types. However, farmers explained its susceptibility to erosion as a constraint or drawback. As shown in Table 21, black and brown soil types also exist in smaller proportion.

**Table 21:** Major soil types and their constraint and opportunity in Arbici Menfesawit kebele

Soil type	Coverage (%)	Type of crops grown	Opportunities	Constraints
<b>Red</b>	90	Teff, barley and chickpea	- Double cropping	- Limited selection of crops - Difficult to plough - Prone to landslides and cracking
<b>Black</b>	7	Maize, pepper, teff, finger millet, wheat, faba bean, barley, rapeseed, Niger seed, linseed, potato, field pea, fruit and vegetables	- Productive - Able to grow varied crop types - Responsive to fertilizer	- Highly eroded
<b>Brown</b>	3	Wheat, faba bean, barley, maize, field pea	- Suitable for pulses - High water drainage	- High soil acidity - Low water holding capacity



**Figure 19:** Arbici menfesawit kebele soil map

**3.4.2. Socio-economic conditions**



### 3.4.2.1 Demographic characteristics

According to secondary information obtained from the *kebele* farmers training centre (FTC), the area has a total population of 5,080 out of which 2,498 is male and 2,582 female. Currently, 903 (722 male and 181 female) household heads are living in the area. Both male and female headed households live together in the same villages. The average family size is 5.6. All the community members are Amhara in ethnicity and followers of the Ethiopian orthodox religion. Farmers showed during the social mapping exercise that the long-term trend in population is increasing. More young people are marrying and having children, and contraceptive use is low due to limited awareness, and health complications faced by women. These were the major factors mentioned as causes for the increasing population trend. The average family size has, however, recently started to decrease.

### 3.4.2.2 Sources of income or livelihood

The sources of income or livelihood in this *kebele* are similar to the previous three *kebeles*. The wealth strata are also similar, but there are slight difference in the criteria used (Table 22)

Table 22: Wealth ranking of Arbici Menfesawit kebele

No	Criteria for each Wealth category	Wealth category		
		Rich	Medium	Poor
1	Number of oxen plough	≥3	2	≤1
2	Size of house (Number of corrugated iron sheets)	>50	37-46	≤32
3	Grain for household consumption	Own production	Will purchase occasionally	Will purchase
4	Credit	No	Will take but repay on time	Will take with delayed repayment time
5	Time of sell	Will sell when prices high (Aug- Sep)	Sell at all times	Sell at harvest time
6	Amount of land	>4 timad	2-4 timad	≤2 timad
7	Availability of additional assets	Animal pulled cart, house in nearby town, grain mill, perennial crops and fruits, water pump, large number of herds	perennial crops and fruits, medium number of herds	low number of small ruminants and poultry

