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SURVEY OF A RIVER COMMUNITY OF KAVANGO
MASHARE VILLAGE
JUNE 1995

BY

Kavango Farming Systems Research Team

Klemens Hatutale

Amand Mbambo

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ACKNOWLEDGEMENTS

We would like to thank those villagers of Mashare who helped us in this first community survey for their time and hospitality. Thanks also to Reino Aisindi and Pendukeni Amunyela who joined us for several days of the survey and made a very useful and enthusiastic contribution to the PRA work.

CONTENTS

1. INTRODUCTION

This preliminary community survey follows the Kavango Farming System Research Team's (KFSRT) district profile and initial site selection activities (see KFSRT reports describing these activities). In its first year of operation KFSRT plans to begin adaptive research activities in one river and one inland community. Mashare was found to be representative of a typical river community, and was selected as a focus study and adaptive research area after discussions with the local Chief, Councillors and with the community themselves. The team were particularly keen to work in Mashare because it is situated next to Mashare Agricultural Research Station but has not yet been a beneficiary of agricultural research. It is planned to begin adaptive research activities with the community later this year. The aims of this survey were:-

- to deepen our understanding of the socioeconomic structure and agricultural activities of a river community
- to collect information which allows research topics to be prioritised jointly by farmers, researchers and extensionists.
- to identify farmers to participate in a collaborative research process
- to develop a good relationship with the community

2. METHODOLOGY

The team spent 10 days in the field and 2 days writing up this report.

Facilitators

Amand Mbambo	KFSRT Extension Officer
Ernest Mangundu	KFSRT Extension Officer
Johannes Simbombo	KFSRT Extension Officer
Henry Thompson	KFSRT Team leader
Harriet Matsaert	KFSRT Social Anthropologist
Pelagus Hamsira	Kavango Regional Farmers Union (from June 8th)
Pendukeni Amunyela	Extension Officer (June 8,9 &28th)
Reino Aisindi	Principal Extension Officer (June 28th)

Also invited but unable to attend were:-
Research technicians, stationed at Mashare - unable to attend due to prior commitments (harvesting and survey work).
The CANAMCO field worker for this district, Hetty Mahavero - prior commitments
Titus Hausiku, local extension officer - occupied with EU survey work.

Research Methods used:-

The survey used a number of informal interview and participatory rural appraisal (PRA) methods:-

Group meetings

Several group meetings (community groups and with a women's group) were held over the three weeks. These meetings were use to:-
- introduce the community to the aims of the survey

- carry out community mapping (see fig 1)
- carry out a historical profile of the community (see fig 2)
- rank enterprises (to identify which were most important in this community)
- discuss problems encountered and possible solutions and research opportunities
- to plan future activities.

Problems with meetings:-

Low attendance

The first meetings were dominated by the headman's family. There is a problem because Mashare is divided into two hamlets (*mukundas*) and the meeting place was at the far end of Muroro (E side). Communication and relationship problems (past bad experiences with development projects, and resentment of college appropriation of land) may have contributed to low turn out.

We responded to this problem by also holding additional meetings in Mashare West side.

High expectations

The meeting with a women's group on June 12th was not successful because the women who attended were expecting to receive inputs and financial support from KFSRT. They were very disappointed to hear that this was not the case and the whole meeting was spent discussing what the KFSRT actually plans to do.

This problem may have been due to misinformation. The notice was given at church, second hand. We could avoid this in the future by giving the message directly or by explaining ourselves more clearly.

Size of Village

The large size of the village and the fact that its split into two *mukunda*s means exercises and mapping and wealth ranking are quite difficult as people don't know each other.

Household Interviews:

The team carried out 23 individual interviews. The interviews were used to carry out farm profiles, enterprise profiles and enterprise ranking and management, income/spending calenders, health calender, seasonal calender, resource management matrices and a transect walk.

Before interviewing, wealth ranking was carried out with the headman and a number of individuals (see section on socioeconomic features for descriptions richer and poorer households). Based on the criteria for wealth given, plough ownership was selected as a indicator for a richer household. Having marked household types on the community map, the team was able to ensure that interviews were held with both plough owners, poorer farmers and women headed households.

Interview breakdown:-
Plough owners:- 7
No plough:- 16
Women headed households: 13

Advantages of Individual Interviews:-

Personal information (compared with generalised information generated by group discussions)

Meet household members who don't have time to come to meetings or who are very quiet in group situations.
Opportunity to observe what is actually happening.
Cross checking what people have told you in groups.

Problems experienced:-
Dominant visitors sometimes took over the interviews.
Men don't know much about the crop management but tend to dominate household interviews
Some women are shy especially when the facilitators are all male.
The facilitators tended to talk to household heads (older and middle aged people) rather than to younger couples.

The farmers of Mashare were very cooperative and generous with their time.

Adaptations to methodology for the next Community Survey
Carry out joint planning with research and extension (at monthly coordination meetings), and inform facilitators earlier, to improve participation in diagnostic survey activities.

Positive action to recruit more female facilitators on to the research team.

Improve organisation of group meetings (clearer communication, attempt to get a wider range of people, make objectives clear)

Disagreggate 'de facto' and 'de jure' female headed households when selecting samples for interviews.

Better analysis of household structure. Ensure that sub units (e.g young couples) are interviewed as well as household heads.

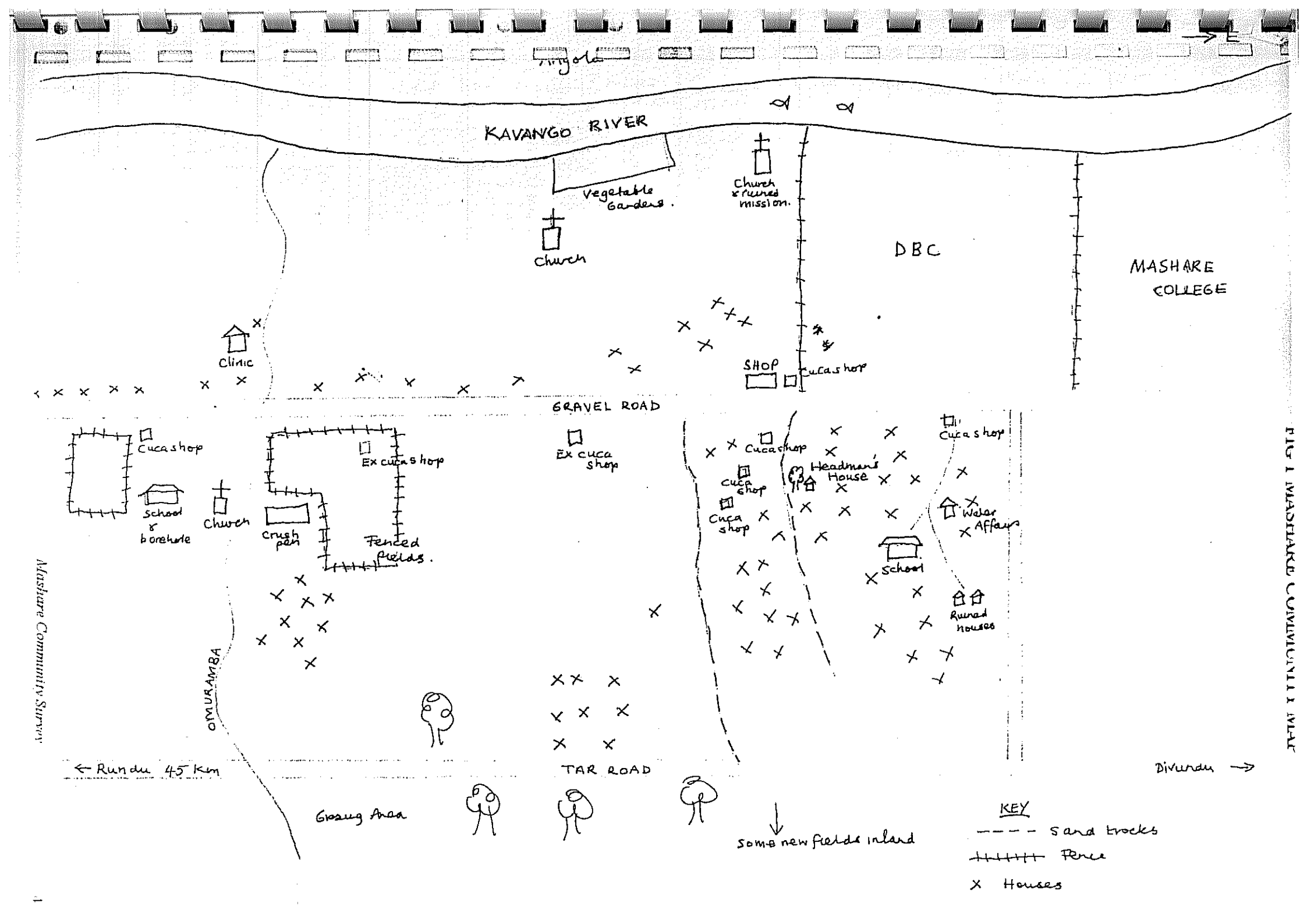


FIG 1 MASHARE COMMUNITY AREA

3. GENERAL DESCRIPTION OF MASHARE VILLAGE

The village is divided into two hamlets (*mukundas*): Mashare and Muroro. The distance from one end of the village to the other is 4 - 5 km. The village runs along the edge of the gravel road and houses can be found up to about 2km inland. Cultivated fields stretch up to the tar road. The main forested areas are inland, close to the tar road.

