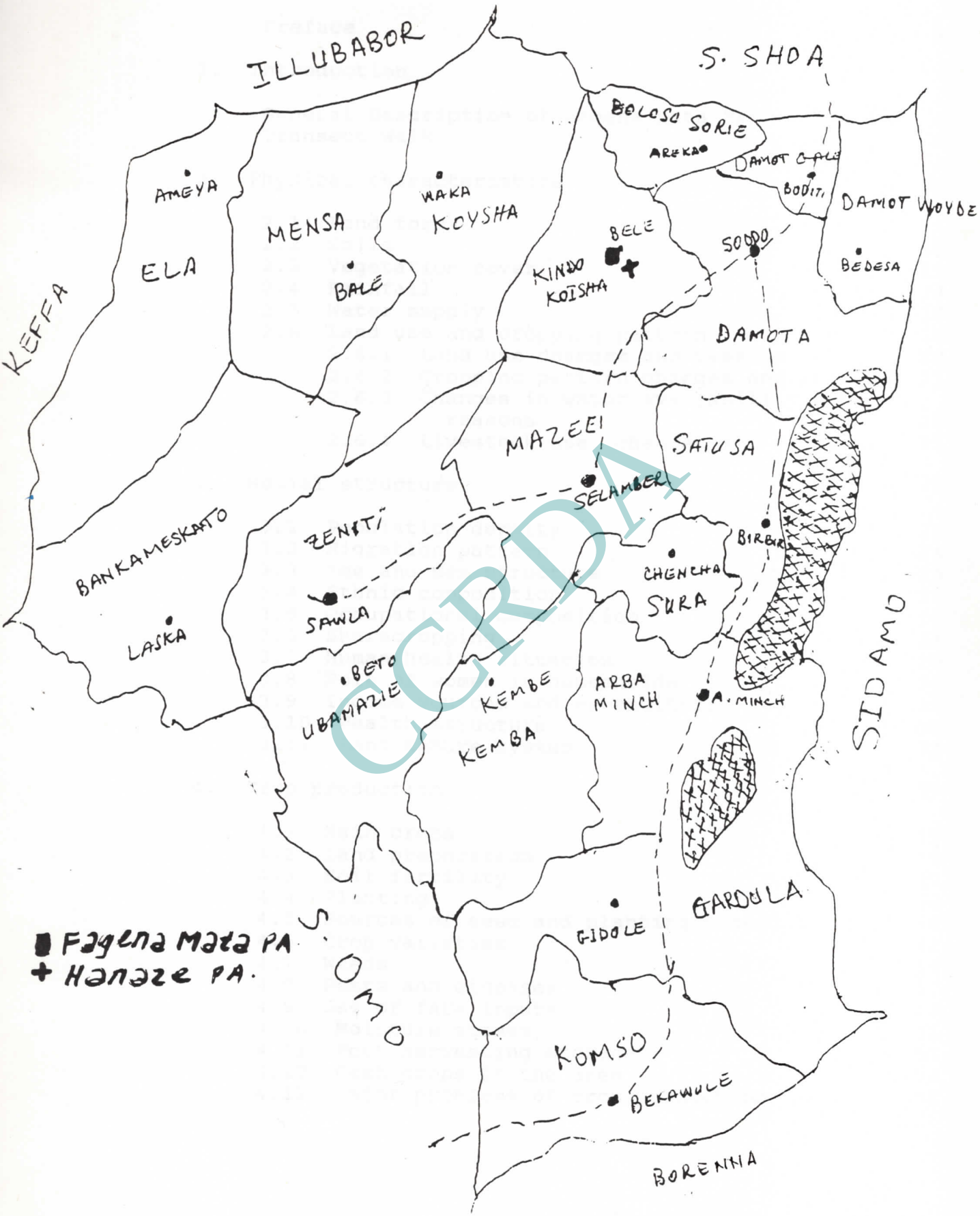
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MAP OF NORTH OMO REGION



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PREFACE

This is the report of a Rapid Rural Appraisal survey carried out in the area of the Fagena Mata Peasant Association of Kindo Koysha awraja in the North Omo region in South West Ethiopia. The survey including writing a draft report took place between November 10th and 24th 1991.

The core members of the survey team were

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Ato Mohammed Yisahak, Ministry of Agriculture, Soddo
Ato Simon Adebo, Farmers' Research Project, FARM AFRICA

In addition to this core further members of the staff of SOS Sahel and FARM AFRICA made significant contributions. They include:-

Ato Muluken Jorge, Ato Abrham Bogale, Wzt. Lisan, Wzt. Elfinesh Atske and Ato Eshetu Abate

The objectives of the survey were:-

1. To survey the ecology, technology, and economic and social characteristics of the farming systems in the selected PAs with a view to:

   a) Identifying and defining the existing farming system and farmer-perceived constraints.

   b) Identify and document past and present farming systems changes, the driving forces of FS changes, methods of agricultural technology development and transfer, and farmers' interest in and capacity for participatory research.

2. On the basis of the findings of this survey to:

   a) Identify farmers' priorities or solutions for the constraints identified and their "best-bet" development options.

   b) Identify participatory research topics which farm ers would like to carry out, and the individuals and groups best-motivated and capable to carry out this research.

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FAGENA MATA PEASANT ASSOCATION

CHAPTER 1. INTRODUCTION

This study is mainly focussed on Fagena Mata Peasant Assocation (PA) under Belle service co-operative. This PA is located in Kindo Koysha awraja. Members of the PA number about 217 households with the average family size of about nine persons. The population is christian and the people are Welaita origin.

Topographically, most of the landscape is flat and suitable for oxen plowing. The major soil types are black cotton soil (swampy during wet seasons), red soil and clay loam. The natural fertility of the soil is low and necessarily requires chemical fertilizer.

The area is dry with an average annual rainfall at Belle station of 1059 mm (8 years average 1972 - 1979). The rainfall highly varies between years, and dramatically changed since 1984 drought year. There are Belg and Meher seasons in the area and rainfall is bimodal.

The PA covers a total area of 1200 hectares, of which the greater proportion is covered with dense savanna grasses and scattered trees. The PA is surrounded by 3 rivers, and is densely forested along the river banks.

The major crops grown in the PA include, maize, cotton, teff, sorghum, sweet potato, taro, cassava and haricot beans. Crop production entirely depends on rainfall. The short season rainfall and cropping season starts in March.

Cattle and goats are the main livestock mix and poultry keeping is a very important activity. Land preparation is carried out by oxen ploughing and traditional hand implements.

As regards to infrastructure, the area has a dry weather road which runs through the middle of the PA towards Omo river. Belle town which provides all kinds of service is on the border of the PA. The PA has got an elementary school and a church. The PA gets its medical treatment from 2 clinics and veterinary service from the MOA office situated in Belle town.

Fagena Mata lowland was settled for the first time in 1958 E.C by the tenants who immigrated from the then Welaita awraja. Tenants from densely populated areas of Humbo mountains, Koysha, Boditi, Areka, Soddo, Delbo and adjacent highlands voluntarily immigrated . The families migrated with their members and movable property leaving their land behind.

The second bunch of resettlers immigrated in 1963 E.C with the assistance of WADU. It was landless tenants who were interested in the resettlement initiative.

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WADU initially provided wheat flour, coffee, maize flour, oil, canned fish and beef for food and drinks. The food ration was based on the number of families and was given until 1965 E.C.

The farmers immigrated with planting materials of enset, banana, sweet potato, yam, taro root and seeds of local variety of maize, teff and haricot beans. In addition, WADU distributed improved varieties of maize, cotton, teff, haricot beans and fertilizer and pesticides.

The farmers had experienced some difficulties in coping with the climatic conditions and the farming practices of the area.

The problems of adjustment have been made worse by diseases prevalent in the area, such as malaria, and a high incidence of livestock disease; and by acclimatisation problems and shortage of drinking water.

In 1972 E.C. resettled farmers were forced to be organised in to producers co-operatives. About 130 households pooled their land, labour and oxen power. The enterprise was unproductive and disliked. Eight years later some 58 members were missing, and 10 years later only 56 members were in PCs. In spite of all the disincentives, the PC members were forced to be collected in two villages. As a result, the system of production collapsed. Between 1977 and 1979 E.C. they were on relief aid.

Now, devillagised and disrupted, farmers are largely expecting relief aid.

Using the RRA approach, the study team conducted surveys of the area. A checklist, methods and sources of data were compiled and discussed prior to field work in order to investigate farming system changes and reasons, major problems and constraints of agricultural production in the area. A check list to survey technology development and transfer, and future opportunities/ options was compiled and discussed, prior to field work.

From the survey the following problem areas emerged.

- Soil moisture stress and soil fertility problem
- Lack of construction trees *
- Crop pests and diseases, wild animals
- Agricultural inputs availability - credit facility
- Livestock disease - trypanosomiasis
- Human diseases - malaria
- Lack of capital ; debts

* The expression "construction trees" means trees whose timber can be used in the building of houses or other forms of construction.

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GENERAL DESCRIPTION OF FAGENA MATA PA

Fagena Mata Peasant Assocation lies on the foot slopes of Tepa, Sere Beleka and Gale mountain chains on the east, Sorto on the north and, Mashnga and Oydu Chama mountains along the western side. It is surrounded by Bale river on the south east, Dimayo river on the north west, Omo river on the western and Belle town on the eastern side. The area narrowly stretches down to the Omo river gorges from the outskirts of the Belle town. It lies between 15 km ranges from Omo river to Belle town. Its diameter from Dimayo river to Bale river is very short. The landscape gradually uplifts in the middle and slopes down towards the three rivers.

The Omo river and the Dimayo river gorges are very steep, deep and rocky which makes it difficult for the people to use water from the rivers. Dimayo river gorge is estimated at 265 metres depth. The water and forest resources in the gorges have not been used. The Omo river gorge is covered with savanna grasses, bushes , some fig and other scattered trees. The soils appear to be rocky and sandy in the gorges and not utilized . Only the land up to the edges of the escarpment has been used. The PA area elevation ranges between 700 masl at the Omo river bridge and 1200 masl at the Belle town. However, the effectively utilized land area lies between 1000 and 1200 masl. The climate is extremely hot during the day and warm in the evenings. The rainfall in the area is erratic and unreliable. The area is highly infested by insects like tsetse fly and malaria mosquitoes. Livestock and population deaths have been very high for the last seven years.

Two maps showing physical and social characteristics of the PA were drawn by men and women groups. And the study team drew Map Fig. 1 to show the original land features before settlement. The area was covered with scattered tall tree species and tall savanna grasses. Some economically important trees were widely grown. But, when the first settlements were introduced many were cut down and bushes, grasses and trees were cleared off the land.

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FIGURE 1 A MAP OF FAGENA MATA PA
(before settlement)

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Map Figure 2, drawn by male farmers in village 2 indicated:

- Farmland which was under cultivaticn, which has got cotton, maize, sweet potato
- The location of villages and homesteads
- The boundary of the PA, including Omo river, Dimayo river and Bale river
- The area for communal grazing, homestead farmland, fallow land and trees were included.
- The schools, the churches and the road from Belle town to Kulo Konta.
- Scattered houses built after villagization in the middle of farmland

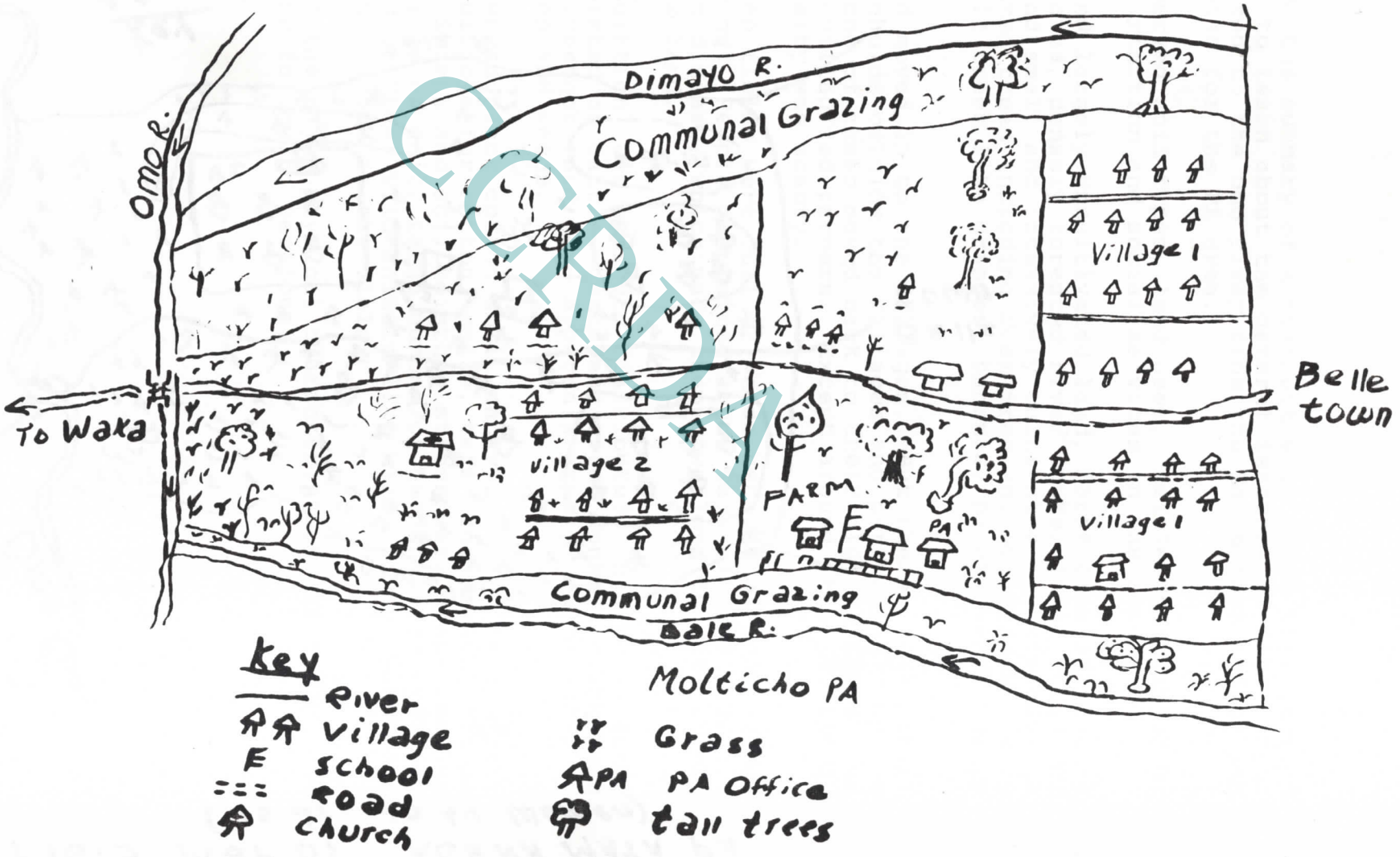
Fig. 3 the map drawn by women indicated

- The villages
- The rivers
- The school, the church
- The road to Kullo Konta
- Farmland and grazing land, boundaries of the PA
- Water sources, rivers
- Forest resources

Three women were engaged in drawing the map and used local materials such as tree pods, tree leaves, ashes, cow dung, soil etc.

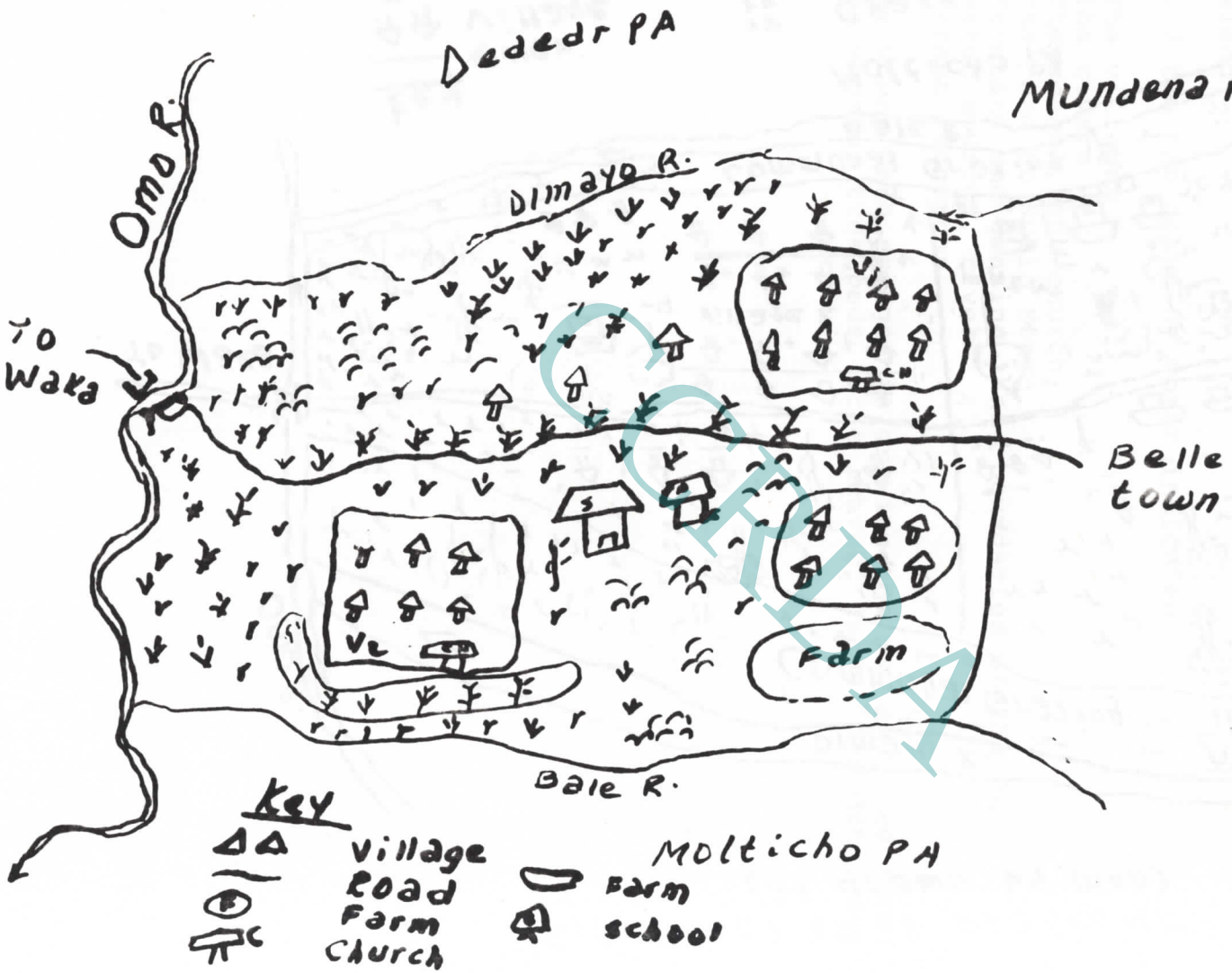
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FIG. 2 A MAP OF FAGENAMATA PA
(As drawn by men)



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FIG. 3 MAP OF AGENA MATA PA
(as drawn by Women)



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Transect walk

Figure 4. shows the summary of a transect walk which was carried out in order to learn about the general features of the area. The group walked to the Omo river from the Belle town which was the highest point for the PA area.

The group observed soil types, land uses, settlement patterns, population distribution and social services in the area.

The group found largely uncultivated land, large area of grazing land, fallow area, densely forested river banks, large areas of grass lands and small and intensively cultivated homesteads. A very few planted trees including Neem tree and eucalyptus were observed. Fruit trees like oranges, bananas, papaya were thinly distributed.

Many people had moved in to the villages. But there were still scattered households outside the villages and particularly by the road side. Some of these moved back to their old villages and some were non-villagized farmers. Except around the villages, population density was scanty.

Most of the crop fields were full of weeds because of poor weeding and plowing. People complained about lack of oxen due to trypanosomiasis disease, which made them powerless to intensively cultivate their land.

Livestock population was sparsely distributed in the grazing areas and consisted of cattle, goats and a few donkeys. The main sources of livestock feed were hyperenia grass, maize stalks, some tree leaves and weeds.

The group observed black cotton soil, sandy loam and red soil, which were suitable for cotton, maize, teff and sweet potato cultivation. Swamps and soil moisture stress were mentioned as the main problems of soil. Large number of baboons were seen in the crop field . Other wild animals like wild pigs, warthogs, monkeys, attacked crops in the field.

Descriptions of the major physical characteristics of the PA are indicated in the following sections.

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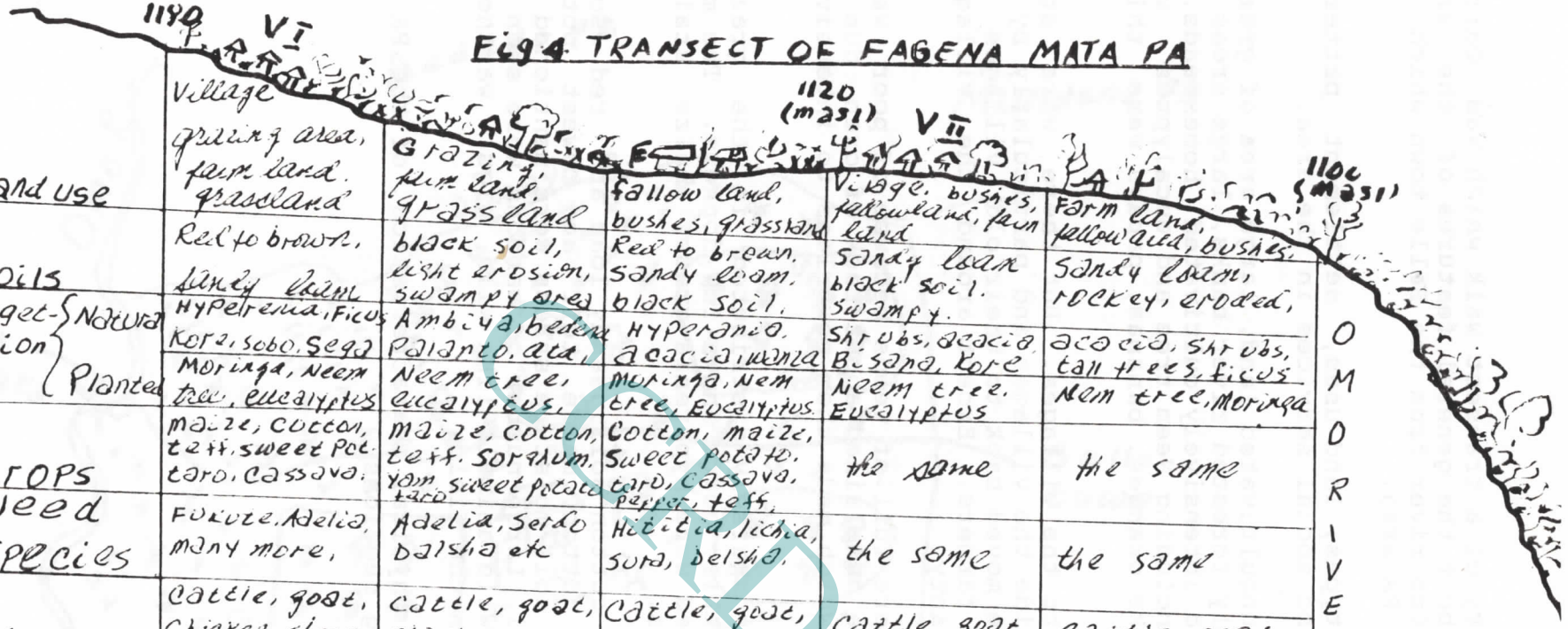


Fig 4 TRANSECT OF FAGENA MATA PA

Land use	Village grazing area, farm land. grassland	Grazing, farm land, grassland	fallow land, bushes, grassland	Vilage, bushes, fallowland, farm land	Farm land, fallow area, bushes,
Soils	Red to brown, sandy loam	black soil, light erosion, swampy area	Red to brown, sandy loam, black soil.	sandy loam black soil. swampy.	sandy loam, rockey, eroded,
Veget-ation { Natural	Hypetrema, Ficus	Ambiya, bedena	Hyperanio.	shrubs, acacia	acacia, shrubs,
Veget-ation { Natural	Kore, sobo, Segg	Palanto, ata,	acacia, wanza	Bisana, kore	tall trees, ficus
Veget-ation { Planted	Moringa, Neem tree, eucalyptus	Neem tree, eucalyptus,	Moringa, Nem tree, Eucalyptus.	Neem tree. Eucalyptus	Nem tree, Moringa
Crops	maize, cotton, teff, sweet Pot. taro, cassava.	maize, cotton, teff. sorghum. yam sweet potato taro	Cotton, maize, Sweet potato, taro, cassava, pepper, teff,	the same	the same
Weed species	Fokote. Adelia, many more,	Adelia, Serdo Dalsha etc	Hittitia, licha, sora, delsha.	the same	the same
Livestock	cattle, goat, Chicken, sheep	cattle, goat, chicken	cattle, goat, donkey. Chicken	cattle goat donkey. Chicken	cattle, goat, chicken
Livestock Diseases	Anthrax, Tripanosomiasis	Anaplasmosis, Black leg, Anthrax, Trips.	the same	the same	Tripanosomiasis (most)
population Density	Higher around village land. low in general	scanty distribution. collected in villages.	High around village area	sparse, very few fokois	sparse, very few fokois
HUMAN Diseases	malaria, diarrhea. rehumatism	malaria, diarrhea eye infection	malaria, diarrhea sore en foot	malaria, diarrhea	malaria. rehumatism
Fruit Trees	Orange, banana. papaya	Oranges, banana, papaya	Orange, banana, papaya	Oranges, banana	Oranges, banana,
Problems	Sweet potato butterfly, wild animals, termites,	Stock borer wild animals. livestock disease water logging	Worthog, Pigs, baboons, Sweet potatobitterfly, Livestock and human diseases.	the same problems	the same problems

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CHAPTER 2. PHYSICAL CHARACTERISTICS

2.1 Land forms

The area lies in the kolla agro-climatic zone and is dry most of the year. The topography of the land is flat in general with some steep slopes and gorges at the Omo and Dimayo rivers. Mid-area is flat and suitable for oxen cultivation and tractor uses.

