PARTICIPATORY RURAL APPRAISAL REPORT: JABI TEHNAN DISTRICT

Molla Tafere, Asresie Hassen, Biruhalem Kassa, Baye Berihun, Mekonen Tolla, Yihalem Denekew,Yihenew G.Selassie and Firew Tegegne

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List of abbreviations and acronyms

ACSI	Amhara Credit and Saving Institute
AGP	Agricultural Growth Programme
BDU	Bahir Dar University
BoA	Bureau of Agriculture
CASCAPE	Capacity Building for Scaling up of Best Practices in Agricultural Production in Ethiopia
DA	Development Agent
FCE	Facilitator for change in Ethiopia
FTC	Farmers Training Centre
GOs	Government Organisations
IFAD	International Fund for Agricultural Development
NGOs	Non Governmental Organisations
OoA	Office of Agriculture
PA	Peasant Association
PRA	Participatory Rural Appraisal
WVE	World Vision Ethiopia
YC	Youth Club

Executive summary

PRA surveys were conducted in December 2011 in four CASCAPE project *kebeles*, namely Jiga, Mana, Zaba and Jimat, which are *kebeles* of Jabitehnan district. The objectives of the surveys were to identify the potential, constraints and intervention points necessary for improvement of agricultural production and productivity of the project *kebeles*, and also to get an insight into, and clear picture of the farming systems of the community. The knowledge and information obtained were then used to propose appropriate development interventions.

A multi-disciplinary team deployed by the CASCAPE project carried out the surveys. The composition of the team allowed discussion of the constraints from different perspectives, and the problems of each sector could be addressed by experts. The perceptions and opinions of farmers were explored using a variety of PRA tools. To ensure fair representation by area and social group, participants in the PRA surveys were drawn from all villages and from different social groups.

Finally, the results of each PRA survey were summarised, analysed and thoroughly discussed to give an insight into the farming system, to identify the problems and potential associated with each of the project *kebeles* and contribute to the formulation of possible interventions in each theme.

1. Introduction

The farming community of Jabi Tehnan district in general, and the project *kebeles* of Mana, Zaba, Jimat and Jiga in particular, have multiple development constraints related to agricultural production, marketing, utilization and processing, that adversely affect their standards of living. On the other hand, they use some technologies that help them to solve some of these constraints and optimize outputs and benefits.

The rural people may not, however, be in a position to explore or gain access to these technologies or may not adopt them readily. This could happen for two reasons. Firstly, new practices and ideas may not be welcomed for fear of failure. Secondly, if the process of developing and adopting these technologies is not participatory, the rural community can be deprived of access to them. There is also the possibility that the technologies developed might not be a priority for the target people.

Thus, CASCAPE employed PRA surveys in its project *kebeles* to encourage active involvement of the rural community in describing the potential and constraints associated with the current farming system, to prioritise problems and propose solutions. The outputs of these PRA surveys provided quick and reliable information that was later used to identify appropriate intervention themes in line with the outlined objectives of CASAPE.

1.1 Objectives

The objectives of CASCAPE are:

- To identify current best practices and bottlenecks for agricultral productivity and all aspects of farm management
- To identify and scale up evidence based technologies and best practices for sustainable agricultural production
- To innovate in bringing together sustainable practices from different themes - bio-physical, socio-economic, and environmental - to increase agricutural produtivity
- To strengthen the capacity of stakeholders such as extension staff, university staff, reasearchers and students.

1.2 Methodology and selection of PRA tools

To fulfil the project's objectives, methods that maximised the participatory involvement of the target communities were selected for the PRAs. There are hundreds of PRA tools, the selection of which depends on the level of precision required, the time available for the study, and also the resources available. Thus, in this survey, seven to ten appropriate PRA tools were selected.

1.2.1 Resource mapping

Resource mapping was done in all *kebeles* by mixed groups of up to 35 men and women farmers of all ages. The use of this tool allowed the survey teams and the community representatives to gain a common understanding of farmers' perceptions of the natural resources available to them. It also allowed them to gain an insight into the status of these resources, their abundance or scarcity, the problems associated with them, and how fairly they are shared among the community members. The resource mapping also showed the spatial distribution of resources in relation to the farms and villages.

One or two members of the group who were assumed to know the *kebele* boundary and the location of the different natural resources very well drew the map on the ground. These facilitators got assistance from other members of the group to clarify any uncertainties encountered while drawing the map. For ease of understanding of the different natural resources among group members, locally available materials were used that were representative of the real situation. Leaves of trees were used to represent forest, grass for grazing, and the straw from different crops to represent agricultural land.

1.2.2 Social mapping

A social map of each *kebele* was also prepared, to indicate the presence or absence of the different institutions and organisations that are working together with the community, and how they are distributed relative to the *kebele* boundary. This exercise also helped to examine the spatial distribution of the institutions in relation to the settlement, and thus their distribution in relation to those who need their services.

1.2.3 Actor landscape and Venn diagram

Another PRA tool employed in the survey was presenting the actor landscape of each *kebele* in a Venn diagram. This tool enabled the survey team to assess the relative importance of the local or governmental institutions in terms of the service they are rendering to the community. The tool also highlighted the quality of services given by different institutions at present. In most *kebeles*, this exercise was carried out by mixed groups of men and women farmers, but in some *kebeles*, where the gender related institution were functioning well, the actor landscaping for male and female groups were conducted separately.

1.2.4 Pair-wise problem ranking

One of the most powerful PRA tools that was employed in all *kebeles* was pair wise problem ranking. The problems faced by farmers in each of the *kebeles* were prioritized by use of the pair wise problem ranking method that simplifies the comparison of problems in a way that they can easily understand. 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.

1.2.5 Soil mapping

Soil maps were used to map out the different soil types in each *kebele*. This was done to gain insight into the proportion of each soil type, and also to identify the potential and constraints of each soil type, so that appropriate alternative uses could be considered, according to the intrinsic character of the soil.

1.3 Data analysis methods

As in many other PRA studies, different participatory tools were employed generating various levels of information that provide the required detail in analyses. The general participatory tools gave insights into the social, cultural, economic and environmental situation in the project *kebeles*. The data and information generated from the resource map and the subsequent discussion were used to describe the different natural resources of the project *kebeles*, their allocation among the different members, and the various problems associated with them. The discussion after the actor landscaping exercise concluded by reaching consensus to describe the services rendered by the different institutions to the community and their relative importance. The more specific pair wise ranking tool helped to prioritize the problems according to their seriousness.

2. Description of the *woreda* and selected *kebeles*

2.1 Description of Jabi Tehnan *woreda*

2.1.1 Location and area

The Jabi Tehnan district is believed to have been be founded in 1933 E.C. It is one of the nine districts of West Gojjam administrative zone, bordered by six other *woredas*. In the north, it is bordered by Quarit and Sekella *woredas*, in the east by Denbecha and Dega Damot, and in the west by Bure. It is located 180 km due south from the zonal capital and regional capital of Bahir Dar and 350 km north from the national capital Addis Ababa. The administrative centre of the *woreda* is Finote Selam. The total area of the *woreda* is estimated to be 1,170 km^2 or 116,954 ha. (source; Woreda office of agriculture). The district is divided into 37 rural *kebeles*, four of which, namely Jiga, Zaba, Jimat and Mana, were selected as project *kebeles*.

2.1.2 Population

The total population of the district was estimated in 2008 to be 277,590 of which 139,616 were male and 137,974 female with an average annual growth rate of 2.8%.(Source *woreda* plan and economy).

This means that the population density of the *woreda* is 221 persons per km^2, which is greater that the regional average of 177persons per km^2. The district has 37 rural *kebeles* and 2 urban *kebeles*. The majority, or 94% of the population, i.e. 259,826 people, live in rural areas and the remaining 6% accounting for about 17,724 people, live in urban areas. Separated by gender, of the total of 259,826 resident in rural areas 131,773 are male and 128,093 are female, from the total urban population 7,843 are male and 9,881 are female.

It was difficult to obtain the age structure data at *woreda* or *kebele* level. However, it is expected to show a growing trend with the majority of the population in the lower age classes.

Table 1: Population data of project kebeles

s.n	**sex**	**Total population in each '*kebele*' separated by gender**			
		Jimat	***Zaba***	***Mana***	***Jiga***
1	Male	2,540	2,340	3,233	2,283
2	Female	2,630	2,259	3,623	1,945
Total number of households separated by gender of household head					
s.n	sex	*Jimat*	*Zaba*	*Mana*	*Jiga*
1	Male	752	732	1,083	656
2	Female	183	171	207	158

2.1.3 Topography and climate

The altitude of the *woreda* ranges from 1,500-2,300 m. above sea level. The majority of the area lies in the higher altitude range, closer to 2,300 m, and all four of the project *kebeles* are found in the *Woyna dega* or mid-alitude area, each with similar agro-ecology and similar temperature and rainfall distribution. Agro-ecologically, 88% of the *woreda* is classified as *Woyina Dega* and the remaining 12% as *kolla*. The topography of the *woreda* is dominated by areas of plain. According to the *woreda* office of agriculture, the topography is classified as:

- 65% plain
- 15% mountainous
- 15% undulating
- 10% valley

The temperature of the '*woreda*' ranges between 14^0 C and 32^0 C, with an average annual temperature of 32^0 C. The rainfall distribution is uni-modal and the rainy season lasts for four months from mid-May to mid-September. The average annual rainfall is 1,250 mm per annum.

2.1.4 Land use and soil

Since the majority of the population lives in the rural area with crop production as the main livelihood option, arable land constituted the largest portion of the *woreda* land use type. The proportion and areas under different land uses in the *woreda* are as follows (woreda office of agriculture):

- Cultivated land: 49.8% or 58,262 ha
- Cultivable land: 4.4% or 5,208 ha
- Natural forest: 5.5 % or 6,502 ha
- Bush /scrub land or natural pasture: 17.6% or 20,662 ha
- Settlement: 9.3% or 10,931 ha
- Others: 13% or 15,389 ha

The soil type of the *woreda* is classified as 60% red soil, 25% brown, and 15% black soil. The soil fertility can be classified as 27% fertile, 71% medium and 2% infertile (source: *woreda* office of agriculture). The presence of well-developed fertile soil is considered to give the *woreda* strong potential for increasing the productivity of smallholding farmers.

Table 2: Major land use of project kebeles.

s.n	**Land use type**	**unit**	**Estimated area of each land use type in Ha for each project *kebele***			
			Jimat	***Zaba***	***Mana***	***Jiga***
1	Cultivated land	ha	1,630	1,015	1,405	2,715
2	Cultivable land	ha	--	--	--	--
3	Natural forest	ha	20	18		65
4	Bush land	ha			128	
5	Grazing land	ha	240	185	349	160
6	Settlement	ha	25	32	15	13
7	Others	ha				25
	Total	**ha**	**1,915**	**1,250**	**1,897**	**2,978**

2.1 5 Infrastructure and accessibility

The highway from the national capital Addis Ababa to the regional capital Bahir Dar passes through the *woreda* capital Finote Selam. This same highway crosses the Jiga project *kebele* and is accessible the whole year. Two other project *kebeles,* namely Jimat and Zaba, can be accessed only during the dry season because the dry weather roads become impassably muddy during the rainy season. Mana, which

is the fourth project '*kebele*' has an all-weather gravel road from the main highway and can be accessed all year round.

2.1.6 Livelihood

Mixed farming, with crop and livestock production, constituted the main livelihood for the rural community of the project '*woreda*'.

2.1.7 Crop production

Crop production covers a wide range of crops which include both cash and food crops. The crops grown include rain-fed maize, finger millet, pepper, teff, wheat, faba bean, potato, barley and niger seed. Crops grown under irrigation include potato, pepper, barley, shallot, garlic, coffee, banana and buckthorn (*Rhamnus prinoides)*. Other perennial and annual horticultural crops are also cultivated using irrigation. Chickpea and grass pea are cultivated on vertisol using residual moisture after teff. There is room for improvement in production practices, and for example, the use of unimproved, low yielding cultivars is common. Most annual crops are sown by the broadcast method and row planting is only adopted for maize and pepper.

2.1.8 Livestock production

Livestock production is the second most important economic activity in the project area. Good numbers of of livestock are found in all *kebeles* and the *woreda* totals in 2011 are presented in Table 3. The production system is traditional, most breeds and production systems are multipurpose, supplying draught power, milk, meat, skin and hides. The manure from animals, particularly from large ruminants, serves as fuel and can be used as fertilizer in the form of compost and manure.

Table 3: Livestock population of Jabi Tehnan woreda versus project kebele

Type of livestock	**Number of animals in *woreda***	**Number of animals in CASCAPE Project *Kebeles***			
		Zaba	**Mana**	**Jimat**	**Jiga**
Cattle	187,481	1,637	3,123	2,439	7,176
Sheep	40,931	350	854	288	266
Goats	19,933	96	186	59	63
Equines	68,181	68	-	134	633
Poultry	201,569	1,440	1,907	-	3,850
Bee hive colonies	-	201	137	276	363

3. PRA results

The PRA results for each *kebele* are discussed separately.