The headman of the village is Mr Augustinus Bendeka. He originally came to Mashare from Rundu to work in the hospital.

There are two primary schools at Muroro (headmaster - Albert Mashare) and Mashare (headmaster Cornelius Njoba).

The village has one clinic in Mashare West. This is run by a nurse, Mr Faustinus Ndango and his assistant Julia Sikongo. There are also nine traditional healers in the village. The clinic has electricity and water but no telephone or radio communication.

The village has one functioning shop at Muroro run by a Portuguese man. The shop stocks maize meal, sugar, bread, tinned food, alcohol and general household goods.

There are five main cuca shops in the village (and many other temporary stalls).

There are two main churches, Catholic and ELOK. There are also a number of other small churches and prophets.

There are boreholes at the schools but the water is salty. Most people collect their water from the river.

There is one crush pen in Mashare West serving the whole village.

The Development Brigade Corporation (formerly a leprosy hospital) is situated on the E. side of the village. It sells vegetables to the village. Mashare College, also on the E. side of the village provides training for farmers, extension officers and NGO staff. Several Mashare villagers are employed at the college. The college sells seed to farmers and occasionally fertilisers. In the past people were able to buy goats, pigs and milk from the college.

There are two women's groups at Muroro. These groups are involved in bread making, vegetable production, sewing and fence making. The church women's group at Mashare is no longer active.

There was formerly an ELOK mission by the river on the E side of the village. This is now abandoned, though the area is still fenced and some buildings remain.

The clinic, schools, the DBC, Mashare college and one cuca shop have electricity.

There are two blacksmiths in the community.

Date	Main event	other events	Wild-life	Forest	Infra-structure	Settle-ment	Crop-fields	Livestock	Weather	Hospital/School
1945–1948	Compound for Miners to RSA.	Road along side the river (Nakare)	Plenty of Wildlife.	Thick forest lot of wild-fruits	No good roads/ sandy.	No house-holds at Muroro	-	Few, grazing was adequate	-	-
1964–1969.	Built hospital at Muroro	Employment of people: Nurses. Cleaners	more wild-life.	Thick forest more wild-fruits	Establish-ment of gravel-road (Mare)	4–5 house-holds at Muroro.	-	Few live-stock, enough grazing		
1970–1973	Agric college built at Mashare		Plenty of fish in the river. Kamuncaya shot 2 eleph.	still thick forest and wildlife		Refugees from Angola settle at Muroro	few and small fields	drought	Flooding of water/ river.	
1974–1979	Agric College operates	Miners stop their contract – Angolan war.				People forced to leave College area	Crop-fields are increasing			First school at Muroro under a tree.
1980–1985	Muroro hospital taken over by the Army	Recruit-ment of young people in the Army	Restriction on fishing with Nets	More people clearing land for cultivation.		Settlement of Soldier together with communities	More fields Good yield Restriction of movement of Soldiers		Good rains	Clinic at Muroro
1985–1990	NAMIBIAN independence.			Forest, still OK	Telephones	more people settled.	Good yield	Cattle-stealing start.	late 80's dry and hot, no rain	
1991–1995.	Returnees at Muroro base	Start meeting ext officers from Mashare	People go fish/hunt as they want.	Wild fruits is becoming less.	Telephones Electricity Tar road		Ploughing service reinforced with Tractors	Cattle stealing becomes critical	Good harvest – Okashana	
1.										
Long term future.	Unemploy-ment.		Wild animals, fish will get finish	Forest will be destroyed – field fire, cutting	Telephones & electri-city, limited	No settle-ment, more people	Less crop fields	Cattle no will decrease – thieves		Increase in payment for both.

("MURORO")

FIG 2 MASHARE HISTORICAL PROFILE. – June 1st

3.1 Natural Resources

The community borders the Kavango river. Fishing is good in the Eastern side of the village.

A list of tree and shrub species identified is given in Appendix 1 (with transect walk). There are more *mausivi* trees in Muroro than in Mashare.

There is one main dry river bed (*omuramba*) at Mashare W., and several smaller omurambas. Soil is sandy loam by the river and sandy inland. The best soil is in the East of the village and the very best is at Mashare college!

3.2 Socioeconomic Characteristics

The village has a mixture of Sambyu, Mbukushu, Gciriku, Nyemba, Shimbundu and Kachokwe people. These groups intermarry and residential areas are mixed. Total number of households marked on the map is 144.

Of the 13 farm profiles carried out, 8 households had moved to this village from elsewhere. Only three household heads had been born in the village (and one was a young woman).

The main reason for coming to this village was to look for work and to come to the hospital because of illness (particularly leprosy). Some soldiers also settled here in the 1980s.

In the historical profiles (see fig. 2) we were told that in the 1930s there were only two households in Mashare and none in Muroro. The main settlement began in the 1960s when the hospital was built and people came here to be employed as cleaners and nurses and as patients. Mashare college was built in the 1970s, bringing more people to the village. The 1970s also brought a stream of refugees from Angola who settled in the village. In the 1980s the hospital was taken over by the army. Some young people were recruited to the army. Some soldiers came to Mashare and decided to settle here. The first school was constructed in the 1960s and the clinic in the 1980s. The DBC was constructed after independence on the site of the old hospital.

When the college was built people were forced to move off the college land. There is some resentment that the best land in the village has been appropriated by the college and the DBC. Lack of land has forced people to move from Muroro to Mashare. Shortage of land and deteriorating soil fertility is forcing people to clear fields inland. Some people have moved to settle inland.

3.3 Socioeconomic Differentiation

There are considerable differences in wealth and income between different households in the village (see wealth ranking criteria). In discussion with the headman, an important criteria for wealth was identified to be plough ownership. There were 25 plough owners marked on the map which was prepared in the first community meeting. This represents only 21% of the community. Most plough owners lived in the Western part of the village.

Richer households appeared to be those where a household member has employment or has had employment in the past. They are characterised by owning livestock, ploughs, big fields (often fenced), well constructed houses and usually have labourers working for them. They may also own cuca shops. A few have cars. Richer households are normally bigger than poorer households.

This is because they accommodate poorer relatives (usually cousins, nephews, brothers and sisters and parents). Richer households are increasingly opening up new fields inland, while poorer families are limited by lack of transport and labour. Richer households also make use of inland grazing. Richer farmers have access to services of tractor ploughing, seed, fertiliser and marketing from the NDC Farmer Support services.

Some successful traditional healers are also rich.

Poorer households have no or few livestock, small fields, use hand hoe or borrow or rent ploughs, work for others for survival. It is likely that many of these families recieve support in the form of food from richer relatives. However, we did not have the opportunity to collect much information on this. It is likely that the very poorest are those who don't have family support networks - who perhaps came here for a job or to the hospital and have no employment now. Some poorer people drink a lot of local beer. Drinking, we were told, is a way for them to fill their stomachs for the day. Drinking may also be a result of depression and lack of hope. Richer people tend to drink less frequently, though there are some exceptions.