2.2 Soils

Major types of soils include "Gobo" "Dubule" and "Chere" soils (red soils, clay loam and black cotton soils) Dubule and Gobo have been classified as "suitable for ploughing during dry and wet seasons" (Farmers' response). "Chere" (black cotton soil) soil is cultivated before heavy rains. This soil becomes marshy (swampy) during heavy rainfall periods and becomes difficult to prepare for planting and weeding.

Maize, teff, cotton , cassava and taro root crops grow well on dubule soil and gobo is suitable for cotton and sweet potato crops. Chere - swampy soil is mainly good for taro root crop. The farmers use hand - hoe (Aylie) to prepare chere soil because, it has got a heavy soil nature to plow with oxen after it rains. With long and high water collection in the swamps, the crops cultivated fail and die. Very few crops like sweet potato and sorghum grow in the area without fertilizer application.

Fertilizer use has been practised for the last 20 years, as a result it became difficult to grow any crop without fertilizer application. Some patches of eroded soils were observed along the slope running towards Bale river.

In the area soil fertility restoring methods are not widely used. However, when fertilizer is in short supply, manure and some crop rotations were practised. For example, taro root crop requires all year round management as it matures once in a year. Farmers frequently add manure and cultivate for longer time than any other crop. When harvesting the crop, the root is completely uprooted by digging deep down the soil. The plot eventually gains its fertility and becomes suitable for the next crop. Without adding any fertilizer the area produces relatively good yield.

2.3 Vegetation cover/ trees

Fagena Mata PA area consists of wide area of natural vegetation, dense grasslands, scattered trees, intensive cultivations, etc.

Prior to the settlement programme (in 1960), the area was covered with vegetation. In 1988 (MOA Awraja office 1988) about 39% of the area was under crop cultivation. The current cropping season's performance indicated that about 15 -20% of the land was under crop cultivation.

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Since 1960, the natural vegetation of the area has been disturbed by settlement process . Large area of forest land was cleared for crop cultivation and trees were cut down for house construction and farms tools. Every year, tall savanna grasses and bushes are cleared by wild fire. When producers co-operatives were formed in 1980, more land was cleared for communal farming and large amount of trees were cut for village buildings.

Since devillagization (1990) a large area of cooperative land was left out of production. Lots of plots have been left fallow and turned into open grassland with scattered construction trees on them. Other areas were covered with bushes and dense tall grasses.

Large area of grassland and trees were under wild fire during the survey period.

FIGURE 5 PROPORTION OF LAND ALLOCATED TO DIFFERENT USES



60% grassland, 15% farmland , 10% bushes , 8% grazing land, 5% fallowland, 2% forest land

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Various scattered tree species were identified in the PA area. Some of these include:

Vernacular name	Vernacular name
Arambe	Kenkala
Shola (Amahric)	Balobede
Neem (English)	Sisal (English)
Bisana (Amahric)	Wola
Sobbo	Wanza (Amahric)
Sega	Moringa (English)
Ambiya	Acacia (English)
Bedena	Dache
Palanto	Ulunta
Eta	Dokma (Amharic)
Zafia	Uguge
Odopi	
Senseleta	
Tunduriga	

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There is an indication that some of the construction trees are under threat. The sources of trees so far for house construction seems to have been the river bank and the highland PAs, already some people have begun purchasing poles for house construction from the highlanders.

Neem tree and eucalyptus have been introduced by WADU . The performance of Neem tree was good but eucalyptus largely died from climatic difficulties. It's attacked by termites. It's root could not go deep into the soil and it easily falls down when there is a strong wind.

Natural vegetation is the major source of livestock feed. Grazing and cut and carry systems were the main feeding methods. Some trees like uguge are used for dry season feeding.

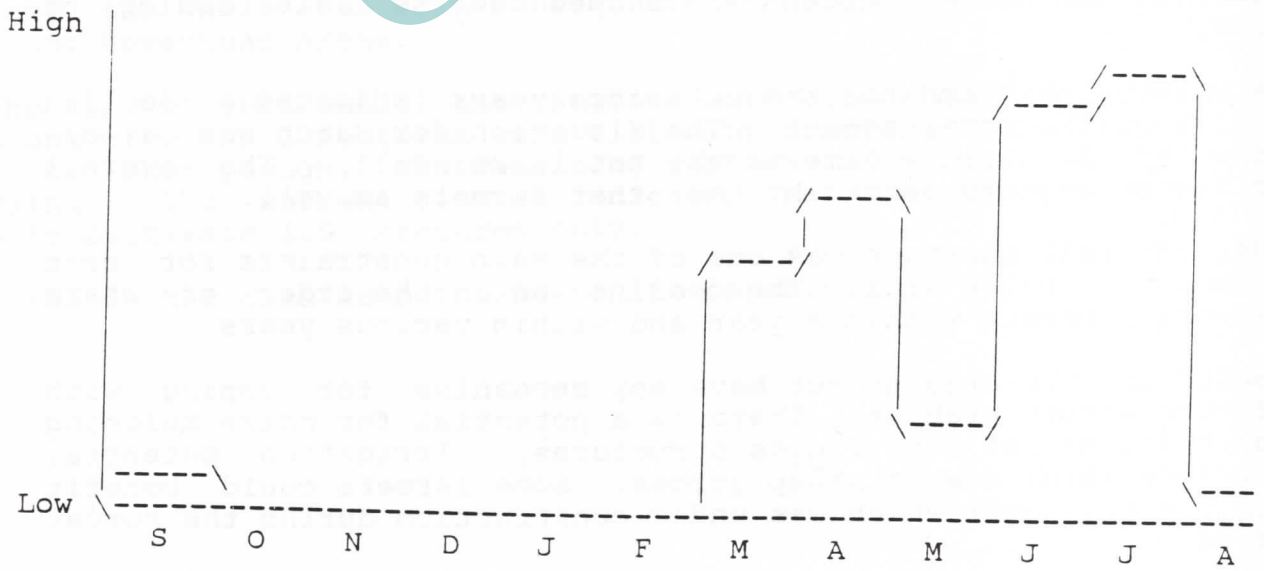
Trees on private land belong to the owner of the land. But trees along the river banks are communally owned and used. The trees are indiscriminately cut down and used for house construction, farm tools, for fuel and household uses.

2.4 Rainfall

Fagena Mata PA area is dry and gets an annual average rainfall of 1059 mm (8 years rainfall data average). The rainfall distribution is highly erratic and tends towards shifting to the early rainfall patterns or to the late rainfall patterns. The amount of rainfall decreased corresponding to the rainfall shifting as well.

The following rainfall pattern was drawn by 3 farmers in village 2. It shows a normal rainfall trend.

FIGURE 6 ANNUAL RAINFALL PATTERN (BASED ON 3 FARMERS' MEMORY)



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Normal rainfall begins in March and the highest rainfall comes in June and July. The farmers asserted that between October to February the rains do not come. In May sometimes it does not rain. Limited showers of rain in September provide moisture to the soil to prepare land in October to plant first maize crop in March. The March rainfall is extremely important in cropping activities of the area. The June and July rains are also important in maize crop performance and land preparation for cotton and teff. The rainfall failure in March, June and July causes a major imbalance in the crop production trends of the area. Because, it affects growth of maize and land preparation for the two major cash crops teff and cotton planted in June and July. There are two peaks of rainfall, one in April and the second in July.

Rainfall pattern before 1977 (1984/85) by scoring method
Ato Dana Daka, 50 years old, who stayed in the area for 21 years, tried to recall rainfall pattern before the 1984/85 GC. drought year and compared it with the after 1984/85 GC. rainfall situation .

FIGURE 7 RAINFALL PATTERN BEFORE AND AFTER 1977 EC.
(drawn by Ato Dana Daka)

	S	O	N	D	J	F	M	A	M	J	J	A
Before-1977 EC.	.. 6%	.. 6%					... 32%	. 15%	. 17%	. 12%	. 9%	3%
After-1977 EC.	. 10%						. 10%	.. 20%	. 10%	.. 2%	.. 20%	. 10%

Before 1984/85 March rainfall contributed 32% of the total rainfall for the year. But after the bench mark year the March rainfall covered only 10% of the year's rainfall. It shows that in April, July and August rainfall have slightly increased in distribution. The pattern was skewed towards late coming of rains,

The rainfall pattern for the reference years indicated a decline by 33% in the total amount. The situation for March was a decline by 33% , the same as the total rainfall. The overall decline by 33% was sensed by the other farmers as well.

Thus, rainfall shortage was one of the main constraints for crop production in the area. The decline was in the order of sharp downward movement within a year and within various years.

People in the area do not have any mechanism for coping with moisture stress problem. There is a potential for maize mulching and building of tied ridges structures, Irrigation potential does not exist due to steep gorges. Some farmers could benefit from the tap water which was under construction during the survey period.

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2.5 Water Supply

The main source of water for livestock and humans is Bale river. The river dries out in the dry season and is flooded during rainy season. The Omo and Dimayo rivers are inaccessible and are not used. In December, January and February when Bale river dries up the farmers dig in the sand at the plains and collect water in ponds for human beings and livestock uses. These ponds usually are infested by insects and unhygenic. This has been a cause for various diseases , such as diarrhea, and amoeba. Livestock diseases also occur from drinking dirty water.

The SOS E.S.F. water development project has recently started installing a pipe line for water supply from the adjacent hills. Clean water will be available in the near future. The farmers participated in construction of pipe line on payment basis.

2.6 Land use and cropping pattern

Major land uses in the area consist of grazing, farming, forest and bushland and resettlement sites. Forest and bushes constitute 4 % of the PA, 52% grazing land 30% fallow land 15 -20% intensively cultivated areas. (This figure was about 40% during collective farming). All area under former collective farm are now abandoned.

During villagization and collectivization process about one - tenth of a hectare was allocated to a single family and one - fifth of a hectare to a family with two wives or more around their houses. This land was intensively utilized providing major crop product to the families.

Land relatively developed during WADU was abused under collective farming and degenerated under devillagization process. A large area of land was not cultivated due to lack of oxen and fertilizer, and was colonized by weed and regenerating grass species and bushes. The trend has been aggravated by the ever declining rainfall , debilitating malaria disease. Sweeping savanna grass covered the whole area with subsequent expansion of tsetse fly into the homestead areas.

At the time of settlement, the families were allocated 5 hectares each out of which 3 hectares were tilled by tractors to be later used by oxen plough. The remaining part was for grazing and browsing. The current figures indicated that the farmers are able to cultivate 1.5 hectares only.

The land in the area is not used to its capacity.

CURDA

Case study: Ato Marchos's farm

Ato Marchos was contacted by the group, to interview him on the history of the area and to map his field. He was one of the non-villagized farmers.

He owns a total of five hectares of land of which 55% is covered with grass, 20% maize, and sweet potato, cotton, haricot beans constitute 5% each. Fallow land and homesteads also cover 5% each.

Ato Marchos plants teff, maize, cotton, sorghum, taro, haricot beans and sweet potato. He also owns one cow and one sick oxen, and two calves, whose mother died from unknown disease in last October (one month ago). The farmer lost his other oxen in September.

The farmer practises crop rotation on his field. On a swampy land he grows, maize --> teff --> Taro ---> Maize in a sequence. On non - swampy land he grows maize ---> cotton ---> haricot beans or maize. He does not repeat the same crop for the next cropping season.

Ato Marchos has got ten children of whom 4 are female and 6 male.

He has got several tree species grown on his land some of them include (vernacular name)

- Shaima
- Dache
- Mimi
- Bedenna
- Sobbo
- Ambe
- Digiso
- Karcheto
- Temir
- Bullo
- Putago
- Magago
- Gomogade
- Matto
- Macha
- Ongafre
- Garra
- Zafia
- Wella
- Burtukan
- Lomi
- Aleko
- Tawaye (Taro root crop variety)
- Kalkalla
- Pullessa

Ato Marchos uses Beddeno as a fodder tree and all his other trees were scattered in the field.

Figures 8 and 9 indicates the land use types of Ato Marchos

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FIG. 8 Map of Ato Marchos's farm

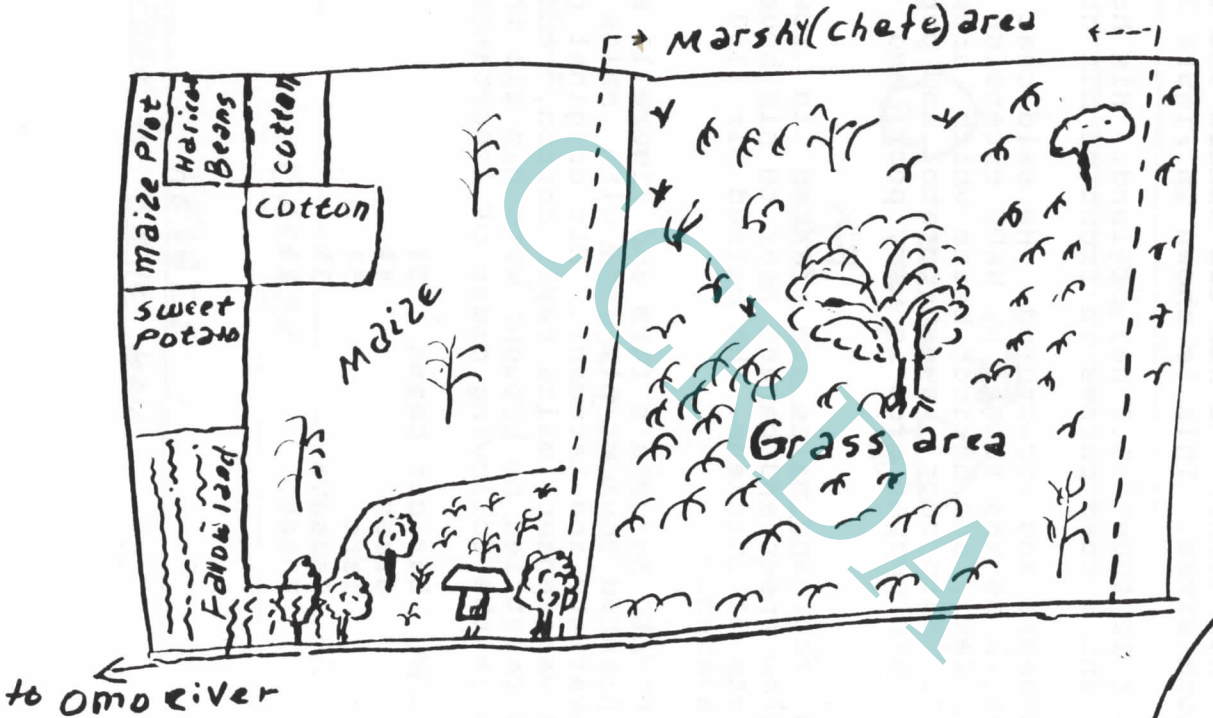
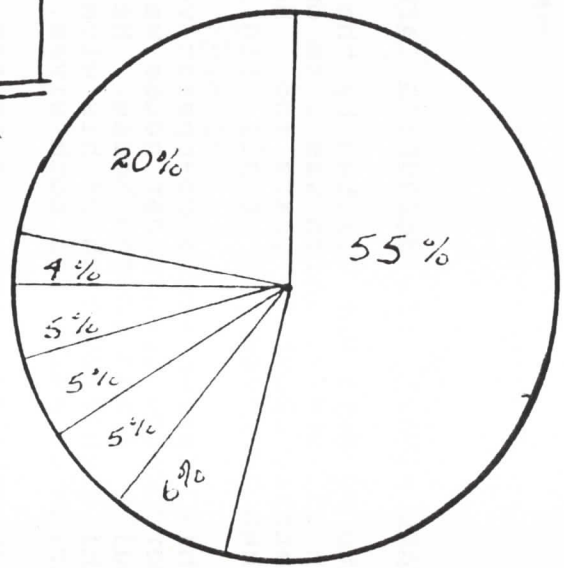


FIG. 9 Land use on Ato Marchos's land.



Grass	55 %
Maize	20 %
sweet Potato	5 %
cotton	5 %
Home stead	6 %
fallow	5 %
Horse Beans	4 %

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Case study: Ato Bargena's farm

Ato Bargena was visited by the team on the 3rd day of field work in village 2, which was 2 km out of Belle town. He arrived as a settler about 30 years ago. He was a young man and newly married when he moved out of his original place called Boloso.

This farmer was a co-operative member and was villagized. His corrugated iron sheet house was removed during villagization and built grass roofed house. He has two wives and 16 children , 8 children from each of his wives. He has two tukuls and two granaries of maize for both wives. This is shown in Figure 10.

Bargena has a total of 12,000m^2 (1.2 ha) of land. His houses are built in the middle, and a road passes in front of his house.

His land was well managed and structured. He said that he followed the pattern which he was taught by WADU extension agents. He cultivated maize, teff, and haricot beans which are already harvested and stored. Taro root , sweet potato, and pepper are still in the field. His pepper crop is very poor and severely damaged by disease.

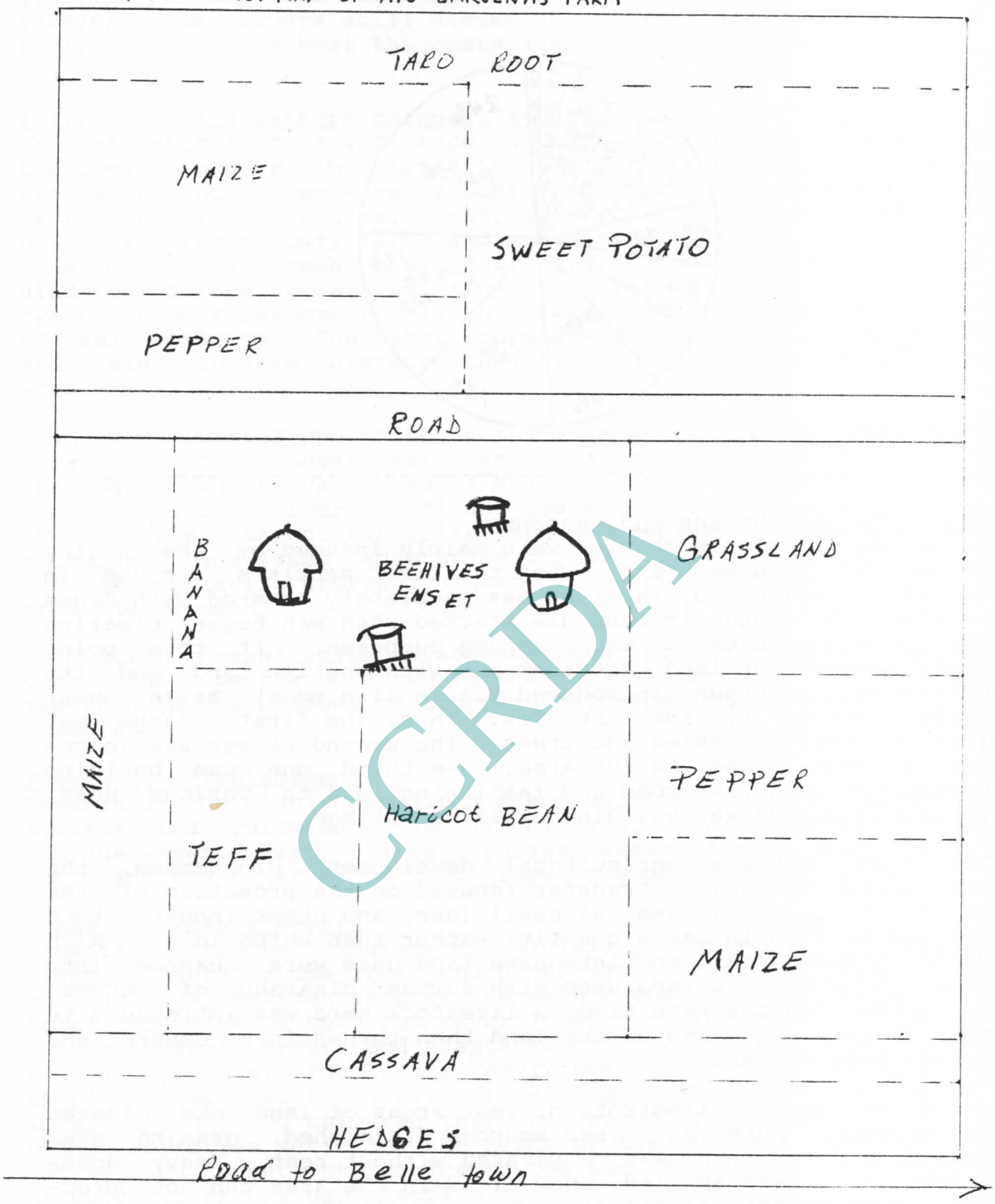
Sweet potato, taro root and maize are planted in rows. Ato Bargena manages to grow enset and banana near to his houses. He has beehives and lots of chickens. He gained Bir 150 out of honey sale for this season.

Figure 10 shows map of Ato Bargena's farm and Figure 11 shows his land use. He has planted most of his land with maize and is mainly using kenyan variety and katumani. His original crops in the middle altitude were enset, maize teff, cotton, coffee and ginger. When he was resettled he brought with him all the crops. He has planted crops in the following order of importance.

Maize	24 %	Haricot beans	5%
Sweet potato	17%	Grass	4%
Homesteads	11%	Taro	5%
Teff	14%	Cassava	3%
Pepper	11%	Enset	3%
Banana	2%		

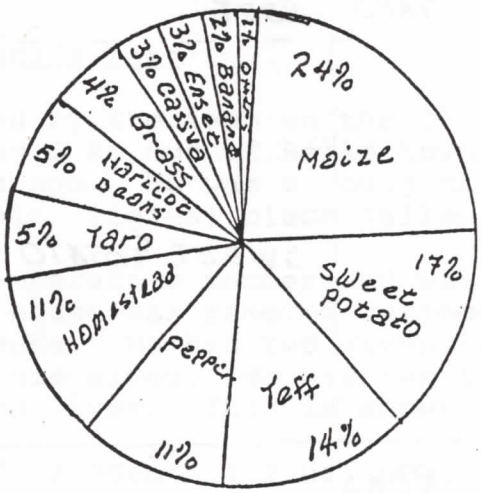
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FIGURE 10. MAP OF ATO BARGENA'S FARM



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FIGURE 11 LAND USE ON ATO BARGENA'S FARM



2.6.1 Land use changes and reasons

Fagena Mata land use changes were mainly induced by the policy changes of the government. When the first settlers arrived in the area 30 years ago, the land was completely covered with dense forests. The change in land use started when man began clearing forest for settlement and cropping purposes. At this point people hungry for land resources met with hostile land and its environment. Pioneers introduced plants like enset, maize, sweet potato, cotton etc into the area. Thus, the first change was clearing forest, grasses and trees. The second change was introducting food crops to the area. The third one was building infrastractures like road and fashioning land to various uses. The fourth change was building dwelling villages.

When WADU initiated agricultural development programmes, the first modern technology transfer focused on the promotion of the use of fertilizers, chemical pesticides, and other inputs. Land began to produce in large quantity rather than being idle. With modern inputs small and intensive land uses were changed into large and extensive land uses with further clearance of natural vegetation. In the mean time, a livestock herd was introduced to graze on grasses. Some of the land then turned into communal and private grazing land.