3.1 Jiga kebele

3.1.1 Environmental conditions

The key questions to be answered under the environmental theme as proposed in PRA guidelines were addressed by the use of combined PRA tools, principally resource mapping and focus group discussion. In describing the environmental conditions of Jiga *kebele,* a mixed group of 15 participants, 13 male and 2 female, were drawn from all the villages to describe and discuss the environmental potential and constraints. The representation of women was lower than expected, but most of the issues discussed were gender neutral.

The major natural resources identified by the community representatives were water, for both irrigation and drinking, arable land, grazing land and forest. The present status of these resources was discussed under the subtopics that follow.

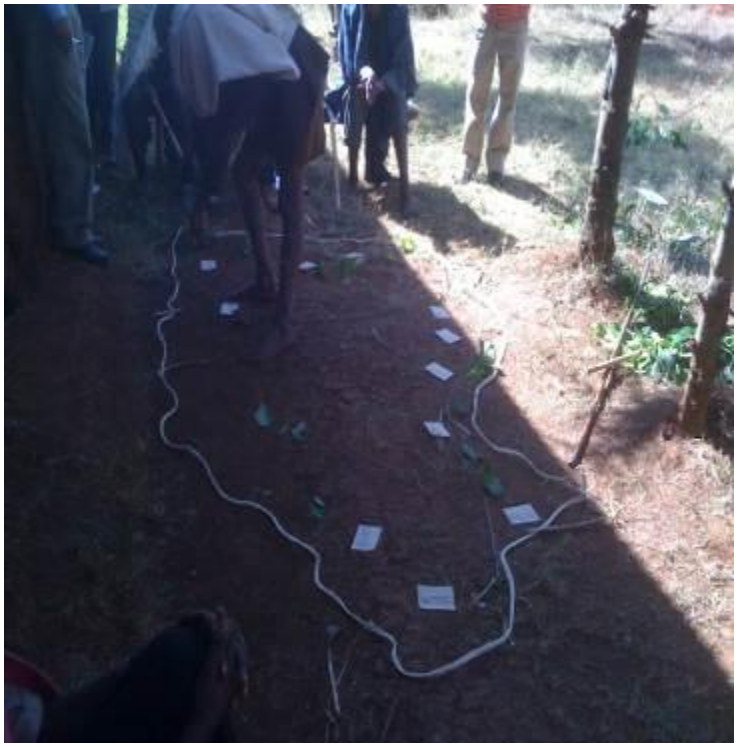


Figure 1: Jiga *Kebele* Resource Map

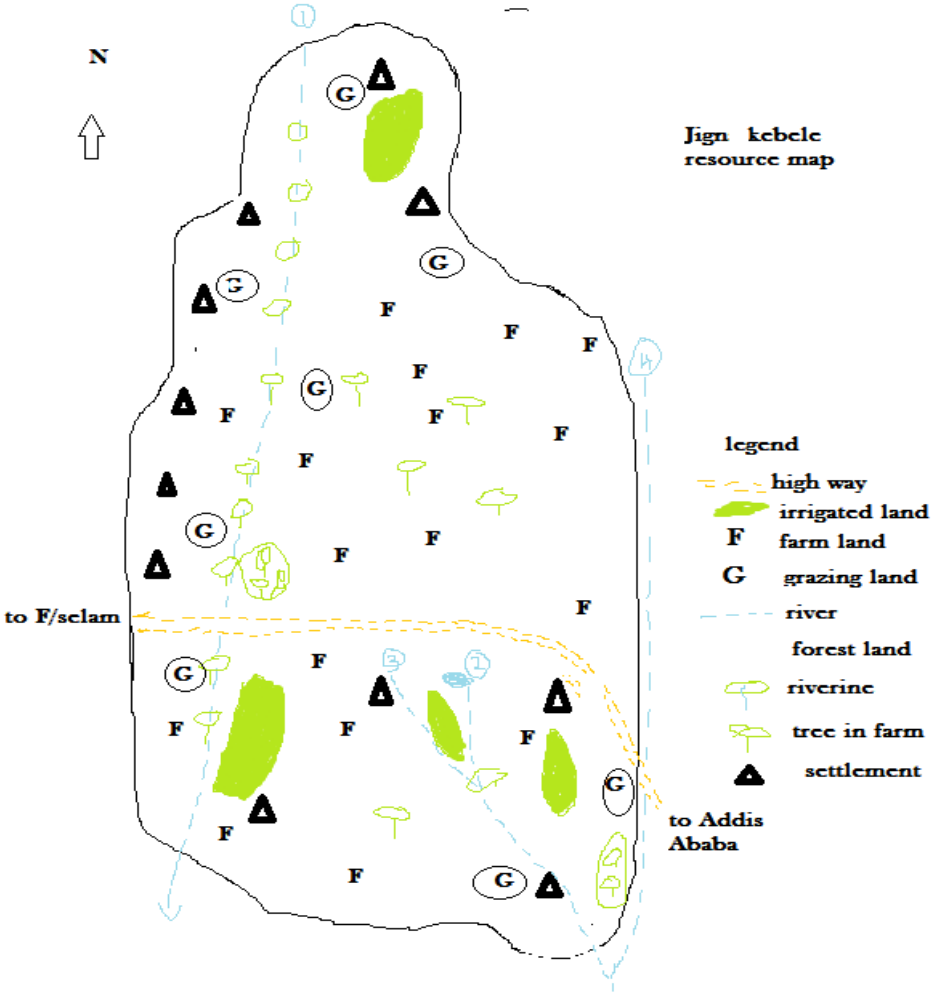


Figure 2: Sketch of Jiga *kebele* resource map for abundant and scarce resources.

None of the four natural resource identified by the community In Jiga *kebele*, are abundant. All are scarce for all groups of the community. The scarcity of arable land particularly affects one group of the community, namely, the young farmers, both male and female. The economic threshold level for arable land ownership in all project *kebeles* was set 15 years ago. The last redistribution of arable land was conducted during 1997. This situation results in large numbers of landless young farmers.

3.1.1.1 Problematic resources

The participating farmers described the problems associated with the natural resources they identified. This section presents the problems as perceived by farmers. One of the common problems with arable land was a continuing decline in fertility. The causes of this problem showed great similarity among the adjoining *kebeles*, although some location specific causes were also evident. Mismanagement of farmland, and lack of effective erosion control measures were the common causes mentioned during the discussion. Fesses, which are small drainage furrows to remove excess runoff from farmland, have been found to be the most extensively used erosion control measure. The soil and water conservation campaign initiated by the government in all *kebeles* may be a good start to reducing soil erosion.

However, its coverage is restricted only to the pilot watershed. The area under integrated soil and water conservation activity did not exceed 50 ha in most *kebeles*,. Thus, compared to the magnitude of the problem its contribution was insignificant. Other erosion control and soil fertility improvement measures that will protect the soil against the erosive force of rainfall such as minimum tillage, mulching, and cover crops were either introduced as a test, or not known at all. Another specific cause of soil erosion in the *kebele*s was the high trampling effect of livestock on the soil, which triggers erosion by wind and rain.

Waterlogging on natural pasture that derives from the very nature of the soil, i.e. vertisol, was mentioned as a problem on grazing land that hampers the growth of feed expected from it. This problem was also exacerbated by the fact that during the rainy season, the cattle were allowed to enter the waterlogged pasture and caused great damage by trampling.

One of the problems with irrigation water was its uneven distribution. Only some of the villagers in the *kebele* benefited from the irrigation dam that was constructed in 1980-81. The resource map drawn by the farmers showed most of the irrigated land concentrated in the southern part of the *kebele*. Siltation of the dam and earthen channels was also mentioned as a problem causing shortage of water through blockage of channels and leakage of water.

The resource map did not show any natural forest or manmade plantations designated as forest areas. The wood and wood products required by the community are obtained from trees growing in farmland, grazing land, along the river and in homestead plantations.

The soil map drawn by the participants showed that red soil (nitosol) accounted for more than 75% and the remaining 25% vertisol is found in some villages. Vertisol is crop selective and the major crops grown are teff, niger seed, chickpea and grass pea. Vertisol has problems such as waterlogging, being difficult to plough during the dry season, cracking and susceptibility to gully formation.

3.1.1.2 Access to land per community group

Arable land holdings among the different groups of society were not uniform. The variation was particularly evident between the poor and rich farmers, and the landless young farmers are a special case, as described above. The average land holding size for the poor farmers was less than one hectare, the middle category could have arable land of up two ha and the rich farmers, although few in proportion could have more than three hectares of arable land. The area of arable land held was included in the farmers' wealth ranking criteria. Those male or female households who took advantage of arable land before redistribution also benefited from the redistribution, because it was made in proportion to the previous holding, regardless of gender. There are therefore some female headed households who administer as much as three ha of arable land.

3.1.1.3 Fertility distribution of the land

Uneven distribution of soil fertility was observed during the survey. Farmers identified three categories of soil fertility, namely fertile, medium fertility, and infertile. The proportional distribution of these fertility categories was estimated by the farmers as 10% fertile land, 25% medium and the remaining 65% infertile soil. Farmers claimed that only the backyards of farms that benefit from continuous application of manure and compost are considered to be fertile, while other farmland is grouped under medium or poor fertility because of the continuing decline in soil fertility caused by soil erosion and leaching of nutrients from exhaustively cultivated land.

3.1.1.4 Decision making on land allocation

Decisions about what type of crop to sow in each growing season were made by consultation with the spouse. These decisions took into consideration the appropriate rotation and also the size of the land area held by each household. If the household landholding size is small, most of the time they preferred to grow what are considered to be staple crops continuously, without any sort of rotation.

3.1.1.5 Collection of water and firewood

The major source of energy for cooking is derived from firewood. Eucalyptus plantations grown in the homestead are the preferred source of energy. Firewood from branches of trees grown among the crops is also used as a source of energy. Crop residues, mainly the lower parts of the maize stalks, and cattle dung were also considered important sources of energy. Every household member participated in the collection, transporting and stacking of the different sources of energy. The majority of the community members did not suffer from shortage of energy sources because of the wide range available. The main sources of potable water in the project area are natural springs and capped wells. Water availability differs from village to village, and it was difficult to estimate the average walking distance from the *kebele* to fetch water. Women and children are usually responsible for fetching water for household usage.

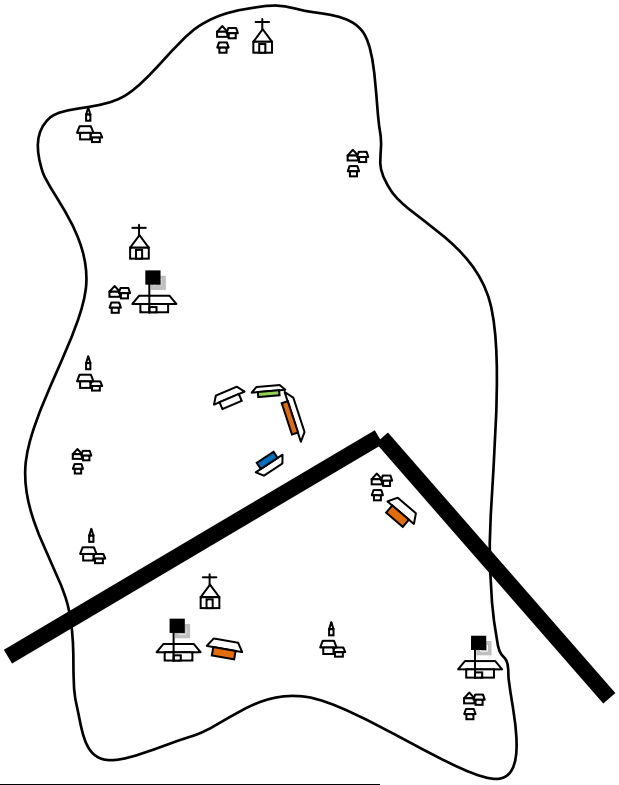
3.1.1.6 Livestock grazing

The scarcity or abundance of grazing land differed from village to village, and from *kebele* to *kebele*. It was not categorised as an abundant resource in any of the villages, although in most villages it is the management of grazing land rather than its shortage that is the problem. The fact that the grazing land is administered as a communal resource has been the cause of more problems than benefits, because the natural pasture is being grazed throughout the year without rest. This uncontrolled and free grazing is sometimes extended beyond the carrying capacity of the grazing land. Everybody in the community has the right to graze whatever number of cattle they have without considering the amount of grass available. In some villages, the scarcity of grazing land was so high that villagers were forced to allocate a portion of their cultivated land to grazing. In this *kebele*, the same grazing land has been used by the nearby urban livestock, placing it under additional pressure.

3..1.2 Jiga *Kebele* Socio-economic conditions

3.1.2.1 Social mapping.

Social mapping was performed by the same community group which had participated in resource mapping. The resource map was changed to a social map to indicate the location of the most important institutions in the *kebele* and also to show their spatial distribution in relation to the settlement pattern of the villages. Thus, this social map showed that the boundaries of the Jiga *kebele* are wider with regard to social interactions and social services than the physical boundaries of the *kebele*. The reason is that there is frequent interaction in many issues such as marriages, funerals, *Edir*, and *Equb* with the nearby villages of other *kebeles*. In addition, some social and economic institutions such as secondary schools are located in other *kebeles* or in the urban centre. Some other institutions delivering social services, such as schools, grinding mills, city market, health clinics and water points are serving many people from beyond the boundaries of the *kebele*.