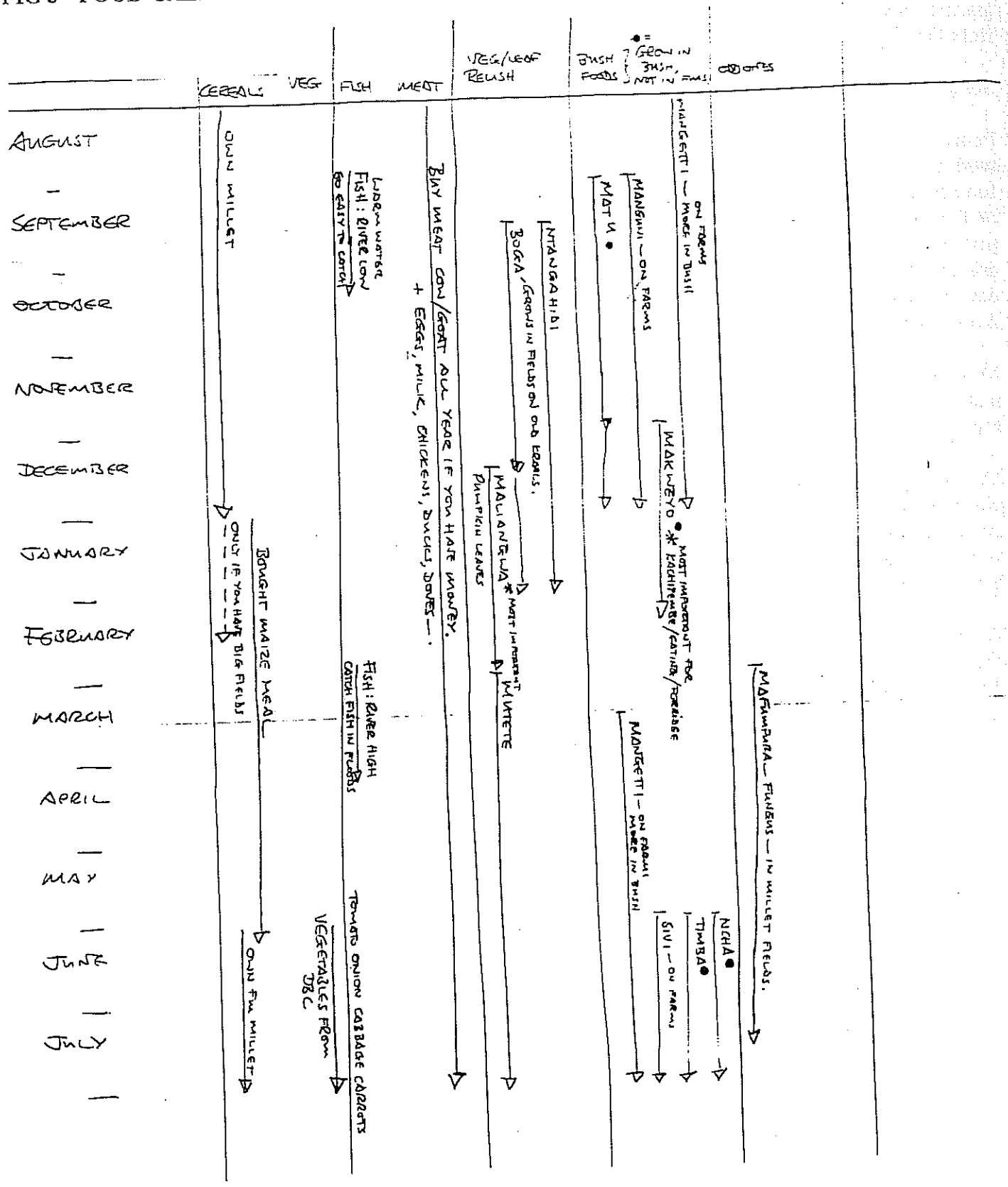
Most households interviewed were run by middle aged/older people. Younger couples appear to be mainly resident with their parents (initially with wife's parents, later with husband's parents). Further understanding of the household cycle is needed.

Many young people, especially men, are away working on mines and as contract labourers. Most plan to come back though some (*mbwiti*) never do. Some will send money back to their parents to buy cattle. Some do this work all their lives. We didn't interview any women household heads whose husbands were away working. We think this is because they are normally resident with their husband's parents.

There were 31 women headed households in the community (22% - de jure and de facto were not distinguished). Those interviewed were either women whose husbands were employed locally, leaving their wifes in charge of farming activities, or widows who had moved back to live with their children or to their home villages (one had inherited her parents land).

Those in the village who are employed, are mainly working for Government (school, clinic) and Mashare College.

FIG 3 - FOOD CALENDER



3.4 NUTRITION

This information is based on a food calender drawn up with one household (see fig 3). Millet and maize meal are the staple carbohydrate. Millet is harvested from May and usually eaten until supplies run out (December, for the household who carried out a food calender). Maize meal is purchased by those who can afford it until the next harvest in May/June. Fish is most available in August/September (when the river is low and fish easy to catch) and in March/April (when the river is high and flooded). Meat eggs and milk may be bought throughout the year, when cash is available. Wild fruit and vegetables are eaten throughout the year but play a particularly vital role in food security during the hungry months before harvest. Some wild fruit can be dried and stored to eat during the dry winter months. Pumpkins also play an important role in nutrition as they are ready to harvest before the other main food crops.

Richer households will make payment in the form of milk or millet, for labour for weeding and harvesting .

3.5 HEALTH

The main health problems in the community were discussed, using a health calender, with the clinic staff (see fig 4). The most important diseases, effecting children, adults and old people are malaria, diarrhoea and coughs. Winter (June/July) is the most unhealthy period of the year. Malaria is also a serious problem through summer and autumn (November - May) when people are most busy ploughing, planting and weeding the land.

FIG 4 - HEALTH CALENDER

Δ = CHILDREN
O = ADULTS
✳ = OLDER PEOPLES

UNHEALTHY — HEALTHY

F. NJANGO
J. SIKONGO

12/06/95

MASHARE CLINIC

DISEASES / MAIVERA	WINTER KUFU	MANGENYENA	SPRING KWENYE	SOMER KUROMBO	AUTUMN EPEMBA	
1) MALARIA Δ O ✳	5	4	3	5	5	22
EZIMO lyo KUSINSANA 2) DIARRHOEA Δ O ✳	4	3	1	2	6	16
3) COUGHING NTURO Δ O ✳	5	2	3	7	7	24
4) SORE EYES UVERA WO MEHO Δ O ✳	5	2	1	1	2	11
5) FLU ESAKISA Δ O ✳	3	0	3	0	0	6
6) GONORHOEA (STD) ENDONGO O	4	2	3	2	3	14
7) SCABIES RUKURU Δ ✳	4	0	3	0	0	7
8) TUBERCULOSES TIBI O Δ ✳	1	1	1	1	1	5
OTHER ACTIVITIES	HARVESTING THRESHING	THRESHING LAND CLEANING	LAND PREP.	PLOUGHING WEEDING	WEEDING HARVESTING MELONS PUMPKINS } START EATING	

FACILITATOR: HARRIET MATSAERT, JOHANNES SIMBOMBO

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4. MAIN ENTERPRISES AND RESOURCE MANAGEMENT.

From individual interviews and group discussions the research team made the following ranking:-

MAIN ENTERPRISES **(most important at top)**

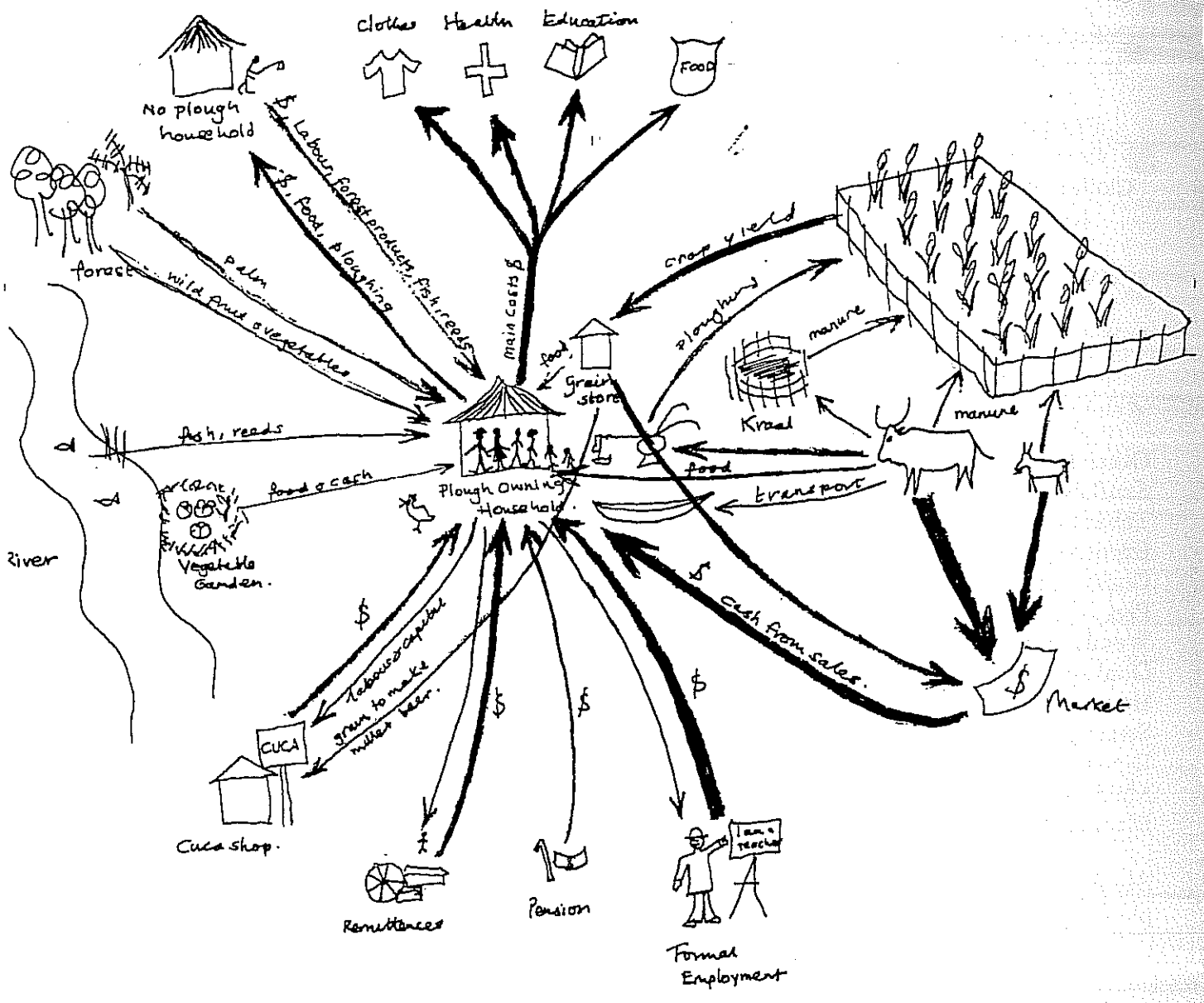
Mainly poorer households	**All households**	**Mainly richer households**
	Millet	Income from employment
Income from casual labour	Maize, Sorghum, wild fruit and vegetable in the bush.	cattle
Collection of reeds, grass and poles, making mats	Bambara nuts, Chicken, Cowpeas.	goats
Fetching water and firewood. Washing Clothes, pounding millet, tending children.	Fishing, Cucurbits	cuca shop (permanent)
Making fishing baskets.	Groundnuts, Pensions, Brewing kachipembe	renting plough
Wild vegetables grown around the house.	Cuca shop (temporary)	
	Basket making, Gourds.	