During the era of villagization, vast areas of land were cleared for cropping purposes. Tree sources diminished, grazing area reduced in size. Land was cultivated without rest. Heavy doses of fertilizer were applied. Now land in the area can not procduce crops without fertilizer. As a result the soil structure changed to the extent of addiction to fertilizer. No measures have been taken to replenish it.

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Since 1990, Fagena Mata co-operative members have been devillagized. The farmers began moving back to their original land, However some farmers still stayed at the villagized area due to their inability to bear the costs associated with moving house.

2.6.2 Cropping pattern changes, and reasons

The climatic factors influence the type of crops cultivated in the area. However, the pioneering settlers tried crops of their knowledge and experience brought from their original places. Various crops like coffee, enset, sweet potato, haricot beans (in black and red colour) taro, and yam were cultivated. The crops like coffee and enset could not survive long dry seasons, and died out before harvesting. The farmers' explanation for the two crops poor performance is an excess amount of heat, and lack of soil moisture. The other crops are still under cultivation and seems to have tolerated the climatic difficulties of the area.

When WADU started operating in the area new crops and varieties were introduced. Local varieties of Maize, cotton and teff were changed. Kenyan varieties of maize, Albara and Akala cotton varieties,white coloured teff and cassava root crops were introduced. The use of fertilizer and subsequent improved yield encouraged and eased adaptation of the crops. Improved seeds with fertilization provided higher yield and gained appreciation from the farmers.

Production organization systems passed through various stages ever since people occupied Fagena Mata PA area. The process resulted in the changes of cropping patterns and intensity. For example.

Phase 1. Displacement

Tenants of the highland regions abandoned their original cropping systems and cultures. The main crops of the original places include enset, wheat, barley, pulses, sweet potato, taro, haricot beans and other minor root crops of economic importance.

Phase 2. Resettlements

Resettled farmers, unaware of rainfall patterns and types of crops suitable to the area, and other significant characteristics of the area, shifted some of the main crops of their origin and tried to live on them for several years. During this period learning from errors and adaptation to the area followed its natural process. The natural environment selected the types of crops suitable to the area. Crops like local variety of maize, local cotton, red coloured teff, red and black coloured haricot beans varieties satisfied the needs of the people. Eventually, coffee and enset the choice of the people were rejected and dropped out of the new cropping system.

Phase 3. Intervention - Diffusion of improved technology

WADU made a major break through in the production system and crop culture of the area and the people. In this phase, new variety

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of crops, improved inputs, farm implements and crop management systems were introduced. This become a complete substitute for the old farming system and old norms of crop operations.

Some significant changes were made in the patterns of arranging plants in the field. Row planting replaced broadcasting of seeds which added to the efficiency of land utilization and economizing of seeds used. The outputs were appreciated as a result of changing planting patterns.

The new technology diffused by WADU was sustainable, in nature easy to cope with, but difficult to attain (the materials) in an appropriate time of need. For poor farmers and incompetents it's even difficult to materialize even in physical abundance. The option remains searching for indigeneous techniques. Once the resource is out of stock, it becomes difficult to regain. For instance, "Boloke" haricot bean once introduced in the area is now out of stock or markets. Once widely grown, groundnuts now are not in production.

Market demands and the need for consumption during hunger period and varying cropping seasons (due to rainfall variation) were reported as the main causes of diminishing resources.

At the moment the farmers opt for recapturing the local varieties of haricot beans.

Phase 4. Collectivization/ villagization

When producers co-operatives were organized and farmers were collected, village crop development and diversification were relatively retarded. The cropping pattern changed to intensification through fertilizer application and chemical weed control. The same varieties introduced by WADU became the main crops of consideration. Under rigid production organization individuals were not motivated to look for better and high yielding varieties of crops. For a decade Kenya varieties of maize, white colour teff, Akala and Albera cotton variety and the two red and white types of sweet potatoes remained unchanged.

In spite of intensive cropping pattern, the production and productivity of land declined under co-operative farming. Crops for consumption and cash needs were in short supply. Thus, cassava was introduced as a remedial crop in the area. The root crop was also expanded and intensified by fertilizer application and better management practices.

Phase 5 Devillagization/ decollectivisation

Following the last government's mixed economic policy, co-operatives were dismembered and devillagization process was under way. However, most farmers were impoverished, because they sold their oxen to repay their fertilizer debts, and to cover other cash needs. In the absence of oxen power, land was not widely cultivated. Production of cereal crops reveals a declining trend while cassava, taro and sweet potato root producion slightly increased. Cassava root crop is a food reserve for the hunger

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period. A significant proportion of the families plant it around their homes.

The trend in the crop development of the PA was rather controlled by organization of production systems.

Phase 6
SOS Sahel intervention through introduction of new crop varieties like Katumani, and different vegetables and fruit trees.

2.6.3 Changes in water availability and reasons:
Water resources are in short supply and unhygenic. Only Bale river provides water for livestock and human uses during rainy seasons. No other sources of water are available for dry seasons. People depend on small water wells dug into the sand at the Bale river bank. Usually, the water is infested by insects, dirty , and is insufficient . The SOS ESF NGO provide clean water for Belle town and began constructing a pipe line from the adjacent hills with participation of the benefiting farmers. A few months later clean water could be available.

There is no foreseeable irrigation potential in the PA . The two tributaries of Omo river consist of deep gorges and rocky slopes. It seems difficult to provide water for any kind of irrigation development.

2.6.4 Livestock Changes and reasons
The mixture of livestock species appears to be low. From the transects and other interviews it was observed that cattle and goats constitute livestock herd in the PA. Very few donkeys are available.

Newly settled farmers introduced the first livestock species into the area. Oxen were brought down for traction and manure. Cows were brought for milk production and goats for cash income. Sheep were tried but could not adapt to the environment. Sheep rearing was given up.

Long savanna grasses and other shrubs are widely distributed in the PA and became the home of wild animals and insects, hazardous to the livestock species. Early in the morning and late in the afternoon the herd is out for grazing and is exposed to the insect tsetse fly and predators. Because livestock is mainly fed on open grazing.

The farmers sadly attributed livestock death due to trypanosomiasis after four years of settlement. Perhaps the livestock's natural immune system broke down gradually through several bites of insects poisoning the animal. As a result, the livestock size, mixture, production and performance declined.

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From the interviews, it was deduced that the number of sheep declined to nil and the donkeys to the minimum. The performance of both of cows and oxen declined. The disease greatly debilitated physical capability of the species.

In 1977 E.C, large number of livestock died from drought effects (many houses lost their complete herd). The only available water resource dried up during drought. Farmers normaly burn the old grass before the next rainfall season. But rainfall failed to come at the expected time. Livestock feed was in short supply. Consequently, many families completely lost their livestock herd.

The trend in livestock deaths continued for the last couple of years. The spread of the grass towards villages multiplied the occurrence of the fly. With the spread of the fly, the number of livestock affected increased and resulted in a higher loss of livestock. The situation directly affected the production of livestock in the PA.

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CHAPTER 3 SOCIAL STRUCTURES

Fagena Mata PA has a sparsely distributed population of 2500, of which 217 are household heads. (PA office). The SOS-ESF- run clinic in Belle recorded a total population of 1590 and the Awraja MOA estimated 1670. All figures were inconsistent. The number of children per woman were estimated at 8 on the day of the survey. Family size according to PA figures will be 11 persons/ household. The Welaita community traditionally practises polygamous marriage, for instance one man has four wives and 19 children altogether, and another man who was in an interview group had two wives and 16 children. Another interviewee had 12 children from the same mother . As case studies and our observation indicated, the family size could be between 8 - 10 people family. The average house hold owns an average of 1.3 ha of cropped land. But every household was initially allocated 5 ha. each.

All the houses have been built along the main road and shared with animals. The pattern of settlements was changed with villagization programme. Dispersed dwelling units were brought together into two well-structured villages. After devillagization programme the houses were restructured into hamlets, dispersed houses on the private plots of land, and some still in the old villages.

There are different classes of farmers differentiated mainly by livestock ownership and the amount of land cultivated. These differentiated classes were associated with the place they live in and the type of a house they built.

Categories of farmers identified in the PA were:

I. Non- villagized farmers (NVF) or (non-co-operative) These farmers remained in their original houses on their land and their wealth was not destabilized. They still own oxen, cows, goats, poultry and live in tin-roofed houses and have got grain store - food reserve.

II De-villagized farmers These farmers were in villeges and in producer co-ops but were able to maintain some of their wealth and also have acquired additional property while in the co-operative. They own shared ox or one cow , goats, poultry and live in grass roofed houses and have grain store - food reserve.

III. Farmers still in villages These are a category of farmers who have lost their wealth during collectivization process. They have lost their oxen and other cattle and could not re-establish themselves. Because of lack of oxen for cultivation and cash for purchase , they still live in deserted villages. They mainly live on secondary income, i.e. petty trade, such as selling ready made food, local beverages and retail sales, Some of them own goat, poultry and live in poor grass-roofed houses.

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Most of all, the farmers interviewed underlined the importance of oxen and fertilizer in wealth making. Those who have a pair of oxen or more are classified as "rich" farmers. because , they can cultivate a large area of land.

3.1 Population density

Fagena Mata PA has a scanty population. Large number of house-holds own 5 hectares of land of which about 1/5 of a ha is inten sively utilized. Rainfall variability and lack of subsidiary economic activities seems to have controlled pressure on land. Thus, out of grown-up children, a significant proportion left the area to look for a job elsewhere. Some are back in their places of origin and became farmers.

3.2 Migration patterns

Early settlements were encouraged by the then governors. Econom-ically and socially disadvantaged farmers took the opportunity and voluntarily moved down towards Kindo Koysha' lowlands with their property. House hold heads, family members, livestock wealth etc migrated early in 1950 E.C. For the first settlers life was easy and relatively smooth. They were able to build wealth which made them better off than their counter parts in the higher altitudes. This relative prosperity meant an incentive for those who later moved to the same valley in early 1960 E.C.

Early in 1960 E.C. WADU motivated tenants in the high areas to move down the hills and join their fellow men. Tenants who were provoked by heavy land tenure regulation and land taxes moved out with their wealth.

Settlements were assisted and well established under WADU. WADU provided the necessary and sufficient inputs through credit schemes. As a result, crop yield and volume of produce, live-stock size and production were high and promising.

When in mid-1970s (EC) WADU was phased out, all the provisions of inputs and marketing facilities were abandoned. Total produc-tion declined and food was in short supply. Subsequent deteriora-tion of rainfall and a complete failure in 1976/77 E.C signifi-cantly reduced crop production and livestock herd. As a result, life become miserable to many settler farmers.

The situation became intolerable to many farmers. Thus, some returned to their original places, others sent back their chil-dren. From village II thirty households deserted their homes and some 28 heads of households died. Malaria disease and hunger caused loss of human lives in the PA and forced people to move back to their original places.

3.3 Age - sex structure:

French NGO operating in the area carried out census in the Fagena Mata PA in July 1991. The outcome of census indicated sex ratio of 191 men : 205 female. In a society where polygamy is prac-

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tised and where there is immigration, it would be expected that the female slightly exceeds the male population.

From the age structures of the survey, children under 5 years of age were 241 and over 5 years were 876. A sample of 100 households reviewed indicated an age specific ratio of 189 male: 206 Female for greater than 5 years, and 60 male: 48 female for less than 5 years.

According to this data, children under 5 constituted 15.2 % of the population of which 55.6 % covered male and 44.4 % female children

3.4 Ethnic composition

The people in the PA belong to the Welaita Ethnic group and speak the same Welaita language. Christianity is their main religion.

The Welaita ethnic group consists of many different clans, whose members are socially equal and caste groups who are reckoned as exclusive social class.

The clan grouping consists of 1) Kawona Family , (the family descendents of king 2) The Goka constituents - which includes different clans that claim common ancestors. 3) The caste group - socially degraded and outcast group that includes pot makers, tanners, blacksmith, and x-slaves.

The Kawona family belongs to the socially respectable clan and is known as clanship of "wisemen". Members can only socially interact with a few Tigriyan and Hizia clan whose members are also respected as "wisemen".

The Welaita ethnic group, practice exogamous and endogamous marriage. The Kawo family was socially restricted to socially interact with wide range of clans. Their inter marriage was careful and controlled. It was reported that they discriminately marry from the "Tigriya" and Hizia" clans and rarely from other Goka clusters.

Social values of the Welaita people, permit marriage between Goka clusters, but not intra - marriage between members of a single clan who belong to the same lineal descent and claim the same clan father. Endogamous marriage is an unacceptable form and results in ostracism .

In the social out cast group's (pot makers, tanners, black smith and ex-slaves) values, endogamous marriage is appreciated and permitted, within the same group for instance, pot makers marry between themselves, the tanners, black smith and the ex-slaves as well. However, marriage between blood relatives i.e. brothers to sisters or other close kinsmen is an incest and accepted as a taboo. The outcast groups do not have a marriage interaction with the Goka clusters or the Kawona family.

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Polygamous marriage has been an accepted form of marriage in the Welaita society. The economic status of the man dictates the number of women to marry. But there are other social factors which enforce an additional marriage. Some of these include:

a) If the first wife
   - Is naive, foolish or unwise
   - Does not cook well
   - Could not entertain guests
   - Does not produce children or,
   - Produces only female children

b) To establish relationship with socially respected clans
   - To have children from respected and wise clans
   - To have many children
   - Land ownership at two different places
   - Eagerness to have a beautiful wife
   - To share his-father-inlaw's property - if he is rich
   - When the husband loses many children from his first wife

The women become responsible for the land which they are allocated to live on. They have use-rights on the produce of the land. The husband controls the use of properties and gives his directives.

3.5 Occupational compositiion

Farmers in the PA subsist on farming activities which consist of crop farming and livestock rearing. Other activities like weaving, tannery, basketry and black smith do not exist. Farmers throughout the year are occupied in crop cultivation and caring for livestock.

Some women spin cotton thread, make baskets out of grasses and trade ready-made food and some crops.

The farmers interviewed replied that ten black smith makers resettled in the PA and deserted after staying for one year.

3.6 Sharecropping

Share cropping mechanism as it is practised in the PA appears to be an efficient way to use land and labour resources. Two parties get into contract to bring their resources together, to manage it in common, and equally share the produce at full maturation and harvest.

The first partner owns land which he/she is unable to utilize mainly due to lack of oxen. The second partner owns labour power for traction, which is ready to be used in common. Any of them do not have ownership right on one-anothers' resources. Pooling of the resources for production is seasonal and voluntary.

Both parties contribute to buying seeds and fertilizer. But, the land owner pays his share upon harvesting. Thus, the crop and fertilizer costs are initially covered by the second partner.

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Both parties equally share the product before or after harvesting and threshing.

People who own oxen and are physically fit do not let their land for sharecropping. Only those who do not have oxen ,or are physically weak, widowed, orphans and old aged enter into such production mechanism, i.e. only those who are in one way or another handicapped let their land.

3.7 Human Health Status

Human health situation was discussed in a general group of 4 women, 2 men and 1 boy, and with two households.

The main health problem was related to the dry and hot climate of the area. The farmers thought that the root cause for every disease was the sun's heat.

The major disease hazardous to the people was malaria, which affected all kinds of people. Lots of people have died and many were debilitated.

The occurrence of malaria has mainly been after the month of rainfall, when food is in short supply and it is labour-intensive month of the year. As indicated in figure 21, April and July are months after the first and second rainfall seasons, in which farmers are busy planting and weeding maize. During this time the grain reserve is used for seed and seed purchases. In July, cotton and teff, which requires lots of human labour are planted. Food is still short and malaria incidence increases. From heavy work load and fatigue, body rheumatism and pain affects many people. May rains support growth of some edible vegetables and grasses which causes diarrhoea for children and adults. This adds stress to the malaria victims and many die in this month.

During the driest months, water borne diseases, eye infections and sores on legs affect children and some adults.

On the whole, the main diseases that constrain human lives in the PA were malaria, water borne diseases, eye infection, sores on legs and diarrhea.

There are two clinics and a private drug store helping patients in Belle town. The Ministry of Health run a public clinic and the French NGO run a clinic to provide general medication for all kinds of diseases.

The French NGO clinic provided also vaccination for mothers and children through MCH Programme . They conducted house to house registration in Fagena Mata PA. The objectives of the records were:- a) to estimate children under 5 and over 5, for MCH programme outreach; b) to obtain pregnancy numbers for vaccination; c) to record school attendance of children per family; d) to keep health records of the families.

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3.8 Role of Women in household

Women play an important and decisive role in crop production, livestock rearing and house management activities.
During active crop cultivation periods of the cropping cycle, they give a hand to their spouse in every stage of operation. For instance, during planting maize, women add fertilizer, plant the seed in rows, and dress up with soil, while the spouse makes furrows with an oxen plough. They also clear out weeds from the maize field on the day of planting. In addition, they prepare food and drinks for the group of people (Debo) participating in planting of maize. Women also assist during weeding of the crops. They provide simillar assistance when cotton, teff, sweet potato and taro root crops are planted.

Women mainly were responsible for digging up of taro, and sweet potato root crops for home uses. Picking cotton and transportation to store, collection and transportation of teff and maize to the storeage, were also womens duties.

In the absence of their spouse and grown up children, women scare wild animals and birds from attacking fresh crops.

Women cut and carry grass for home feeding of the cattle and requlary clean paddocks and spread waste materials in the crop fields around homesteads.

It is the responsibility of women to milk cows, churn milk, make butter to sell in the markets. Women decide upon utilization of livestock products. They decide in what form to sell, when and where to sell and the quantity as well. They use the cash income for food purchases.

Women maintain their household subsistence through subsidiary activities. From the discussions held with a group of 5 women, 2 householders and a widow, it became clear that large number of women engage themselves in petty trade and retail sales of goods for the whole year.

The women undertake four types of preparations before trading activities

1) Processing of goods at home for sale
2) Instant trade - "Purchase - to - resale at the spot"
3) Move goods from one market to the other.
4) Making handicrafts as baskets, spinning cotton threads etc.

In all cases, goods sold and purchased for instant sale were simple and involved small amount of cash.

1) Some of the goods processed at home for sale include, livestock products such as , butter, churned milk, cheese, ready-made food like enjera, sweet potato, boiled coffee, bread made of maize, cooked taro, drinks like Borde (made of maize and sorghum)

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liquid extract from sugar cane (cane sugar squash) and locally brewed spirit (Areke). Women sell these goods on the market days sitting along the roadside that passes through their PA area. The main customers are merchants coming from the other side of the Omo river from Kulo Konta Awraja. These merchants supply Belle market with pulses, teff, spices, wheat, barley and clothes.

According to women groups interviewed, the prices and amount of cash income per market day depends on the number of merchants travelling and their food needs. In the rainy seasons, the number of people travelling declines with a resulting decline in food sales, and sometimes with no sale at all.

Women support their meagre income by selling fire wood and grass in Belle town. It is sold in a small market on a day - to - day basis while processed items are sold on the major market day on Thursday. The women said that selling of firewood and grass in their culture was a sign of absolute poverty. It was shameful for them to sell fire wood and grass. The necessity of subsistance forced them to depend on unwanted kind of business.

Women engaged in retail marketing, purchase a load (of a pack animal) or a quintal of grain in the market and instantly resell it in small guantities. Whatever profit they gain for the day is used to purchase food sufficient until the next market day.

Some women and girls make baskets out of grass and straw for sale. Adult women spin cotton thread as well.

On the whole, women play a key role in the household subsistence. They assist the family in crop farming, livestock rearing and cover a large part of household food needs for the whole year. They are traders, handicraftsmen, and producers of agricultural outputs.

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3.9 Income sources and expenditures

The main sources of income for farmers include sales of crop produce, livestock and livestock products, chickens and eggs, fuel wood and grass sales. The main harvesting season, November to January, is the period of the highest income from crop sales. The men receive their income from cotton, teff and livestock sales and sometimes from grass and fuel wood sales. The women depend on livestock products, ready made food, local beverages sales and retail trade.

Cotton and teff are cultivated for cash income, and sweet potato and maize partly for sale and mainly for food needs.

Men and women spend their income in different household needs. The major area of men's expenditures include:

- Meskel festival debts
- Fertilizer credits
- Land taxes
- PA contributions
- Household clothing
- Childrens' school fees
- Food purchases
- Additional taxes
- Purchase of farm implements
- Medication
- Funeral ceremony

The women mainly spend on food purchases and retail trading goods.

In any of the interviews, farmers did not mention about spending on savings i.e. purchase of livestock or savings on buildings or improving part of a house. All expenses were focussed on consumable goods and coverage of debts and credits. Purchases of clothes and farm implements usually take place in November and December. Thus the greater proportion of the crops produced in the year are sold in these two months. Under normal rainfall situation and better harvest, prices for marketable crops and livestock is significantly reduced. The prices of major crops were taken at the Belle market for the year 1982/83 E.C.

Table 3.1 Average monthly price of crops at Belle Market (Birr/Qts)

Type of crop	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec
Maize	41	39	36	41	42	40	39	30.5	34	42	61	
Teff	80	80	67.5	72.5	81	83.5	90	-	*102.5	94.2	92.5	
H.bean	45	45	62.5	67.5	67	69	62.5	56.5	*13.25	58.7	67	
Sorghum	45	45	45	57.5	59	59	55	-	-	-	-	
Wheat	75	75	67	73.5	77	79.5	88	-	-	-	-	
Barley	45	45	50	52.5	58	58.5	59	47	46.25	50.8	56.5	
Lentils	175	175	190	-	-	-	-	-	-	-	-	
F. peas	90	85	82.5	87.5	88	88.5	95	92.5	92.5	89.7	88.5	
S.Potato	11	14	16.5	19	7	6	14	16	19	19.6	-	

Source: MOA, Kindo Koysha Awraja office

* Suspect figure

As indicated in the table, the prices offered for crops of the area were high for maize and teff, and low for sweet potato and sorghum in harvesting season. In the months of "Hunger", prices for all crops were high. Crops with the highest price were those brought from Kulo Konta Awraja and which are not widely used as food.

CCRDA

Case study

Three farmers were interviewed to summarise their 1983 E.C. annual income and expenses. Their main sources of income were from the sale of crops, livestock and petty trade activities. Their expenditures were mainly on land tax, PA contributions, meskel festival, fertilizer credit repayments, school fees, family clothing and medical services. Their summary is given in the following table.

Table 3.2 Summary of the aggregate income and expenses of 3 farmers

Months	Amount of income (Birr)	Expenditure
January	110	100
February	90	80
March	60	40
April	40	40
May	20	30
June	10	30
July	10	30
August	10	30
September	60	60
October	80	70
November	90	100
December	110	100
TOTAL	690	710

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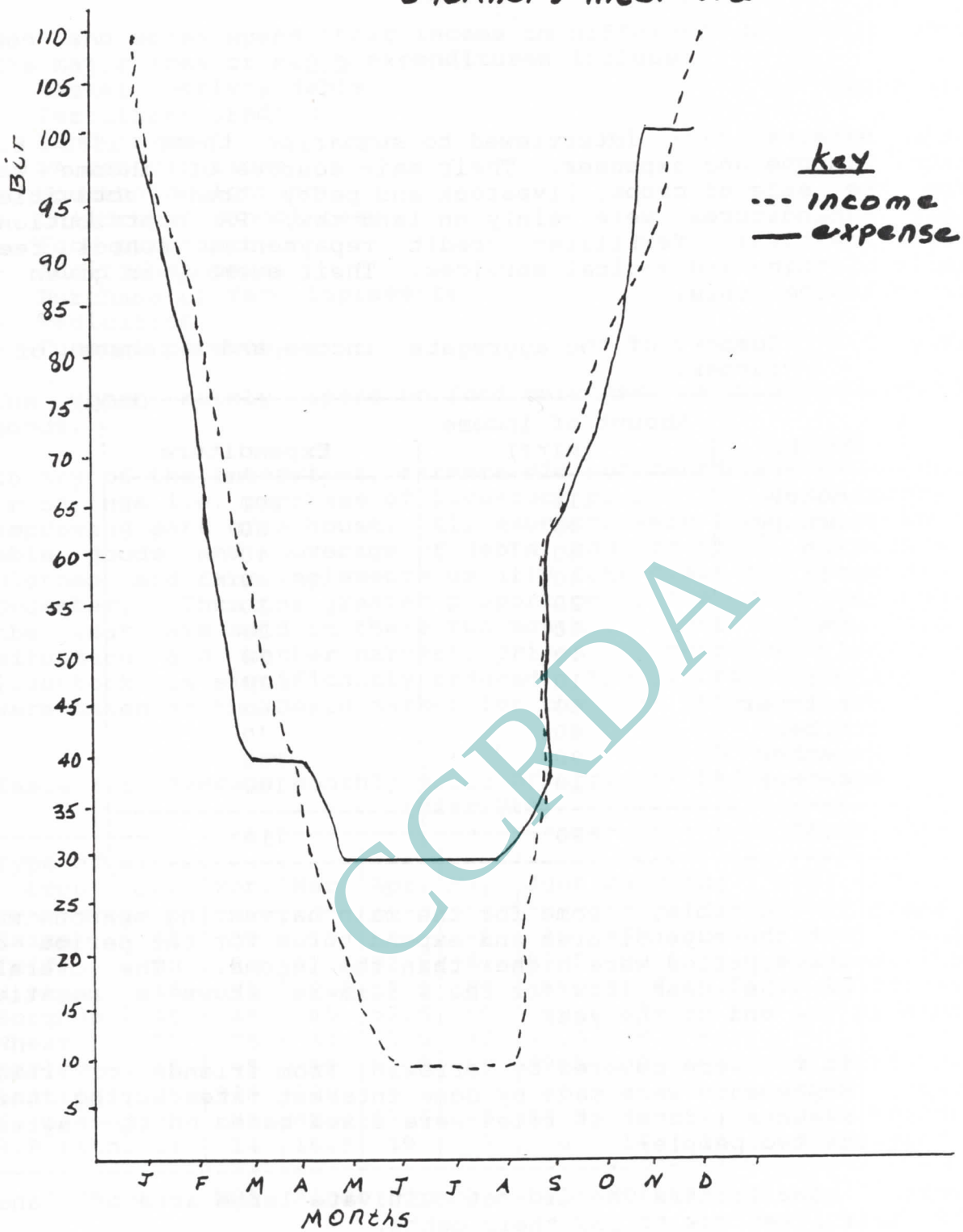
As shown in the table, income for the main harvesting seasons was higher than the expenditures and expenditures for the period of food shortage period were higher than the income. The overall picture of the cash flow for the 3 farmers shows a negative return at the end of the year.