Key: Grinding mill	
School	
DA's office	
Church	
villages	
Road	

Figure 3: Social map of 'Jiga *kebele*'

3.1.2 2 Demographic characteristics

The population of Jiga *kebele* showed an increasing trend. That means the number of households, the total population and the average family size within a given household are all growing with time. Population increase causes many problems for a community like Jiga that totally depends for its livelihood on land.

More than 90% of the farmers in this project *kebele* are followers of the Ethiopian Orthodox Church, with a few individuals from other religions such as Muslims and Protestants. The female headed households live together with other community members and they are also entitled to equal access to available services. This does not mean that there are no gender related problems.

3.1.2.3 The main economic activities

Small-scale mixed farming is the main economic activity in the rural community of Jiga *kebele*, with crop production being the major economic activity followed by livestock production. Crop production covers a wide range of crops which include both cash and food crops. The crops grown include rain-fed maize, pepper, teff, wheat, faba bean, and niger seed. Crops grown under irrigation include potato, pepper, barley, shallot, garlic, coffee, buckthorn (*Rhamnus prinoides)* and banana, and other perennial and annual horticultural crops are also cultivated using irrigation. Chickpea and grass pea are also cultivated on vertisol, using residual moisture after teff.

Livestock production is the second most important economic activity for the *woreda* as a whole. Here, farmers also generate quite good incomes from livestock production although the production system is also traditional.

3.1.2.4 Access to finance

The availability of finance and credit for resource poor farmers has a strong link with agricultural productivity because on one hand many farmers are poor, and on the other hand it is this group that suffers most from lack of credit services to buy agricultural inputs such as fertilizer and improved seeds. This is mainly because the creditors demands collateral.

ACSI represents the only micro-finance institution in the *kebele*. The problem with this institution is the low level of its loans. The maximum one farmer can borrow is 3,000 birr (112 euro). Farmers' cooperatives also sell agricultural inputs on credit, but this service has some problems for the poor: the cooperative gives priority to cash transactions and makes late decisions on credit provision. The inefficiency of the cooperative as a supplier of credit is another problem.

3.1.2.5 Access to markets

Jiga rural community exchanges products and commodities in the nearest local market and also in the city market in Finote Selam. During this survey, farmers showed that they are forced to sell their products at prices fixed by merchants in the markets.

The other problem with market access is that farmers could not sell their products beyond the specified market place because the government restricts the free movement of agricultural outputs during the peak harvest time, in the name of price stabilization.

The inflation rate has also challenged farmers' livelihoods in the project area. The prices of industrial products such as clothes, food items, household items and sanitation items such as soap seemed to be unaffordable to the majority. For most villages, marketing problems thus constituted the top challenge in the problem ranking.

3.1.2.6 The main economic constraints

Problems related to marketing were identified as a major economic constraint particularly for the poor (see Table 4, the outcome of pairwise ranking). Because they usually buy agricultural inputs on credit and they are forced to repay their loans just after harvest, when the supply of agricultural products is high and prices are low.

Table 4. Pair-wise problem ranking matrix of problems faced by farmers in Jiga kebele. For description of method see 1.2.4

s.n	***problems***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***14***	***score***	***rank***
1	High fertilizer price		2	1	1	1	1	1	1	1	1	1	1	1	1	12	2
2	Declining soil fertility			2	2	2	2	2	2	2	2	2	2	2	14	12+1	1
3	Marketing problems				3	3	3	3	3	3	3	11	3	3	14	9	5
4	Poor quality seed					4	4	4	4	9	4	11	4	4	14	7+1	6
5	Supply of credit and inputs						5	7	5	5	5	11	5	13	14	5	10
6	Animal diseases							7	6	9	10	11	6	13	14	2	12
7	Crop diseases and pests								7	9	7	7	7	13	14	6	9
8	Irrigation water problems									8	9	10	11	12	13	0	14
9	Shortage of land for young farmers										9	11	9	13	14	6+1	8
10	Animal feed shortage											11	10	13	14	3	11
11	Drinking water												11	11	11	10	4
12	Lack of improved animal breeds													13	14	1	13
13	Deforestation														14	7	7
14	Gully formation															11	3

3.1.3 Actor landscape

3.1.3.1 Organisations, institutions and groups that are working in or with the community.

The different formal and informal institutions working in Jiga *kebele* were identified by a mixed group of 8 male and 7 female participants. Table 5 lists these institutions and their roles and responsibilities.

Table 5. Organisations and groups who are working with Jiga kebele community

No.	Organisations	Role and responsibility
1	World Vision Ethiopia (WVE)	Construction of potable water supply, community toilet , school, family planning, agricultural activities
2	Health Extension	Provides health extension service such as distribution of malaria medicine, training, contraceptives, door to door advisory service
3	Farmers' Training Centre	All agricultural activities
4	Public School	Education
5	Police	Peace and security
6	District Office of Agriculture	Periodic supervision and technical backstopping
7	Irrigation Cooperative	Supply of irrigation
8	Farmers' cooperatives	Supply of agricultural inputs and commercial goods
9	Amhara Credit And Saving Institution	Credit and savings service
10	*Kebele* Administration	Administration
11	*Kebele* Land Administration	Administration of land related issues
12	Church	Religious service
13	Edir	Social service in times of bad and good conditions
14	Youth Club	Mobilization of youth issues and development
15	Women's Affairs	Women's awareness and empowerment
16	Community Leaders	Conflict resolution

The participating farmers tried to identify the level of partnership among these institutions. According to them, most of the time these organisations work independently without giving due consideration for partnership with other stakeholders. However, in some cases some organisations and groups work in close cooperation with each other. For example, World Vision Ethiopia works with the *kebele*

administration, farmers training centre, schools and health extension workers. Similarly, the farmers' training centre, *kebele* administration, cooperative and church are also working together.

The relative importance of the identified institutions to the community were assessed with the Venn diagram (see figure 3).

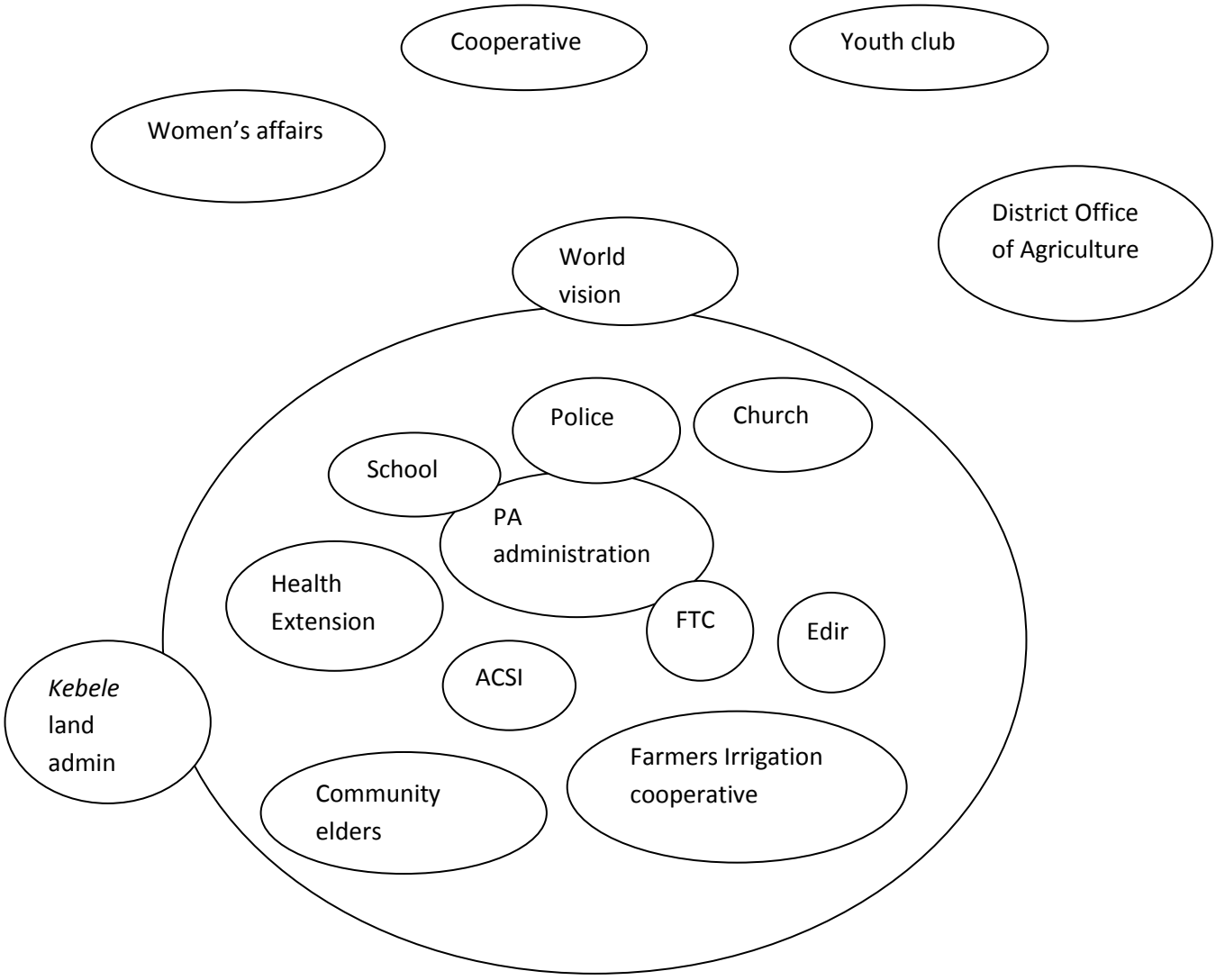


Figure 4: Venn diagram of institutions in Jiga *kebele* prepared by mixed group of men and women

3.2 Zaba *kebele*

3.2.1 Environmental conditions

A resource mapping exercise and subsequent discussion were used to describe the natural resources of Zaba *kebele*. Participants comprised a mixed group of 30 farmerss (22 male and 8 female) from all social groups including young farmers, male headed and female headed households, poor and rich farmers and model and non-model farmers. The major natural resources and their spatial distribution were shown on maps prepared on the ground outdoors by this group using locally available materials (Figure 5).

Figure 5: Zaba *kebele* resource map

Natural resources identified by community groups.

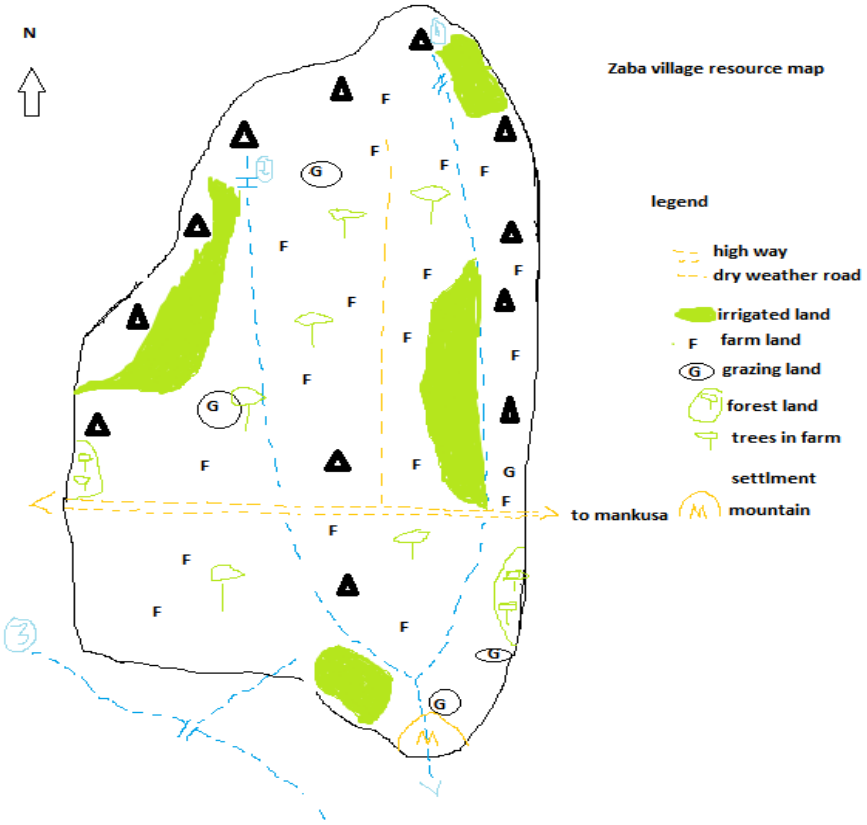


Figure 6: Sketch of Zaba kebele resource map

Because of the high population pressure from both people and livestock, and the dependence of most people on the land for their livelihoods, none of the natural resources in this project *kebele* were categorised by the community as abundant. The situation presented on the resource map was worsened for some farmers by the fact that land was re-allocated to farmers 15 years ago, due to fears of land fragmentation, and many of the young generation of farmers are now landless.

3.2.1.1 Problematic resources

Some of the common problems concerning the arable land in Zaba *kebele* are shared with the previously covered one, notably declining soil fertility and an increase in fertilizer requirement on the same farmland each year. The causes attributed were mismanagement of the farmland, and lack of effective physical, biological and agronomic flood erosion control measures, as discussed for Jiga *kebele*. Unlike Jiga *kebele,* in Zaba, flooding and gully formation caused great damage to farmland and other social infrastructure such as schools, and this problem was third in the pair-wise problem ranking of the *kebele* conducted by a mixed group of 20 male and 7 female participants. The scale of this problem increased because of the topography of this low-lying *kebele* which suffers from excessive flooding from upstream. The floods are caused by a lack of flood prevention measures in the upper watersheds, and poorly designed drainage while constructing feeder roads, resulting in rill erosion and the formation of gullies.