Other Enterprises (few households)

Sunflower - this is a new crop, seen in one farm only.
Tobacco - small plots for personal use
Exotic vegetables - women's groups
Ducks - seen at two richer households
Pigs
Woodcarving
Donkeys - richer households
Horses - richer households
Sweet potato - not seen at any farm, but was mentioned in enterprise ranking exercises.
Doves - ?
Making tool handles - poorer households
Blacksmithing

See figs 5 & 6 for diagrammatic representation of the main enterprises and system interactions for plough and non plough owners.

FIG 5

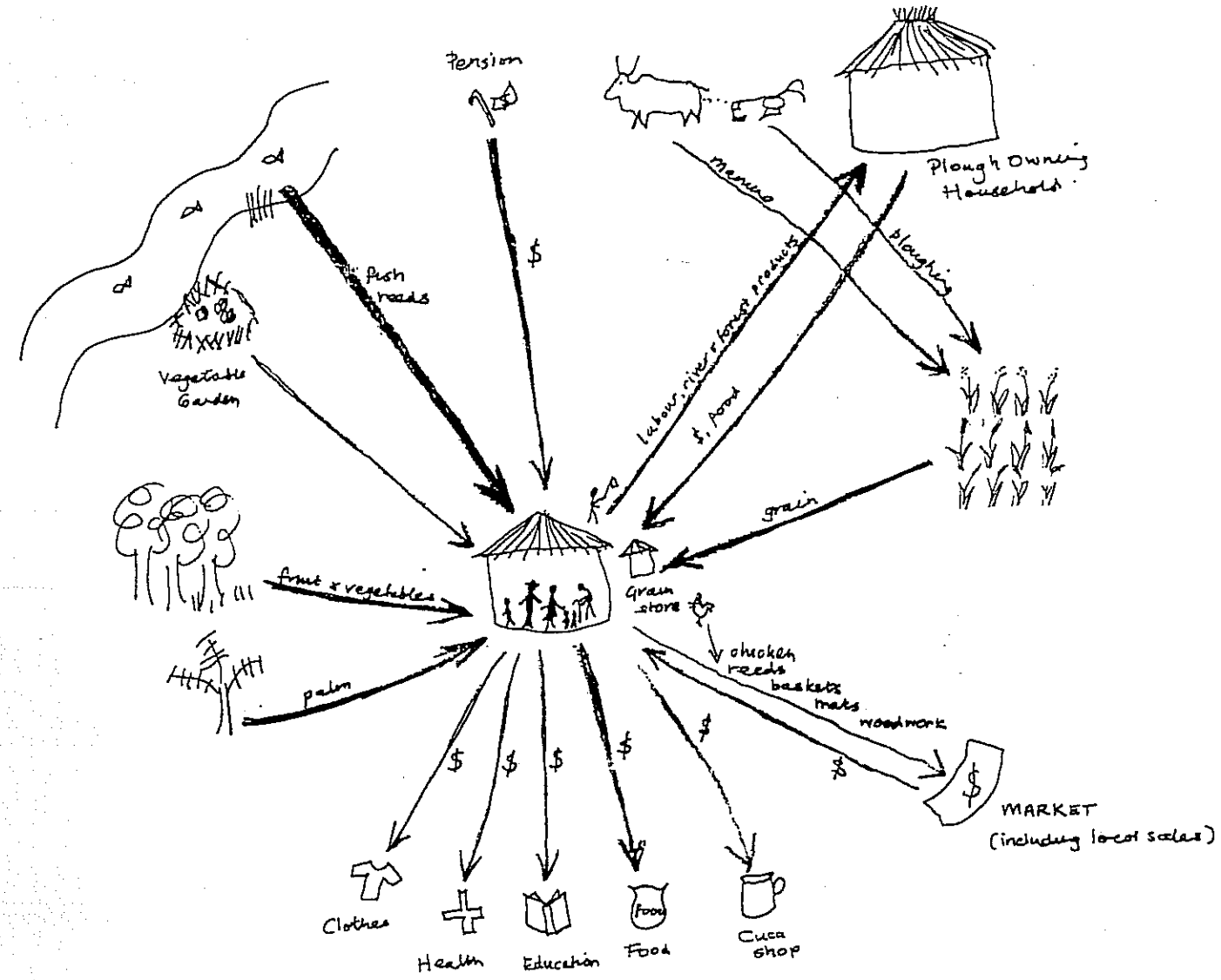


SYSTEM INTERACTIONS

PLOUGH OWNING HOUSEHOLD

RIVERSIDE VILLAGE

FIG 6



SYSTEM INTERACTIONS

NO PLOUGH HOUSEHOLD

RIVERSIDE VILLAGE

4.1 Management of Main Enterprises

This information is taken from group and individual household discussions.

Millet	Husband and wife together. Women are more familiar with the millet varieties. They are ones mainly involved in planting and seed selection.
Wild fruit and vegetables in the bush.	Mainly women and girls, though men can also collect.
Maize	As for millet
Sorghum	As for millet
Bambara	Women
Cowpea	Women
Melons/pumpkins	Women
Groundnuts	Women
Gourds	Women or young children

Livestock

Chicken	Women
Cattle	Men and boys (though women can own)
Goats	Men and boys
Cuca shop	Men and women

Other

Fishing	Men - hooks and nets Women - fish traps (sikuku) (sintunga) Children - hooks
Casual labour	Men - collecting poles, clearing fields, ploughing, weeding. Women - planting, weeding, harvesting, threshing, pounding.
Reeds and poles	Men and some women can collect reeds.
Income from paid employment	Men and women (more men)
Brewing kachipembe	Men and women
Basket making	Women
Mat making	Men

Field Management

Husband and wife may have their own field or may farm together. The wife will work on the husband's field in any case.

Inheritence

Inheritence passes normally from a man to his nephew and from a woman to her brothers. If a man dies his wife will not be entitled to anything in the house, or to the land. In his lifetime, however, a man can give cash to buy livestock to his wife. A parent may also give livestock to their children. There are also cases of children inheriting land from their parents.

Sale of produce

Household heads generally make the decision on sale of resources.

More information is needed on resource ownership, management and inheritence.

FIG 7- SEASONAL CALENDER

	JAN	FEBR	MART	APR	MAY	JUN	J.	A.	SEP.	OC.	NOV	DEC
PLOUGHING												
SLASHING									6		5	
BURNING											4	
HOEING											5	4
SOWING	2										4	5
WEEDING	3	2	3									
~~FARM~~ HARVEST					4							
THRESSING						4						
POUNDING	-	-	3	3	3	3	3	3	3	3	4	-
WATER	1	1	1	1	1	1	1	1	3	1	1	1
GOOD	1	1	3	3	3	3	1	1	1	1	1	1
COOKING	1	1	3	3	2	1	1	1	1	1	1	1
WASHING/CARE	1	1	1	1	2	2	2	1	1	1	1	1
FISHING	1	1	1	1	1	1	3	3	3	3	1	1
BASKET MAKING	1	1	1	1	1	2	2	3	3	3	1	1
GRASS CUTTING	-	-	-	-	-	2	2	2	2	1	1	1
BUILDING HOUSES												
FRUIT COLLECT 2					1	2	2					
MILKING												
HERDING	1	1	1	1	1	1	1	1	1	1	1	1
CONS LAPAS	-	-	-	-	-	2	2	1	2	1	1	1
SAWING							1	1	1	2		
DRINKING	1	1	1	1	1	1	1	1	1	1	1	1
BANGING			1	1								
KASHIPEMBE			2	2								

FACILITATORS: HAMUNYELA PENSULKENI, JOHANNES SIMBOMBO

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Numbers 1 - 6 represent the amount of labour/time involved in each activity.

4.2 Description of Main Enterprises

Due to time limitations, information was collected only for 7 priority enterprises: millet, maize, sorghum, cowpeas, bambara nuts, wild fruit, vegetables and chickens. We plan to collect more detailed information on all the main enterprises in future 'focus surveys' working in collaboration with agricultural and livestock research staff.