### 3.4.2.3 Sources of finance and supply of agricultural inputs

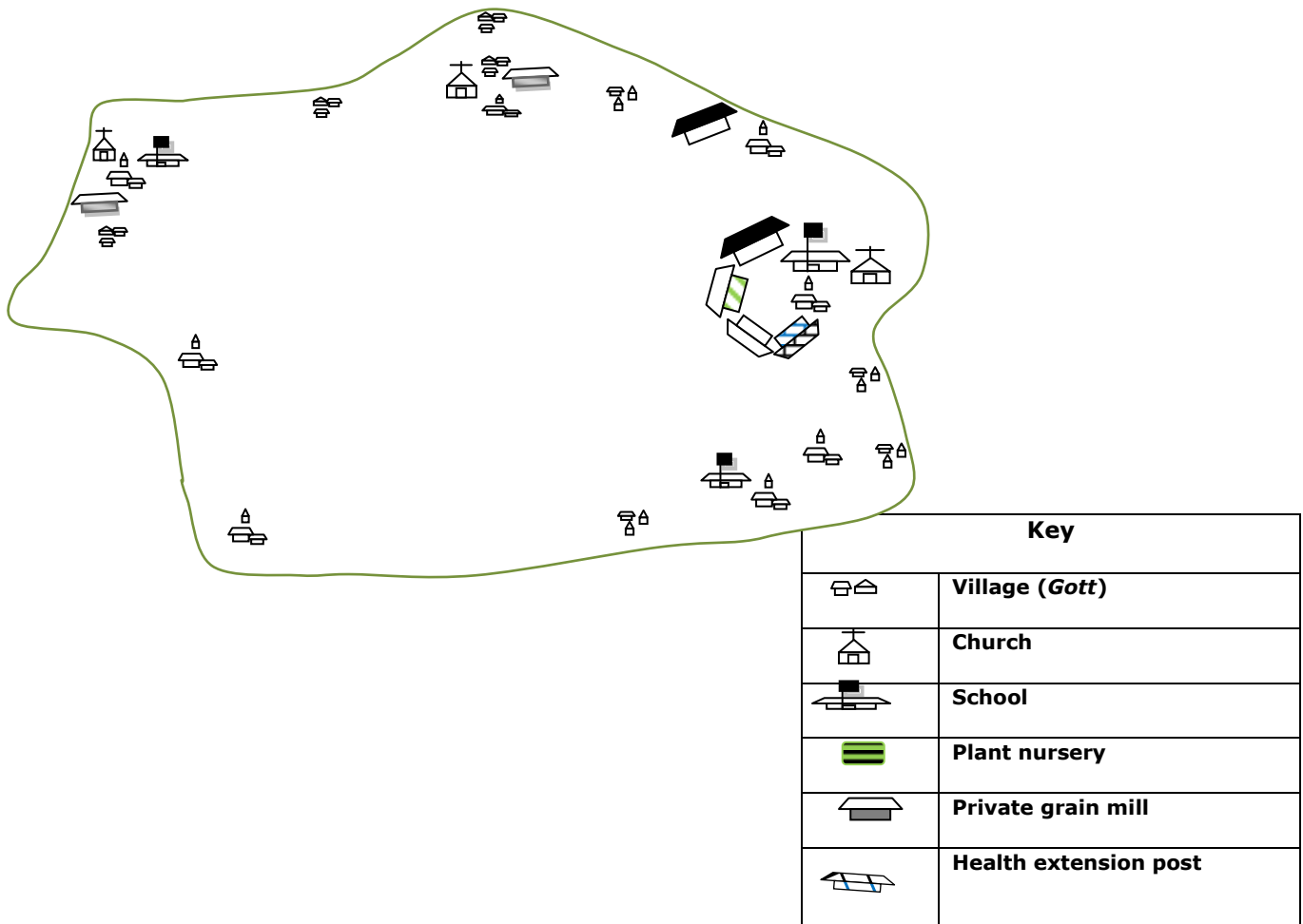
The sources and manner of credit and input supply are similar to the previous three *kebeles*.

### 3.4.2.4 Marketing

During the social mapping exercise, farmers showed that there is no market place in the *kebele*. They use markets in the nearby *kebeles* of Derekoa and Mankussa. An individual may take one to two hours to reach these market places on foot. Low market prices and the low bargaining power of farmers were market related problems identified by farmers. Farmers sell their produce, particularly crops, in the local market place and farmers cooperatives. However, there is no price advantage in cooperatives and prices are almost the same as at the local markets. Farmers also reported that cooperatives have performance problems, that they are not regularly audited, and the management committee has low competence.

### 3.4.3. Actor landscape

The community social map (Figure 20) indicates the presence of many organisations providing social services. These are 4 public schools, 3 Ethiopian Orthodox Churches, and one each of health extension post, FTC, *kebele* administration, farmers' cooperative, community police and market place. There is no animal health service centre in the area. All such organisations exist in one place "*kebele* centre".








	<b>Administrative and police office</b>
	<b>Farmers' cooperative</b>
	<b>FTC</b>

Figure 20: Arbici Menfesawit kebele social mapping

By using a Venn diagram, a group of farmers from all community groups identified 18 different formal and informal institutions and farmers' groups which are working in or within the community. A list of institutions and their roles and responsibilities is presented in Annex 2. As in the other *kebeles* both men and women farmers identified the most important institutions and placed those which represent the farming community inside a big circle. They then put the remaining institutions outside the circle at varying distances. The closer to the centre, the more important the institution is considered to be.