The high livestock population relative to available grazing land causes overgrazing and degradation of the grazing land. Cattle loosen the soil with their hooves and make it susceptible to erosion, leading eventually to the formation of gullies. Illegal expansion of their grazing land by neighbouring farmers also reduces the size of natural pastures.

The Zaba farming community uses traditional diversion to irrigate their farmland. Only a small portion of the community benefits from this (see resource map). Even for those who are using irrigation, shortage of water forces them to plant only perennial crops because sometimes water can only be allocated once a month. This shortage is caused by a large number of upstream irrigation users, and from inefficient utilization of water under traditional diversion methods. Traditional diversion has two intrinsic problems. Firstly, diversion is done locally and is susceptible to upstream shortages. Secondly, it is labour intensive because new channels need to be constructed every year. A particular problem for Zaba *kebele* is that conflicts of interest over irrigation water arise mainly with neighbouring *kebeles*. This has occurred because they are being administered by different local administrations and also different local institutions such as water users' associations. The point of diversion for Zaba *kebele* is found in the adjacent *kebele* and when the irrigation users from Zaba are digging to create a more effective diversion, the residents of the other *kebele* do not welcome them. They argue that Zaba *kebele* farmers are not entitled to come to their land and maintain the diversion, and as a result there is conflict every year. On the other hand, the conflict for irrigation water within the *kebele* has been reduced because they are governed by the same irrigation users and the same bylaws. One special problem from the bylaws is that the irrigation shifts did not take into consideration the needs of female-headed households. Night shifts for female-headed households are not convenient due to issues of safety and security.

The natural forest in the *kebele* has been dwindling in past decades as it has been converted to farmland and grazing land and is now concentrated in two small patchy areas. These forest areas are meant for environmental purposes. Most of the community's wood and wood product requirements are met from trees in farmland, grazing land, along the river and in homestead plantations.

A soil map prepared by the participants showed that red soil (nitosol) covered almost 100% of the land area of the *kebele*.

3.2.1.2 Access to land by different community groups

Access to land among the different community groups also varied in this *kebele*. The variation in landholding sizes between poor and rich came as a result of redistribution of land 15 years before, which is leaving increasing numbers of young farmers without land. The average land holding size according to the discussion group is 0.75 ha, with the maximum holding being up to only 1.25 ha. Those male or female households who held a higher proportion of arable land before redistribution also benefited from the redistribution.

3.2.1.3 Fertility distribution of the land

Two categories of soil fertility, poor and medium, were identified by farmers. The first accounts for two thirds of the land area, and the second, one third. These data are not consistent with the background data obtained from the *woreda* administration, due to differences in definition of fertility between farmers and experts. Here, farmers define fertile land as any land where crops will grow without fertiliser.

3.2.1.4 Decision making on land allocation

In each household, the decision on what type of crops should be grown was made in consultation with the spouse. This decision took into consideration the appropriate rotation and also the area of land held by each household. If the household landholding size is small, most of the time they preferred to grow what are considered to be staple crops, continuously and without any sort of rotation that might have positive effects on soil fertility.

3.2.1.5 Collection of water and firewood

The problem of shortage of drinking water varies from village to village in the *kebele* because the settlements are scattered and water availability in the area is varied. Therefore, in some villages women may spend from one to six hours per day fetching water, including the waiting hours in the queue. A central problem in all villages is that the water in capped wells receives no treatment, causing sanitation problems and waterborne disease.

The major source of energy for cooking comes from wood, crop residues and cow dung. Firewood is collected from backyard plantations, and from trees on user-owned farmland. Open access to natural forest and bush land is considered an illegal act. Although firewood is the preferred source of energy, supply is insufficient to provide fuel all year round for the majority of inhabitants. The majority of the community members use a combination of different fuel sources to prevent energy shortages, but use of crop residues and cow dung can conflict with the need to improve soil fertility.

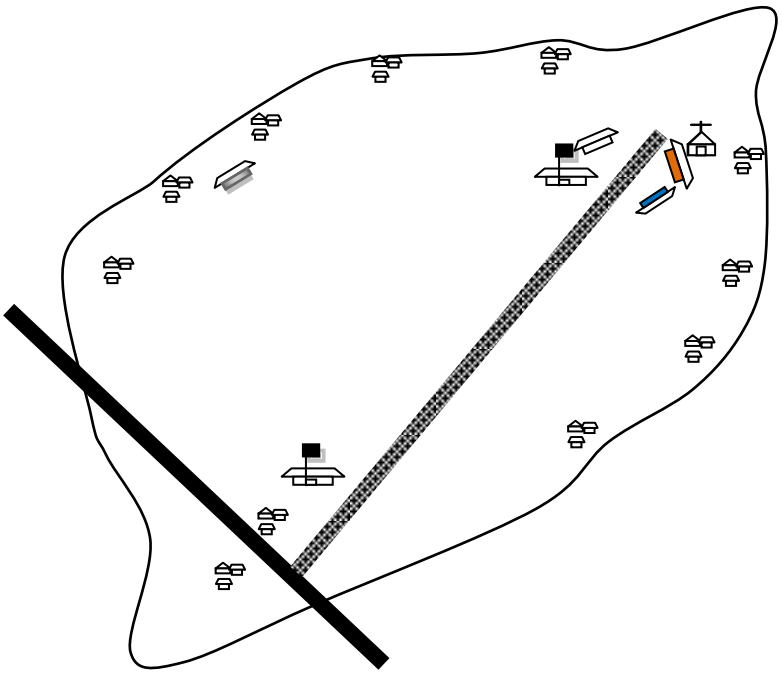
3.2.1.6 Livestock grazing

Grazing land shortage was found to be greater in Zaba than in other study *kebeles.* Its administration as a communal resource also caused many productivity problems. The flood damage from the upper catchment also negatively affects the productivity of grazing land when huge amounts of silt are washed over the natural pasture.

3.2.2 Socio-economic conditions

3.2.2.1 Village boundaries with regard to social interaction and social services

The social map of the *kebele* showed that settlement is scattered. Those villages far from the local administration centre obtained most of their social services from neighbouring *kebeles*. Social interaction and social services extend beyond boundaries. The social interactions include marriages, shared labour and funeral ceremonies. There were also incidents where the villages of Zaba *kebele* shared other social services such as grinding mills, schools and health services form other *kebeles.*



Key: Grinding mill	
School	
DA's office	
Church	
Villages	
Road	

Figure 7: Social map of Zaba *kebele*

3.2.2.2 Demographic characteristics

The population is showing an increasing trend. The majority of Zaba *kebele* inhabitants are followers of the Ethiopian Orthodox Church with small numbers of Muslims and Protestants. Female headed households live together with other community members and they are entitled to the same access to services as other community members. This does not mean, however, that there are no gender related problems.

3.2.2.3 The main economic activities

Like all rural *kebeles* of the project *woreda,* the main economic activity for this *kebele* is small-scale mixed farming, with crop and livestock production. Major crops grown by rain-fed agriculture include maize, finger millet, pepper, teff, wheat, faba bean, potato, and barley. The major crops grown under irrigation are potato, pepper, barley, shallot, garlic, coffee, buckthorn (*Rhamnus prinoides)* and banana, and other perennial and annual horticultural crops are also cultivated using irrigation.

Livestock production is of secondary importance to crop production, and most of the breeds and production systems are multipurpose, supplying draught power, milk, meat, skin and hides.

3.2.2.4 Access to finance

Formal access to finance throughout the *kebele* is from ACSI which is the only micro-finance institution operating in the district. Poor farmers who are unable to buy agricultural inputs on a cash basis consider this to be the best option despite its limitations. The stake of other informal, individual and group, lenders has diminished with the dominance of ACSI. One reason for this is that they are unable to reach as many farmers as ACSI because of limited financial capacity. Farmers also use additional, informal institutions such as Ekub and Endir as an option.

3.2.2.5 Access to markets

The marketing problems identified in this survey were identical across the project *kebeles.* Farmers were forced to sell their produce at the fixed prices set by merchants, they could not sell their produce beyond the specified market place, and all community groups including farmers are victims of growing price inflation. These factors cause poverty which challenges all areas of life in the project area.

Table 6. Pair-wise problem ranking matrix of problems faced by farmers in Zaba kebele

For description of method see 1.2.4

No.	Problem list	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Score	Rank
1	Marketing problems	X	2	1	1	1	1	7	1	9	10	1	12	13	1	7	7
2	High fertilizer prices		X	2	2	2	2	2	2	2	10	2	2	2	2	12+1	1
3	Poor supply of agricultural inputs			X	3	3	3	7	3	9	10	3	12	13	3	6	8
4	Quality and quantity of drinking water				X	4	4	7	4	9	10	4	12	13	4	5	9
5	Irrigation problems					X	5	7	5	9	10	5	12	13	5	4	10
6	Monkey problem						X	7	6	9	10	11	12	13	6	2	12
7	Poor seed quality							X	7	7	10	7	12	13	7	9	5
8	Overgrazing								X	9	10	11	12	13	8	1	13
9	Shortage of crop land									X	10	9	12	13	9	8	6
10	Decreasing soil fertility										X	10	12	13	10	11	4
11	Animal diseases and veterinary service											X	12	13	11	3	11
12	Crop diseases and pests												X	12	12	12	2
13	Upper watershed flood problem													X	13	11+1	3
14	Shortage of improved farm machinery and technology														X	0	14

3.2.2.6 The main economic constraints

In order to pay off their loans to ASCI, a majority of famers are forced to sell their produce immediately after harvest when the supply of most agricultural products is high and prices are low. At the same time, farmers are not organised to benefit from the sale of produce, and suffer from instability in the market.

3.2.3 The actor landscape

Separate groups of 10 men and 7 women farmers participated in identifying the different formal and informal institutions operating in their *kebele*. Each group came up with similar results and they identified 19 institutions, three more than in the previous *kebele*. Table 7 presents the additional institutions identified in this *kebele*.

Table 7: Institutions/groups working in or with the community

No.	**Organisations**	**Role and responsibility**
1	Facilitator for Change in Ethiopia (FCE)	Construction of public school
2	*Equib*	Traditional saving
3	Religious Group *'Mahber'*	Executing religious obligations

The relative importance of these institutions to the two groups showed slight variation as shown in Figures 8 and 9.

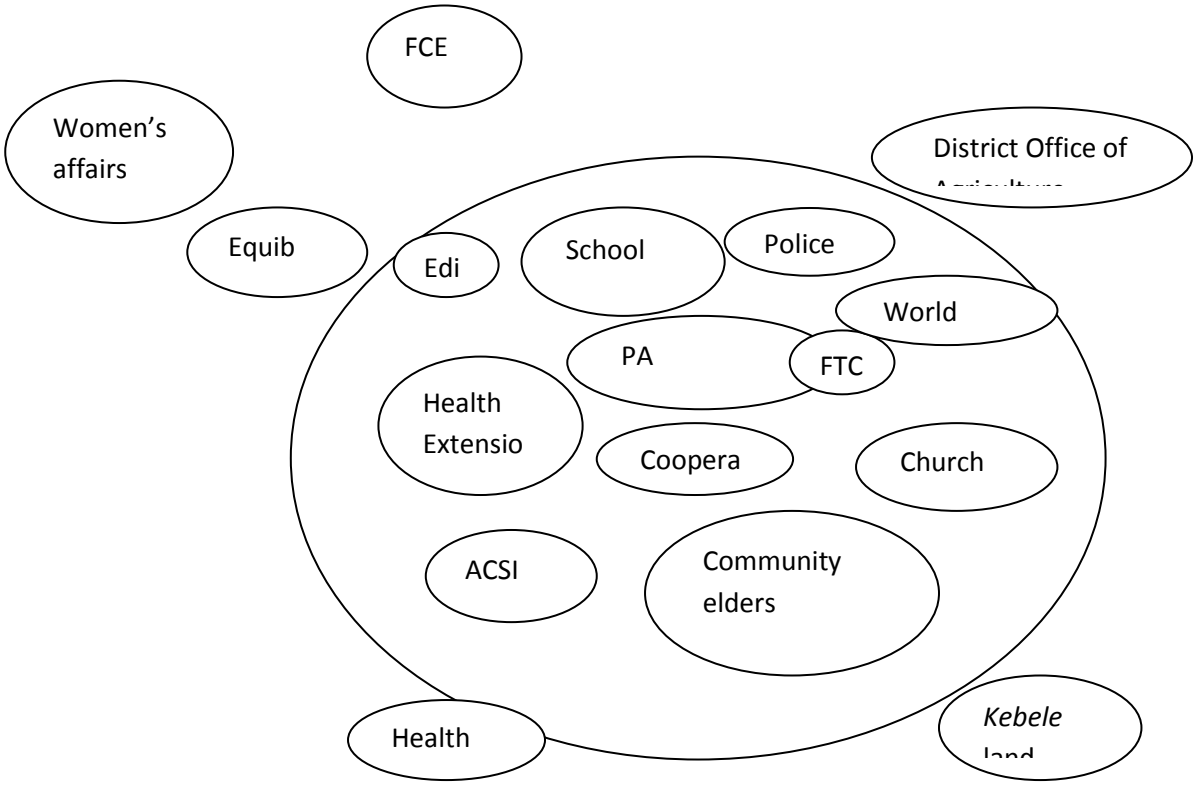


Figure 8: Relative importance of institutions in Zaba *kebele* according to the men's group