Crop Production

General Management

Land clearing - August to October (old and new land). Shrubs are cut using an axe or hoe. Together with crop residues these are burn't.

Ploughing and planting is carried out normally from November to January. Hand cultivation and planting is carried out at the same time. Ploughing is mainly carried out by men, though women also can plough. Hand cultivation is carried out by men and women. Planting is normally carried out, by women, on the same day as ploughing. Women are also responsible for seed selection. All crops are normally planted at the same time, though overall planting time is staggered as small areas of land are prepared at a time. This is a strategy to reduce risk. This year people generally planted very late because of the rains. People also planted smaller areas than usual. Some farmers, usually those who are using hoes, may dry plant.

Some few farmers add manure to their fields to improve fertility. Use of rotating cattle kraals was also observed. Only richer farmers, with livestock, are able to do this, though all farms benefit from the movement of cattle over the fields after harvesting. We didn't interview farmers who were using fertiliser, but there was a lot of interest in using fertiliser.

Thinning and gapping is carried out by some farmers while weeding.

Weeding begins as soon as the crop has germinated (December/January). We were told that it is particularly important to weed sorghum early. Number of weedings will depend on date of planting, type of weeds and on the rainfall. Both men, women and children weed.

We did not come across any type of pest control measures. Birdscaring is mainly carried out by men and children.

Harvesting carried out by all members of the household in May/June. Threshing is carried out mainly by women in June/July. Flat surfaces are prepared on the ground from anthill soil. Richer farmers can use a canvas sheet. Processing and cooking carried out by women and children.

Granaries are made from reeds and sealed with clay. These are made by men. Crops are stored threshed. No storage chemicals were observed. What about ash, etc?

Labour for Crop Production

Women household members appear to do most of the crop production work, though men can also help with land preparation and weeding. Children are expected to help with weeding when they are out of school. Richer households use hired labour for most work on the fields. Those without ploughs will carry out ploughing in exchange for later borrowing the plough on their own land.

Weeding, harvesting, threshing and pounding is carried out in exchange for cash or food. It is likely that poorer relatives, who live with richer households will also be expected to provide labour.

For poorer households, shortage of labour is a constraint to crop production. Many households expressed the wish to use a plough or tractor to increase the area under cultivation.

General Constraints to Crop Production noted by household's interviewed
Shortage of ploughs/labour for land preparation limits area under cultivation and delays planting - particularly poorer households
Shortage of land by river
Low and decreasing soil fertility
Army worms NB - not mentioned at all among "Inland village"
Low rainfall
Loss of seeds in storage

Trends
Land for crop production by the river is becoming scarce. Farmers are increasingly clearing fields inland. This is more possible for richer farmers who have transport or labour than for poorer households. Most farmers we interviewed would like to increase the area of land under cultivation. To do this they need the use of a plough and oxen, or a tractor. Some farmers (male) told us they would like to increase yields by using fertiliser.

MILLET
Varieties
Traditional Varieties: *Daureni* and *Mpende*
New Varieties: *Okashana*

Several of the households we interviewed had tried *Okashana* for the first time this, or last, year. Most people are very happy with *Okashana*, though one women complained that the stems are too short, the plant lodges easily and can be eaten by chickens.

Some people told us they had trouble obtaining *Okashana* seeds. Cash rather than availability appeared to be the constraint. Some had got seeds from other farmers in the village.

Management Practices
Normally planted together with sorghum, cowpeas, melons and pumpkins. Stored in granaries and in bags. None of the farmers interviewed sold millet commercially. Grain may be sold locally, exchanged for labour or sold as beer in cuca shops.

Specific Constraints
Some smut was observed by the team on millet.
Bird pests were also mentioned by farmers.

MAIZE
Varieties
Local varieties (black & white?)
White maize - from open market or stores.

The local is sweeter and more drought resistant than the white maize.

Management Practices
Maize is normally planted on the best soil (with clay) or on old cattle corrals. Some farmers were applying manure to areas where maize was to be planted or were rotating cattle kraals. Maize can be intercropped with millet and pumpkin. Needs early weeding.
Length of growing season?
Harvested green?

Specific Constraints
Loss of traditional maize varieties.
Maize is particularly effected by poor soil fertility & low rainfall.

SORGHUM
Varieties
Kotovara - red
Chacha - white, tall stalk
White variety from college - (problem identifying this because long ID numbers can't be remembered)
New variety from Rundu - short and red (not identified)

Management
Planted with millet or alone. Needs to be weeded early for heads to develop properly. Stored and processed like millet.

Contraints
Smut was observed on some sorghum heads. However farmers did not mention any specific constraints for sorghum. This should be investigated further as should the different qualities of the various sorghum varieties.

BAMBARA NUTS
Varieties
Only one variety grown in Mashare

Management Practices
Can be grown alone or together with other crops. Shouldn't be grown with groundnuts as they have spreading roots. Sandy clay soil is better than sandy soil unless rainfall is high. Stored in gourds and prepared by boiling with water. Can be pounded.

Seeds can be bought in Rundu or Shitemo.

Marketing
A large cupful can be sold for 3 dollars.

Constraints
Insects destroy the young nuts. They are like ants but can burrow under the surface. No way of controlling this known.

COWPEAS

Varieties

Mbira (red)
Gwayi (white)
Gwayi was thought by one farmer to be more resistant to drought.

Management Practices

Planted with cereal crop.
Some farmers plant them in infertile areas to restore fertility.

Constraints

Aphids were observed on pods. Those farmers interviewed said there was no method of control.

CUCURBITS

Varieties

Watermelon (sweet):- *katchama wamukenu* (white marks on melon), katchama homtipu (black melon), another with white marks - name unknown?
Don't store well, go rotten easily.

Melons (bitter):- 4 varieties: *nkanga, mushoko, mushurukwe, kavaramato.* Harvested in March/April. Can store for 3 months. Nice to cook.

Pumpkins:- *shinuti* (small, long shape), big round pumpkin. Pumpkins can be harvested earlier than the others.

Rukweihu - gourd.

Management Practices

Planted together with other crops

Constraints

Seed loss in storage to weevils.

WILD VEGETABLES

For varieties see Appendix 2

Management methods

Maliangwa, Mpungu and *Mutete* can be grown in the fields.
Mutete, mboga, mpungu, ekundu and *maliangwa* can be dried and stored.

Constraints

Long distance to collection area.

WILD FRUIT
For varieties see Appendix 3

Management
Mangetti is the only tree that is locally planted. Fruit trees tend to be left when others are cleared. Collected by all household members but particularly women and children.
Eaten as fruit, used as relish, some can be pounded to make porridge, some can be mixed with milk or made into drinks into alcohol. *Nongongo, nonsivi, matu, maroro, nompundu, maguni, nomaka* grow in the village. Some of the other trees can be very far away.

Constraints
Far distance to some fruit trees.
Higher population means there is more demand for fruit and it gets used up quickly.
Accidental fires and fires made by hunters destroy fruit trees.
People would like to, but are unable to plant *nonsivi, nonsa, matu, nonsimba* and *nombezi.*

CHICKENS
Kept by nearly every household. Only one variety of chicken in this area - the indigenous breed. Chickens are kept free range all year and may be fed extra millet or maize seed. There is no special chicken housing. May sleep on trees or house roofs. There are not many predators except occasionally cats and the kangamba (pole cat). There are no inputs used.

Constraints
Pole cat
Newcastle disease - known as *katjiyo.* Farmers try to cure this by giving *usivi* leaves or *ekundu* in water. Those interviewed did not know of another cure, or of drugs available.

5. SYSTEM INTERACTIONS
(See figs 5 & 6 for diagrammatic representation)

POSITIVE INTERACTIONS
Use of cattle manure for fields, including rotating cattle kraals - richer farmers
Use of cattle for ploughing - richer farmers
Cattle graze crop residue and fertilise fields - all farms
Intercropping of all crops - to improve soil fertility and reduce risk - all farmers
Cowpeas planted to improve areas of low fertility.
Fruit trees left standing in cultivated fields. *Mutu, muguni* and *mugongo* are good because light and rainfall pass easily through their leaves. *Usivi* creates too much shade.
Some cash and food is redistributed between richer and poorer households through labour exchange (& exchange for wild fruit, fish, wood etc)
Staggered planting - reduces risk and labour constraints

SYSTEM CONFLICTS
Forest fires for hunting destroy fruit trees and natural food source of birds.
Malaria problems reduce labour capacity at peak ploughing and weeding times.
Manure application reduces weeds.
Destruction of growing crop by unherded livestock.

6. PROBLEMS/CONSTRAINTS IDENTIFIED

Constraints identified in individual interviews were presented and discussed with a group of 20 farmers (12 men and 8 women). The group rejected some of the problems, added some new problems and then ranked them according to importance.

MOST IMPORTANT

1st

Lack of cash

=2nd

Lack of oxen for ploughing Livestock Theft

3rd

Lack of ploughs

4th

Shortage of land by the river

5th

Poor soil fertility Hard to transport manure to fields

=6th

Shortage of water supplies inland
Fields too far from house

Bird pests
insects attacking banbara
aphids on cowpeas
Smut on sorghum and millet
Army worms

Loss of seed in storage
Lack of millet seed
Lack of banbara seed
Loss of old varieties of maize

Fish are becoming less.