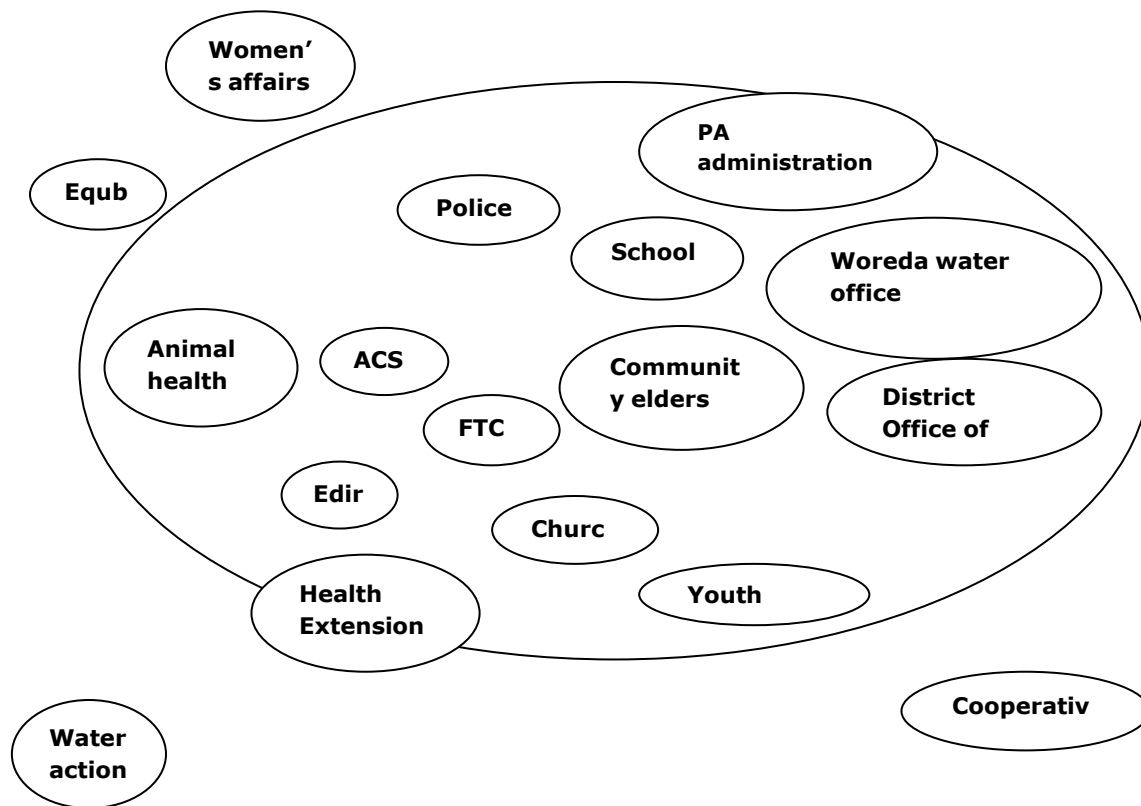


Figure 21: Venn diagram of institutions in Arbici Menfesawit kebele

### 3.4.4. Agricultural production conditions





Subsistence smallholder mixed crop and livestock farming is the major production system in the study area.

### 3.4.4.1 Crop production

Like other rural areas, crop production is the main source of income. The production is mainly rain fed but the area has also tremendous irrigation potential since there is one big dam in the area. Accordingly, 580 ha of land is under irrigation and there are over 613 household beneficiaries (Arbici Menfesawit FTC, 2011). Maize, pepper, wheat, finger millet, fruit and vegetables are the major crops produced.

### 3.4.4.2 Livestock production

Livestock production is an integral part of the farming system. As in other rural areas, livestock are kept for different purposes, including being a source of cash income during drought seasons, for traction power, social prestige, animal by-products and manure for their crop land. As shown in Table 23, the major livestock types are cattle, small ruminants and poultry. Animal diseases, feed shortage, and the limited supply of improved animal breeds and an AI service were mentioned as the main problems hindering livestock production and productivity. The causes, effects and suggested solutions or best practices are presented in Table 25.