Cash deficits were covered by borrowing from friends or relatives. Repayments were made by some interest rates during harvesting seasons (interest rates were fixed based on the agreement of the two people).

However, some farmers who did not cultivate large area of land, sold their livestock to pay their debts.

A graph was drawn to show monthly decreasing and increasing trend of the 3 farmers incomes and expenditures for the year 1983 E.C. See Figure 12.

FIGURE 12 Income and expenses of 3 farmers interviewed.



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Case study

A case study was made in village II to understand profitability of poultry keeping. Because, almost all families visited own numbers of indigenous and exotic breed chicken and received some income out of hen and egg sales, information was gathered from 3 farmers and summarised in the following table.

Table 3.3 Turnover of chicken based on 3 farmers experience

Farmer	Years of Production	Initial No. of Chickens	No. of chickens Sold	No. of chickens died	Total no of chickens now present	Total no. of chickens involved	Income * from chickens ETB
A	2	M 1 F 2 T 3	14	9	M 1 F 3 T 4	25	70
B	3	M 1 F 4 T 5	25	13	M 1 F 6 T 5	40	150
C	1	M 1 F 1 T 2	5	5	M 1 F 1 T 2	10	20

M = Male
F = Female
T = Total

* Income from chicken does not include income from egg sales

All 3 farmers indicated a fast turnover of chickens. Farmer A had reared 25 chicken after 2 years of keeping, farmer B 40 and farmer C 10. Over different periods they made cumulative income of 70, 150 and 20 Birr respectively. The farmers think that it is easier to sell chickens than other livestock resources.

The major constraint for poultry production is epidemic disease, which mostly occurs in September and October. The farmers do not keep poultry in fences and feed them properly. The chicken wander around the whole day and are exposed to the attack of wild animals.

3.10 Wealth structure

Large number of livestock possession was mentioned as the main factor for dividing the people into rich and poor catagories. The size of land and tenure rights were not important in the wealth classification of farmers. The farmers clearly considered that "oxen created men".

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Material goods and services which encourage wealth establishment in the community were unstable due to the then government policies and natural disasters. When producers co-operatives were formed and the people were forced to stay in villages, some sold or gave away their livestock to their highland relatives in fear of collectivization process. Some animals died from drought or were sold as cash income.

Land, an important asset of the people, was communally owned for about 10 years. Communal ownership of land and oxen power discouraged people from establishing house hold wealth. Instead, the majority of the people were impoverished and led a marginal life.

The people do not undertake secondary activities to make side income. Off-farm activities such as artisanship, employment, trade etc do not exist.

In the absence of large property ownership to classify wealth structure, the farmers interviewed put forward more modest resources as a criterion. These factors of classification include:

- More than one pair of oxen
- More than one milking cow
- Number of other cattle
- Goats
- Donkey
- Tin roofed or well built grass roofed house
- Grain reserve - grain store
- Healthy family - healthy household head.

From the outcome of various interviews and observations, the above mentioned possessions were found distributed among the people by the place they were living at the time of this survey. Thus from the place they occupy and variations in possessions, the following 3 classes of people came out.

Category 1 Non producer co-operative and non villagised farmers' group. This group of farmers was not communa lly producing and sharing the output. They owned livestock land and labour privately. Their production system remained undisturbed, and they were able to make additional wealth. Thus they own:

- Oxen
- Cows
- Goats
- Donkey
- Poultry
- Tin roofed house
- Grain stores

These was still productive and healthy farmers in the community. They cultivate a large area of land and plant diversified crops in their fields. Some of them grow bananas, enset, oranges and eucalyptus trees.

CRDA

Category 2 De-villagized or transitional farmers

These farmers were in villages and owned their land and labour communally. They did not lose their live stock wealth during co-operative farming. In some cases they bought additional cattle while working for the co-operative. According to our interviewee, they own:

- An ox, or shared ox
- Cow
- Goat
- Poultry
- Grass roofed house
- Grain store

These farmers were classified as transitional farmers, because they recently moved out of the villages. According to the informants, it is the farmers who have got oxen power who are healthy and able to build a new house in their original fields who moved out. Farmers who could not afford to offer food and drinks to the group of people to build a house still stay in the old villages. Ability to rebuild a house to move out of the old village was one of the measurements for absolute impoverishment.

Availability of oxen enabled transitional farmers to start farming again on their old and abandoned fields. Oxen were the critical means for restablishing life in their old fields.

Category 3 Village Farmers

These farmers are still in the deserted villages. They are victims of villagization, communal farming and are exposed to natural disasters like human and livestock diseases. A group of farmers were interviewed to point out the causes of most farmer's impoverishment in their PA. They indicated in the order of importance the following points

- Villagization
- Lack of rainfall
- Livestock diseases
- Lack of fertilizer
- Lack of seeds
- Selling of livestock to cover debts and other cash needs.

In village II, a woman and her children were interviewed to tell us about their family status.

The mother sadily said that she lost 3 of her children in 1982 EC. due to meningitis. She also lost one ox, one donkey, and 4 of her milking cows between May to September 1983 EC. Until November 1991 G.C. (the day she was interviewed) she did not have any livestock in her house. She was living on petty trade and expecting food aid from any sources.

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In another interview with 3 men and 3 women, livestock and human losses were indicated which caused destitution to many families. They informed us that one widow lost 4 out of 5 of her livestock, one man lost all of his 4 cattle, one boy said that his parents lost 3 cows in September 1991, and another family lost 4 since September 1991.

Farmers in this category were absolutely poor and highly (immediately) expecting outside assistance of any kind. During the survey period they owned

- A shared cattle or none
- A goat
- Some chicken
- Poorly built grass roofed house and they depended on secondary activity - petty trade, fuel wood and grass sales.

The main concern of the farmers in this category was how and when to move out of their village. Their major constraint was cash in hand to rebuild their tukul in their original fields.

3.11 Land tenure system

When farmer tenants were settled in Fagena Mata PA, all of them were entitiled to own 5 hectares of land as private property. They had rights to sell, rent or lease it out in a way they wanted. But after the 1975 land proclamation and subsequent collectivization land rights were suspended.

During the collectivization / villagization programme, only one - fifth of a hectare was allocated to individual families around their homes in the villages. The rest was pooled as a common property.

During the survey period, some farmers in villages were occupying the land which belongs to other farmers in the village. When villages were formed, land holding system was reshuffled and confused. Land was allocated to any member of the village.

When people began to move out of the villages, they started claiming their original land which actually is used by another farmer now. The current users could not give up their use rights, beause their original land was covered with dense grasses and bushes and became the home of wild animals. They do not possess the ability to go back and start farming. They do not have oxen, and cash to purchse fertilizer.

The situation was reported to the EPRDF office in Belle town, but was not resolved yet. The situation was chaotic and might result in confusion and delay in next cropping season. Still, farmers legally own their original 5 hectares of land.

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CHAPTER 4. CROP PRODUCTION

4.1 Main crops grown

The main crops grown presently in Fagena Mata PA, in order of their importance are: maize, teff, cotton, sweet potato, sorghum, taro, haricot beans, cassava and yam. Each of these crops has got either local and / or introduced improved varieties.

Cereal crops take a greater share in terms of all available agricultural inputs in almost all circumstances.

4.2 Land preparation

Farmland in the area is prepared either by draught oxen or by hand tool called "Aylie". Farmers who have draught oxen work their soils with this power while those who do not have no other option than working the soil with "Aylie".

For the PA oxen shortage is extremely high. As interviews with farmer key informants revealed, out of 5 farmers only one owns a single ox.

The other problem mentioned by the farmers, that has a negative impact on land preparation in the area is the prevalence of several diseases particularly malaria which make the people physically weak.

4.3 Soil fertility

The soil is poor. Except for sorghum and, with small fertiliser and manure application, sweet potato and taro, all crops give very poor yield without either fertiliser or farm yard manure.

Farmers recalled that WADU had made soil fertility test. This fertiliser trial had been carried out for about three years. The conclusion was that the true capacity of the soil to yield without fertiliser is extremely poor.

Following this conclusion WADU carried out on-farm fertiliser demonstration, in which selected farmers actively participated, with the aim of convincing the farmers of the PA to apply fertiliser on their farm plots.

The on-farm demonstration plots were of three categories: A Plot with DAP, a plot with urea and a control plot without fertiliser. The results were found to be that the produce of a a plot with DAP was as much as three fold that of a plot with urea, and the yield of the plot without fertiliser was almost nil. The plant in the plot without fertiliser was seen to be very thin and yellowish.

The crops under trial and demonstration were maize (Kenya), teff (WADU nech teff), and cotton (Alabera and Akale).

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The farmers indicated that they were not slow to be convinced by the conspicuous results of fertiliser application. Since that time, they have been using commercial fertiliser (DAP), athough the amount has been declining owing to the depreciating purchasing power of the farmers coupled with ever increasing fertilizer price. Farmers remembered that they were making a great use of manure, but as time went by the livestock population decreased due to different diseases and consequently manure supply was proportionally decreasing. Now the amount of manure that can be produced from the very few livestock left is very small and its use is limited to homestead farm plots.

4.4 Planting

Sowing or planting in rows is a common practice in the area. All crops (cereals, pulses, root crops) except teff and sorghum are planted in this fashion.

The main advantages of sowing in rows, according to the farmers, are convenience for fertiliser application and to make post-emergence cultivation easier, especially for maize and cotton.

Though it is believed that intercropping of cereals (like maize and sorghum) with pulses (like haricot beans) is advantageous, farmers of Fagena Mata do not practice intercropping presently. The reason behind this is the difficulty to control weeds because cultivation by oxen cannot be carried out. In addition four farmers say that the trailing stem of haricot beans hinder the maize from developing ear (fruit) and hence reduce yield of the maize crop. Due to this farmers resorted to a pure stand.

Planting of different crops may be late or early in relation to the onset of rains. Thus, planting may be as early as January or as late as April to May.

In a normal rain season, time of planting of belg crops (i.e. maize, sorghum and haricot beans) is March. This favours high yield and good crop growth. However, for the last several years planting of the main crops has shifted to mid April to early May.

The arrangement of the main crops in the field during the two seasons is :

Belg season: Maize, haricot beans, sorghum, sweet potato yam, and cassava, of which taro is the last crop to be planted in the field.

Meher season: Cotton -- teff -- haricot beans

4.5 Source of seeds / planting material

The seeds or planting material that the farmer have at present are mainly the proceedings of what they brought with them from their original places, or that were provided by WADU (improved

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varieties), or MOA or that they brought from the neighbouring high land (taro, yam, cassava and sweet potato). In addition to these, the farmers buy seeds from the local market (Bele) and at times they get improved seed from MOA and SOS Sahel.

However, the farmers indicated that they have problems with seeds and the supply of good seeds, especially improved ones, is costly and short. The farmers further more explained that seeds/planting material are often unhealthy and damaged when supplied from own reserve, colleagues or local market.

To alleviate these problems farmers try to select the best seeds from the produced crop and store these away out of reach of storage pests and rodents

The sources of seeds of different crops at present are shown below.

Seed	Source
Maize	Own reserve, MOA, SOS Sahel (Bélíe), local market
Tef	Own reserve, local market
Cotton	MOA, local market
H.beans	Own reserve, local market
Sorghum	Own reserve, local market
S. potato	MOA. own reserve, colleague
Taro	Own reserve, neighbouring upland local market, colleague
Cassava	Own planting material, colleague
Yam	Own material, local market, colleague

4.6 Crop varieties

The varieties in the area are either local or introduced improved or cross - breed (local x improved)

Each crop grown has at least two varieties of each of the afore-mentioned categories.

Crop varieties available in the PA are listed in the table below:

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Table 4.1 Crop varieties available in the PA

Crop	Variety		Remark
	Improved	Local	
Maize	Kenya /WADU/ Israel /MOA/ Katumani /SOS Sahel Bele/	Moshore } Welaita Sotole } Borantie}	
Teff	Nech teff/WADU	Dalesha (Dawro teff) Sergegna} Mutazya } Yilga } Welaita Buniye }	Purchasable at Bele market
Cotton	Albera } MOA Akala }	----	
Sweet Potato	Japan /MOA	Erbo } Welaita Lessan }	
Sorghum		Boka (Wogaro) Belilia (Bilua) Aruzua	
Taro		Tawaya } Neigh- Bilia } bouring Gereza } up land Molia } Dolke } Yitra } Demi } Ulotelia }	
Yam		Wedeka } Neigh- Bunsubuche } bouring Bolaboye } high-land	
Haricot Bean		Zoowehia Karetawehia Botawehia Wichia Fraacha Kebelua	
Cassava ("Kayinaska")		Kuyaria {Short} Panpassa {tall}	

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Table 4.3 Ranking of teff varieties by 4 men

Criteria	WADU Nech Teff	Market (Dawro Teff) (welaita)	Welaita				Remark
			Sergegna	Mitazua	Yilga	Buniye	
Yield	1	2	4	5	3	6	
Early maturity	2	3	3	3	3	1	
Tolerance to moisture stress	2	1	4	1	3	5	
Storage	*	*	*	*	*	*	* No storage
Pests and diseases resistant	4	1	4	2	3	5	
Labour intensive	1	3	6	4	5	2	
Amount of flour produced per kg	3	1	5	2	4	6	
Price	1	2	5	3	4	5	

Overall preference from the farmers' point of view : Nech Teff

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Table 4.4 Ranking of cotton varieties

Criteria	Introduced by WADU		Remark
	Albera	Akala	
Yield	2	1	
Early maturing	1	2	
Less susceptibility to pests and diseases	2	1	
Tolerance to moisture stress	2	1	
Price at market	1	2	

Table 4.5 Ranking of sweet potato varieties by 4 men

Ceriteria	MOA	Indigenous (Wolayta)		Remark
	Japan Sweet potato	Erbbo	Lessan	
Yield	1	2	3	
Early maturing	1	2	2	
Drought resistant	2	1	1	
Pests and diseases resistant	3	2	1	
Food value	1	3	2	
Taste	1	2	3	
Price	1	3	2	

Overall preference from the farmers' point of view: Japan Sweet potato variety

Some of the interviewed farmers reported that some of the varieties that had been in the area have already disappeared due to cross breeding (local x improved). The typical example which was presented by these farmers was Nech teff which had been introduced by WADU.

In the course of the study, the team has come to appreciate that the farmers are fully acquainted with the merits and demerits of each of a given crop's varieties.

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The farmers have got their own criteria by which they make preference amongst varieties of a crop. Some of the criteria are : level of yield, maturity period, tolerance to drought, resistance to pests and diseases, storage quality, food value and market price. (see rankings)

4.7 Weeds

Dozens of weeds has been observed and reported by farmers. Most of the plots and their surroundings are weedy. It was clear in our tour in the area, and further confirmed by the farmers, that "Adelia" is the most tenacious and widely distributed weed.

In the past, the farmers said "the infestation coverage was not as big as today's". They indicated that weed problem is building up. Weeding is carried out either by one or a combination of the following method.

Method	Crops
- Cultivation by ox plow (shilshalo)	- Maize, sorghum, cotton
- Hoeing up weeds with hand tools like Aylie, Tike Shelke	- Maize, sorghum, cotton, sweet potato, taro, yam, haricot beans, cassava
- Uprooting weeds with bare hands	- Teff, haricot beans

All the crops are affected by weeds. However, the most susceptible, according to the farmers, are maize and cotton. Owing to this, farmers weed maize three times - starting from its third week after sowing (once hoeing and twice cultivation by draught oxen - shilshalo). Similarly cotton is weeded five times out of which twice hoeing, twice "shilshalo", and once uprooting weeds.

The weeds observed during our tour and reported by the farmers are:

- Adelia
- Zeisa
- Hititia
- Huwachia
- Kerchua
- Dalesha
- Sura
- Girolia

The purpose of weeding are to get rid of weeds from competing for soil nutrients and as a means of controlling pests and diseases.

Weeding time can be seen in the cropping calendar in the following pages.

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4.8 Pests and Diseases

The major pests and diseases that cause damage in the field and the store were identified by the farmers. These are

Pests	Crop affected
Stalk borer	Maize, sorghum
Boll worms	Cotton, maize, sorghum, h.bean and tomato
Aphids	Maize, sorghun , cotton
S. potato butterfly	S. potato
S. potato weevils	S. potato
Grass hopper	Teff
Cricket	Teff
Cut worms	Maize, sorghum, s. potato
Termite	All crops
Birds	Especially sorghum

Pests and diseases affecting crops in the area are listed in table 13. The months of the year which the pests and diseases affect are also indicated against different crops.

Diseases

- Rust ----------] maize and sorghum
- Smuts ----------]

Farmers explained that they had been using chemical pesticides for some crops. However, presently, control measures against pests and diseases are limited to weeding, crop rotation and sometimes rescheduling the normal planting time (ie. planting early or late as is supposed to be appropriate)

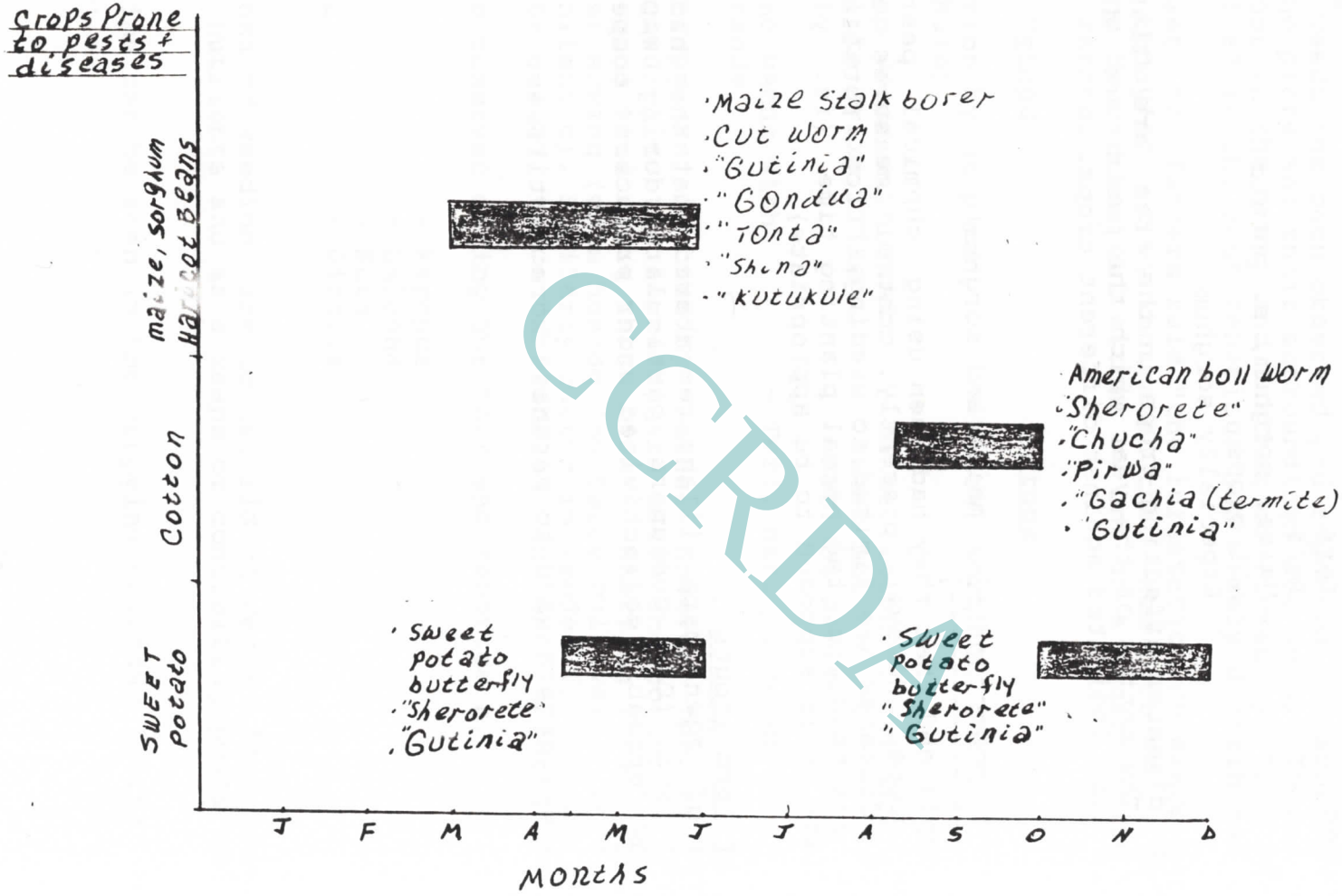
4.9 Use of farm inputs

The farmer of Fagena Mata village remembered that they had been high fertiliser (DAP) consumers, particularly during WADU and before being forceably collectivized under producers' cooperative in 1972 E.C.

In those times farmers used to purchase more fertiliser:

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Fig 13 Crop pests and diseases calendar



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Rich farmer	> 4 quintals
Middle	3 "
Poor	1.5 "

The application rate had been one quintal of fertiliser per hectare.

However, nowadays,the "average" farmer feels that the amount of fertiliser he can afford is not more than one quintal. Many farmers indicated that they are forced to decrease the application rate. The yield has also decreased correspondingly.

The major fertiliser beneficiary crops have been maize, teff and cotton.

Even though the supply of fertiliser is limited, since the farmers do not yet find alternative methods of upgrading or maintaining fertility, most of the farmers try to use fertiliser. As to manure usage, the farmers pointed out two limiting factors:-

i) Since there is a limited number of livestock the amount of manure that is available is also very limited, and,

ii) Difficulties in transporting it to the main farm plot which is situated far from the home stead.

Owing to these constraints, use of manure in the PA is limited to small portions of the homestead farm.

Manure beneficiary crops are taro, garden maize and cassava.

Ample quantities of chemical pesticides were formerly used for the cotton crop in the area. But as time went by, the farmers' capital status deteriorated and finally farmers were not able to afford it. Presently usage of chemical pesticides is extremely limited if it exists at all.

The farm implements with which these farmers work their farm plots are:

- plow -/ maresha/ oxen drawn
- Aylie - Human labour hand tool
- Tyika -] both are hand tools and are used - hoeing up weeds
- Shilde -] - softening homestead plots

Relative comparison by farmers between plow oxen and " Aylia" (poor man's oxen) as implements for working the soil.

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Table 4.6 Comparision of efficiency of oxen power and hand tools

Criteria	Plow - oxen drawn	Aylie-Human labour powered hand tool
Area cultivated Per given period of time or season	Very big - Sufficient land developed - Many crops can be grown	Very small - Insufficient land development - Limited number of crops
Labour intensity	Low - All able young and old can work with it	Extremely high - limited use because many are physically weak due to several diseases especialy malaria - And limited use by old men and women because it is tiring work
Cultivated land quality	Poor (Shallow) - air and water circulation is limited - root development hampered - impact on yield	Very good/ deep and well turned/ - Air and water circulation is facilitated - Root development is initiated - Good yield
Investment cost	Extremely expensive - limited usage because most can not afford	Cheap - Most farmers can afford it - Extensive use particularly the poor.