ALSO IMPORTANT

Late planting
Weeds
Livestock diseases
Not enough rain
Maize failure in low rainfall years

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Loss of old varieties of maize

Fish are becoming less.

ALSO IMPORTANT

Late planting
Weeds
Livestock diseases
Not enough rain
Maize failure in low rainfall years

QUITE IMPORTANT
Newcastle disease in chicken
Wild fruit far away
Burning of fruit trees.

NOT A PROBLEM (though identified as problems by some farmers previously interviewed by the team)

	Comments
Unavailability of *Okashana* seed.	Its not availability, but cash that is the problem. People know where to get *Okashana.*
No vegetable seeds available	
Not enough labour	There are plenty of people who want to work, but no money to pay them.
Pig disease	We don't have pigs
Manure brings weeds	Our problem is carrying manure to the fields.

7. SOLUTIONS & OPPORTUNITIES

Need translations from KH & JS

Small groups (from the larger group which ranked problems) analysed a number of problem themes in further detail and discussed existing strategies and other possible solutions.

Group 1 - Lack of Draught Animal Power and cash to buy or hire labour.

Participants	**Facilitators**
David Karunga	Johannes Simbombo
Maseka Vilengeya	Pellageus Hamsira
Petrus Kasero	
Ihemba Markus	
John Murangi	

Causes:-
Unemployment
Lower rainfall leading to low crop yields
Lack of cash
Diseases and thieves (steal oxen)

Existing Strategies
Hire plough
Prepare land with hoe
Farm smaller area

Solutions
Income generation projects
Training in group formation for income generating projects
Loans/grants to purchase ploughs
Government ploughing services should be accessible to more farmers.
Employment oppotunities.

Group 2 - Lack of land near river. Poor fertility of land
Facilitators - Klemens Hatutale, Amunyela
Romanus Nyangana
Augustinus Mbendeka (headman)
Albert Mashare
Helena Shininge
Selina Nankali
Engletroud Tuta

Causes
Low soil fertility
Lack of fertiliser
Extension officers don't sell fertiliser.
Lack of cash to buy fertiliser
Not enough space
Too many people

Effects
Hunger and poverty
Theft of millet
Low yield
Long distance to new cropped fields

Existing Strategies
New cropped fields inland.
Manure small portion of the field
Use mobile kraal to fertilise different areas of the farm each year.
Burning tree stumps (ashes help improve the soil)
Rotate millet with beans and bambara nuts
Shifting cultivation

What else could be done?
Improve water supply inland so that people can move.
Make fertiliser available to farmers
Extension advice
Increased use of manure.
Barter system - people with transport should put the first 1 or 2 loads of manure on the owner's field in exchange for keeping the last load themselves.
Fallow lands to restore fertility

Group 3 - Crop Problems
Facilitators:- Reino Aisindi, Amand Mbambo
Joseph Ndenga
Regenbert Furtiro
Jason Lukas
Josephine Livingi

Selma Mwaka
Angelika Musova

Problems
Low rainfall
Pests and diseases (caused by low rainfall)
Poor weed control (due to infrequent cultivation & low soil fertility)
Poor soil fertility (caused by monoculture and lack of fertile soil)
Birds (due to fires which destroy the long grasses which birds normally feed on, and force the birds to eat the crops).
Lack of draught animal power and equipment (due to lack of cashe and unemployment, no support for female headed households).
Late planting
Lack of traditional maize seeds.
Sandy soils not suitable for maize
Destruction of crops by animals (livestock owners don't take responsibility for herding their animals)
Smut on sorghum and millet (due to low rainfall, unselected seed and poor seed quality).

Solutions
Birds:-
Catch the first bird, burn it and throw it towards the West.
Control field fires to save grass where the birds feed through law enforcement

Unselected and poor seed
Training of farmers in seed multiplication.
Trial plots to practice their skills.
Marketing mechanism
Reduce storage losses..

Frequency of cultivation results in weed multiplication:-
Rotate sorghum, millet and cowpeas
Intercrop millet with cowpeas

8. ISSUES FOR RESEARCH, EXTENSION, TRAINING AND FARMER SUPPORT SERVICES

In our initial regional profile, Mashare was found to share similar characteristics with most riverside villages visited. We therefore suggest that issues raised in this community are also applicable to the experience of a large proportion of the Kavango people farming in riverside communities.

These issues are preliminary only. Further analysis of community structures and production systems is still needed. Some important areas, such as livestock production and range management were not examined in detail in this study. Areas for further basic research are listed in the next section.

APPLIED RESEARCH ISSUES

Soil fertility	- optimum fertiliser use for dryland millet production on sandy soils - optimum use of manure (practices which address transport constraints) - alternative soil fertility improvement measures for low income farmers with no livestock (mulching, agroforestry...)
Lack of seed (and loss of traditional varieties)	- collection, storage and bulking of traditional varieties. - Collaborate with local farmers in seed bulking activities.
Crop pests	- low input control of field and storage pests. - identification of bambara nut pest & recommend control measures
Lack of draught animal power	- low draught ploughs for 1 animal? - minimum tillage treatments
Low rainfall	- continue testing of drought resistant or avoiding crops. * need short working names for new varieties been tested. Long numbers cause confusion.
Fruit trees	- investigate propogation methods for indigenous fruit trees which farmers would like to plant near their homes.
Weeds	- weed control management practices - draught animal tools for weed control (needs additional assessment of corresponding change in planting practices and the impact of this on yield and soil fertility)
Decline in fish	- explore community management strategies - fish farms?

EXTENSION

Soil fertility	- farmers require specific information on type of fertiliser most suitable for millet production on sandy soils and application rates.
Crop pests	- provide farmers ~~on~~ information on control of aphids and bambara nut pests - information on control of smut - bird control measures?
Protection of Fruit trees	- develop community strategies for control of forest fires
Newcastle disease	- inform farmers of control measures for this disease (an effective drug is available).
Weeds	- use of draught animal power for weed control?
Decline in fish	- explore community management strategies

TRAINING

Organisational capacity	- Training in group formation and management.

Income generation	- Starting up an income generating project - Basic account management - Loan management.
Seed supply	- Seed multiplication methods
Fruit trees	- Propogation and care of fruit trees

FARMER SUPPORT SERVICES

Lack of draught animal power or ploughing services.	- Make ploughing services more accessible to poorer household. - Explore means of improving farmers access to draught animal power e.g credit schemes, leasing, savings groups. - make indigenous and exotic fruit tree seedlings available to farmers

9. FUTURE ACTION AND FURTHER BASIC RESEARCH NEEDS

Following this preliminary community survey, the KFSRT plans to initiate collaborative research activities with a group of farmers in Mashare community. Working together with agricultural researchers and extension officers, we plan to identify and put forward a number of technologies or management recommendations which we believe could help farmers overcome some of the constraints to production which they have identified. This 'basket of options' will be generated from past on station research results, from innovative practices observed in Kavango itself and from farmers practices or successful adaptive research in other areas. The technologies will then be screened by a group of farmers, who will select which they feel might be appropriate for their own farming systems. These technologies will be tested by farmers, under their own farming conditions (with parallel trials on station) over the next year.

FURTHER BASIC RESEARCH NEEDED

Develop understanding of interactions between river and inland communities.
Focused discussions with young farmers (these were largely missed in this survey as they tend not to be household heads)
Improve understanding of the household cycle (formation of new household, inheritence etc)
Improve understanding of resource ownership and management
Detailed enterprise analysis (in collaboration with agriculture, forestry and livestock researchers)
Livestock and range management
Management of draught animals (preferential feeding?)
Planting methods - frequency of dry planting, row planting etc.
Comparison of dry planting/late planting on crop security and yield.
Inventory of forest species. Improve understanding of distriution and trends.
Improve understanding of forestry management (this survey examined fruit trees only)
Fish - investigate primary causes of decline in numbers

APPENDIX 1 TRANSECT WALK AND LIST OF TREE AND SHRUB SPECIES

Question	Familiarisation with tree & shrub species, soil types, land tenure, land use
Which method was used?	TRANSECT WALK.
Name(s) of facilitators	~~Pauline Hoaseb~~ Harnet Imand Johannes Ernest
Name of place, household & description of site	See map
When (date and times)	5th - 6th June.
Who took part?	Men (old, middle-aged, young) Women (old, middle-aged, young) Children Paulus Hausiku Christophina & brother.
Other important information about the people who took part: ie position in community, woman as household head, etc.	Headmans family Ernestinus' uncle.
Special things you noticed or want to point out: easy or difficult, how good was overall participation and communication?	Much information on uses of trees and shrubs. Land use - more land fallow this year than usual because of late rain
Which main answers to the questions were given?	Soil Types Tree species Land use.
Which extra information was given by people?	Traditional healing knowledge - being lost Irrigation side - formerly used for growing, crops & gardens Tree planting
How do you see the situation?	