Breed type	Animal type	Local breed	Cross breed
<b>Cattle</b>	<b>Ox</b>	994	-
	<b>Cow</b>	410	-
	<b>Heifer</b>	276	-
	<b>Bull</b>	280	-
	<b>Calf</b>	281	-
<b>Equines</b>	<b>Horse</b>	13	
	<b>Mule</b>	2	
	<b>Donkey</b>	163	
<b>Sheep and goats</b>	<b>Sheep</b>	596	
	<b>Goat</b>	154	
<b>Poultry</b>	<b>Local chicken</b>	1,986	
<b>Bees</b>	<b>Modern bee colony</b>	150	
	<b>Transitional colony</b>	2	
	<b>Traditional colony</b>	330	

**Table 23:** Type and number of livestock in Arbici Menfesawit kebele as of 2010



Table 24: Pair wise matrix ranking of farmers’ agricultural problems of Arbici Menfesawit kebele

No.	Problem list	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Score	Rank
1	Marketing problems		1	1	1	1	1	1	1	1	1	1	1	1	1	13	1
2	High fertilizer price			2	2	2	2	2	2	2	2	2	2	2	2	12	2
3	Grazing land problems				3	5	3	3	3	3	3	11	3	3	3	9 <sup>+1</sup>	6
4	Shortage of improved labour saving farm technologies					5	6	7	8	9	4	11	4	13	4	3	11
5	Crop diseases and pests						5	5	5	5	5	5	5	5	5	11	3
6	Shortage of improved animal breeds or AI							7	8	9	6	11	6	13	6	3 <sup>+1</sup>	10
7	Animal diseases								7	7	7	11	7	13	7	7	7
8	Irrigation problems									9	8	11	8	13	8	5	9
9	Drinking water problems										9	11	9	13	9	6	8
10	Shortage of credit											11	12	13	10	1	13
11	High number of landless young farmers												11	13	11	9 <sup>+1</sup>	5
12	Poorly scheduled meetings													13	12	2	12
13	Poor seed quality														13	9 <sup>+1+1</sup>	4
14	High soil acidity															0	14



**Table 25:** Agricultural production problems, causes, effect and suggested possible solutions or best practices in Arbici Menfesawit

No.	Problem	Causes	Effects	Suggested solutions and best practice
1	Marketing problems	<ul style="list-style-type: none"> <li>- High industrial commodity prices and low product prices</li> <li>- High commodity supply during harvesting time for loan repayment</li> <li>- A few traders monopolise the price (they negotiate and fix low price during harvest time)</li> <li>- Absence of government intervention in price determination</li> <li>- Cooperatives are too weak</li> </ul>	<ul style="list-style-type: none"> <li>- Low household income and high expenditure</li> <li>- Increased vulnerability</li> </ul>	<ul style="list-style-type: none"> <li>- Government should regulate the market</li> <li>- Strengthen cooperatives</li> <li>- Supply industrial commodities via cooperatives</li> </ul>
2	High fertilizer price	<ul style="list-style-type: none"> <li>- Absence of domestic production</li> <li>- high exchange rate</li> <li>- long marketing/supply chain and presence of many middle men</li> </ul>	<ul style="list-style-type: none"> <li>- Crop yield reduction</li> <li>- Inability to pay loan on time</li> <li>- Supply of high amount of produce to the market during harvesting time to cover loans</li> </ul>	<ul style="list-style-type: none"> <li>- Fertilizer subsidy</li> <li>- Domestic production</li> </ul>
3	Grazing land problems	<ul style="list-style-type: none"> <li>- Shortage of pasture land</li> <li>- High human and livestock populations</li> <li>- Soil erosion and landslides</li> <li>- Use of pasture areas for crop land</li> </ul>	<ul style="list-style-type: none"> <li>- Degradation</li> <li>- High livestock disease transmission and outbreaks</li> <li>- Low productivity of grazing areas</li> <li>- Shortage of feed</li> </ul>	<ul style="list-style-type: none"> <li>- Improve and manage the existing pasture land (rotation system)*</li> <li>- Conserve and use other alternative animal feed sources</li> </ul>