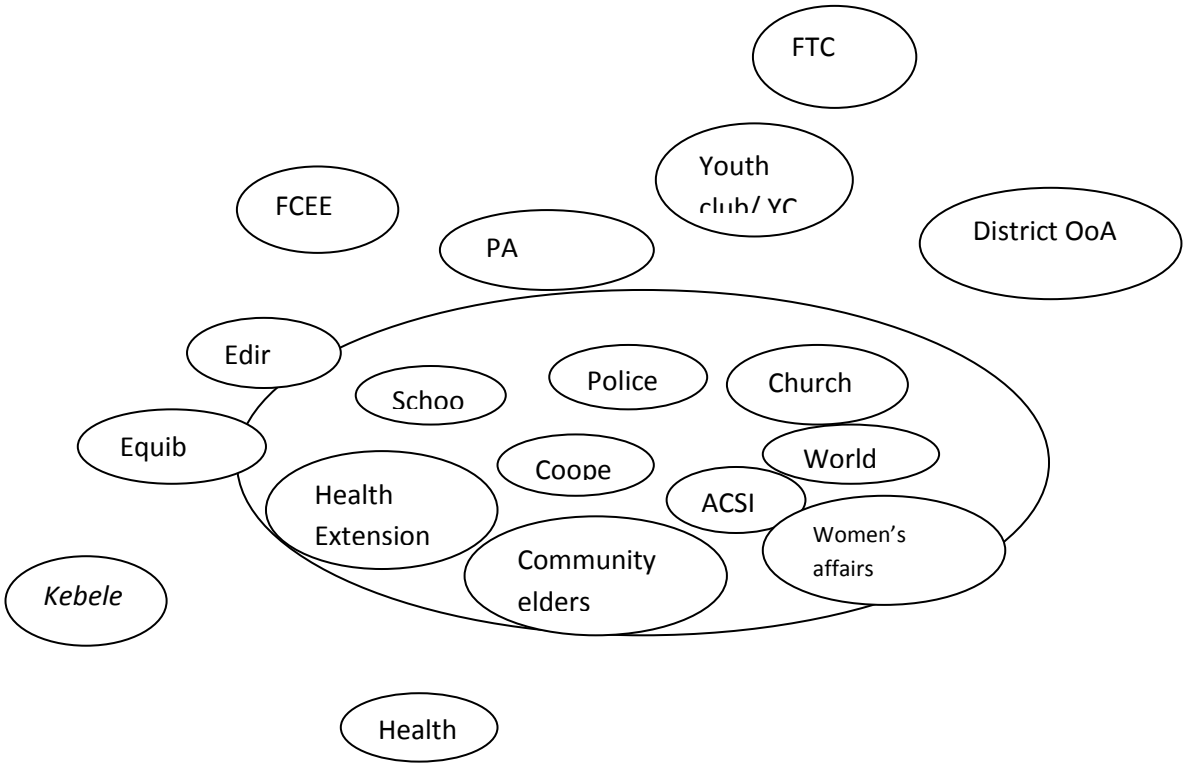


Figure 9: Relative importance of institutions in Zaba *kebele* according to the women's group

It is apparent from the Venn diagrams that some institutions such as schools, the police, cooperative and church, ACSI, World Vision, the health extension service, and community elders, serve the two groups equally and are placed centrally in both cases, whereas institutions such as women's affairs are only found to be very important by the women's group. There are also institutions whose relative importance for both groups is relatively low, such as the youth club and FCE. The partnership level of the different institutions described for the previous *kebele*, was found to be similar in Zaba, with only a few cases of close networking between different institutions.

3.3 Mana *kebele*

3.3.1 Environmental conditions

Mana *kebele* is located on the southern border of Zaba *kebele*, and most of the environmental and socio - economic conditions showed great similarity. Here, a mixed group of 22 farmers (18 men and 4 women), representing villages throughout the *kebele,* participated in drawing a resource map and describing the environmental conditions in the *kebele*. The sketch map (Figure 10) shows how the different natural resources are distributed within the *kebele*.

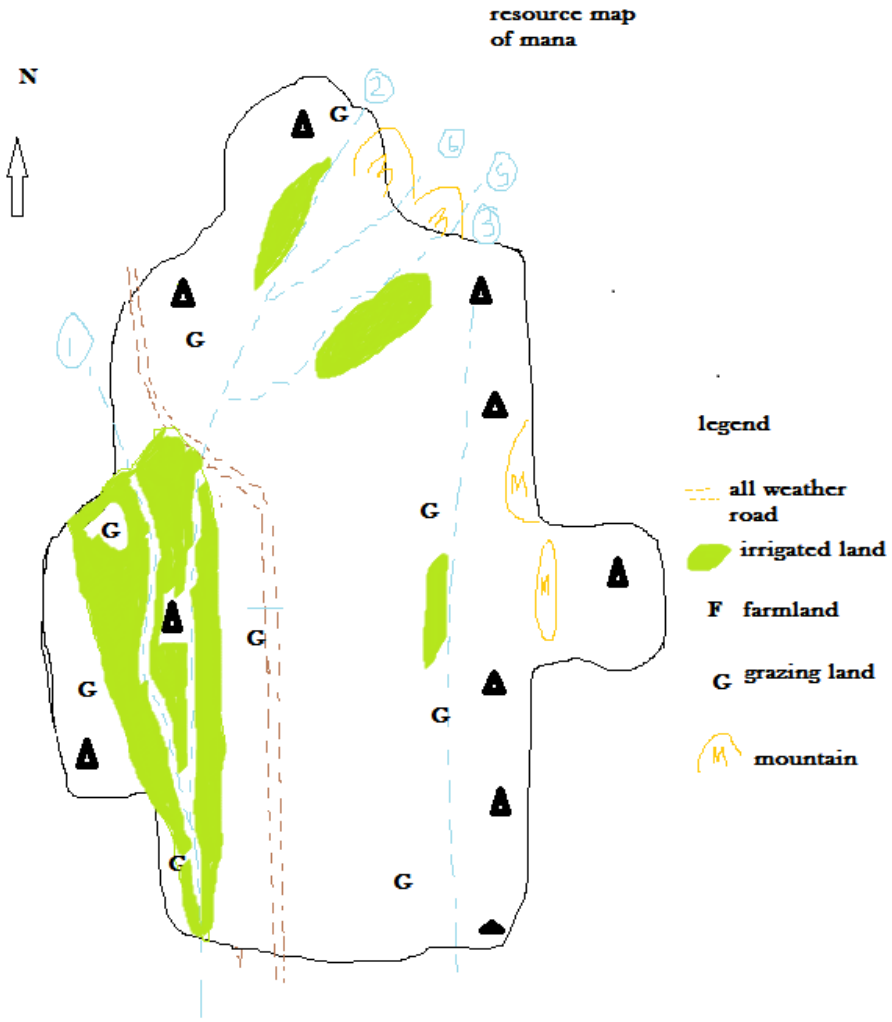


Figure 10: Resource map of *Mana* (sketch)

3.3.1.1 Resources identified by community groups

All the natural resources identified by the group showed scarcity due to the high level of pressure on land. The descriptions and the reasons given for the relative abundance and scarcity of the natural resources in other *kebeles* also hold true in Mana.

3.3.1.2 Problematic resources

The decline in soil fertility on arable land continues to be a central problem for the farming community of this *kebele*. The sketch map drawn by PRA participants showed the natural forest cover as one patch in the northern-most part of the *kebele* in close proximity to the neighbouring *kebele.* This has caused conflicts over ownership and protection of the forest. The western part of the *kebele* benefits from the Debeholla river, which is a source for a large part of the irrigated land concentrated in these parts of the *kebele*. There are also small patches of irrigated land in the northern and eastern parts which use small

springs as a source of water. Apart from its uneven distribution, shortage of irrigation water was also mentioned as a problem. Because of the large number of irrigation users upstream in neighbouring *kebeles,* farmers in Mana can face a wait of up to one month for irrigation water. Thus, farmers are not able to produce high value vegetable crops, and focus instead on perennial crops that need less water.

The problem with grazing land is diverse, in most villages there is enough grazing land in terms of area but not enough feed because of mismanagement of communal pasture. In others, the area of available pasture land is inadequate, so that the amount of available feed is insufficient, and in some parts of the *kebele* weeds in the pasture were also found to be a problem.

3.3.1.3 Access to land by different community groups

According to the discussion group participants, the sizes of arable land holdings range from 0.25 ha to 2 ha. It is important to note that many young farmers are landless.

3.3.1.4 Fertility distribution of the land

Three categories of soil fertility were identified by farmers. They estimated that 60% of their land had poor fertility, 30% had medium fertility and 10% was fertile. Farmers define fertile land as simply being land that can grow crops without fertiliser.

3.3.1.5 Decision making on land allocation

The type of crops to be grown is decided in consultation with the spouse, and according to the land holding size of the family.

3.3.1.6 Collection of water and firewood

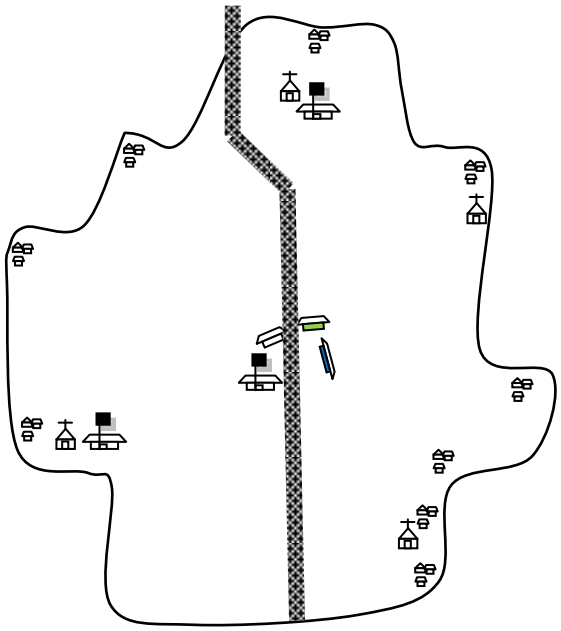
The availability of drinking water for people and livestock consumption differs between villages in the *kebele*. The sanitation of existing water points also needs attention. Water is untreated and as a result, the prevalence of water borne diseases increases from time to time.

As in the adjoining *kebeles,* the energy sources for cooking are wood from eucalyptus plantations grown in the homesteads, and firewood from the branches of trees growing on farmland. Crop residues and cow dung are also sources of fuel. All household members participate in the collection, transport and stacking of the different sources of energy. Energy sources become scarce for two months each year during the rainy season.

3.3.2 Socio economic conditions

3.3.2.1 Village boundaries with regard to social interaction and social services

The same mixed group of PRA participants who sketched the resource map drew the social map of the *kebele* (Figure 11). This showed scattered settlements, and those villages far from the local administration centre obtain most of their social services from other nearby *kebeles*. This situation makes the social interaction and social services wider than the physical boundaries of the *kebele*.



Key: Grinding mill	
School	
DA's office	
Church	
Villages	
Gravel road	

Figure 11: Social sketch map of *Mana*

3.3.2.2 Demographic characteristics

The total population showed an increasing trend that came from an increase in the younger household members. Ethiopian Orthodox Church followers dominate the area with small numbers of Muslims and Protestants. There is no stigma attached to female headed households and they have the same access to the services as any other member of the community.

3.3.2.3 The main economic activities

The main economic activity for the *kebele* is small-scale, mixed farming of crops and livestock. The major crops are maize, finger millet, pepper, teff, wheat, faba bean, potato and barley. The livestock production system is also traditional, and most breeds and production systems are multipurpose, supplying draught power, milk, meat, skin and hides. The manure from animals, particularly from large ruminants, serves as fuel and can be used as fertilizer in the form of compost manure.

3.3.2.4 Access to finance

ACSI is the only formal micro -finance institution operating in the *kebeles*. It gives credit to beneficiaries after assessing their capacity to repay the loan. This situation prevents the poor farmers from taking loans for agricultural inputs such as fertilizer and improved seed.

3.3.2.5 Access to markets

Farmers sell and buy products in the city and the local market. The restriction of free movement of agricultural products and price inflation are the most common marketing problem for all villagers, and marketing problems were top of the list in the problem ranking exercise.

