INDIGENOUS SOIL AND WATER CONSERVATION PHASE 11 UGANDA

A PARTICIPATORY RURAL APPRAISAL (PRA) IN BUBALE SUB- COUNTY KABALE DISTRICT, UGANDA

MINISTRY OF AGRICULTURE ANIMAL INDUSTRIES AND FISHERIES (MAAIF) AND VRIJE UNIVERSITY, AMSTERDAM

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GLOSSARY

AAO	Assistant Agricultural Officer
CDCS	Centre for Development Cooperation Services
DAO	District Agricultural Officer
EMCBP/NEAP	Environment Management Capacity Building Project/ National Environment Action Plan
ICRAF	International Centre for Research in Agroforestry
ISWC	Indigenous Soil and Water Conservation
LC	Local Council
MAAIF	Ministry of agriculture Animal Industry and Fisheries
PAP	Poverty Alleviation Project
PRA	Participatory Rural Appraisal
UFSI	Uganda Food Security Initiative

ACKNOWLEDGMENTS

The team would like to acknowledge the valuable support given by the District Agricultural Officer and the Local Administration staff of Bubaale Sub -county who gave off their time and actively participated almost all throughout the PRA process.

COVER PHOTO

Turning compost for soil fertility improvement, Bubale Sub county.

PARTICIPATORY RURAL APPRAISAL REPORT
BUBALE SUB-COUNTY KABALE DISTRICT

SUMMARY

Before the expansion of the activities of ISWC 11 project in the more wetter parts of Ka bale, a participatory rural appraisal (PRA) was conducted during the months of March and April 1998 in Bubale sub- county. One of the objectives of the exercise was to access the extent of innovativeness in soil and water conservation by the farmers in the area.

Through using participatory rural appraisal techniques- like individual and group discussions, farm visits, transect walks and workshops, a multi-displinary team undertook the gathering of the information contained in this text.

Bubale sub-county is found in Rubanda county which is located in the center of Kabale District. The area is composed of flat topped hills alternated by U- shaped valleys. The rainfall is over 1000mm , bi-modal with peaks in April and November. The soils are generally Ferrallic, moderately fertile and deep.

The sub-county is the most densely populated in the District with 39904 people. The majority of these people especially the women are engaged in crop production, growing a variety of crops. Most crops are grown for both food and income. Land in the area like in other parts of Kabale is highly fragmented. Land is individually owned by both men and women . A person owning a piece of land is free to develop, sale or lease it. There is a general decline in crop production in the area since independence. Food production is poor and many people are malnutrised. Livestock are less important in the area than crops mainly due to scarcity of land, though integration of livestock into the cropping system is gradually increasing.

Little integration of tree growing into the farming system prevail in the area. Scattered woodlots of *Eucalyptus spp* and black wattle *(Acacia mersii)* on marginal lands and boundaries are the only common agroforestry activities.

Loss of soil fertility, soil erosion, overgrazing and land slides are considered to be the major soil problems in the area. A range of measures in place to address these problems include; crop rotation, ridging, fallow strips, strip cropping, mulching and incorporating trash material into the soil.

During the PRA, an initial eight farmer innovators to collaborate with were identified. These are to be verified as true innovators during the course of the project.

CHAPTER ONE

INTRODUCTION

1.1 Background

In order to act as an opening to a more holistic understanding of the social and technical constraints to land use and soil conservation systems in Bubale, a PRA exercise was a pre-requisite. The exercise was sought to be a useful tool in highlighting the level of innovativeness by the farmers and access what interventions can be made in a totally new area with quite different agro-ecological setting compared to Kamwezi where the first phase of the project was operating.

This PRA is the one of the major activity of the Uganda sub-component of the project, " Indigenous Soil and Water Conservation 11", which is being implemented in six other African countries of Tanzania, Ethiopia, Burkina Faso, Cameroon, Tunisia and Zimbabwe.

The project is funded by the Dutch government through a collaborative agreement between the Centre for Development Co-operation Services (CDCS), in the Free University of Amsterdam, and the Ministry of Agriculture Animal Industry and Fisheries (MAAIF), Uganda .

In the first phase, the major activities were to **evaluate** the indigenous land conservation husbandry practices and **develop** the most effective and widely used ones in two parishes of Kamwezi subcounty. Also carried out was the **dissemination** of practices identified as promising all of which were concentrated in only one network of collaborating farmers.