No.	Problem	Causes	Effects	Suggested solutions and best practice
		<ul style="list-style-type: none"> <li>- Improper drainage system</li> </ul>	<ul style="list-style-type: none"> <li>- Low animal productivity and traction power</li> </ul>	
4	Shortage of improved labour saving technologies	<ul style="list-style-type: none"> <li>- Lack of supply</li> </ul>	<ul style="list-style-type: none"> <li>- Wastage of time and effort</li> </ul>	<ul style="list-style-type: none"> <li>- Demand based supply of technologies</li> </ul>
5	Crop diseases and pests	<ul style="list-style-type: none"> <li>- Lack of know-how and management; unknown causes in some crops like pepper</li> </ul>	<ul style="list-style-type: none"> <li>- Decline in crop yield and total loss</li> </ul>	<ul style="list-style-type: none"> <li>- Undertake research</li> </ul>
6	Shortage of improved animal breeds or AI	<ul style="list-style-type: none"> <li>- Absence of improved animal breeds</li> <li>- Lack of regular AI service delivery</li> </ul>	<ul style="list-style-type: none"> <li>- Low animal productivity and household income</li> </ul>	<ul style="list-style-type: none"> <li>- Provide regular AI service</li> </ul>
7	Animal disease	<ul style="list-style-type: none"> <li>- Lack of animal health centre and efficient service</li> <li>- Shortage of free grazing and feed</li> <li>- Degradation of grazing areas</li> <li>- Uncontrolled animal movements</li> </ul>	<ul style="list-style-type: none"> <li>- High incidence of animal mortality</li> <li>- Low animal productivity</li> <li>- Low household income</li> </ul>	<ul style="list-style-type: none"> <li>- Identify animal diseases</li> <li>- Build animal health centre and hire sufficient manpower</li> </ul>
8	Irrigation problems	<ul style="list-style-type: none"> <li>- Lack of improved seeds supply for irrigation</li> <li>- Poor quality of irrigation dams in traditional irrigation schemes</li> <li>- Lack of supply and high price of water harvesting materials (jo membrane, water pump, etc.)</li> <li>- High water drainage and low quality canal system</li> </ul>	<ul style="list-style-type: none"> <li>- High water loss</li> <li>- Low productivity of irrigation water</li> <li>- Low household income</li> </ul>	<ul style="list-style-type: none"> <li>- Develop modern irrigation scheme</li> <li>- Timely supply of improved seeds</li> <li>- Regular expert supervision</li> </ul>



No.	Problem	Causes	Effects	Suggested solutions and best practice
9	Drinking water shortage	<ul style="list-style-type: none"> <li>- High population pressure</li> <li>- Limited number of potable water sources and natural springs</li> <li>- Poor water quality</li> <li>- Mismanagement of communal water sources</li> <li>- Shortage of water especially during dry season</li> <li>- Both people and livestock use the same water source</li> </ul>	<ul style="list-style-type: none"> <li>- Exposed to water borne disease</li> <li>- Women spend much time fetching water</li> </ul>	<ul style="list-style-type: none"> <li>- Clean water supply with community cost sharing</li> </ul>
10	Credit problems	<ul style="list-style-type: none"> <li>- The amount of credit supplied is too low</li> <li>- Narrow loan repayment periods</li> <li>- High interest rate for animal fattening and time of returning is short,</li> <li>- Interest rate of ACSI is high compared other institutions</li> </ul>	<ul style="list-style-type: none"> <li>- Involvement in high economic return generating activities (livestock fattening) impossible</li> <li>- Low income</li> </ul>	<ul style="list-style-type: none"> <li>- Increase the amount of credit</li> <li>- Allow long loan repayment period</li> </ul>
11	Landless young farmers	<ul style="list-style-type: none"> <li>- High population pressure</li> <li>- Absence of periodic land re-distribution</li> <li>- Lack of employment opportunities</li> <li>- Absence of resettlement programme for young people</li> </ul>	<ul style="list-style-type: none"> <li>- Increased youth unemployment</li> <li>- Migration</li> <li>- Increased theft and crime problem in the community</li> <li>- Poverty</li> </ul>	<ul style="list-style-type: none"> <li>- Abandoned low land areas should be given to young farmers</li> <li>- Resettlement</li> </ul>