Table 8: Pair-wise problem ranking matrix of problems faced by farmers in Mana kebele *For description of method see 1.2.4*

No.	Problem list	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Score	Rank
1	Credit problems	X	2	3	4	5	1	7	8	9	10	11	12	13	1	15	**2**	13
2	Increasing fertilizer prices		X	2	4	5	2	2	2	2	2	2	12	2	2	2	**11**	4
3	Poor seed quality			X	4	5	3	7	8	9	3	3	12	3	3	3	**7+1**	7
4	Decreasing soil fertility				X	5	4	4	4	4	4	4	12	4	4	4	**12**	3
5	Gully erosion and landslides					X	5	5	5	5	5	5	5	5	5	5	**14**	1
6	Irrigation problems						X	7	8	9	10	11	12	13	6	15	**1**	14
7	Marketing problems							X	7	9	7	7	12	7	7	7	**9**	6
8	Drinking water								X	9	10	8	12	8	8	8	**7+1**	7
9	Crop diseases and pests									X	9	9	12	9	9	9	**10**	5
10	Deforestation										X	10	12	10	10	10	**7+1**	7
11	Shortage of soil and water conservation tools											X	12	13	11	11	**4**	11
12	Land shortage for young farmers												X	12	12	12	**13**	2
13	Animal diseases													X	13	13	5	10
14	Shortage of improved animal breeds														X	15	0	15
15	Grazing pasture problem and feed shortage															X	3	12

3.3.3 The actor landscape

The PRA group of Mana identified two additional institutions compared with the first *kebele,* bringing the total number of formal and informal institutions to 18. The mixed group of 24 participants listed these institutions and also judged their relative importance to the community as presented in Figure 12.

Table 9: Additional institutions/groups working in or with the community compared with Jiga

No.	Organisations/institutions/groups working with community	Role and responsibility
1	Facilitator For Change In Ethiopia(FCE)	Construction of public school; Support for community savings and credit association through involvement in community level seed production and marketing
2	Community seed producing association	Seed multiplication and marketing

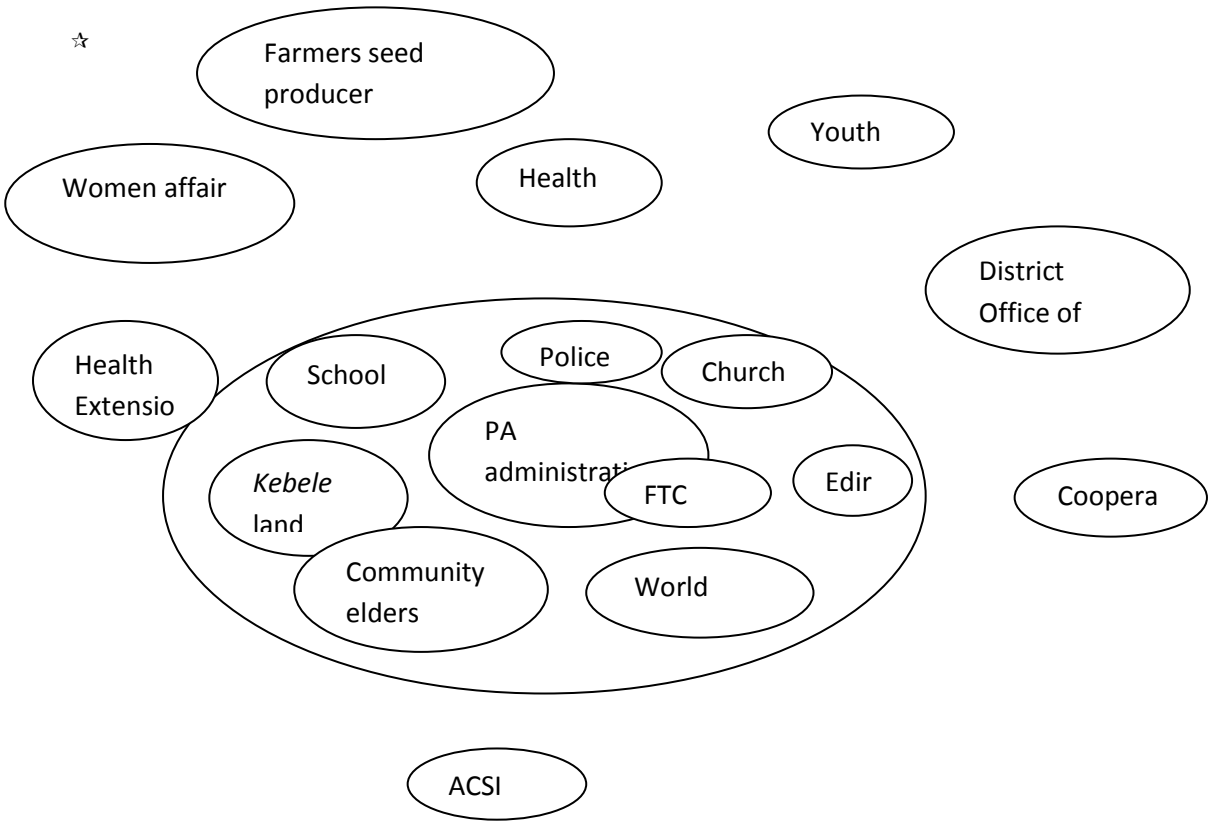


Figure 12: Venn diagram of institutions in Mana *kebele* by both male and female group

Those institutions in the centre of the diagram were considered most important by the community because of the quality of their services.

3.4 Jimat kebele

3.4.1 Environmental conditions

The resource map of *Jimat kebele* was drawn by a mixed group of 8 women and 18 men totalling 26 participant farmers, representing all villages and social groups in the *kebele* (Figures 13 and 14).

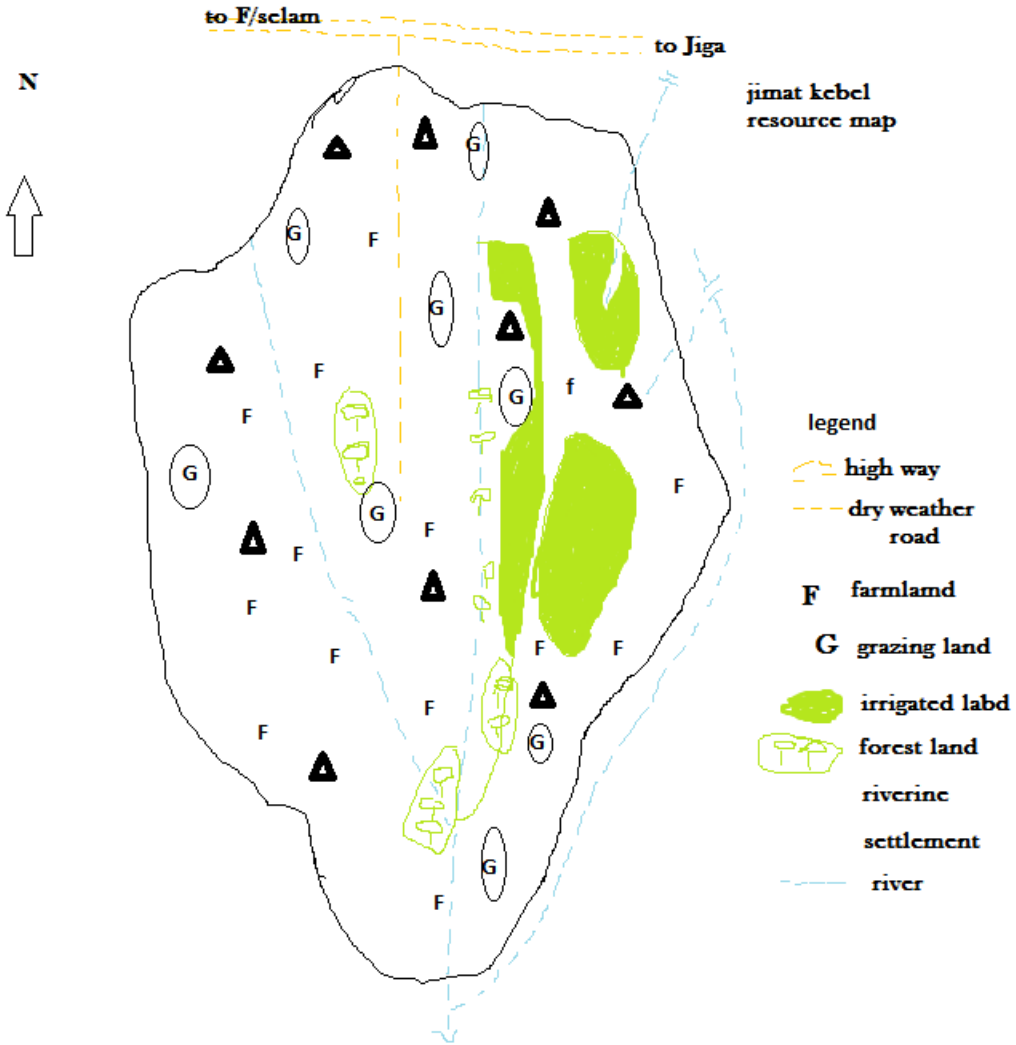


Figure 13: Sketch of Jimat resource map

Figure 14: Photo of Jimat resource map

3.4.1.1 Availability of resources

People are settled in a scattered pattern in every corner of the kebele, meaning every part of it is accessible and has been used as a means of livelihood in the long term. All natural resources are thus exhausted and none are abundant. The high human and livestock population pressure are the main causes of this scarcity.

3.4.1 2 Problematic resources

The decline in soil fertility on arable land was found to be a central problem. Irrigated land is concentrated in the eastern part of the *kebele* along the Deboholla river, and shortage of irrigation water seemed to affect most of the farming community of Jimat *kebele* because the Laza modern irrigation scheme (a diversion in the local river) is not completed and water is still lost from the earthen channels. The seepage is particularly high where the water passes through areas with black soil. Irrigation channels also become blocked by cattle and carts because there is no bridge or easy way of crossing. In some places, excess water flows from irrigation channels and floods the grazing area, forming stagnant water that can harbour animal disease and parasites, which have adverse effects on livestock.

3.4.1.3 Access to land per community group

The area of arable land holdings showed variation among the different community groups, ranging from 1 to 3 ha, with landless young farmers being a special case, as described above for the other *kebeles*. The redistribution of land was done in proportion to the previous holding regardless of gender. Therefore, there are female headed households who administer as much as 3 ha of arable land.

3.4.1.4 Fertility distribution of the land

Uneven distribution of soil fertility was observed during the survey. Farmers identified three categories of soil fertility, namely: fertile, medium and infertile. The proportional distribution of these fertility categories estimated by the farmers was 10% for fertile land, 25% for medium and the remaining 65% infertile soil. Farmers claimed that only backyard plots that benefit from continuous application of manure and compost were considered to be fertile, while other farmlands were classified as medium or poor because of the continuous decline in soil fertility caused by soil erosion and leaching of nutrients from exhaustively cultivated land .

3.4.1.5 Decision making on land allocation

Decisions on what type of crops should be sown in each growing season were made by consultation of the spouse. These decisions took into consideration the appropriate rotation and also the size of the land holding owned by each household. If the household landholding size is small, most of the time they preferred to grow what are considered to be staple crops in the area, continuously, without any sort of rotation that might have a positive impact on the soil fertility.

3.4.1.6 Collection of water and firewood

The community of Jimat uses diverse sources of fuel, including eucalyptus wood grown in the homestead and branches of trees from trees in their farmland, as well as crop residues and cow dung. There is no shortage of biomass for energy supply.

The availability of drinking water for people and livestock showed great variability among the different villages, because they are dispersed all over the *kebele* and water sources are unevenly distributed. In the worst case it would take 2-3 hours to fetch water, and as in adjoining *kebeles,* this is the responsibility of women and children.

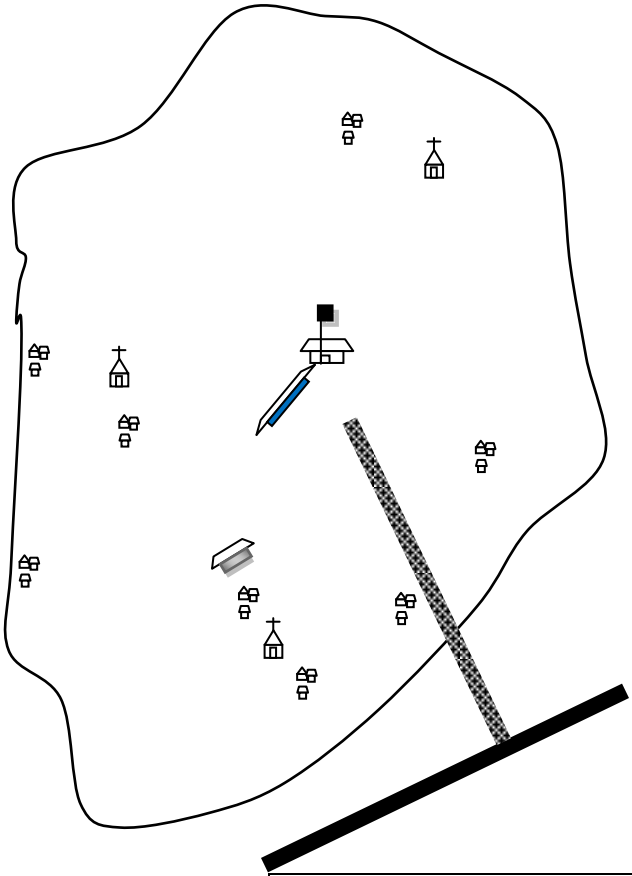
3.4.1.7 Livestock grazing

The farmers living near the grazing areas are encroaching on it. The growing livestock population has increased pressure on grazing land so that the natural pasture has become degraded and is unable to supply enough feed. This over-exploitation of the natural pasture and the effects of trampling have made it more susceptible to flash erosion and gully expansion.