Conclusion : Farmers of Fagena Mata ranked plow oxen first and foremost in an overall assessment.

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4.10 Moisture Stress

Declining rainfall coupled with erratic distribution is one of the major problems of the area.

Farmers explained that they had good rainfall before 1976 - 1977E.C.

Though Fagena Mata PA is bounded by rivers / streams on its three sides, the rivers are either seasonal and with small water flow or unaccessible.

Bale River - Seasonal / dries up almost completely in some months of the year

- The flow is small/ potential for irrigation is almost non - existant.

Dimayo River - Seasonal
(Dimayo Gorge) - Unaccessible

Omo river - Very far and situated beyond difficult topography, unaccessible

In brief the area does not has any foreseeable alternative source of water for crop development.

To cope with the moisture stress, farmers include drought resistant crop varieties in their crop production process.

Alhough, it is not generally true of all farmers, some of the interviewed farmers indicated that they are shying away from production of cereal crops and are resorting to root crops like yam, cassava and sweet potato because the latter ones are less susceptible to drought.

4.11 Post harvest storage

- Storage made up of bamboo and commonly deployed out of doors. In such storage unthreshed maize is commonly stored
- Sacks, pots and the like as storage for cotton
- Making bundle of unthreshed grain namely teff, sorghum, and haricot beans and putting them on some sort of scaffold.
- Letting root crops to stay in the ground (crops like sweet potato, cassava, yam)

Storage problem

- Storage pests like weevils, termites, rodents and wild animals exist in the area and the damage is big as farmers indicated.

Seed selection

Seed selection criteria for next cropping season by the farmers looks like:-

- Selecting seeds undamaged by pests and diseases (healthy)
- Seeds looking good and having their natural colour
- Bigger and vigorous ones.

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Storage seed practices

-Suspending banch of unthreshed grain in smoky places (indoor)
- Suspending banch of unthreshed grain outdoors unreachable by storage pests and rodents.

4.12 Cash crop in the area

The farmers remembered that the main cash crop up till 1972 EC. was cotton.

Now crops considered as cash crop are teff and maize (partially)

4.13 Major problems of crop production in Fagena Mata PA

After having successive field work days and analysis of the results of information collected during those days a set of problem areas were identified as priorities.

1. Shortage of plow oxen
2. Soil moisture stress
3. Soil fertility
4. Pests and diseases
5. Weeds
6. Wild animals

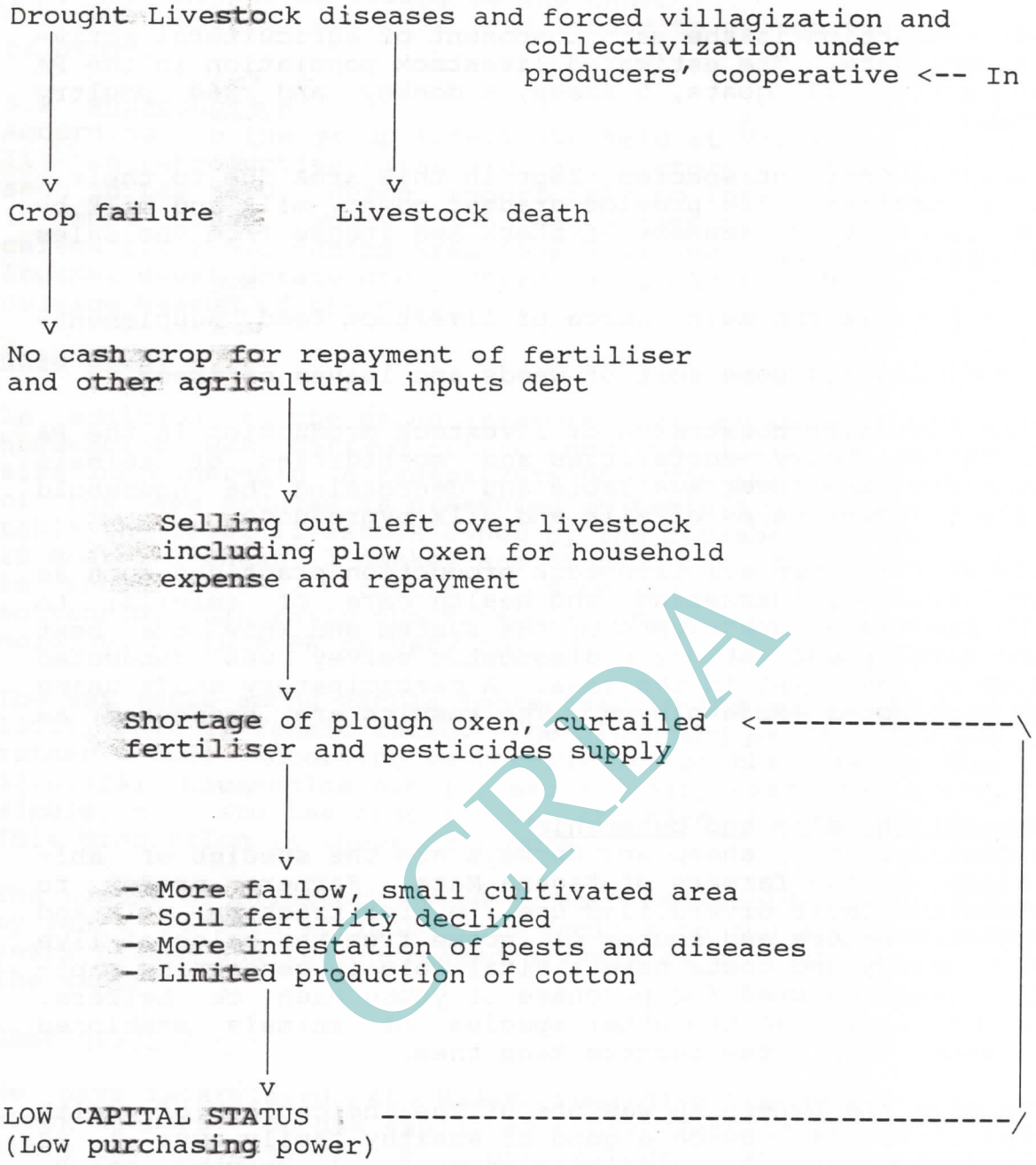
The listed problem areas are interlinked with one another.

During the discussion with the farmers, they explained that most of the problems started to appear and build up since around 1972 EC. According to the farmers the prime factors that cause the existing farmers' situation are:

- Drought
- Livestock diseases
- Forced villagization and collectivization in producers' cooperatives.

The whole text of the discussion with the farmers may be summarized as follows.

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Drought
Livestock diseases and forced villagization and collectivization under producers' cooperative <-- In 1972 EC.
Crop failure
Livestock death
No cash crop for repayment of fertiliser and other agricultural inputs debt
Selling out left over livestock including plow oxen for household expense and repayment
Shortage of plough oxen, curtailed fertiliser and pesticides supply
- More fallow, small cultivated area
- Soil fertility declined
- More infestation of pests and diseases
- Limited production of cotton
LOW CAPITAL STATUS
(Low purchasing power)

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CHAPTER 5 LIVESTOCK PRODUCTION IN FAGENA MATA PA

Livestock production is the main component of agricultural activity in Fagena Mata. The estimated livestock population in the PA is 490 cattle, 225 goats, 5 Sheep, 6 donkey and 360 poultry (Source:MOA, Bele).

Cattle are the dominant species kept in this area due to their diversified advantage i.e provide draught power, milk and milk by products, use as a replacement of stock and income from the sales of live animals.

Natural pasture is the main source of livestock feed, supplemented by crop residues and some sort of weeds and leaves of trees.

Disease is the major constraint of livestock production in the PA which dictates heavy mortalities and morbidities of animals minimizing the oxen power available and decreasing the household income due to lower sales of milk and milk byproducts.

To understand the over all livestock production practices such as husbandry feeding, marketing and health care of animals; to identify the main constraints of the system and know the best bets and development options a diagnostic survey was conducted from 10 to 23 Nov. 1991 in the area. A participatory study using the RRA techinques was employed. The results are presented as follows.

5.1 Composition, size and ownership

Cattle, goat, poultry, sheep and donkeys are the species of animals raised by the farmers of Fagena Mata. Farmers prefer to keep cattle for their diversified use i.e, for traction, milk and milk products, manure and source of income from the sales of live animals. Poultry and goats have a vital role in generating capital which could be used for purchase of young oxen or heifers. Sheep adapt less than the other species of animals mentioned above. Hence, only a few farmers keep them.

Livestock size and ownership was one of the indications of wealth structure in the PA. Hence a good or wealthy family owns 1 -2 timad (pair of oxen), 2 - 3 milking cows, 2 - 3 growing stock. The medium income group owns 0.5 - 1 ox, 1 or 2 milking cows and 1 or 2 calves. The lower income group are those who do not have livestock at all.

There are three types of livestock ownership.

i. Livestock owned by the household members only,
ii. Livestock shared between two households,
- Cow are milked turn by turn on week basis or calving basis
- Oxen are used turn by turn on two days basis
iii. Cows or young oxen kept for some relative or wealthy farmer especially from the highlands where feed problem is very severe.

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- The household have only the right to use the yoghvrtand butter, but the calves belong to the owner
- The household provides free labour to plough the land of the ox owner.

5.2 Reproduction

According to the group interviews held at Village I and Village II the reproductive rates are satisfactory. Abortion is rarely seen in the herd. Women report calving interval of 1 - 2 years in most cases. Women give great attention to cows and young calves for 2 - 3 months keep them home and feed them green grass, legume, sweet potato etc. There is no way in use to control the calving season of the cows.

Case study - 1

In addition to the group interview random case studies of 28 households was carried out to know the livestock composition, size and ownership in Fagena Mata PA. The summary of the result of the case studies is presented in table 5.1 As shown in the table the total livestock owned by the households were 79 cattle 25 goats, 1 sheep, 1 donkey and 69 poultry. the average holding is shown to be 2.8 cattle , 0.5 ox and 1.15 milking cows per household. Generally the total livestock population and average holdings of this PA is very low.

The sex ratio among cattle looks fair in the young stock which is 13:11, male to female ratio. The ploughing ox distribution looks rather worse. According to the summary of the case studies only 3(10.72%) households own 1 timad (1 pair) oxen, 8 (28.57%) own, single ox, and the rest 17 (60.71%) have no ploughing oxens. This proportion is shown in Figure 14.

The number of livestock owned by each household is declining year by year, Farmers atribute this decline to the successive drought years passed and the increased prevalence of livestock dieseae in the area.

Case study 2

We have interviewed Ato Hadero regarding the decline of livestock numbers. He has explained every event in the past responsible for the loss of his livestock. He started living in Fagena Mata in 1963 (EC) with 1 ox and 1 heifer only. Just after one year he brought 2 oxen and 2 cows. The area was very conducive for livestock rearing, with sufficient rainfall and good grass growth. His cattle size reached to 2 pair of oxen, 5 milking cows, 4 calves by 1969. Then the successive drought period started early in 1971. Regardless of the 20 sacks of fertilizer he used that year his crop yield was not sufficient to feed his family the whole year and repay the fertilizer credit. So he was forced to sell his cattle to purchase additional food and repay his credit. The remaining cattle were again attacked by diseases. Year after year the disease prevalence increased - resulting in higher mortality rates. The severe drought in 1977

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wiped out all his wealth in livestock. Some died and the rest were sold to purchase food for his family. Since then supported by his highland relatives he is trying to build up his herd and regenerate the condition. The biography is presented in Diagram 5.1

Table 5.1 Size and Composition of livestock / household

Farmers Serial No.	Cattle										
	Total	Ploughing ox	Young bull	Cow	Heifer	Calf M	Calf F	Goat	Sheep	Donkey	Poultry
1	5	1	1	1	1	1	-	-	-	-	5
2	9	2	1	2	1	-	3	2	-	-	12
3	4	1	-	1	-	2	-	5	-	-	5
4	5	1	-	2	-	2	-	1	-	-	4
5	3	-	-	2	-	-	1	-	-	-	2
6	3	-	-	2	-	-	1	-	-	-	3
7	7	1	-	4	-	1	1	1	-	-	8
8	2	-	-	1	-	-	1	-	-	-	7
9	9	2	1	3	1	1	1	7	1	-	-
10	3	1	-	1	1	-	-	2	-	-	5
11	2	-	-	1	-	1	-	-	-	-	3
12	3	-	-	1	1	-	1	-	-	-	-
13	2	-	-	2	-	-	-	3	-	-	8
14	1	-	-	-	-	-	1	-	-	-	-
15	2	-	-	1	-	1	-	-	-	-	4
16	-	-	-	-	-	-	-	-	-	-	-
17	4	2	-	1	-	1	-	-	-	-	7
18	1	-	-	1	-	-	-	-	-	-	-
19	7	1	1	3	-	1	1	3	-	-	3
20	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-
23	3	1	-	1	-	1	-	1	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-
25	1	-	-	1	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-
27	3	1	-	1	-	1	-	-	-	-	3
28	-	-	-	-	-	-	-	1	-	-	-
Total Holding	79	14	4	32	5	13	11	25	1	1	69
Average Holding	2.82	0.5	0.14	1.14	.19	.46	.39	.89	.04	.04	2.46
Sex Proportion	18 : 37					13	11				
Sex ratio	1 : 2					1 : 1					

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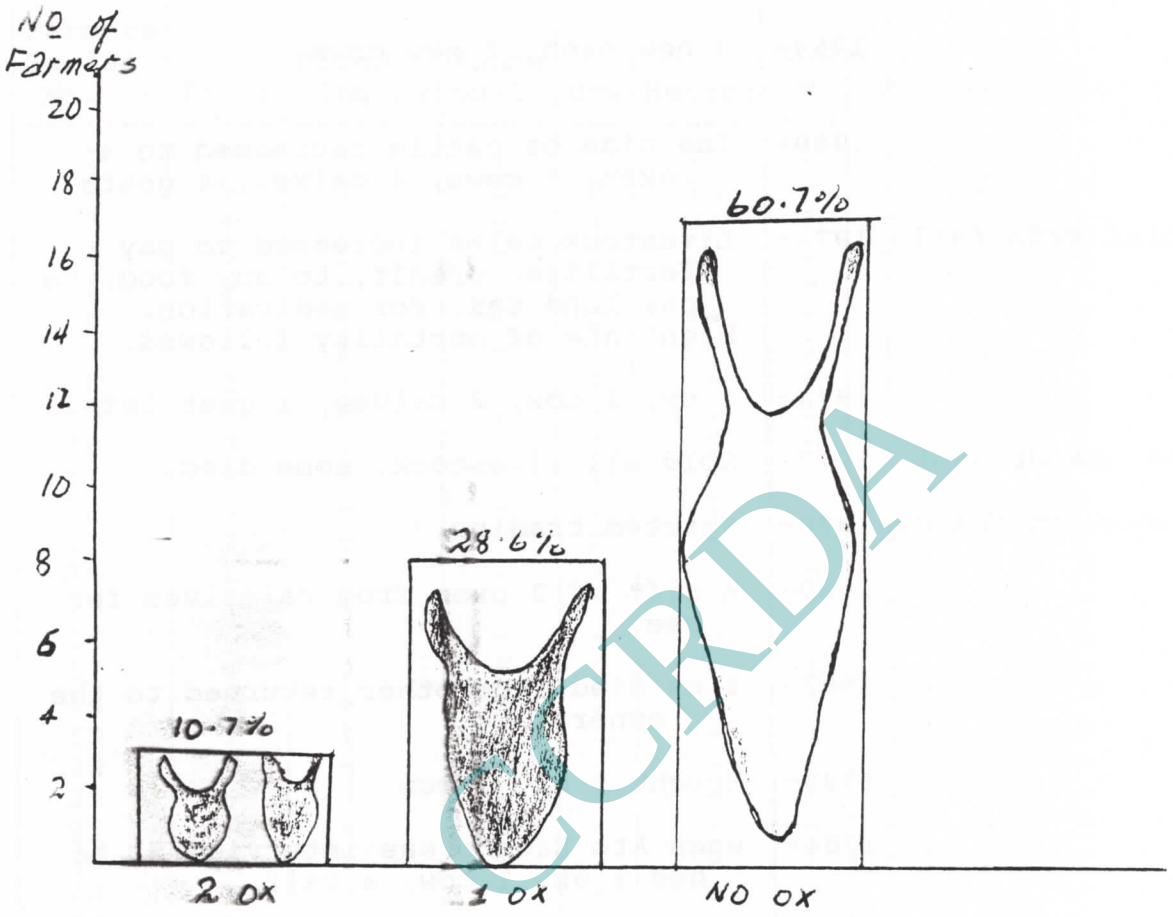
Case study 2

Biography of livestock population decline, based on Ato Hadero's experience. (Years are given by EC)

Constraints	Time line	Effect on livestock
	1963-	5 ha of land, Family size 2. 1 ox, 1 heifer.
	1964-	2 new oxen, 2 new cows.
	1969-	The size of cattle increased to 4 oxen, 5 cows, 4 calves, 4 goats
Eratic rain fall	1971-	Livestock sales increased to pay fertilizer credit, to buy food, to pay land tax, for medication. High rate of mortality followed.
	1974-	1 ox, 1 cow, 2 calves, 1 goat left.
Severe drought	1977-	Sold all livestock, some died.
Family size increased	1978-	Started trading.
	1980-	A gift of 2 oxen from relatives for use.
	1982-	1 ox died, the other returned to the owner.
	1983-	Bought 1 ox, 1 cow
	1984-	when Ato Hadero was interviewed, he had 1 ox, 1 cow, a calf

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FIG 14. Oxen distribution among 28 households interviewed.



Number of oxen owned or leld

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Case study 3

Calf history analysis from the case studies of 12 cows in Fagena Mata

The 12 interviewed calves had 88 reproductive years and 60 calvings, yielding an average calving interval of 1.47 years ie. 18 months, which is satisfactory for such type of management system. Table 5.2 shows details of the calving interval.

Table 5.2 Calving history of 12 cows

No.	Cow-No	Age (years)		Assumed age at sexual maturity (years)	Reproductive period (years)	No. of calvings	Calving interval (years)
		Now	When bought				
1	FM-001	12	-	4	8	4	2
2	FM-002	13	-	4	9	6	1.5
3	FM-003	15	5	4	10	4	2.5
4	FM-004	13	-	4	9	8	1.12
5	FM-005	8	5	4	3	2	1.5
6	FM-006	8	5	4	3	2	1.5
7	FM-007	15	-	4	11	8	1.3
8	FM-008	10	-	4	6	6	1
9	FM-009	11	-	4	7	5	1.2
10	FM-010	7	-	4	3	2	1.5
11	FM-011	9	-	4	5	5	1
12	FM-012	18	-	4	14	8	1.75
					88	60	
Calving Interval =					1.47 years		

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5.3 Feeds and feeding

Feed sources in Fagena Mata

Natural pasture is the main feed source in Fagena Mata PA. The proportion of grazing land is believed to be 60% of the total area of the PA. The natural pasture is composed of indigenous grass and legume spp. such as:

Grass
- Hyparrhena rufa
- Brachiaria spp.
- Panicum Spp.

Legume
- Stylosanthes [illegible]conticosa
- Cassia spp.
- Eriosema spp.
- Desmodium spp.
- Aeschynomene spp.
- Indigofera spp.
- Nenotonia Wigntii

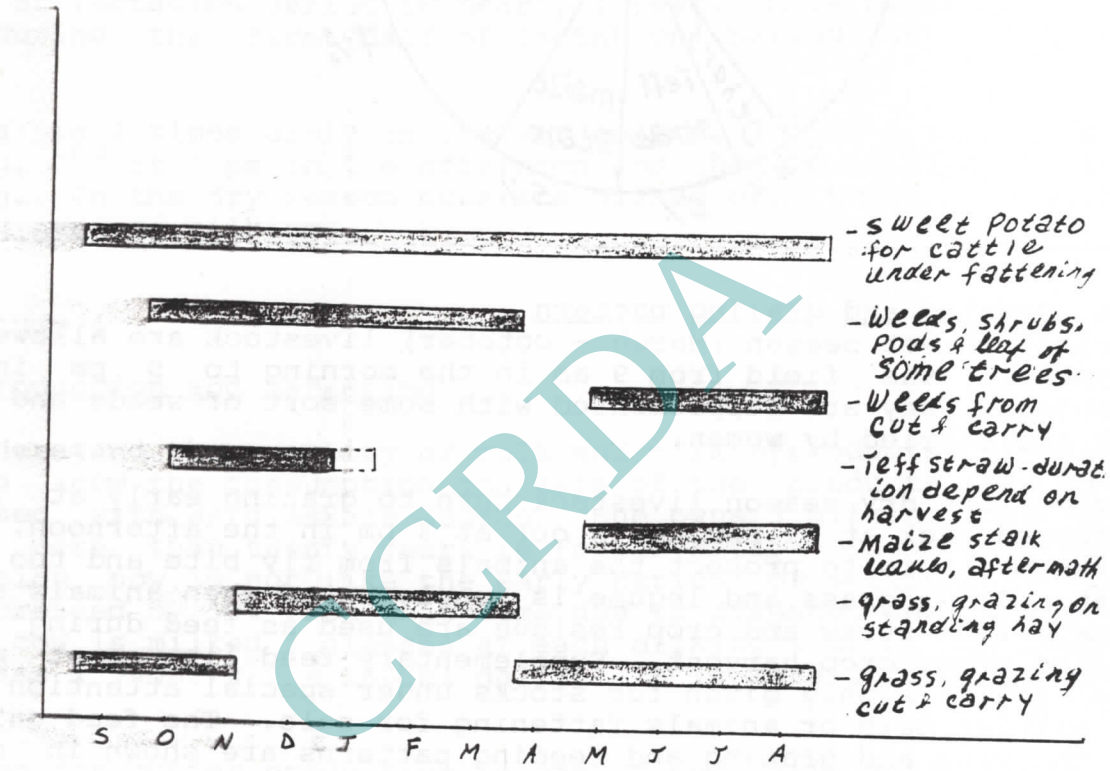
Some new legume and grass spp. are also planted on the plots of SOS Sahel contact farmers. The introduced spp. includes pennistum clandestinum (grass spp) M. axillare, Desmodium intortum, Stylosanthes hamata, Cajanus cajan. L. leucocephala, Sesbania sesban, M. serato (legumes). (Source: SOS Sahel Extension Supervisor, Muluken jorge).

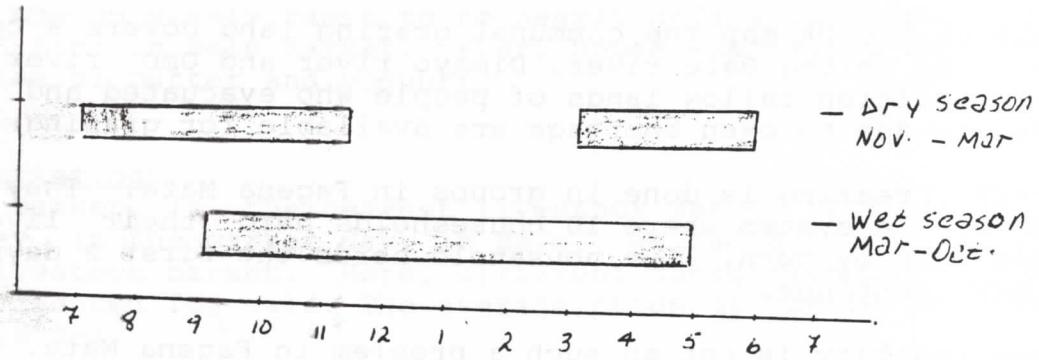
Farmers use the natural pasture communally in every season. It is a source of green grass and legume in the wet season and of standing hay in the dry season. Maize stalk, teff straw, weeds from the stubble plots, shrubs, pods and leaves of different trees and sweet potato are the other type of feeds used for livestock in Fagena Mata.