During phase 11, the project expanded from the initial one network in the parishes of Rwenyanje, Kibanda and Kigara to cover the remaining parishes of Kamwezi sub county (network B), and the neighbouring Bukinda sub county (network C). A need to expand the project activities to cover a more wider area was evident from the attractions by the non collaborating farmers in and outside Kamwezi to the collaborating farmers. Thus, it was thought feasible to include the wetter parts of Kabale District. With the help of the District Agricultural Office, Bubale subcounty was identified as the potential area for the expansion of project activities in the more wetter western parts of the District.

The major objectives of ISWC 11 project are:

- to identify adaptable indigenous and introduced soil and water conservation technologies and try to improve their effectiveness through a process of experimentation involving farmers, researchers, extension and NGO staff.

- to initiate and support research on Indigenous and Introduced SWC practices, promote the dissemination of improved practices and other relevant information and create or support a lobbying platform to show policy makers that building on ISWC practices is a rational and effective option.

- to increase the knowledge base of ISWC in Africa through , additional case studies or more in-depth studies of existing ISWC cases.

The outputs expected from the project are:

* identification of existing Indigenous or traditional conservation systems
* characterisation and performance of the identified ISWC techniques
* promoted use of the different practices in order to sustain or increase land productivity.

1.2 Methodology

The techniques adopted in this PRA were based on participatory approaches which enabled acquisition of detailed information leading to an understanding of the farming practices in Bubale sub county.

A multi- disciplinary team[1] held extensive discussions with local leaders. groups. individual farmers. through farm visits. village transect walks and workshops.

A reconnaissance mission was first made to the District headquarters and Bubale sub-county and made contacts with the local leaders and made logistical arrangements. Two parishes of Bubale and Nyamiyaga were randomly selected and used as sample areas for the study.

The team consulted and discussed individually with District Government and Non-Government organisations officials for both primary and secondary data. The government officers consulted included: the District Agricultural Officer. Deputy District Agricultural Officer. Deputy District Executive Secretary. and District Economist/ Planner. The active NGOs in Bubale subcounty consulted include. Africare. ICRAF. CARE. and the Heifer Project of the Church of Uganda.

This PRA set out:

- to study the agro-ecological areas in Bubale sub county
- to describe the farming systems in the area and how they relate to soil and water conservation technologies
- to identify and/ or confirm appropriate indigenous or introduced SWC techniques that will be taken up for research in Bubale sub county as part of the ISWC 11 project activities.
- to identify innovators to form network D.

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Photo 1 : PRA team carrying out a transect walk though the study area

Photo 2: A Group discussion to verify PRA findings held at Bubale Sub-county Headquarters.

CHAPTER TWO

NATURAL ENVIRONMENT

2.1 Location

Bubale subcounty is located in Rubanda county. Kabale District in south western Uganda. The subcounty borders Kabale Municipality to the south east. Hamurwa in the north and Rwamucucu (Rukiga County) in the east. On its southern boarder is Kitumba (Ndorwa County). south western part is Bufundi and in the west is Muko subcounty (Fig 1 and 2)

2.2 Topography

The area is mainly composed of flat topped hills alternated by u-shaped valleys. The valleys lie at altitudes as low as 1200m and the hill tops rise to over 2000m (EMCBP/NEAP 1994).

2.3 Climate

2.3.1 Rainfall

The rainfall pattern in Bubale sub-county is bimodal with a long rainy season that starts from mid March to end of May and short rains come in September to middle December. From around the middle of June through July and August up to the middle of September, the area experiences the driest time of the year. The mean annual rainfall is about 1000 mm (DAO's Office).

2.3.2 Temperatures

Bubale sub county has a relatively lower temperature compared to the rest of the District. The sub county has a mean temperature of 16° (ranges between 9°C and 23°C), while the mean for the whole District is 16°C (DAOs Office .1997).

2.4 Geology, Geomorphology and Hydrology

Bubale subcounty is underlain by the oldest rock system, the precambrian age Karagwe-Ankolean system which consists of swamp deposits and alluvium (pleistocene), Shales and Phyllites, Quartzites, intercalated Stales and Schites (Table 1 and Figs 3 &4). Bubale and Nyamiyaga parishes (study areas) possess the general local relief in much of Kabale district of upland surfaces with wide open valleys and rounded by interflures. Nyamiyaga parish is composed of six hills while Bubale parish in located on one hill. There are two streams that run through the area and one swamp.