No.	Problem	Causes	Effects	Suggested solutions and best practice
12	Poorly scheduled meetings	<ul style="list-style-type: none"> <li>- Meeting programmes arranged without consultation of farmers even at busy times</li> </ul>	<ul style="list-style-type: none"> <li>- Wastage of working hours</li> </ul>	<ul style="list-style-type: none"> <li>- Community gatherings should be on holidays and at carefully chosen times</li> </ul>
13	Poor seed quality	<ul style="list-style-type: none"> <li>- Low seed quality and high prices</li> <li>- Absence of quality control on seed suppliers</li> </ul>	<ul style="list-style-type: none"> <li>- Decreasing crop yield</li> </ul>	<ul style="list-style-type: none"> <li>- Seed quality should be controlled and certified</li> </ul>
14	Increased soil acidity	<ul style="list-style-type: none"> <li>- miss management of natural resources</li> <li>- soil erosion</li> <li>- limited crop land fallowing (continuous plowing )</li> </ul>	<ul style="list-style-type: none"> <li>- Decreasing crop yield</li> </ul>	<ul style="list-style-type: none"> <li>- Addition of lime and compost</li> </ul>



## 4. Stakeholder workshops

### 4.1. Organisation of workshops and feedback received

Two consecutive workshops were organised at *woreda* and regional level with the aim of identifying challenges and opportunities for agricultural production from an expert's point of view, prioritising them, and suggesting possible intervention activities,. During the *woreda* level workshop or scoping study, the result of the PRA was presented to all stakeholders representing the *woreda* office of agriculture, *woreda* and *kebele* administrations, DAs, and selected key informant farmers.

The results of both PRA and *woreda* level workshop feedback were compiled and presented to the regional workshop. Many stakeholders from the region and from the CASCAPE project intervention *woredas* attended this workshop, and a list of intervention activities or innovation themes was identified and prioritised on the basis of commodities. The results of the regional workshop are presented in a list of innovation themes in the section below.

### 4.2 List of Innovation themes

Innovation themes were identified in a step-wise process. Constraints and opportunities initially identified during the PRA surveys were summarised on a *woreda* basis. These summarised results of the PRA surveys were then presented to various stakeholders comprising farmers, *woreda* and *kebele* administrators, DAs, and *woreda* level experts, during scoping study sessions held at each of the CASCAPE intervention *woredas*. Participants in each *woreda* identified and prioritised potential intervention areas/ innovation themes that can address the problems and exploit existing opportunities on a commodity basis. Then, the results of the PRA surveys and scoping studies were again presented and refined during a regional stakeholders' workshop. Finally, the innovation themes were developed further, taking account of comments and suggestions given by NCU and WUR team members during various backstopping sessions. In general, innovation themes were identified and prioritised from the results of the PRA survey, scoping study and regional stakeholder workshops.