TRANSECT WALK.

Date:- 6.6.95 From:- GRAVEL ROAD To:- RIVER

Participants:- Amand, Hamet Paulus

ANGLE

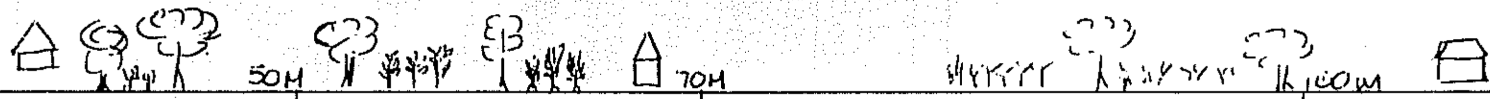
SOIL	'Ndombe heke' sandy clay quite good soil	Ndombe heke sandy clay	Darker soil with more clay	Darker soil with more clay	
TREES	Mbare Ugwi Usavi Musu Marara Mukekete Mugumba hambo Mupupu Mzaru	Mbara Mutundugu Ugongo Musu Usivi	Mpumutji Mungorwe Uge Cassia Mundiku Mbare	Mbare	Mukuukuli Bango
SHRUBS/GRASSES/ WEEDS	Ekonborora Edudinyime Muncasira Sihumbi Vandundu Enofu Singondo		grass in compound	Gwera - weed	Marenge roofing grass
LAND USE. (& HISTORY)	Fallow Not cultivated this year because of lack of rain. Millet field adjoining with sorghum, melon & castor	Goats grazing Football field. Land is fallow because of lack of rain	Unused fenced area	Not cultivated because of poor soil. Big weed problem	Grazing land vegetable garden water collection point. - maize, pumpkin, millet
LAND TENURE	An old residential area. Owner dead. Land inherited by daughter of George Herman	Belongs to 'son of soil' As uncultivated, anyone can graze here	Used to be inhabited by Evangelical priests. Now deserted	Owned by lady in adjoining house.	
HABITATION	House nearby	House nearby	Ruined houses Church adjoining - still used	House nearby.	
OTHER NOTES.	No manure used on this field. Adjoining DBC - fenced land where millet, maize and cabbages are grown. (Mainly Ovambo & Caprivi people)		Current Evangelical priest - Nico Kayanda. Windmill powered borehole still operating that built long ago. Tree planting (cassia, mundiku) began in 1970s. People brought trees from Rundu	'Gwera' grass a big problem in millet fields. Sorghum more resistant.	Vegetable gardens made and managed by women. Women are the ones who collect water.

A:

TRANSECT WALK.

Date: 5-6: 6: 95 — From: - Gravel road — To: - Inland

Participants: -



SOIL	Sandy Clay	More Sandy Soil	Sand Soil	Sand Soil
TREES	USIVI	Munkudi Hupupu Acasia [illegible]	More different trees than before	MAATPOL - old one have growing up for long years ago USIVI - KANDJA [illegible] UHAHE - MBUNZE [illegible] MANGUNI [illegible] weed
SHRUBS/GRASSES/ WEEDS	EROHIBOZORA ESUSU	Mukugho vegetable Mangeti	As before	
LAND USE (& HISTORY)	HAHANGU TILYA MUTETE HATANGU MAKUNDE CACANA MAIZE Sand Loam Soil NGWENA NOMBARE KANKUMBWE Wild fruit [illegible]	Grassland Millet Mellon Cowpea	- Mungoro - [illegible] - Ukerete. - Bush toilet - Follow grasses - Nompunda - Hungorwe Kankumbwe · Hupupu - Upako · Uhahe	Follow and Millet
LAND TENURE	Foreman's Grunfields		- Millet fields - Lots of follow land. · More uses year because of usivi	
HABITATION	Foreman's House		Some Houses See one	Apostolich Church and [illegible]
OTHER NOTES.	Foreman's House			

B.

TRANSECT WALK.

Date: - 6-6-95

Participants: -

From: - Inland

To: - tar road

	150 M	50M		100M		
SOIL	Very SANDSOIL	LeamSandsoil and ClayLeam soil - around the Pan.	BROWN SandSoil	Sandy	White Sandy	
TREES	- USIMBA - UGOZO - UZWE - UAGUVA - UPAKO -USIVI	NGWENA . old field	-USIVI. -UHANE. -MAUGUVA. -MUCE. -MUWOWO. -MUPUPU -MUGORO -Hupandu -Sikoro -Nambu-Unbu	- Mugoru - MUPANDA - MUZIVE - UGUNI - Mutundungu (Forest, MUZIE, ACACIA Trees)		
SHRUBS/GRASSES/ WEEDS			- ESUSU - NGWENA - HANGONDJE - NANDUNDU	MISUNZE - NGOGO (Mixed field) - NANONDWE		
LAND USE. (& HISTORY)	- firewood - Bush Toilet - NANEGNI - NAKWEVO - VIMAKA - Utunduungu - Ukarara - MWEGE - Hukuku - flood land poor with Sorghum	- MUKUKU - MUHAHA - UKEIELE - UHORUWA - MUTUMBO - Utundungu - Haruyeya - Tree - Field - PAN - acacia			Field	
LAND TENURE		- Sorghum - Millet - Pumpkin			500 M to Territorial	
HABITATION	Committee Resoses				Forest	
OTHER NOTES.		~~Many Anti-hills~~	Many Anti-hills	200M inland - small forest. Big trees - - MAUNGUVA - MUSIVI - Hupupu - Mahoho - No Mugoro - Mutunguru	MAUHUHE UGUVU MUNTUNDUNGU and Mupupu Mauzwe	Many ~~Shrubs~~ Grasses

TRANSECT WALK I GRAVEL ROAD TO TAR ROAD

TREE SPECIES IDENTIFIED

LOCAL NAME		USES
1) Uowi	Guibourtia Coleosperma	FRUITS, Medicine, MORTA, SPOON
2) Mumkudi	Boscia Albitrunca	FRUITS, Yoke, Root put in milk
3) Mupupu	Combretum Sp.	Palls, Yoke, handle for hoe, ax, Woos
4) Ugongo	Ricinodendron — Rautanenii	FRUITS, Wato ⟷ Paddle, Canoe, Beer, Making container
5) Ukeretel	Ziziphus Mucronata	FRUIT, Made Buscicets
6) Mugoro	TERMINALIA Sericea	Palls, Ropes, Yoke, Medicine, Tabacc
7) Ugwwa	Pterocarpus Angolensis DC. KIHAT (Sclero Caya hirrea)	Wato, Palls, sledges, Chairs Tables
8) Uhahi	Baikiaea Plurijuga or Rhodesian Teak	Palls, sledges, Woods
9) Uguni	STYCHNOS COCCULOIDES BAKER	FRUIT, MEDICINE
10. Mbunze	Baphia Massaiensis	BUILDING, MEDICINE
11. USIMBA	Dialium Engleranum Henriq.	FRUIT, Woods
12 UZWE	OCHNA PULCHRA HOOK Combretum sp.	COOKING OIL
13 UPANO		PALLS, WOOD
15. MUTUNDUNGU	BURKEA AFRICANA	PALLS, MORTA, SLEDGES, ladder
16. MUPARARA	Peltophorum africanum	PALLS, WOOD, DECORATION
17. MUKUKU	Rhus tenuinervis Engl.	FRUITS, BASKET MAKING
18. ~~MA~~ SIKWEWO	Diospyros Chamaethamnus mildbr.	FRUIT, MEDICINE
19. SIMAKA	GREWIA FALCISTIPULA ~~Vet~~ Schumann	FRUITS, ROPES
20. MUHAMA	TERMINALIA prunioides	PALLS, WOOD
21. YIHOROWA	Diospyros lycioides	BUILDING, TOOTHBRUSH, (SHAURA) medicine
22. MUSUMBAHAMBO	ACACIA FLECKII	FENCING, WOOD
23. MUCE		THRESHING STICK (TOOLS)
24. MUPANDA	Lonchocarpus Nelsii	YOKE, SLEDGES, PALLS, WOOD, ladder
25. ~~A~~ SIKOPA	GREWIA avellana Hiern	FRUIT, ROPES
26. NGOGO	GREWIA Flava	FRUIT, Make beer
27. MUNYONDO	DIPLORHYNCHUS CONDYLOCARPON.	PALL, MEDICINE, WOOD (Combretum ~~IMBERBE~~ WANRA
28. MUSU	ACACIA GIRAFFAE	PALLS FENCING (woods) Medecine - Heath, Sledge
	Acacia erioloba	

TRANSECT WALK 1 - GRAVEL ROAD TO TAR ROAD. 2

TREE SPECIES IDENTIFIED

		Uses
1. SIPUNDU	GREWIA RETENERVIS/ Flavescens	FRUITS, FISH TRIPS
2. MBANGO	Croton-Gratissimus	POLL, BUILDING, TABACCO, Medecine for Headick (Roots)
11. MUWOWO	Commiphora Angolensis	MAKING CONTAINERS
7. MUTUMBA	C. hereroense	POLES, WOOD. Medicine (~~Leave and roots~~)
13. MUNGARWE	Maytenus Senegalensis	FENCING. Medicine (Leave and Roots)
14. CASAVA	Manihot esculenta ~~Crantz~~	SHADE, FOOD
5. SIEWAMPUKU	Clerodendrum Umbellatum	fruit Medezyn
16. MUKARAKASA	VANGUERIA ESCULENTA	FRUIT
17.		
18.		
19		
10		