3.4.2 Socio economic conditions

3.4.2.1 Village boundaries with regards to social interaction and social services

Owning to the scattered nature of villages throughout the *kebele* area, the social interactions and social services of Jimat *kebele* stretched beyond its boundary for different social services and social interactions such as marriages, funerals, Ekub (traditional saving) and Debi (sharing of labour).



Key: Grinding mill	
School	
DA's office	
Church	
Villages	
Gravel road	
Asphalt road	

Figure 15: Social map of Jimat *kebele*

3.4.2.2 Demographic characteristics

The population shows a definitely increasing trend, because of an increase in the number of households and large family sizes that might reach up to 8. The population of Jimat *kebele* is dominated by followers of the Christian Orthodox Church, with a few individuals from other religions such as Muslims and Protestants. Here, female headed households live amongst the other community members.

3.4.2.3 The main economic activities

A mixed farming system of crop and livestock production is the major economic activity, with crop production the dominant source of income. Rain-fed crop production accounts for the largest share of income. Irrigation agronomy is also important, mostly for perennial coffee, buckthorn (*Rhamnus prinoides)* and banana.

A livestock production system that provides various products such as milk, meat, skin and hides, and eggs is practiced in the area. Manure from domestic animals gives additional benefits as fuel, and can be used as fertilizer in the form of compost and manure.

3.4.2.4 Access to finance

ACSI represents the only formal micro-finance institution in the *kebele*. The role of other forms of informal finance in lending money to resource poor farmers is reducing.

3.4.2.5 Access to markets

Access to the market and the problems related to marketing showed similarity with other *kebeles.* Selling of farm products at prices fixed by merchants, forced selling of agricultural produce to repay loans, restricted movement of agricultural produce and price inflation were some of marketing problems also evident in this *kebele*.

Table 10: Pair-wise problem ranking matrix of problems faced by farmers in Jimat kebele

For description of method see 1.2.4

No.	Problem list	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Score	Rank
1	Crop diseases, pests and weeds	X	1	1	1	1	1	1	1	1	1	1	1	1	1	13	1
2	Irrigation problems		X	2	4	5	6	7	2	9	10	11	12	2	2	4	11
3	Poor seed quality			X	4	3	6	7	3	3	10	3	12	3	3	6+1+1	7
4	Animal diseases and lack of veterinary service				X	5	6	7	4	4	4	4	12	4	4	8	5
5	Drinking water shortage					X	6	7	5	5	10	11	12	5	5	6+1	8
6	Increasing fertilizer prices						X	7	6	6	6	6	12	6	6	10	4
7	Marketing problems							X	7	7	7	7	12	7	7	11	3
8	Shortage of improved livestock breeds and AI								X	9	10	11	12	8	14	1	13
9	Grazing pasture problem & feed shortage									X	9	9	12	9	9	6	9
10	Decreasing soil fertility										X	10	12	10	10	7	6
11	Deforestation											X	12	11	11	5	10
12	Land shortage for young farmers												X	12	12	12	2
13	Shortage of improved farm machinery													X	14	0	14
14	Gully formation especially on black soil														X	2	12

3.4.3 The actor landscape

The PRA participants identified 18 institutions or groups that are working in or with the community of Jimat *kebele*. Compared to the first *kebele*, i.e., Jiga, four additional institutions were identified in Jimat. On the other hand, there were two institutions that were found only in Jiga. See tables 11 and 12.

Table 11: Institutions exclusively found in the first kebele i.e. Jiga

No.	Organisations	Role and responsibility
1	Irrigation Cooperative	Supply of irrigation inputs
2	Community Leaders	Conflict resolution

Table 12. Additional four institution found in Jimat

No.	Organisations/institutions/groups working with community	Role and responsibility
1	IFAD project	Construction of irrigation dam
2	Equib	Traditional saving
3	Senai farmers saving and credit association	Provides saving and credit service
4	Community Water Management Committee (CWMC)	Administration of irrigation water distribution and management

The relative importance of the institutions and organisations in the *kebele* as perceived by the mixed group of men and women farmers is shown in Figure 16.

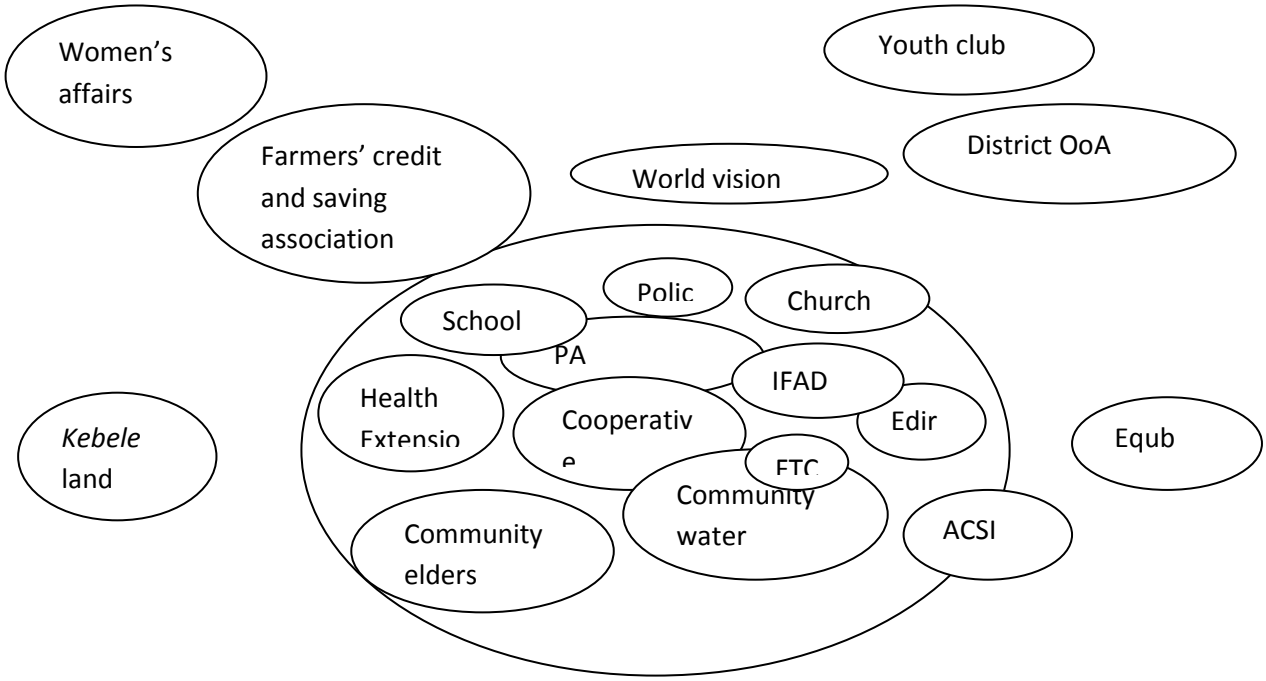


Figure 16: Venn diagram of Jimat *kebele* by mixed group men group & women

3.4.4 Agricultural production conditions

The constraints to agricultural production showed little variability across the project *kebeles*. Thus, the prevalent agricultural practices and constraints are discussed only briefly in this section, covering all the variability observed in the project *kebeles*.

3.4.4.1 Crop production

Crop production is the main economic activity in all *kebeles* of Jabi Tehnan district, including the project *kebeles*. Small-scale farming predominates and the main crops grown in the project *kebeles* showed great similarity. The major crops are maize, teff, pepper, wheat, millet and barley. The area coverage and productivity of major crops for each of the *kebeles* are presented in Annex 1.

3.4.4.2 Livestock

Livestock production constituted the second most important economic activity for the rural community of *Jiga*. In all of the project *kebeles* it is dominated by cattle, followed by small ruminants.

3.4.4.3 Prevalent practices in crop production

Generally, crop production practices in all four of the project *kebeles* would be considered as poor. Most of the farmers used unimproved seed because of limited supply of improved seed, and also low awareness. As a result, low yielding cultivars are common. The predominant method of sowing is still the broadcasting method.

3.4.4.4 Cropping pattern

Farmers in the *woreda* practise a sole cropping system. Currently fallowing is not practised because of rising demand for agricultural land. The usual cropping system in addition to sole cropping is crop rotation, which is used to restore soil fertility when farmers integrate legumes with cereals. But rotation of cereals with cereals is more common than with legumes, because of weed and pest management, with legumes being less productive and more easily damaged by pests.

3.4.4.5 Land preparation

Land preparation is done in a traditional way by oxen. The frequency of ploughing varies from crop to crop and from one soil type to another. Minimum tillage has also been introduced into the *woreda* for maize, and farmers mentioned that its productivity is higher than traditional land preparation. They have also observed that soil erosion from minimum tillage was negligible . The adoption rate is, however, very slow due to difficulties in ploughing in the subsequent cropping seasons, and also the high price of chimericals used in this practice.

3.4.4.6 Sowing and weeding (Cultivation)

The method of sowing for teff and barley is by broadcasting because these crops are difficult to plant in rows as the size of the seed is very small. Row planting is only adopted for a few crops such as maize and pepper. For broad-leaved weeds, farmers commonly use 2,4-D herbicide, but for grassy weeds hand weeding is the common practice.

3.4.4.7 Harvesting and threshing

Harvesting and threshing are the most labour intensive and time-consuming activities. Harvesting is commonly practised using sickles and threshing is done on agricultural ground cleaned, compacted and plastered with cow dung. Post-harvest crop losses are high.

3.4.4.8 Composting and manuring

Compost preparation and application to cropland has become a common practice. Farmers usually apply the compost to their backyard farm. In addition, farmers use household waste and crop residues and broadcast this on the same backyard. Generally the amount of compost produced by each household is small and its use is restricted to the homestead. This is because composting is labour intensive and requires a large amount of biodegradable material which has many alternative uses, such as feed for animals and fuel for burning. The lack of skill to produce quality compost was also a limiting factor for its

wider application. Bulk transportation of manure and compost also poses an obstacle to use on farmlands distant from the homestead.

3.4.4.9 Prevalent practice in livestock production

Even though livestock production is the second most important source of income, its management seemed to be poor. The breeds used are totally dominated by low yielding local breeds, and the husbandry is also traditional. Thus the productivity is low, most breeds and production systems are multipurpose, supplying draught power, milk, meat, skin and hides.

3.4.4.10 Animal feed

Natural pastures and crop residues are the major feed sources for animals in the project areas. Animal feed supply from natural pastures is low in terms of quantity and quality throughout the year, but mainly in the dry season. Various crop residues constituted the main feed for livestock. Teff, maize and millet straw are the largest component of livestock diet in the project areas. These crop residues are stacked after threshing and fed to animals mainly during the dry season. The nutritive values of the different crop residues are not sufficient to fulfil the animals' daily nutrient requirements.

3.4.4.11 Water

The main sources of water for livestock are watering points at rivers, springs and shallow wells. These sources are also used for traditional irrigation and domestic water supply. Shortage of water for livestock during the dry season is very severe because of competition with other users. In addition, water quality is low and an internal parasite known locally as *Alekit* is a problem.

3.4.4.12 Organisation of agricultural input

The major inputs for crop production are improved seeds and chemical fertilizers. These inputs are available to farmers on a credit basis and are sold directly by farmers' cooperatives. These cooperatives in turn obtain the fertilizer from PLCs and seed enterprises. In addition, some pesticides are supplied via the Office of Agriculture.

The input supply for improved animal breeds is critically short and even if they are available the price can go up to 13,000 birr (490 euro) for a single heifer, and demand for artificial insemination (AI) services is low because of capacity and infrastructure problems.

3.4.4.13 Agricultural production constraints

Both the crop and animal production of the project *kebeles* are constrained by a number of factors. Crop production is highly challenged by the ever-increasing decline in soil fertility, the increasing price of fertilizer, and shortage of improved seed.

3.4.4.14 Loss of soil fertility

One of the major constraints to crop production faced by smallholder subsistence farmers in the project *woredas* is the loss of soil fertility. Some of the reasons for this are nutrient depletion due to continuous cultivation, removal of crop residues, loss of nutrients through repeated cultivation without giving time for the plot to recover (absence of fallowing and crop rotation). Farming plots are overused and exploited for a long period. In the past, when land was abundant, such plots would be left uncultivated as fallow land to recover.

3.4.4.15 High price of fertilizer

As the fertility of the soil is declining year after year farmers are forced to use high levels of fertilizer to maintain the productivity of their plots. The price of fertilizer has become so high that resource poor farmers may not be able to afford to buy it.

3.4.4.16 Lack of improved varieties

Improved seed technologies could be said to be limited or non-existent in these *kebeles*. The only dominant crop with improved varieties was maize (BH-660 and BH-540), and next to maize, the Markofana pepper variety, and cr-37, Magna and Kuncho teff varieties were introduced to some extent. In recent years, productivity of the released maize hybrids showed a declining trend in productivity because of low quality seed delivered to the farmers. Farmers complained that the quality of the seed was very low, with high impurity, broken seeds, germination problems and very poor productivity. Improved varieties for other crops such as teff, finger millet, faba bean and chickpea were not introduced in the *woreda*.