**Table 26: Proposed List of Innovation Themes****A. Crops**

<b>Commodity / Theme</b>	<b>Activities/ sub themes</b>	<b>Responsible body</b>	<b>Intervention area</b>
<b>Pepper</b>	<ul style="list-style-type: none"> <li>▪ Identify and demonstrate disease and pest control options</li> <li>▪ Establish quality seed supply system</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE and ARARI</li> <li>▪ CASCAPE and WoA</li> </ul>	All <i>woredas</i>
<b>Potato</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate high yielding and disease resistant varieties</li> <li>▪ Disease and pest control/ management options</li> <li>▪ Quality seed multiplication</li> <li>▪ Develop potato post-harvest handling system(DLS construction)</li> <li>▪ Food preparation</li> <li>▪ Value chain development</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE&amp; BDU scientists</li> <li>▪ CASCAPE &amp; WoA</li> <li>▪ CASCAPE &amp; AGP</li> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE, NIDP &amp; AGP</li> </ul>	Burie and South Achefer
<b>Maize</b>	<ul style="list-style-type: none"> <li>▪ Establish quality seed supply system</li> <li>▪ Demonstration improved varieties for different agro-ecologies</li> <li>▪ Enhance farmers' level hybrid seed production</li> <li>▪ Demonstrate seed Sheller</li> <li>▪ Demonstrate maize – pigeon pea and maize - faba bean intercropping</li> <li>▪ Food preparation</li> <li>▪ Disease and pest control options</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; BoA</li> <li>▪ CASCAPE</li> <li>▪ Regional seed enterprise</li> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE</li> </ul>	All <i>woredas</i>
<b>Wheat</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate high-yielding and disease-resistant varieties</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; ARARI</li> </ul>	All <i>woredas</i>



	<ul style="list-style-type: none"> <li>▪ Disease and pest control options</li> <li>▪ Seed multiplication and dissemination</li> <li>▪ Food preparation</li> <li>▪ Value chain development</li> <li>▪ Demonstrate wheat threshing machine</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE, ISSD &amp; BoA</li> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE &amp; AGP</li> <li>▪ CASCAPE, ARARI, BoA &amp; AGP</li> </ul>	
<b>Teff</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate/scale up improved varieties 'Koncho' and 'Etsub'</li> <li>▪ Demonstrate green manure on teff plot before planting</li> <li>▪ Demonstrate row planting and transplanting vs broadcasting</li> <li>▪ Establish quality seed supply system</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE</li> <li>▪ CASCAPE</li> <li>▪ CASCAPE, ISSD &amp; BoA</li> </ul>	All <i>woreda</i>
<b>Rice</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate improved variety</li> <li>▪ Row planting (grass pea as a relay crop)</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE</li> <li>▪ CASCAPE</li> </ul>	Dera <i>woreda</i> (Jigna PA)
<b>Faba bean &amp; field pea</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate high yielding and chocolate spot resistant variety</li> <li>▪ Establish quality seed supply system</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; ARARI</li> <li>▪ CASCAPE, ISSD &amp; WoA</li> </ul>	Burie & Dera <i>woredas</i>
<b>Barley</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate improved varieties</li> <li>▪ Establish quality seed supply system</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE AND ARARI</li> <li>▪ CASCAPE, ISSD and BOA</li> </ul>	Burie & Dera
<b>Snap bean</b>	<ul style="list-style-type: none"> <li>▪ Develop and integrate value chain</li> <li>▪ Demonstrate high quality and international market competent varieties</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE</li> <li>▪ CASCAPE &amp; ARARI</li> </ul>	Dera (korata and jigna PA)
<b>Finger millet</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate head blast disease resistant and high yielding varieties</li> <li>▪ Threshing machine</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE</li> <li>▪ CASCAPE &amp; ARARI</li> </ul>	All <i>woredas</i>
<b>Cassava</b>	<ul style="list-style-type: none"> <li>▪ Introduce cassava</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE &amp; AGP</li> </ul>	South Achefer

	<ul style="list-style-type: none"> <li>▪ Food preparation and utilisation</li> </ul>		
<b>Sun flower</b>	<ul style="list-style-type: none"> <li>▪ Introduce improved varieties</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE</li> </ul>	Dera and south Achefer
<b>Banana</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate improved banana varieties under irrigation</li> <li>▪ Banana-haricot bean intercropping</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE</li> </ul>	Jabi Tehnan