- Type of feed stuff used for livestock - group interview with 8 women and 11 men farmers
  - Grass
  - Standing hay
  - Maize stalk
  - Teff straw
  - Weeds
  - Shrubs, pods and leaf of different plants
  - Sweet Potato

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FIG 15 Livestock feed calendar

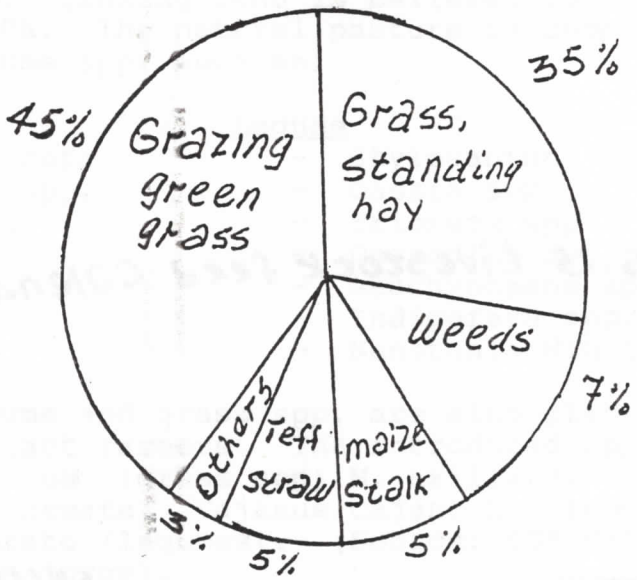




Grazing hours of the day

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FIGURE 16. PROPORTION OF LIVESTOCK FEED OBTAINED FROM VARIOUS SOURCES IN THE PA



5.4 Grazing and grazing pattern

During the wet season (March - October) livestock are allowed to graze in the field from 9 am in the morning to 5 pm in the evening. They are supplemented with some sort of weeds and grass cut and carried by women.

During the dry season livestock turn to grazing early at 7 am, returned back at 11 and again out at 3 pm in the afternoon. This arrangment is to protect the animals from fly bite and too much heat. Green grass and legume is supplemented when animals are at home. Teff straw and crop residue are used as feed during short period after crop harvest. Supplementary feed like sweet potato and grain is only given for stocks under special attention such as milking cows or animals fattening for sale. The feed calender of the area and grazing and feeding patterns are shown in calendar Fig. 14 and 15.

As shown on the PA map the communal grazing land covers a considerable area on the Bale river, Dimayo river and Omo river valleys. In addition fallow lands of people who evacuated and lands left fallow due to oxen shortage are available for grazing.

Livestock rearing is done in groups in Fagena Mata. They call it "Wudea" a system where 10 housesholds herd their livestock together turn by turn. One household herds the first 2 days and the others continue.

- Feed quantity is not as such a problem in Fagena Mata. Livestock graze on standing hay remaining from surplus growth of the past rainy season. But the grass is over-matured and has low nutrition value.

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5.5 Water Resource

During participatory mapping of the PA area, the farmers indicated that the water source for livestock is the Bale river, the accessible water source for man and livestock. Water is not a problem in the wet season. Water problem becomes prominent during the dry seasons specially in the months of January and February. Installation of water line from the highland to Fegena Mata is underway by the SOS - ESF. Hence there is strong hope of available clean water for human and animal consumption.

5.6 Productivity and marketing of livestock

Age at first calving is estimated to be 4 years by the group of 3 women interviewed. Milk production varies with stage of calving, months of lactation, season of the year and disease condition. Length of lactation period is nearly 1 year. Milk production is high during the first half of lactation period depending on season.

Milking is 3 times daily in the wet season, 1st at 9 am in the morning, 2nd at 3 pm in the afternoon and the 3rd at 11pm. in the evening. In the dry season cows are milked only twice ie. morning and evening milkings.

Case study 4

Milk production and marketing

To understand the quantity of milk and milk byproducts produced and to know the consumption and sale of the products we have discussed with W/ro Askale Godebo. She owns 3 milking cows and stayed more than twenty years in Fagena Mata. She said milk production now is not like the early periods of settlement. It is decreased by 30% from that time due to diseases and drought. A good cow is milked 3 glasses at each milking time at the moment (3 glass x 300ml x 2 = 1800ml daily); it is more during the wet season.

Churning for butter production is one of her daily activities, it takes her 1 hour each day. She estimated her butter production from 1 cow on weekly basis to be nearly half a kilogram. It is worth 6 Birr in Bele market. Every house expense is covered from the sales of butter and yoghurt.

5.7 Marketing

Belle market is the nearest livestock market for this area. Thursday is the market day in Bele. We had a chance to visit the livestock market. Here, different categories of livestock were presented for sale. The average price of cattle is presented on table 5-3.

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Table 5.3 Livestock prices in Bele market Nov. 1991

Animal type	Average price
Ox (fattened)	500 - 600
Ox (for ploughing)	350 - 400
Young bull (2 - 3 years)	150 - 200
Heifer (2- 3 years)	150 - 200
Calf (1 year old)	80 - 100
Doe	50 - 70
Buck (average size)	50 - 90

The livestock prices rise in periods of high demand. The two peak periods, when livestock prices rise, are:

1 - March - June (high demand of ox for land preparation)
2 - September - for mesKel holiday

Case study 4

Categories of animals sold and reasons for selling

From the calf history analysis, we have found 22 (37%) of the animals that we investigated were sold. 14 of them (64%) were sold before reaching 3 years, 2 (9%) at age range of 3 - 4 years and 6 (27%) at 4 years and above. A higher sale rate for young stock is seen in this analysis. The main reason given by the farmers was repayment of fertilizer credit and purchase of additional grain after the 1977 EC. drought year. Detail of the sale analysis is presented in table 5.4

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5.8 Livestock disease in Fagena Mata

Disease is the main factor which hampered livestock production in the PA. Different livestock disease are reported to occur with varying mortality and morbidity rates. The prevalent diseases in the PA and the time of occurrence is presented in Fig. 17 (Disease calender). The farmers were able to state the diseases with the vernacular names and some clinical signs and postmortem lesions for each disease.

Trypanosomiasis is endemic in the area. Trypanosomiasis and tse tse fly survey carried out by SOS Sahel and MOA veterinary servic department in the low land PA including Fagena Mata revealed the existance of both cyclically (T. congolenses) and mechanical (T. vivax) transmitted trypanosomiasis infections. Tick born diseases like anaplasmosis and heart water are common. Through the incidence of anthrax and black leg have been minimized due to vaccinations the diseases still occur sporadically in the area. Ticks and mange mites are widespread but control measures are minimal.

Table 5.5 indicates the ranking of various diseases prevalent in the PA.

Case study 3

To know the effect of disease on the livestock population in the area a cow interview technique was used. The 12 cows under this case study had 60 calvings. The history of each calf was investigated and the analysis is presented in table 5.4

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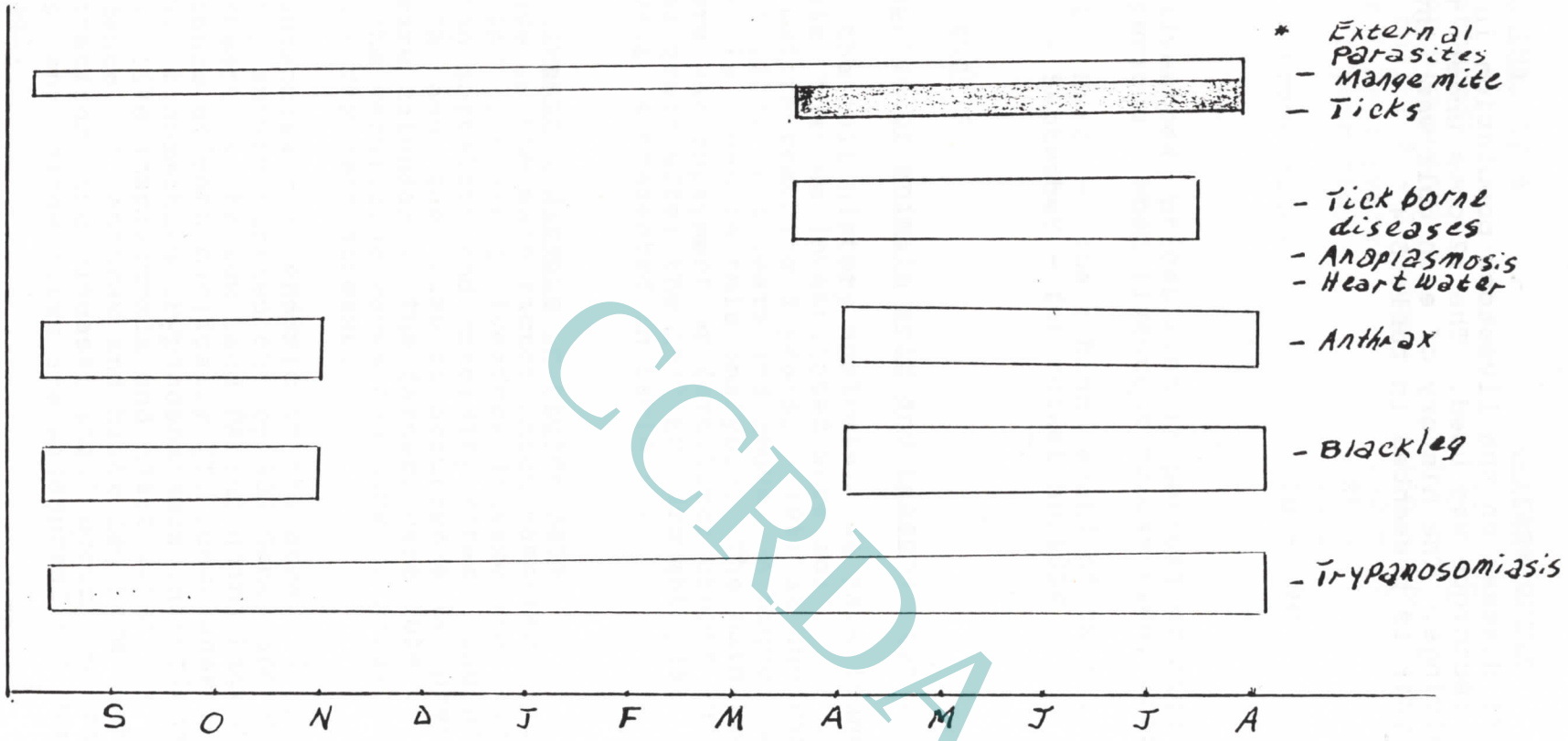


FIG 17 Livestock diseases Calendar

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Table 5.4 Analysis of calf histories

Age	0-1		1-2		2-3		3-4		4+		Total	
Sex	M	F	M	F	M	F	M	F	M	F	#	%
Born or BF from previous age	34	26	23	22	17	15	12	6	6	5		
Analysis of fate												
Sales			2	4	2	6	2	-	4	2	22	37.0
Domestic Slaughter	-	-	-	-	-	-	-	-	-	-	-	-
Deaths	7	2	2	1	1	2	3	1	1	1	21	35.0
Other exits	-	-	-	-	-	-	-	-	-	-	-	-
In herd at this age	4	2	2	2	2	1	1	-	1	2	17	28.0
Accounted for at this age	11	4	6	7	5	9	6	1	6	5	60	100
CF to next age	23	22	17	15	12	6	6	5	0	0		
Causes of death	**Analysis of deaths**											
Accident	2	1								1	4	19.0
Anaplasmosis			1	1			1	1			4	19.0
Black leg						1	1				2	9.5
Anthrax							1				1	4.8
Trypanosomiasis	1				1	1		1			4	19.0
Unknown	4	1	1								6	28.6
Total deaths	7	2	2	1	1	2	3	1	1	1	21	100
Reason for sale	**Analysis of sales**											
Repayment of fertilizer credit			1		1	2	2		1		7	31.8
Cash needs for grain purchase			1	3	1	3				1	9	40.9
Cash needs for funeral ceremonies				1							1	4.6
To buy ox						1			2		3	13.6
Culled due to diseases									1	1	2	9.1
Total sales	-	-	2	4	2	6	2	-	4	2	22	100

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Table 5.5 Ranking of prevalent livestock diseases in Fagena Mata

No.	Diseases syndrome reported by the Farmers Group	Vernacular Name	Scientific name of the disease	Ranking	
				Mortality	Morbidity
1	- Blood from the nose and skin - Bloody diarrhoea - Acute - Enlargement of the spleen	- No	- Acute tryponosomiasis (T.Vivax.)	3	5
2	- Progressive emaciation - Anemia - Death	- Shulula	- Trypanosomiasis (Chronic trypa-)	6	1
3	- Nervous signs - High stepping stiff gait - Death - Oedema - Hydrothorax, hydropericardium	- No	- Heart water	2	6
4	- Sudden death, blood from the natural openings - enlarged spleen	- Duluwa	- Anthrax	5	8
5	- Inappetance, depression, weight loss and death, enlargment of the spleen liver, distended gall bladder, dehydrated reticulum	- Ahera	- Anaplasmosis	1	2
6	- Acute lameness, crepitating swelling in the hip, tremor, death with in 2-3 days	- kersho (Tilike)	- Black leg	4	3
7	- Dry hair coat, wearing of the hair mostly start from the tail and reaches all over the body	- No	- Chorioptic mang-emite	-	7
8	- Tick infestation	- Denko	- Tick infestation	-	4

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As shown on the calf history analysis (table 5.4) out of the 60 calves registered 22 were sold due to different reasons, 21 died and the rest (17) were still in the herd at the time of interview. The result confirms the great loss of livestock due to disease. When we examine the causes of mortality in the 21 calves, 4 were due to accidents and the rest 17 were due to diseases like annaplasmosis, anthrax, black leg, trypanosomiasis and unknown disease conditions.

Regarding the seasonal occurrence of the common livestock diseases, a disease calendar was made by a group of 8 men farmers in village II and further discussion took place with a group of 3 farmer in village I. The livestock disease calender is shown in Fig. 17. As indicated in the calendar, trypanosomiasis occurs all the year round with varying prevalence rate. It is more more prevalent at the beginning of the first rainy season (March and April) and end of the second rainy season (September and october). Tick born diseases occur in months when the tick population is abundant, ie. the wet season (March - September) Anthrax and black leg occur sporadically in the wet season (April to November) Many infestations are seen occasionally at any month of the year. Traditionally farmers use different local methods to treat their animals. The issue was discussed with two key informants.

1. Ato Kuche Anchelo
2. Ato Daya Demise

The traditional disease control methods are presented in Table 5.6

Table 5.6 Traditional livestock disease control methods.

Diseases	Traditional method or herbs used
1. Trypanosomiasis	- no
2. Afrera (Anaplasomosis)	- Root of chedeu; root of bitter plant; root of seritea with butter and egg mixture, to treat the constipation
3. Anthrax	- no treatment, disposal of the carcass by burying
4. Black leg	- Branding round the sholder and incising the wound, to put butter in side, and burning with very hot sickle
5. Black leg and other unknown acute diseases	- Drenching lemon juice, root of temesha, euculyptus and neem tree leaves
6. Ticks	- Mixture of salt, butter and naphta kills ticks

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5.9 Veterinary services and their accesibility

As Fagena Mata PA is located adjacent to the Belle town, the Awraja vet. clinic in Belle is more accesible than it is for other PAs in the awraja. Nevertheless, farmers complain about shortage of drugs in the vet. clinic and the poor service given.

A visit was made to the vet clinic at the MOA compound in Belle, and discussed with the vet staff assigned there.

There is an animal health assistant (Diploma in veterinary science) and 2 animal health technicians working in the clinic. The clinic lacks basic diagnostic and clinical equipments such as sterilizer etc, and water and electricity supplies.

The staff complains about the gradual decrease of drug supply. The drug supplied to the awraja in 1991 is 70% less than the drug supplied in 1990. The mobility of the staff is limited due to vehicle and financial problems.

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CHAPTER 6 WATER RESOURCES

Figure 1 shows 3 river boundaries of Fagena Mata PA. Dimayo and Bale rivers are tribuaries of Omo river and run through the northern and southerns bounds of the PA. Omo and Dimayo rivers are not important rivers for human and livestock use, because, both of them run through deep gorges and are far from the villages. Ponds or springs are not available in the PA.

The only available water source for livestock and human use is Bale river. Bale is an annual river which dries up during dry season. It has been an unreliable source of water. People water their livestock and, drink and use the same sources for washing clothes. The river is unhygenic and dirty through the year. In rainy seasons, it is filled with floods rushing down the hills. In dry seasons it is infested with human and livestock wastes and misuses.

People make ponds or holes in the sand to collect water in the dry seasons for temporary use. Digging holes in the sand for water collection along the river banks was a day-to-day activity.

The French NGO, SOS - ESF is constructing a pipe line from the adjacent hills to provide clean drinking water. Farmers contributed their labour power while constructing the pipe lines. They have set one working day in a week (Friday) to work with water project and assist the NGO.

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CHAPTER 7. TREES ON FARM

Individual trees grown on farm belong to the land owner and are privately appropriated. Trees grown on communal areas belong to the community. Communal areas are situated along the 3 river banks and gorges. Economically important trees are scattered along river banks.

Trees grown on communal lands are used without any control. The community does not exercise any rule or regulation which directs the use of trees. Every member of the community cuts down a tree at any time for any purpose he wants.

Names of the important trees have been given in another section.

Neem tree and eucalyptus were deliberately introduced by WADU. Neem tree serves as a shade for livestock and eucalyptus tree are used for house construction. The people prefer to plant more eucalyptus trees, but its growth is controlled by excessive heat, termites and ants.

A group of farmers, consisting of 3 young men, 5 old men and 2 middle aged women indicated that "Woybeta" and "Gelaelo" tree species perform better when deliberately planted. The two trees were a selection from the indigenous trees. These trees have got seeds from which seedlings established. It could be harvested after 3 years of planting.

Dead tree branches in the field, hedges, bushes and maize stalks are the main sources of fuel wood. There is no indication of fuel shortage in the PA. The original forest resources still provide the necessary materials for house construction and fuel wood. Fuel wood for sale is mainly collected from communal lands. The farmers felt that they lack construction trees in their PA. They want to grow if they get any recommended tree species.

CGRDA

CHAPTER 8. FOOD PREFERRENCE AND FOOD CALENDAR.

Food availability and food habits positively correlate with the cropping seasons and crop maturity. The food availablity calendar indicates that a crop of one kind produced at one moment dominates food habit at that particular time and then declines or disappears until the next crop season.

The main dishes eaten in the PA, based on information from 4 women 3 men and 2 household studies, are in the order of maize, sweet potato, haricot beans, taro, cassava and "Kocho" and corm of enset from markets. Since the 1984/85 drought year, what farmers cultivated on their land was not sufficient to satisfy food needs of any period. Thus , suplementary food was bought from the markets. Kulo Konta Awraja and adjacent highlands were recorded as the main sources of food items such as enset products, cassava, taro and cabbages. It seems that there is an established interdependency between the lowlands and the middle altitude/highlands.

August, September and October were reported as food abundant months, November, December, January and July as medium available periods, in which food resources decline and then increase again. These are months before and after hunger period of the year.

February, March, April, May and June are months in which people are most severely affected by food shortage and diseases and often die. Women in these months are most active. They run from one market to another in order to make money to buy food for the family.

Two households interviewed in village I and II indicated that they mainly depend on purchased food from the markets (highland products). As discussed earlier, petty trade, sale of wood and grass, basket making, and cotton spinning provide the necessary cash. Families travel to their relatives in Humbo, Koysha, Boditi and Soddo to bring kocho and corms of enset.

During food shortage periods, families mainly purchase maize, sorghum, cabbages, "Kocho" and corms of enset and cassava and early maturing taro root "Tewoye". The women sell milk and butter to buy maize and enset.

Cassava root was introduced into the area when the yield of other food crops began declining due to rainfall shortage. Individual farmers brought it down to the lowlands. Almost all farmers planted it around their homes. It has become a life saving crop. because it bridges the food shortage gap in the PA and tolerates moisture stress.

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In the absence of fertilizer, many farmers tend to cultivate sorghum, sweet potato and taro root which do not highly require fertilizer application. This might lead to a further shift to root crops consumption in the future.

The households usually sell their grain products, and livestock during harvesting and threshing season, between October to December. Because, in these months people cover their outstanding debts, pay land taxes, buy clothes and pay other commitments.

However, the major debt is incurred to celebrate the Meskel festival. Traditionally an ox is purchased on credit for the Meskel feast and paid in October and November. On payment, the households need to sell their produce of the year, and in some cases sell their goats or calves. As a result people fail to reserve food for future dates or rainy days.

In the past, many farmers sold their oxen for repayment of fertilizer credit which is not yet fully covered by many farmers.

Thus concerning future food status, all interviewed farmers fearfully expressed that they were on their way to deprivation and "Valley of death" They were seeking a rescue operation (food aid) before the situation gets out of control. This does not mean that there was an observed famine in the area. However, a precaution will be necessary if the rainfall for the next year is delayed, A close monitoring should be undertaken with the French NGO. The following human diet calendar (Figure 18) shows the type of food used in a year.

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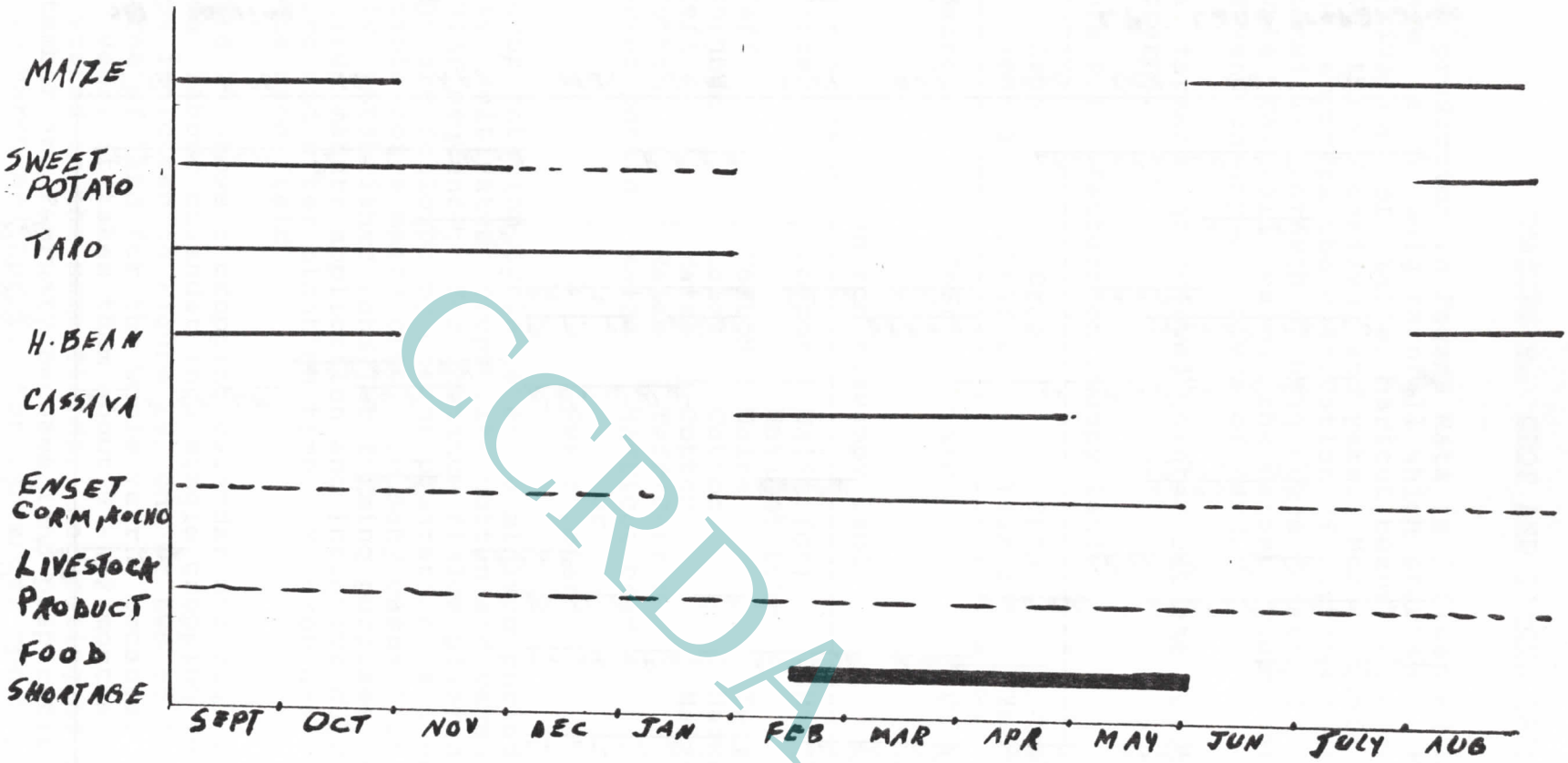
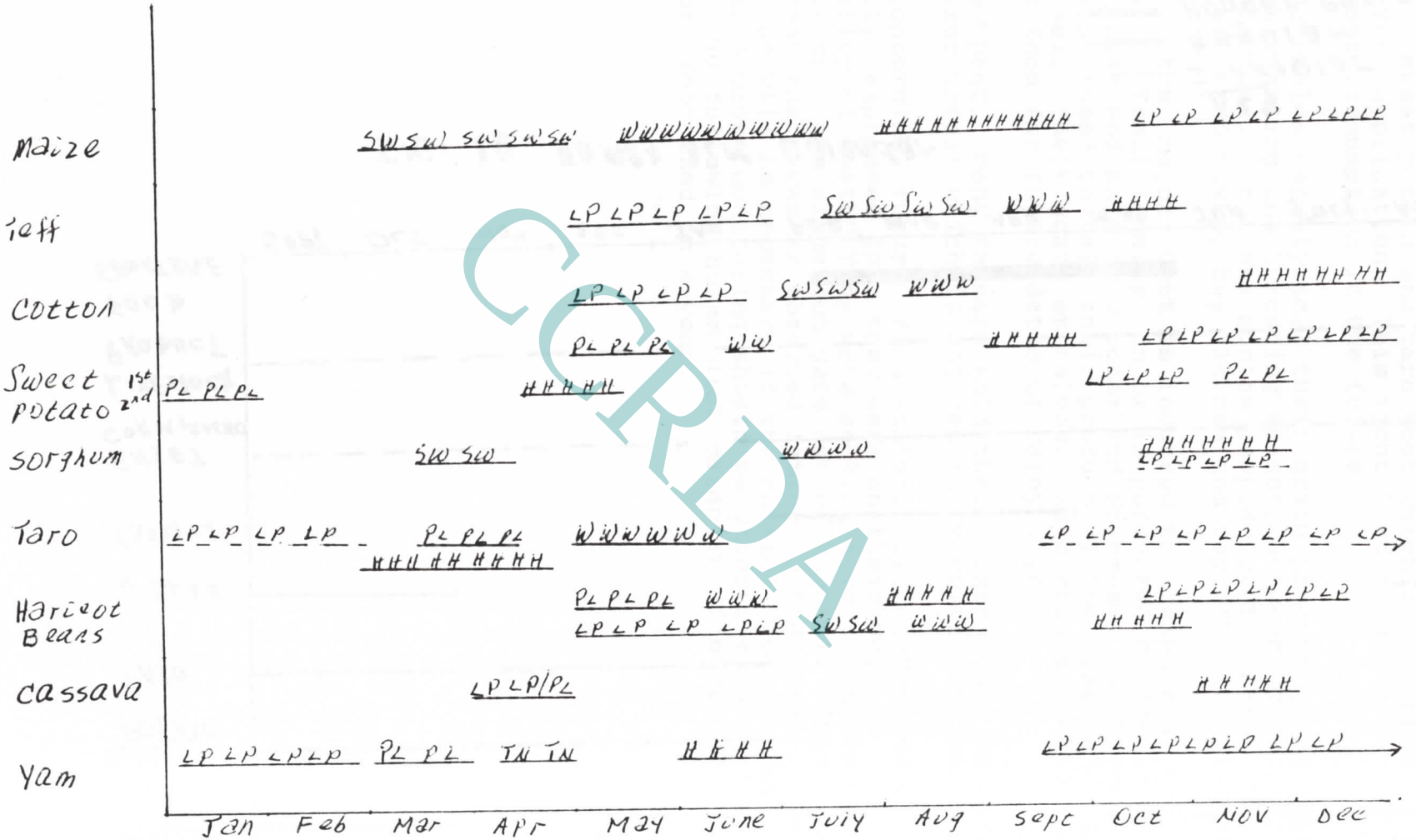