3.4.4.17 Crop pest problems

Crop pest damage was identified as one of the major problems for crop production. The common crop pests found in the project *kebeles* are pepper wilt complex, potato late blight, potato wilt root rot, teff red worm, teff shoot fly, and yellow rust in wheat. Farmers have no effective management options to control these pests except cultural practices like crop rotation, frequent ploughing and removal of crop stubbles to minimize possible inoculums. It was observed that future agriculture will be compromised unless these pests, especially on pepper, potato, wheat, grass pea, chick pea and faba bean are controlled or eliminated. Weeds were not identified as a major constraint as compared to other pests, except the parasitic weed Orobanche which was found to be devastating for faba bean fields. For broad leaved weeds, farmers commonly use 2,4-D but for grassy weeds, hand weeding is the common practice.

3.4.4.18 The major livestock production constraints in the project area

- Animal feed shortage
- Grazing pasture problems
- Animal diseases and veterinary service shortage
- Shortage of improved animals and AI service
- Water quality and quantity problems

Table 13: Problem, cause and effect relationships of Jabi Tehnan project kebeles

s.n	*Problem*	*Causes*	*Effects*	*Solutions*
1	Improved seed problems • Poor quality • High price • Limited crop variety	• Limited suppliers • Private seed supplying enterprises don't deliver quality seed • Suspicious nature of farmers about new varieties	• Decline in crop productivity • Damage or total loss	• Gov. involvement in the seed supply • Farmers need guarantee from supplier • Contractual agreement with suppliers about quality defects • Follow up of seed producing farmers and quality control • Community* based farmer to farmer seed exchange
2	Animal health problems	• Limited vet service & drug supply • Insufficient service delivery • Skill limitation of animal health workers and technicians	• Increased animal mortality • Decrease in productivity • Lame animals	• Improve drug supply • Improve the competence of animal health service providers
3	Shortage of animal breeds and feeds	• Limited supply • Shortage of AI service	• Low productivity of animals • Low income • High incidence of poverty	• Improve the supply of animal breeds • Improve the AI service
4	Mismanagement of natural resources	• Lack of sense of ownership • Limited awareness • Lack of effective management means for communally owned natural resource • Poor design of drainage while constructing road • Extraordinary trampling effect/ from rural & urban cattle population/	• Higher level of wind erosion • Increased incidence of splash and stream erosion and flooding from upstream watershed • Soil acidity • Low crop and animal productivity • Some segments of the community disconnected from social services because of gullies	• Establishment of community bylaw for natural resource management and utilisation • Sustainable watershed management

s.n	Problem	Causes	Effects	Solutions
5	Crop diseases and pests	• Decline in soil fertility •	• Complete failure of some crops, particularly pepper • Increase pre & post-harvest agricultural products • Narrowed choice for farmers to grow diverse farm products for market & for consumption	• Scientific research support
6	Declining soil fertility and crop productivity	• Absence of fallowing • Land shortage • Limited rotation crops (cereals) • Leaching of nutrients	• Declining crop productivity • Low household income	• Application of compost • Practise soil and conservation measures • Use of irrigation for double cropping
7	High fertilizer price	• Increased demand • Not produced domestically (imported)	• Increased production costs • Reduced crop yield ○ Farmers forced to use below the recommended rate • Low household income •	• Application of compost • Improve agricultural marketing facilities • Advocacy and lobbying for Fair and competitive prices for farm products
8	Agricultural marketing problems	• Malfunctioning of agricultural marketing • Lack of competitive market • Sale of commodities at peak time	• Low commodity prices • Low incomes • Poverty	• Government assistance
9	Credit supply problem	• Untimely supply • Shortage of supply • Minimum ceiling for credit	• Reduced crop yield • Late application of fertilizer • High incidence of diseases and pests	• Timely supply (March-May) • Revised credit ceiling
10	Shortage of drinking water	• Population increase • Mismanagement of existing water points • Insufficient water supply	• Increased disease incidence • Time wastage fetching water • Inability to produce backyard vegetables	• Construction of water supply by the government/ NGOs • Improve water treatment programme

11	Irrigation water	• Most of the irrigation schemes are traditional
		• Low water use efficiency
		  ○ seepage
		  ○ traditional irrigation practice
			• Lengthy water shift to users that may extend up to a month
			• Farmers forced to concentrate on perennial crops with low water requirement
				• Effective water user association
				  ○ to ensure fair & equitable distribution of water
				  ○ To reduce conflict among

s.n	Problem	Causes	Effects	Solutions

	• Shortage
	• Seepage
	• Uneven distributio n
		• High construction cost for modern irrigation
		• Large number of users compared to its potential
		• Conflict of interest between upstream and downstream users
		• Siltation of dam reduced the amount of water
		• Pollution of irrigation water
			• Limited high value vegetables crops
			• Reduction in productivity and income from irrigation agronomy
			• Crops dies before maturity due to
			  ○ Pollution
			  ○ Water shortage
				members
				• Neighbouring *kebele* water user associations need to collaborate to solve cross *kebele* boundary conflicts

12	Shortage of land particularly for young farmers	• High population pressure • Land area cannot grow with the population	• Migration of youth to hostile and harsh areas • Household income for big families reduced due to allocation of a portion of land to young people • Reduced area of grazing land	• Promote non- farm activities for the landless • Rent in and share in lands •

13	Grazing pasture problem	• High stocking rates
		• Mismanagement of grazing land
		• Leakage from earthen irrigation channels causes water borne diseases
			• Productivity of pasture land reduced
			  ○ Overgrazing
			  ○ Trampling
			• Open grazing in waterlogged pasture aggravates the decline in dry matter yield
			• Animal track triggered gully formation and expansion
				• Establish effective bylaws for better management of grazing land
				• Promote controlled grazing

High population pressure from people and livestock caused most of the problems for the farming community of the project *kebeles*. This high pressure poses considerable threats to the welfare of the farming community whose livelihood depends on the land, adding to the depletion of natural resources. Shortage of arable land was causing many environmental and economic problems in the PRA area.

The continuous decline in soil fertility and the increasing trend in fertilizer prices pose a serious challenge for agricultural productivity in the project area.

Erosion control measures are too limited in type and area of coverage to significantly contribute to the reduction of soil erosion to an acceptable level. The understanding of the process and course of soil erosion by farmers was minimal, because most farmers believed that the physical soil and water conservation measures alone would control the soil erosion.

Other agronomic soil fertility management practices such as composting have only been introduced in recent years, so their coverage is limited. Composting is also labour intensive and it requires large amounts of biodegradable material which has many other alternative uses such as feed for animals and a source of energy. The lack of skill to produce quality compost was also a limiting factor for its wider application.

4. Stakeholder workshops

4.1 Organisation of workshops and feedback received

A scoping study was conducted to identify the innovation themes that would be refined at different levels later on. The analytical framework for identification of innovation themes contributed a lot to the final basket of innovation themes. This framework helped the team to facilitate the identification of the themes during the workshops that were held at district level with the key stakeholders that constituted representatives from the district administrator, office of agriculture representative, process owners and experts, district cooperatives, agricultural input supply institutions and credit institutions.

As well as the analytical framework, the findings from the PRA surveys were also discussed with the workshop participants. It was assumed that this had helped in qualifying the opportunities and constraints related to an increase in agricultural production, which was considered to be the most important element in theme identification.

4.1.1 Plenary session

In the scoping study, the PRA findings from the project *kebeles* were presented in a plenary session that was considered to be a brainstorming session to gain a quick impression of the opportunities and constraints associated with agricultural production in the project *kebeles*, that later on would be used to identify and qualify innovation themes covering different aspects. It also helped to draw attention to the top ranked problems and show their magnitude.

The steps to qualify the innovation themes were also presented and discussed in this plenary session. It allowed participants to consider both the opportunities and constraints offered by the different themes, and to assess and prioritise their potential importance.

4.1.2 Parallel sessions

The participants were divided into two groups. One group comprised crop and natural resource professionals, the other group animal science and natural resource professionals. In this setting, the natural resource potential and constraints associated with identified themes were discussed by each group as cross cutting issues. Then, each group selected its chairperson and secretary who facilitated the discussion and the write- up of the group findings that would be presented to the plenary session upon completion.

4.1.3 Feedback

The involvement of Universities and Research Institutions in rural development intervention has paramount importance in achieving sustainable development. The scoping workshop also offered a good opportunity for different stakeholders to sit together and discuss agricultural production potentials and constraints of the project area, and also the possible solutions from different perspectives. It was sensational how development parties actively debated to identify the main innovation themes and also to propose what needs to be done to realise each theme. It also inspired all the involved development parties to work in true partnerships.

4.2 List of Innovation themes

The workshop participants identified the following themes after a lively debate on the potential and constraints associated with every theme.

A. **Crops**

Commodity	**Activities/ themes**
Pepper	▪ Identify and demonstrate disease and pest control options ▪ Establish quality seed supply system
Maize	▪ Establish quality seed supply system ▪ Demonstrate improved varieties for different agro-ecologies ▪ Enhance farmers'-level hybrid seed production ▪ Demonstrate seed sheller ▪ Demonstrate maize – pigeon pea and maize- faba bean intercropping ▪ Demonstrate food preparation ▪ Demonstrate disease and pest control options

Wheat	▪ Demonstrate high-yielding and disease resistant varieties ▪ Demonstrate disease and pest control options ▪ Establish seed multiplication and dissemination ▪ Demonstrate food preparation ▪ Develop value chain ▪ Demonstrate wheat threshing machine
Teff	▪ Demonstrate and scale-up improved varieties 'Koncho' and 'Etsub' ▪ Demonstrate green manure on teff plot before planting ▪ Demonstrate row planting and transplanting vs broadcasting ▪ Establish quality seed supply system
Finger millet	▪ Demonstrate head blast disease resistant and high yielding variety ▪ Demonstrate threshing machine
Banana	▪ Demonstrate improved banana varieties under irrigation ▪ Demonstrate Banana-haricot bean intercropping

B. Livestock

l

Commodity/ Theme	Activities/ sub themes
Livestock feed and nutrition development	• Demonstrate improved forage varieties on FTCs and model farmers who are involved in dairy production and fattening activities • Facilitate improved forage seed supply via seed multiplication on FTCs and interested farmers groups and rural youth • Create forage seed market linkage • Demonstrate household level feed package (best cost ration formulation) • Demonstrate small-scale silage making • Demonstrate urea treatment on crop residue • Introduce feeding stalls • Strengthen community grazing land management and forage development practice (rotational grazing)
Poultry production	▪ Demonstrate poultry production system
Honey bee production	▪ Demonstrate modern honey bee production system by integrating with area closure and watershed development

4.3 Best practices

In the absence of an agreed procedure and methodologies for identifying best practices, the BDU CASCAPE team decided to identify some of the best practices in the project *kebeles* during the PRA survey. Best practices presented during group discussions were explored by the PRA team and the following best practices were identified.

One of the practices identified was the existence of functioning community bylaws in protecting or managing trees in different land uses. Nobody is allowed to cut live trees and the community sets bylaws on the management and protection of trees in the farmland, in grazing land and along the streams and rivers that stabilise their banks. An executive committee is responsible for the implementation of the bylaws. This committee hired men to patrol and collect fines from law breakers, and the money raised goes to strengthen their local institution Edir. The commitment of the committees differs from place to place and so does the result. The community bylaws also help in the management of communal grazing land. In some villages, farmers agreed to practice controlled grazing to improve the prevalent mismanagement of communally owned grazing land by the use of community bylaws.

The presence of water users' associations is also seen as another best practice in avoiding conflict among the water users by ensuring equitable distribution of water among the community members.

To reduce the burden of transporting bulk compost from their homesteads, the common preparation of compost away from the farm was also considered as innovative in solving the bulk transport of compost.

Farmers who use modern husbandry to produce high quality forage, and cross-breed cattle to produce high milk yields are considered exemplary to others.

Those institutions working in close cooperation with other organisations and institutions that have a high stake in the rural communities of the project area achieved best results because of the principle behind the partnership spirit that advocates that the whole is greater than the sum of the parts.

4.4 Evaluation PRA process by the team

The team found that the PRA surveys had produced the required results because sufficient data were generated during the given period of time to meet the objectives set at the planning level. This was because at the planning stage, the team selected the appropriate PRA tools to generate the required data. Thus, data were gathered that related to:

- The present farming systems,
- The opportunities and constraints in the rural communities from the economic, social, environmental and marketing points of view.

The Bahir Dar CASCAPE IT team carried out the actual PRA study, and the team believes that quality and reliable data were generated. Each day after the fieldwork, the team sat together and discussed the main findings and challenges of the day. This helped us to get clarity on the PRA tools used.

5. Annex 1

Table 14: Major crops and their productivity in Jiga kebele

s/n	crop	2009		2010		2011	
		area in ha	yield Q.t /ha	area in ha	yield Q.t /ha	area in ha	yield Q.t /ha
1	maize	444	35	405	35	463	40
2	teff	360	10	423	10	341	13
3	pepper	90	12	79	10	85	6
4	barley	70	15	65	15	79	12

Table 15: Major crops and their productivity in Mana kebele

s/n	crop	2009		2010		2011	
		area in ha	yield Q.t /ha	area in ha	yield Q.t /ha	area in ha	yield Q.t /ha
1	maize	405	55.5	480	60	439	60
2	teff	205	12	175	16	202.5	16
3	Finger millet	223	28	204	32	215	32
4	barley	112	16	105	18	99	24