## B. Livestock

Commodity/ Theme	Activities/ sub themes	Responsible body	Intervention area
<b>Livestock feed and nutrition development</b>	<ul style="list-style-type: none"> <li>• Demonstrate improved forage varieties on FTCs and model farmers who are involved in dairy production and fattening activities</li> <li>• Facilitate improved forage seed supply via seed multiplication on FTCs and interested farmers' groups and rural youth</li> <li>• Create forage seed market linkage</li> <li>• Household level feed package (best cost ration formulation)</li> <li>• Demonstrate small scale silage making</li> <li>• Urea treatment on crop residue</li> <li>• Introduce feeding stalls</li> <li>• Strengthen community grazing land management and forage development practice (rotational grazing)</li> </ul>	<ul style="list-style-type: none"> <li>▪ CASCAPE, ARARI &amp; AGP</li> <li>▪ CASCAPE, ARARI &amp; AGP</li> </ul>	All <i>woredas</i>
<b>Poultry production</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate poultry production system</li> </ul>	CASCAPE& WoA (AGP)	All <i>woredas</i>
<b>Honey bee production</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate modern honey bee production system by integrating with area closure and watershed development</li> </ul>	CASCAPE& WoA (AGP)	All <i>woredas</i>

## C. Natural Resource Management



<b>Theme</b>	<b>Activities/ sub themes</b>	<b>Responsible body</b>	<b>Intervention area</b>
<b>Integrated nutrient management</b>	<ul style="list-style-type: none"> <li>▪ Demonstrate integrated nutrient management</li> </ul>	CASCAPE	South Achefer
<b>Area closure, forage and apiculture</b>	<ul style="list-style-type: none"> <li>▪ Capacity building</li> <li>▪ Introduce multipurpose tree species, herbaceous grass and legumes</li> </ul>	CASCAPE	All <i>woredas</i>
<b>Maintain sustainability of soil and water conservation structures</b>	<ul style="list-style-type: none"> <li>▪ Capacity building</li> <li>▪ Introduce multi-purpose tree species</li> </ul>	CASCAPE	All <i>woredas</i>
<b>Gully rehabilitation</b>	<ul style="list-style-type: none"> <li>▪ Introduce forage and multipurpose tree species</li> </ul>	CASCAPE	All <i>woredas</i>

#### **D. Others**

- Create common understanding on the concept of best practice
- Identify, document, validate and scale up best practice
- Deliver training for SMSs, DAs and farmers, based on training need assessment
- Collaborate with AGP



## 4.2 Best practices

Some best practices were identified during the PRA survey, scoping study, regional workshops and personal observation by innovation team members. The best practices identified were as follows:

- Communal grazing land management practice (rotation grazing)
- Application of lime and compost to tackle soil acidity
- Community cost sharing for drinking water source development
- Livestock fattening and marketing
- On farm compost preparation and application
- Private tree seedling nursery site establishment
- Family planning
- Household sanitation programme (construction of toilets, separation of kitchen and livestock housing).

## 5. Evaluation of the PRA process by the team

Farmers and other agricultural development stakeholders or actors were actively involved throughout the PRA process. Farmers could easily identify and prioritise agricultural production constraints and opportunities. Farmers also clearly identified causes, effects and possible solutions of production problems. However, there was also a tendency of focussing on their expectations during problem prioritisation. Participation of women farmers and stakeholders from the private sector was, however, minimal.

In general, the PRA process is successfully executed when we evaluate it against time, resources, and outputs achieved.



## 6. Cited Literature

Arbici Menfesawit *kebele* FTC. 2011. *Unpublished office report*. Burie Zuria *woreda*, Ethiopia.

Burie Zuria *Woreda* Office of Agriculture. 2011. *Unpublished office report*. Burie Zuria *woreda*, Ethiopia.

CSA (Central Statistics Authority). 2003. *Census report*. Addis Ababa, Ethiopia.

IPMS (Improving Productivity and Market Success) of Ethiopian farmers' project. 2007. *Burie Pilot Learning Site Diagnosis and Program Design*. Available on. <http://www.ipms-ethiopia.org/Pilot-Learning-Sites/Burie.asp>. Accessed in February 2012.

Wadara Gendeba *kebele* FTC. 2011. *Unpublished office report*. Burie Zuria *woreda*, Ethiopia.

Woynima Ambaye *kebele* FTC. 2011. *Unpublished office report*. Burie Zuria *woreda*, Ethiopia.

Zalma *kebele* FTC. 2011. *Unpublished office report*. Burie Zuria *woreda*, Ethiopia.