FIG. 18 Human diet calendar

Key
--- Irregular
—— Regular
—— Hunger period

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SW sowing
WW weeding
HH Harvesting

LP Land preparation
PL planting
TN Tending

FIG. 19 Cropping Calendar

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CHAPTER 9. CROP AND LABOUR CALENDARS

Crop production in Fagena Mata is influenced by rainfall seasons. There is a Belg rainfall which starts in March and supports cultivation of maize, haricot beans, cabbages, and root crops like taro , cassava, and yams. Meher rainfall which starts in June, supports the cultivation of cotton, teff, haricot beans and intensifies growth of belg crops. Even if the area experiences double rainfall season, the farmers plant only a single crop in the year on any one piece of land.

The farmers interviewed pointed out the following crop rotation patterns.

Table 9.1 Pattern on Swampy land

Crop Year 1	Crop Year 2	Crop Year 3	Crop Year 4
Maize	Teff	Taro	Cotton

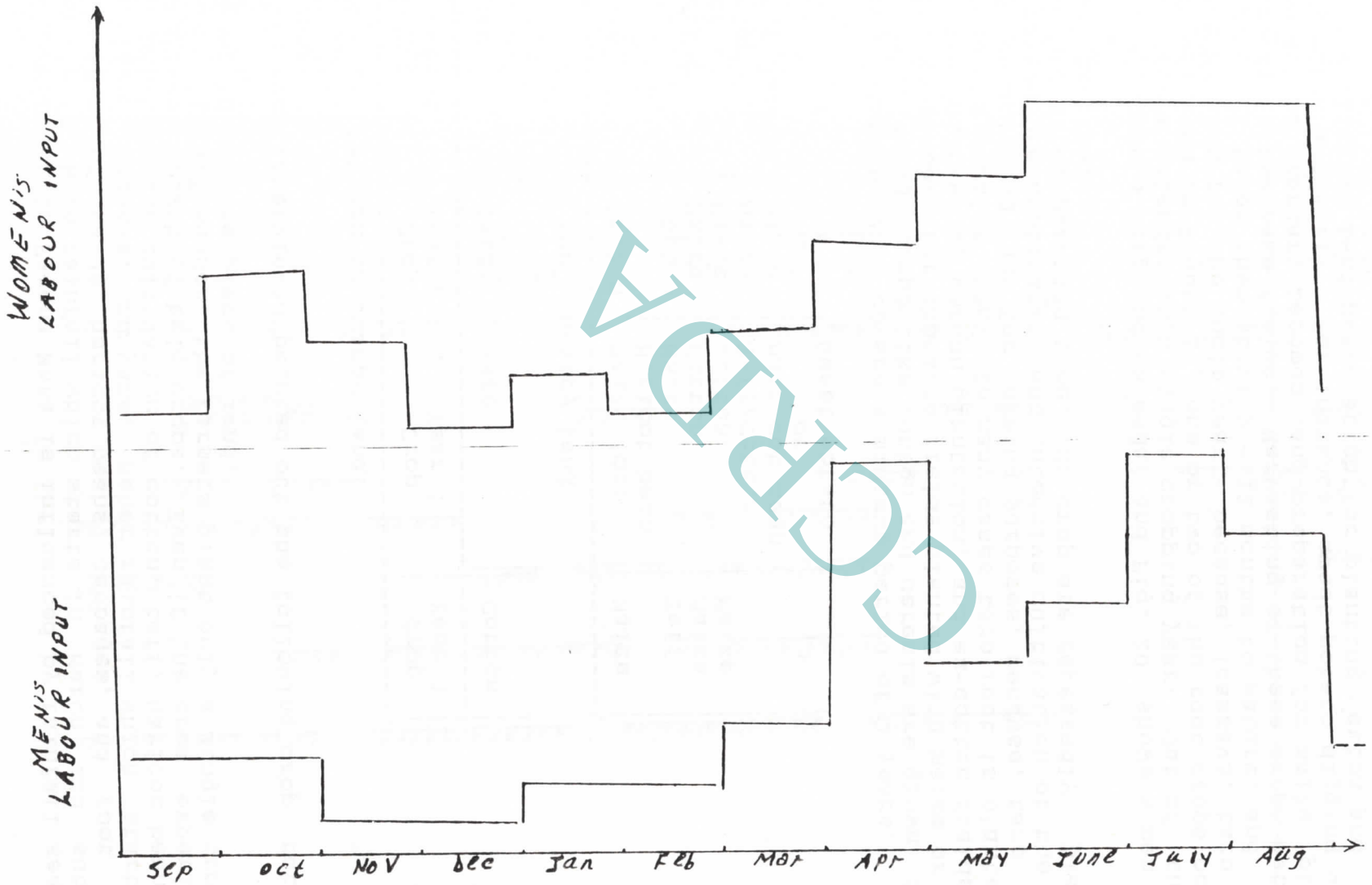
on non - swampy land

Maize	Cotton	Maize (or) Haricot bean	Maize
Teff	Cotton	Maize	Teff
Sorghum	Maize	Cotton	Maize
Teff	Maize	Cotton	Maize
Cotton	Maize	Teff/Cotton	
Sweet potato	Maize	Harricot bean or Sweet potato	

A crop rotation cycle covers a minimum period of 3 years. Commonly cultivated crops like cotton and cereals are grown in a regular sequence. For instance fields planted with maize or teff crops are followed by cotton plantation, and ex-cotton fields are suitable for a maize crop. In many cases taro root is planted on newly established land for farming purposes, because, taro root requires manure application and intensive cultivation of the land before and after planting time. No crop are repeatedly planted in the same field.

Figure 19 shows a cropping calendar and Fig. 20 shows a men and women labour calendar in a single cropping year. Out of the 9 crops indicated in Figure 19, one or two of the root crops occupy an area of land for the whole year, because, (cassava, taro root and yams) it takes them about 9 - 12 months to mature, and they are stored in the same fields. Harvesting of these crops between September and February becomes land preparation for maize planting in March and April. For instance, sweet potato digging up in April facilitates land preparation for planting cotton and teff in July.

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FIG·20 Mens and Womens' monthly labour input
(drawn by 3 women and 2 men groups)

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Land preparation for maize, sweet potato and taro root starts in October when the soil is moist from crop cover and September showers of rain, and is left uncultivated for couple of months.

In a single month, several agricultural operations are undertaken. Combined activities of land preparation, harvesting, building granaries and houses are undertaken during the dry months of the year. In wet seasons, land preparation, sowing and weeding of several crops keep the whole family busy.

Figure 20 shows the amount of labour spent by men and women on agricultural activities on a monthly basis. Based on mens' information, April and July are the busiest months of the year. Both months follow the main peak months of rainfall. In April, a large- area of land is planted with maize, sorghum and haricot beans and the first weeding starts in July. Teff, cotton and haricot beans are planted with simultaneous weeding of maize, sorghum, taro root and sweet potato root crops.

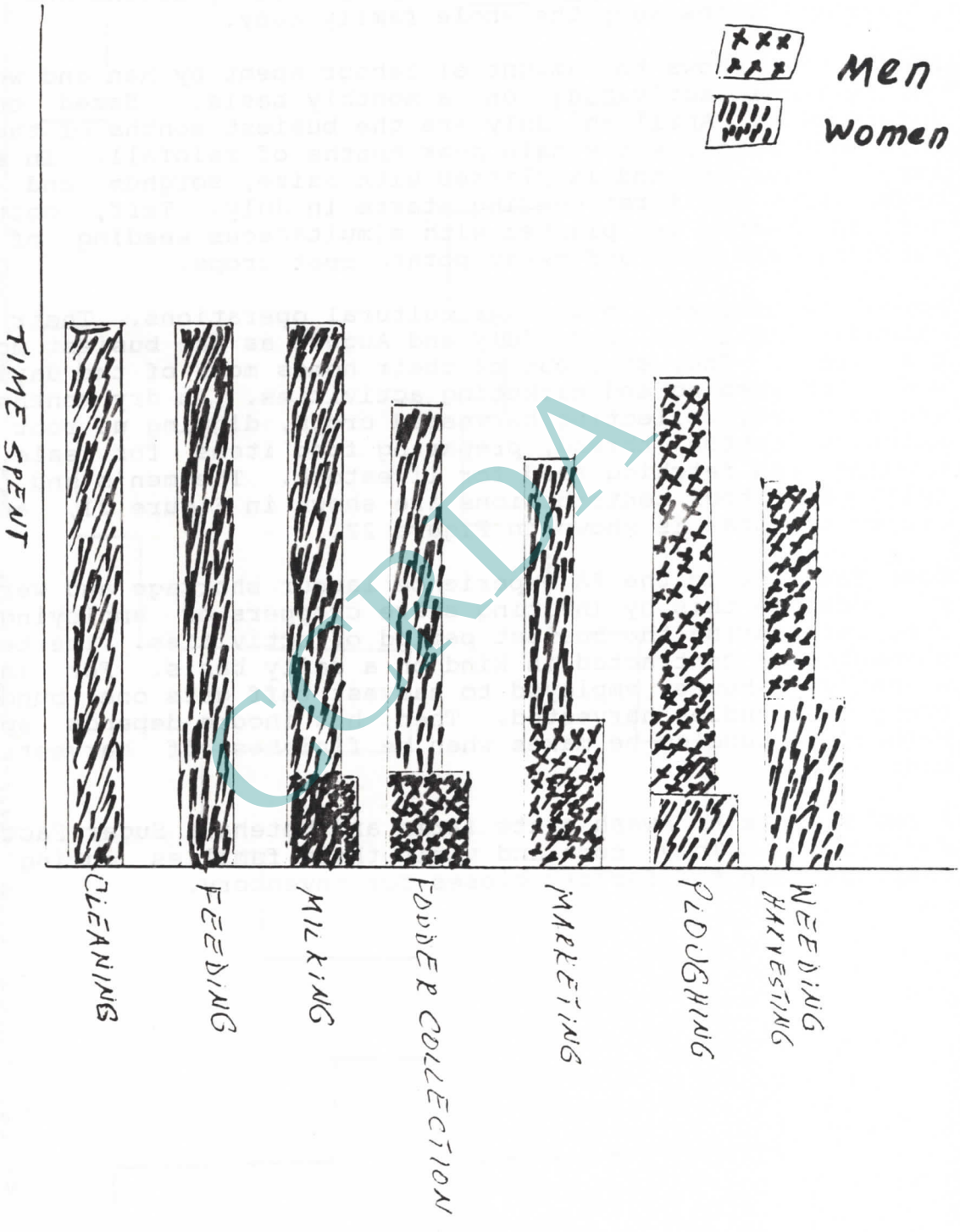
Women participate in all agricultural operations. Their labour calendar indicates June, July and August as the busiest months of the year. They stay out of their homes most of the days in a week for weeding and marketing activities. In dry months women are most busy collecting harvested crops, digging up root crops, spinning cotton thread, preparing food items for sale, petty trading and fetching feed for livestock. The men's and women's relative labour contributions are shown in Figure 21, and oxen labour calendar is shown in Figure 22.

Some families in the PA experience labour shortage and were able to overcome this by inviting share croppers or employing daily labourers during the busiest period of activities. The terms of payments are contracted in kind on a daily basis. For instance, a daily labourer employed to harvest teff gets one bundle for every 10 bundles harvested. Then, his income depends upon the number of bundles he makes when he finishes off harvesting the crop.

A few migrate to Awash state farms and Metehara Sugar Factory for employment. They come and visit their families during Meskel festival when the factory closes for inventory.

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FIG. 21 Relative labour contribution of men and women.



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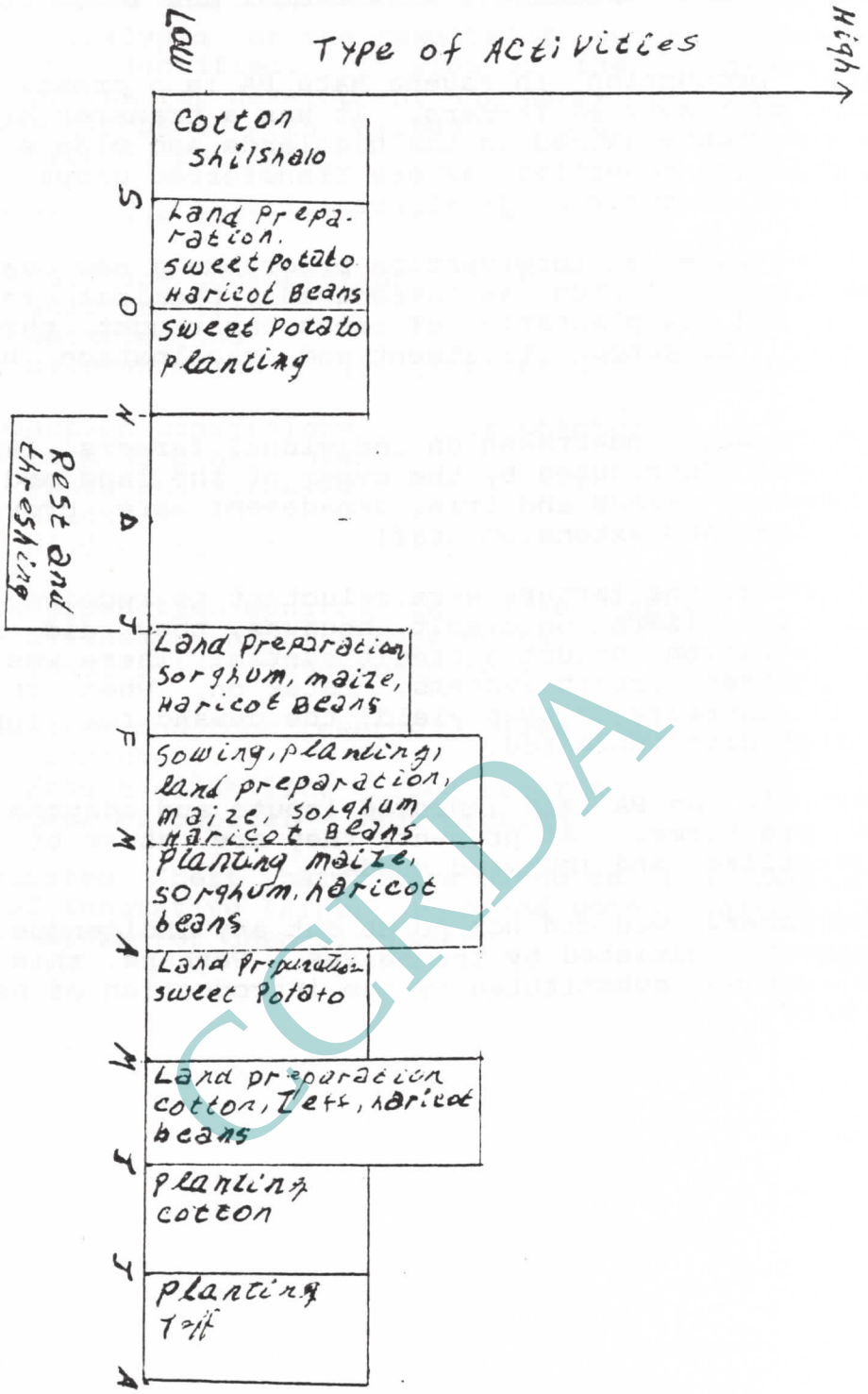


Fig. 22 Oxen labour calendar

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CHAPTER 10. TECHNOLOGY DEVELOPMENT AND TRANSFER

Agricultural production in Fagena Mata PA is a creation or an introduction of resettled farmers. It was a transfer of a knowledge and experience gained in the highlands and middle altitude zone. Initially, resettled farmers transferred crops and farm implements used in their original area.

When WADU initiated an intervention programme a new variety of crops and cropping system was introduced. Chemical fertilizers application and row plantation of crops was taught through on-farm trials. Livestock treatment and vaccination were also provided.

On-farm trials were undertaken on individual farmers' land. Land and labour were contributed by the owner of the land and fertilizers, improved seeds and trial management were provided and directed by the WADU extension staff.

At the beginning, the farmers were reluctant to receive improved seeds and fertilizers on credit, because, they did not like inputs distribution through a credit system. There was counter agitation against credit systems. Later on, when the farmer realized an increase in crop yield, the demand for inputs and their interest both increased.

All farmers in the PA used improved inputs and adapted to new management practices. At present, they are short of cash to purchase fertilizer and improved seeds.

The farmers interviewed did not point out any indigenous technical development, initiated by themselves. Perhaps, this indigenous knowledge was substituted by the introduction of new technology by WADU.

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PART TWO: DIAGNOSIS OF CONSTRAINTS AND OPPORTUNITIES

Following analysis of the results of survey, several problem areas were identified. In view of the problems identified, farmers options for development and farmer participatory research areas were discussed with various focus groups and are summarised in the following sections.

The problem areas identified include:

Soil and moisture conservation (See Chapter 2)

1. Soil fertility
2. Waterlogging
3. Deforestation - lack of construction trees.

Crop production constraints (See Chapter 4)

4. Lack of plough oxen
5. Pests and diseases
6. Weeds
7. Wild animals

Livestock production constraints (See Chapter 5)

8. Diseases - high rate of mortality
9. Insufficient veterinary service

Human diseases and food reserve (See Chapter 3)

10. Diseases
11. Food availability - food reserve
12. Lack of capital - debt problem

The indicated "best bets" were based on the suggestions and opinion of innovative farmers (men and women) selected by the SOS Sahel animators for open discussion.

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CHAPTER 11. SOIL AND MOISTURE CONSERVATION

1. Soil fertility

What is the problem ?

Soil fertility and moisture stress are important issues in Fagena Mata PA. The main problem being inherent fertility of the soil which can not produce without fertilizer application. Lack of irrigable rivers and erratic rainfall situation worsened the capacity of the soil to produce.

Why it is a problem ?

It is a problem, because, without fertilizer the crops which can be grown are limited and with low yield.

Where is it found ?

The problem of soil fertility and moisture stress affect farmers all over the PA.

Who is affected ?

Moisture stress problem affects all inhabitants of the PA. but, soil fertility problem is mostly felt by resource poor farmers who still live in the partly deserted villages.

When did it become an issue ?

Fagena Mata PA became a settled agricultural area during the last 30 years. During the first years of settlement, newly deforested land provided high yield for the crops planted.

In early 1960s (EC.), while the land was still fertile, WADU encouraged intensive use of chemical fertilizer and pesticides to boost productivity on land. WADU regularly supplied inputs like improved seeds, fertilizers and pesticides on credits and facilitated marketing and transport for the settlers produce. In those days, rainfall was regular, prices for inputs and out puts were favourable and the farmers were encouraged to produce high.

When, in mid - 1970s E.C. WADU was phased out, the supply of all improved agricultural inputs were decreased. This was followed by a sudden rainfall failure in 1977 EC. As a result, the productive capacity of the land decreased, until large area of land ceased for crop production. Land conditioned to chemical fertilizers lost its productivity, even when there was a normal rainfall.

How are farmers coping ?

The farmers are not undertaking any technical or mechnical measures (like soil bunding, tied ridging etc.) to improve soil fertility. The main methods which they have adapted were agronomic measures which include:

- Diverting crop production from cereal to root crops
- Applying available manure
- Localizing crop production to homestead because this plot is relatively fertile as it regularly gets manure and refuse.

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"Best bets"

1. Establishment of moisture conservation measures

To ameliorate soil fertility and to improve soil water holding capacity the following sets of measures could be established.

a) Tied ridges, farmers in many soil moisture stress areas build ridges and catch rain water. This technique could be intrio duced to the farmers, and could be sought to start around homesteads and gradually expand into the main fields.

b) Mulching: Fagena Mata PA contains a great deal of biomass which could be extracted for mulching purposes. For in stance, sorghum and maize stalk, tall and short grass species etc. are wasted by wild fire every year.

This could be done by initially establishing two demonstration fields for maize and sorghum crops. The farmers should be encouraged to come and visit the fields at every new type of operation.

The farmers who volunteer should participate in the steps of building ridges and mulching. SOS Sahel Agricultural extension supervisor and experienced animators initiate, establish and provide necessary technical advice to the farmers. A close collaboration with the awraja subject matter specialists would be desireable, Initially, voluntary farmers might benefit and this could have demonstration affect on the neighbours. Farmers optimism for normall rainfall pattern might be a problem for achieving voluntary farmers.

c) Compost making: The area consists of variety of tree leaves, crop residue, grasses, household refuse and other plant materials which could be used for compost making.

Compost making can be done by the family labour without involving additional costs to the families. If the families are able to produce in large quantities, then they will be able to produce as much grain as they used to produce with chemical fertilizer application. This will save the families expenditure on fertti-lizer purchases.

Compost making could be started with the volunteering farmers. Initially, a short visit to Concern Bedessa could be organised to learn compost preparation methods. A farmer to farmer experience sharing will be helpful.

SOS Sahel could organize visits to Concern Bedessa.

FARM Africa could undertake an on-farm trial on performance of crops with compost application and rate of application.

Farmers interested in composting can benefit out of the programme.

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The current decrease in the livestock numbers might cause a shortage of cow dung for compost making

d) Farmer experiments and on-farm trials on legume crops. Legume crops add nutrient to the soil. In the PA, the only apparent legume is haricot bean. The farmers do not inter crop haricot beans with cereals. So alternative pulses or other legume plants should be looked for that would contri bute to the upgrading or maintaining soil fertility.
e) To tap moisture from short rains, it is adviseable to contin ue with provision of drought - tolerant improved seeds at a reasonable price.

2. Waterlogging

What is the problem ?

Farmers cultivating crops on black cotton soil ("Chere") often face waterlogging problem. The land becomes swampy and the soil gets heavy to till with oxen plough.