TRANSECT - GRAVEL ROAD TO RIVER - TREES

LOCAL NAME	SCIENTIFIC NAME	USES
1. MBARE	Hyphaene petersiana	BASKETS
2. MUKEKETE	Ziziphus MAHRONATA Willd.	FRUIT AND MEDICINE
3. MUPURU	Combretum Sp.	BUILDING.
4. MUGUMBA HAMBO	Psidioides welw. ACACIA FLECKII	FENCING.
5. NZARU		MEDICINE
6. UGUNI	~~ACACIA~~ Strychnos Cocculoides BAKER	FRUIT, LEAVES FOR MEDICINE
7. USUVI	Guibourtia Coleosperma (BENTH)	Fruit, " " " /MORTAR
8. MARORO		Fruit.
9. MUSUI	ACACIA GIRAFFAE eriolora	fruit for livestock
10. MUTUNDUNGU	BURREA africana Hook	MEDICINE POLES, accommodate caterpillar.
11. UGONGO	Risinodendron rautanenii Schinz	MANGETI NUTS, IN/ATO, CONTAINERS
12. MPUMUTJI	Euclea divinorum Hiern	MEDICINE, ROOTS TO CURE EYES FOR LIVESTOCK.
13 MUNGORWE	Maytenus Senegalensis	FENCING
14. UGE	Sclerocarya birrea (CAFFRA)	FRUIT, BEER.
15.	CASIA	SHADE (EXOTIC).
16. MUDIKA (CASAVA)	Manihot esculenta Crantz	SHADE, ~~RELISH~~ RELISH.
17 MUKULI-KULI	Rhus QUARTINIANA	- GROWS ONLY BY THE RIVER.
18. UNGANDU.	ACACIA NIGRESCENS	INLAND WHERE THERE IS WATER COLLECTED. FIRE WOOD.
19. MBANGO	Croton gratissimus - Burchell var. gratissimus	BUILDING, FOR SMOCKING.
20		

TRANSECT - GRAVEL ROAD TO ROAD RIVER —

SHRUBS, GRASS AND WEEDS

LOCAL NAME	SCIENTIFIC NAME	USES.
1. EROMBOLORA	SESAMUM SP.	FENCING.
2. EDIDINGIME		FISHING TRAPS.
MURCASIRA		LEAVES FOR RELISH AND FRUITS.
3. SIHIMBI		UNWANTED WEED.
4. NGWENA	Cynodon dactylon	" "
5. MARENGE	Vetiveria Nigritana	FOR ROOFING.
6. NANDUNDU		UNWANTED GRASS
7. EÑOFU		WEED, CAN BE HARVESTED
8. SINGONDO		UNWANTED WEED
9.		
NANGONDWE	A. stipitata	

APPENDIX 2 WILD VEGETABLE SPECIES

Local Name	Scientific Name
FRUIT	
Nongongo	Ricinodendron Rautanenii Schinz Mangetti nut
Maguni	- Strychnos Cocculoides Baker
Matu	- Strychnos Pungens Soler
Nonsimba	- Dialium Engleranum Henriq
Nonsa	
Nomaka	- Grewia Falcistipula Schumann
Nonpundu	- Grewia Retinervis / flavescens
Makweho	- Diospyros Chamaethamnus Milsbr.
Nonsivi	- Guibourtia Coleosperma
MARORO	- Annona Stenophylla Engl.
VEGETABLES	
Maliangwa	-
Mboga	- Amaranthus Thumbergii Moq.
Mutete	- Hibiscus Vitifolus Subsp. Vulgaris
Impungu	-
Mudika	Manihot Esculenta Crantz Cassava - for leaves
Ekundu	- Aloe Zebrina
Namayara	
Nakagora	
Engongo	
Ncaba	
Mukungo	- Amaranthus Thumbergii Moq Sp.
Epoko.	

APPENDIX 3 WILD FRUIT SPECIES

Facilitators: Hamet and Johannes. Participants JOSEF KAYAWA, PAULUS KUSUMO

TREE	NONGONGO	NOMBESI	NONSIVI	NONSA	•NONSIMBA/ MATU	MARORO
RANKING FOR FOOD	1 (15)	2 (13)	3 (12)	4 (10)	5 (8)	6 (7)
COMMENTS	EAT THE FRUIT IN A VERY BAD YEAR USE NUTS AS RELISH. MAKE ALCOHOL Ricinodendron rautanenii	EAT THE FRUIT BY COOKING IT. GOOD FOOD IN BAD SEASON *	MIX THE FRUIT WITH WATER, AND SOME TIME WITH VEGETABLE AND EAT AS RELISH SOME TIME YOU CAN POUND THE NUTS AND MAKE PORRIDGE Guibourtia-coleosperma	CAN EAT THE FRUIT AND THE NUTS AS RELISH MIX WITH WATER AS COOLDRINK Parinari curatellifolia	CAN EAT THE FRUIT MIX THE FRUIT WITH MILK EAT AS PORRIDGE. • Dialium Englerianum Henriq FRUIT CAN BE EAT RAW AND THE NUTS ALSO AS RELISH./CAN MIX WITH ~~WATER~~ MILK MAKE PORRIDGE BOTH	EAT THE FRUIT CAN MIX WITH MILK AND MAKE PORRIDGE. Annona stenophylla
FRUIT WHICH CAN BE STORED	✓		✓		✓	
LOCATION OF TREE FROM MASHARE	In village	5 km At Sambyu but on Angolan side	In village	>10 km INLAND	Nonsimba >10km Inland Matu In village	In village
TREES PEOPLE PLANT	✓		People have tried but don't succeed			
TREES PEOPLE WOULD LIKE TO PLANT		✓	✓	✓	✓ both	

Facilitators: Harnet and Johannes. Participants Josef Kayawa, Paulus Kubumo

TREE	MAKWEWO	•Nompunau/ •NOMAKA	UKERETE	MAKOPA	MUKARAKASA	MAGUNI NTYORE
RANKING FOR FOOD	7 (6)	8 (5)	9 (4)	10 (3)	8 (5)	8 (5)
COMMENTS	CAN EAT THE FRUIT MIX WITH MEAL MAKE PORRIDGE NUTS CAN BE FOUND MAKE FOOD. Diospyros-chamaetha-mnus	CAN EAT THE FRUIT. MIX FRUIT WITH WATER AND DRINK AS COOLDRINK. MAKE ALCOHOL. BOTH •Grewia retenervis/ Flarescens	YOU CAN EAT THE FRUIT (FRESH/DRY) MAKE ALCOHOL *	EAT THE FRUIT MAKE ALCOHOL Grewia avellana Hiern	EAT THE FRUIT MIX FRUIT WITH MILK AND EAT LIKE PORRIDGE Vangueria esculenta	BOTH FOR FRUIT MAKE ALCOHOL OF MAGUNI FRUIT Strychnos coccoloides. barker
FRUIT WHICH CAN BE STORED						
LOCATION OF TREE FROM MASHARE	3 km	Nompunau In village Nomaka 3 km	In village	>10 km (inland)	5 km	Maguni In village Ntyona >10 km
TREES PEOPLE PLANT						People have tried to plant maguni without success
TREES PEOPLE WOULD LIKE TO PLANT						

Facilitators: Harriet and Johannes. Participants

TREE	MUNDOWERE					
RANKING FOR FOOD	11 (2)					
COMMENTS	FOR FRUIT *					
FRUIT WHICH CAN BE STORED						
LOCATION OF TREE FROM MAGHARE	4 km Other side of tar road					
TREES PEOPLE PLANT						
TREES PEOPLE WOULD LIKE TO PLANT		Also mango, banana, papaya, citrus (seen at Soubya Mission)				

APPENDIX 4 CHECKLIST USED FOR FARM AND ENTERPRISE PROFILES

FARM PROFILE
Date:-
Facilitators -
Household members interviewed:-

HOUSEHOLD AND FARM DESCRIPTION (see also map)

HISTORY & TRENDS

ENTERPRISES
Crops:-

Livestock:-

Other:-

PROBLEMS NOTED

ENTERPRISE NOTES

Farmer: -
Facilitator: -

nse: -

ALENDER OF ACTIVITIES

NAGEMENT METHODS

PUTS / OUTPUTS (expenses, yield etc)

PERIMENTATION (different varieties, management methods)

URCE OF ADVICE

OOLS AND EQUIPMENT

STORAGE METHODS

MARKETING

SYSTEM INTERACTIONS WITH OTHER ENTERPRISES

CONSTRAINTS / PROBLEMS

STRATEGIES TO OVERCOME THESE CONSTRAINTS

PLANS FOR FUTURE DEVELOPMENT OF THIS ENTERPRISE