Why it is a problem ?

It is a problem because, the crops planted die out before maturation. Excess and still water availability on top of the soil burns the crop at early stage.

Where is it found ?

Irregularly distributed in the PA.

Who is affected ?

It is a problem for only those who are cultivating black cotton soil ("Chere").

When did it become an issue ?

Since settlement started

How are farmers coping ?

The farmers planted crops like taro root and maize which they assume would resist waterlogging situation. They also cut a drainage ditches to direct an outflow of excess water.

"Best bets"

To mitigate waterlogging problem, various exploratory surveys should be undertaken.

1. The farmers technical measures traditionally adapted
2. Review of recommendations made by various agencies on black cotton soil management.

For an immediate solution, SOS Sahel may purchase shovels (or doma) and distribute to the farmers severely affected.

The most needy farmers could be screened by the SOS Sahel animators and try ILCA's "broad bed and furrow techniques".

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Meanwhile a follow up system could be established to know how farmers are trying to cope with waterlogging problem.

3. Deforestation and lack of construction trees

What is the problem ?

Fagena Mata PA area was cleared for settlement and agricultural production about 3 decades ago. During the immigration period large number of construction trees were cut down for building houses and other household uses. When producers co-operatives were formed and villagization programme was under way, large amounts of economically important trees were lost.

Why it is a problem ?

The problem is so significant that people in the area can not live without shelter. Already, some farmers are staying in the village because they are not able to buy poles from highland farmers and build a house on their original land.

Where is it found ?

It is a problem all over in the PA area.

Who is affected ?

It is a problem of all farmers. But, resource poor farmers who are still in the village are the most affected.

When did it become an issue ?

During settlement and villagization programme a large area of land was cleared for crop production and building houses. Private trees were cut down and more trees were not planted while the people were in villages.

How are farmers coping ?

Farmers request help from the highland farmers or purchase from the same area. Tree remnants grown on the communal grazing lands, and river banks are also used.

"Best Bets"

Plantation of drought resistant tree species. Tree plantations in this area has been discouraging due to drought and termite problems. Farmers have tried to raise trees on their land in the past and they are very keen to plant trees.
There fore:

1. Assist farmers to establish their own nurseries of eucalyp tus, Neem tree and others
2. Encourage regeneration of eucalyptus trees that were cut down during villagization program.
3. Initiate traditional rules for controled use of forest resources remaining along the river banks, and communal grazing lands. This could be the responsibility of the SOS Sahel development committee.

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CHAPTER 12. CROP PRODUCTION PROBLEMS, FARMERS RESPONSE AND OPTIONS FC.. PARTICIPATORY RESEARCH AND DEVELOPMENT.

4. Lack of Plough oxen

What is the problem ? Severe shortage of plow oxen

Why it is a problem ? Plow oxen is a burning issue in Fagena Mata PA, because:

- Greater proportion of the farmers available land left fallow,
- Small and poorly cultivated plots of land because less frequency of ploughing,
  - Low productivity
  - Low harvest
- Small and poorly cultivated land not sufficient to feed the household,
- Unnecessarily large area allotted for grazing area

How is the extent of the problem ?

The magnitude of the problem is extremely big. Out of 183 household of the village:- it was estimated that,

Only 6% with a pair of oxen
17% with 1 oxen
6% Shared with relative or colleagues o.5 oxen and
61% with no oxen but Aylie

How are farmers coping ?

- Making sharing agreement with colleague or relatives in one way or another.
-Localizing farming on land round the homestead, which is small and workable by hand,
- Working the plots by hand tools (Ayilia)

Best Bets

Since lack of draught oxen is the most limiting factor for crop production in the area, this problem has to be solved firstly.

i. Plough oxen provision credit scheme

The capital status of the farmers is extremely low or nil. So to take them out of this problem with a well programmed credit scheme would be rational.

ii. Strengthening the vet. service in the area

- Supply adequate vet. drugs
- Back up with logistics

iii. Provision of appropriate agricultural hand tools

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5. Pests and diseases

What is the problem ?

The farm land in the PA is infested with dozens of pests and diseases

Why is it a problem?

Because it is causing considerable damage to crops which are either in field or storage.

Farmers remembered that cotton had been the major cash crop in the past where pesticides had been cheap and easily available. Since cotton is very susceptible to pests and diseases and since nowadays the farmer cannot afford to buy pesticides , the production of cotton is kept low.

When did it become an issue ?

Back from 1972 EC. ie. from the time at which the farmers capital status has been weakned severely.

How are farmers coping?

- Weeding
- Crop rotation

Best Bets

i. Provision of pesticides on credit basis,
ii. Supplying improved varieties which are resistant or tolerant to pests and diseases.
iii. Farmer area experimentation and on-farm trials on cotton and sweet potato. Because these are the most susceptible crops attacked by boll worms and sweet potato butter fly respectively.

6. Weeds

In the area there are a number of weeds which are competing for soil nutrient, sun light and fertility. They are media for hibernating the pests and diseases from season to season.

Best Bets

i. In depth study on the nature of the weeds particularly those widely distributed and tenacious in nature like "Adelia "and "Zeisu" so that a basic solution can be found.

ii. Provision of modern hand tools for hoeing up weeds.

The farmers say " if we are able to get better hand tools we can control weeds."

7. Wild animals

The farmers explain that almost half of their crops which are in the field and storage are looted away by the wild animals such as warthog, porcupine, baboon, birds, wild pigs.

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Best Bet

i. An in depth study should be carried out so that appropriate control measures would can be found.

ii Technical advice to farmers on mechanical and other control measures.

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CHAPTER 13. LIVESTOCK PRODUCTION CONSTRAINTS IN FAGENA MATA

After understanding the overall livestock production practices in the PA through several group interviews, key informant interviews and some case studies, the team identified:

1. Livestock diseases and
2. Insufficient veterinary service, to be the major livestock production constraints. Hence, the last 2 field days (Nov. 19 and 20) were used to further investigate the problems. The ways farmers cope with the problems, Best Bets and the possible development options are indicated:

8. Livestock diseases

Livestock feed is ample in Fagena Mata as more than 50% of the land is used for grazing. Nevertheless the total livestock in this PA is very low. Livestock holding of the farmers is 0.5 oxen, 1.14 cows and 2.82 cattle/HH, which is very low when compared with the highland part of the country with nearly 5 cattle per household, though feed availability is a limiting factor. (Source: ILCA's ox /seed project 1985 results)

Farmers explained the increased prevalence of livestock diseases in the last 10 years as the case of their livestocck herd being depleted.

Trypanosomiasis is endemic in the area. Mortality and decreased milk and other products result from the chronic and debilitating nature of the disease. The animals are also more susceptable to various other diseases.

The veterinary department of the awraja MOA have reported occurance of Anthrax and Black leg recently. Ticks and tick-born diseases such as anaplasomosis have contributed a lot to the loss of livestock in the PA. Thus livestock diseases are the major limiting factors for the production and proper utilization of the resource.

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Where does the problem occur ?

Disease problems exist all over the PA. Adjacent PAs which have similar elevation experience common livestock health problems.

Who is affected ?

The medium and lower income groups are most affected by the problem. Farmers had at least 2 ploughing oxen, and 2-3 milking cows when they first settled in the area. Now, as shown in table 5-2, only 10.7% of them remained with 2 oxen, 28.6% with one and majority of the farmers, 60.7%, have no ploughing oxen. Rainy days are few in the area. Farmers with no ox are obliged to prepare and plant their land late by 15 days to 1 month. A delay by 15 days may result in a 50% or more loss of crop yield. Most of the farmers prepared and plant their land with an agreement made with oxen owners. Then the owners of the ox is offered 50%

of the yield in return. Hence, the poor farmers produce 75% less crop than the wealthy farmers.

Why is the problem important ?
When farmers explain the importance of this problem, they start with one proverb that goes : "it is not but ox that makes a farmer a good producer".

Loss of ox means decreased or absence of crop yield. Even if we have good rainy season it is impossible to produce enough crop due to oxen shortage and death of oxen in the middle of farming season.

When we see the seasonal occurance of the prevalent livestock diseases in the area, most diseases start to occur at the beginning of April and continue till October. These months are periods where oxen power demand is very high. So the peak months of livestock mortality and morbidity coincide with the months of high draught power demand. As we have seen earlier most house expenses are covered from the income of milk and milk by-product sale. Hence losses of livestock due to diseases seriously affect the livelihood of the house hold.

When did it become an issue ?
Livestock disease existed even when farmers started living in the area, but the rate of mortality was then low. Since 1977 E.C (1983 GC.) the prevalence rate increased. Now mortality rates are high.

How are farmers coping with the problem ?
Farmers are trying their best to minimise the effect of livestock diseases.

They call veterinarians during diseases out breaks. Take their animals to Bele clinc to get veterinary help. They also use some herbal medicines to treat different diseases conditions (see Table 5.6)

Best bets

- Introduction of community based animal health services.
- Controlling the endemic disease trypanosomisis their direct effect, incidence of tick born diseases like anaplasmosis and water.

9. Insufficient vet service
What is the problem ?
Livestock disease is found to be the main problem in the area. Although it is not the only means to solve the problem, the existance of sufficient veterinary service help a lot in minimizing the losses. Farmers report an efficent veterinary service was delivered suring the time of WADU. The project phased out in 1975 EC and since then efficiency of the veterinary service decreased. Response to calls is not rapid. Trypanocidal drugs are mostly not available. As a consequence animals sent to the

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veterinary clinic return back without having treatment. So the veterinary service delivered to the PA is not sufficient.

Where does the problem occur ?
The veterinary service is organized at awraja level, thus the problem affects all PAs in Kindo Koysha Awraja.

Who is affected ?
As explained the low income groups are more affected.

Why is the problem important ?
Faster response to disease outbreak call is important to halt further deaths and sickness of livestock and to control the spread of the disease to other herds or areas. To have faster respones to this call the vet department should be in a position to promptly mobilize its staff to the outbreak area to identify and diagnose correctly the disease, and to apply relevent disease control measures. At the moment the mobility of the vet staff is limited. The clinic is not well-equipped. It lack basic diagnostic instruments and chemicals. The drugs supply is low as compared with previous years and with the livestock population and disease prevalence in the area.

When did it become an issue ?
Since 1975 the drug shortage and insufficient vet services are there, but it is more serious in the last 3 years. On Nov 22/1991 we had a chance to see famers returning their cattle back home without having been treated. We have asked the vet staff and they explained that they brought drugs including 200 doses of trypanocidol drugs before 1 week, and now they don't have even asingle dose of trypanocidol drug left. So the problem is more severe at the moment.

How are farmers coping with the problem ?
- Traditional treatments of sick animals using roots of some trees and herbs is very common.
- Herbal drugs are not much use for trypanosomiasis, Hence farmers make use of local drug dealers. It is very expensive some 4 or 5 times above the price in government vet clinics.

Best bets, areas for further research

- Improving the community participation in diagnosis of diseases and control of outbreaks through proper disposal of dead animals etc.

- Improving the availability of drugs especially trypanocidal, antibiotics, acaricides. It should be sufficient enough to control and treat the livestock population in the awraja.

- Improving mobility of the vet staff so that prompt diagnosis and contol of the disease outreak is possible

- Improving the veterinary infrastracture and diagnostic instruments for the vet staff.

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Options for farmers participation

- Training of farmers in basic livestock health principles - which help in the dignosis of disease in the area.

- Include farmers in further studies of livestock diseases occurance and economic losses.

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CHAPTER 14 HUMAN DISEASES AND FOOD SHORTAGE

10. Diseases:

What is the problem ?

Various endemic diseases like malaria, diarrhea and rheumatism, and epidemic diseases like meningitis and sporadic diarrhea severely affected human health in the P.A.

Where is it found ?

All over in the PA area

Who is affected ?

Malaria affected all the people inhabiting Fagena Mata PA area, but affected especially those families who do not have livestock wealth and food reserve. Meningitis and sporadic diarrhea mainly affected children and teenagers.

Why is the problem important ?

All people affected by diseases were weak and unable to produce. Malaria mainly breaks out during busiest months of the year. As indicated in Figure 23, March , April and June are months in which land preparation for maize, sorghum, haricot beans, teff and cotton are taking place. During which malaria, diarrhea and rheumatism affect the health of adults and children. Thus, weak and debilitated people participate in the farming operation. Many children lost their lives due to meningitis which broke out in October and November 1990. As a result Fagena Mata elementary school was closed for several months.

When did it become an issue ?

Malaria and diarrhea problems have been an issue ever since the settlers arrived in the area in 1950 E.C. Meningitis was a severe problem of health since 1982 E.C.

How are farmers coping with the problem ?

Farmers depend mainly upon medical treatment available in the Belle town. Clinical treatment is being given in the public Health center. The French NGO SOS ESF also provide treatment in clinic situated in the town. An expatriate nurse and other assistants registered all the people in the PA and follow up the family health situations. There are various local traditional treatments provided by wisemen.

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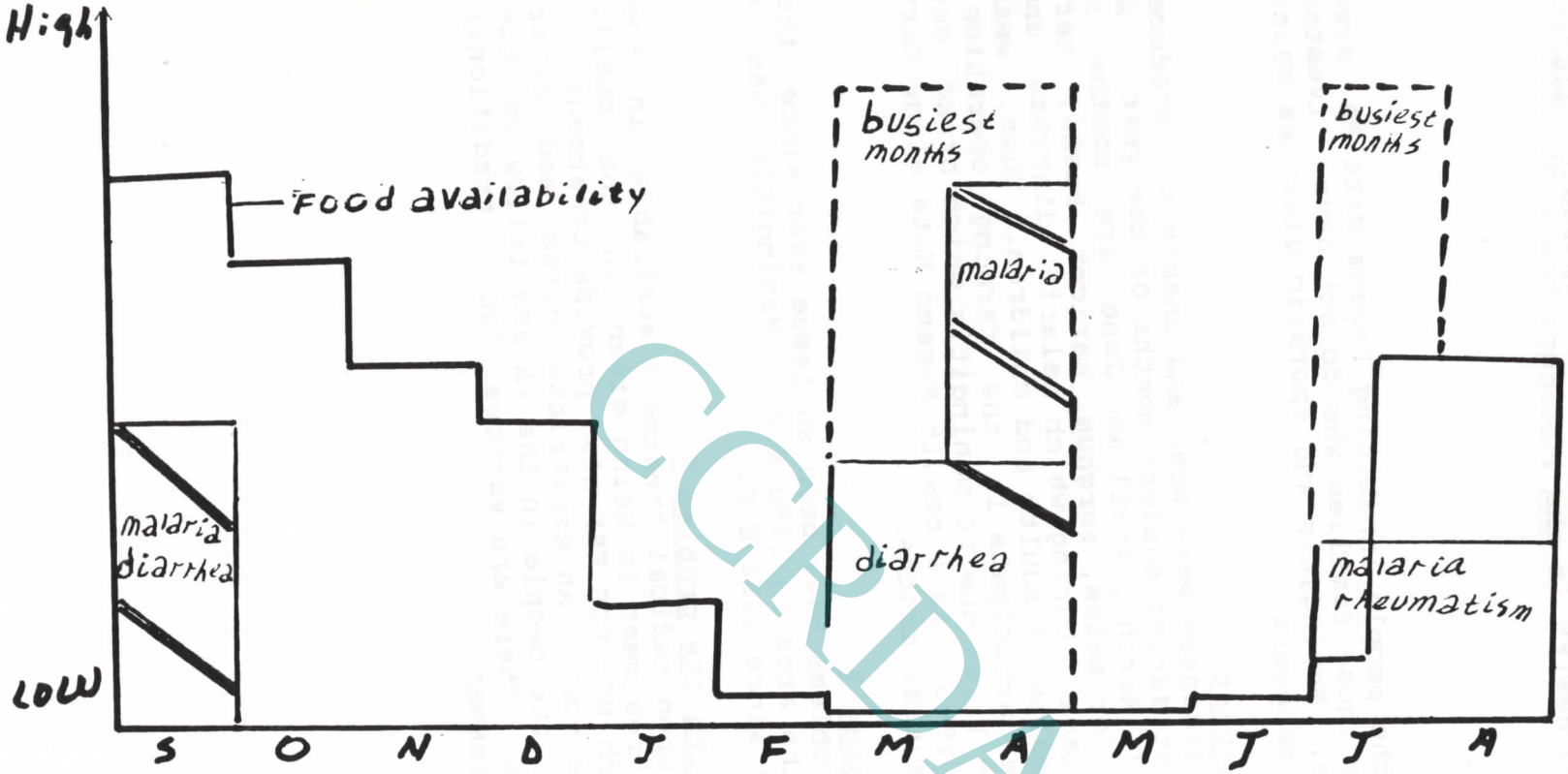


FIG. 23 Food availability, human diseases occurrence and busiest months of the year

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"Best bets"

1. Provision of medical services

To improve health conditions of the people and in particular that of malaria health post should be established on the compound of elementary school near village II.

This could be provided by training Community Health Assistants recruited from farmers (like animators) who could assist the people with general treatment and report malaria outbreaks and other sporadic diseases.

Traditional Birth Attendants (TBAs) could also be trained to help women at delivery and follow up diseases affecting the family as a whole.

The farmers themselves build the health posts and Ministry of Health clinic provides basic medicines and simple medical kits for the TBA's and CHA's.

The training of CHA's and TBA's could be done in collaboration with SOS - ESF and Ministry of Public Health Clinic at Belle town.

11. Food availability: Food reserve

What is the problem ?

Farmers in Fagena Mata PA face serious food shortage and do not have food reserve to feed their families throughout the year.

Where is it found ?

The problem is prevalent all over the PA.

Who is affected ?

The problem of food shortage and food reserve were acute problems of the people who are still living in the villages. Some of the transitional farmers were also facing food shortage and do not have food reserves for the coming months.

Why is the problem important?

As indicated in Fig. 23 Many families live under severe food shortage condition for about 6 months in a year (February to June). This is aggravated by inbalanced diet and unavailability of food substances in the PA area for purchase. As a result, old aged people and children occassionally starve to death mainly in May, June and July.

When did it become and issue ?

Surplus food production and food storage became an issue since WADU phased out in the middle of 1970 E.C Since 1977 EC the problem has got more severe because of declining crop and live-stock performance due to decreasing rainfall pattern. Several farmers have lost all of their livestock which caused shortage of

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livestock production i.e. milk, butter, cheese and meat were in short supply for consumption.

How are farmers coping with the problem?
The farmers sold their livestock to purchase food stuff during hunger periods, They also request for food aid from the highland farmers and sometimes food grains distributed by RRC. However, the main resource of food grains is market places. Women actively trade to earn cash income for food purchases during food shortage period. They travel to the highland market places to exchange milk, butter and cheese with crop products like Kocho, corm of enset, cassava and cabbages. Some farmers reserve cassava for food shortage seasons harvest.

'Best bets'

Provision of inputs and drought oxen to increase productive capacity of land and labour.

To mitigate the current acute shortage of food it becomes necessary to enhance productivity of the people land the and resources. This could be achieved through oxen and input supplies alone.

Particularly, an oxen supply and fertilizer distribution are crucial issues for production increase. The farmers interviewed unanimously demanded for the two inputs.

Thus, supply of oxen, fertilizer and drought resistant variety of crops could be arranged through credit facilities.

Improving food availability in the area should also consider diversification of nutrition. Therefore, vegetable gardening could be encouraged through provision of seeds to improve diets of the families. The farmers living near to the water resources i.e. tap water and Bale river could be largely encouraged.

Most of all, farmers living in the village immediately need food aid to move out of the villages and start new life on their original plots of land. Food aid should be sought to last until the first crop harvesting.

Credits for fertilizers and improved seeds could be arranged thorough MOA who have got contacts with Agricultural Inputs Supply corporation.

For an oxen supply, SOS Sahel might be able to find other financial sources to purchase oxen and distribute on credit to the needy farmers. In this case, CRDA and other NGO's could be potential sources to be approached.

The problem of the current debts of fertilizer have to be cleared through negotiation with the MOA. This might hinder issuance of fertilizers by the MOA Awraja office.

CRDA

12. Lack of capital - debt problem

What is the problem ?

Farmers in Fagena Mata PA are largely in short supply of cash resources to cover major costs of living, because they do not generate enough money out of their agricultural activities to cover their social needs. Therefore, they borrow money from friends or relatives to cover expenditures like meskel festival, funeral ceremonies, weddings and medical treatments. Especially, many families owe debts due to meskel festival.

Where is it found ?

It is a problem all over the PA area.

Who is affected ?

Cash problems are mainly faced by those farmers who still living in the villages and by those transitional (de-villagized) farmers who have recently moved out of the villages and rebuilt houses on their old plots of land.

Why is the problem important ?

Families who do not have sources of cash income do not have enough food for consumption. Their nutritional status is very poor. Their diets are usually simple and inbalanced. They do not go for medical treatments when they are ill.

To cover their previous year's debts they sell out their produce during harvesting seasons when the prices of crops are very low. Thus they need to sell more grains out to cover their debts. Once the crops are sold, there will not be any food reserve for the rest of the year. For major expenditures like fertilizer credits and social obligations their main livestock assets are sold leaving the families without a cow or an ox for future uses or rainy days.

When did it become an issue ?

Financial problems were eminent since WADU left operations in the area and assistance to the farmers in the mid - 1970 E.C. During which WADU provided marketing and transport facilities for cash crop products in the area. Those days for instance WADU collected cotton yields from the farmers fields and sold them out in the Addis Ababa markets for the higher prices. The farm inputs were also provided for lower prices and were physically available in the PA area. All this benefits were gone when WADU phased out.

Subsequent rainfall shortage and producer co-ops formation further worsened sources of financial income of the farmers. The farmers in co-ops were not producing surplus grains for food and for sale. The annual share from communal farming was nil or minimum or barely sufficient for food needs of the families.

How are farmers coping with the problem?

To cover debts, and other major expenses like wedding, medical treatment and death, farmers often sell their last assets i.e an oxen or a cow. Some farmers who do not possess any movable assets lease out their land.

CRDA

A few farmers left the area to look for paid employments in the Awash valley state farms or migrated to Keffa Region to work with the coffee plantation. The money earned is sent back to the loan owners at the time of payment.

'Best bets'

Promote additional income generation activities to enable families to earn money which would help them to cover their basic needs, this could be achieved in many ways.

To ease financial restraints of the families and to discourage borrowing money from money lenders which became a cause for impoverishment of many families.
To help skill development in the communi-y
To produce basic goods and services which would be consumed with in the community.

- Interested farmers could be encouraged to weave and sell clothes to their PA members and outside.
- The women in the PA could be the main suppliers of cotton thread, because, many women spin cotton thread to sell in the open markets. All farmers produce cotton on their land for sale. Thus:
- Establish women groups, (probably the same group of women who received goats) and encourage them to make baskets (improved ones) of different kinds for sale in and outside Fagena Mata PA. Try to facilitate markets through discus sions with traders in Soddo and elsewhere.
- Farmers interested may begin metal works and pot making with training and technical assistance from SOS Sahel. There are no workshops to mend crude farm implements. Initial materials may be provided from the SOS Sahel sources.
- Promotion of poultry keeping through better management and provision of improved chicken guarantees cash income from eggs and chicken sales. MOA veterinary section at Belle could be approached for technical assistance. Markets in Soddo and elsewhere could be sources for improved chicken.
- There is a possibility to promote petty trade activities which women largely undertake throughout the year. Provision of focussed credits to women largely help to promote petty trade. Women buy in the markets maize and sorghum to brew local Borde for sale. They process sugarcane at home to make soft drinks etc. The follow up and credit management may be monitored by SOS Sahel animators.

The families who have completely lost their livestock could largely benefit from income genertation activities. The out put and services will be helpful for all members of the PA.

There could be a problem of credit sources and farmers interested in taking up metal works pot making and weaving. Social barriers shall be dealt with intensive education and convincing approach.

CCDA

FARMERS RESEARCH PROJECT

Introduction

This publication has been financed under the work programe of the Farmers Participatory Research Project. This project, which is designed and coordinated by FARM Africa, a British-registered charitable organisation, is focused on the North Omo Region in south-west Ethiopia. The project started in early 1991 and the first phase is expected to last four years.

Objectives of the project

The overall aim of the project is to increase the capacity of NGOs and other organisations to contribute to farmer-oriented research in which farmers themselves participate. Under this overall aim, specific objectives are:-

* To build a channel of communications between NGOs and research institutions;

* To make resource-poor farmers more aware of their need for research;

* To help farmers realise their own ability to do research;

* To assist farmers to do and to disseminate their own research;

* To test techniques for encouraging community- and farmer-managed research;

* To inform research scientists in Ethiopia of farmers' research priorities.

Further information

Further information about this publication and the farmers research project can be obtained from:

Either:

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