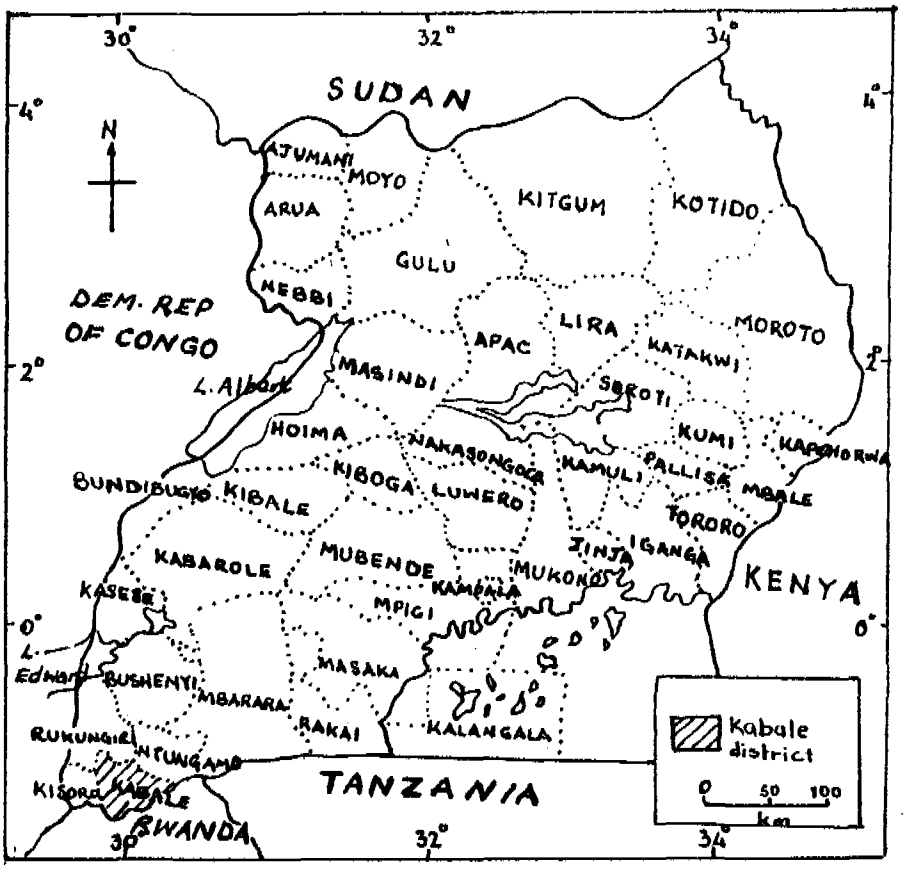


Figure 1 Location of Kabale with Uganda

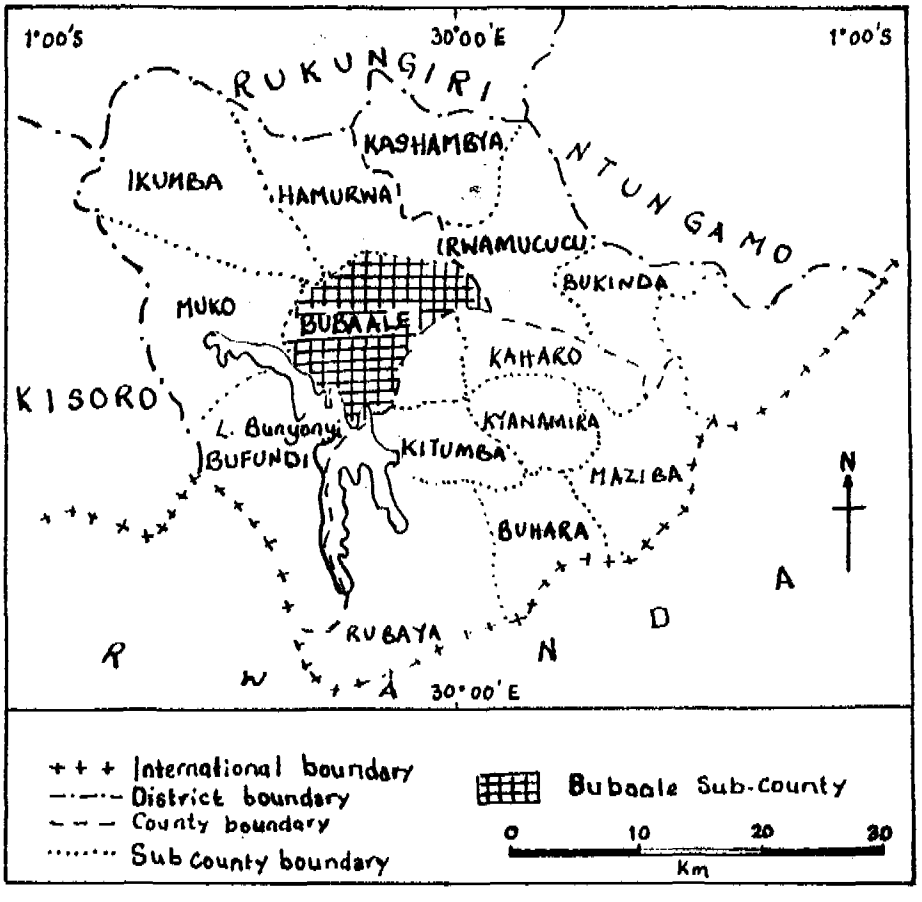
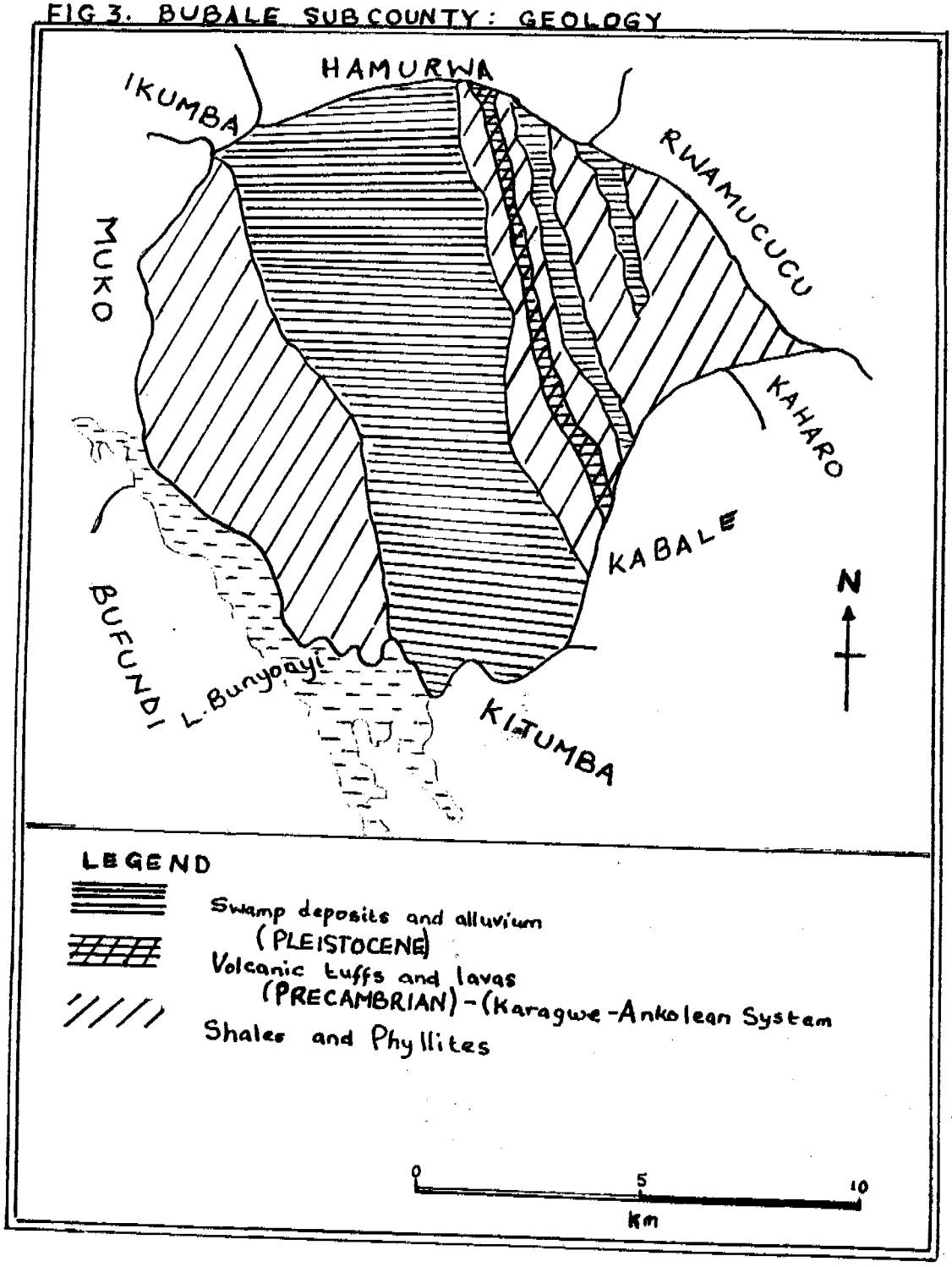


Figure 2 Location of Bubale with Kabale District

FIG 3. BUBALE SUBCOUNTY: GEOLOGY



2.5 Soils

Soils on the hill sides are generally Ferralitic and are in the advanced stage of weathering with little or no mineral resourses to draw on. Nevertheless, Table 1 shows that the soils are productive which can be attributed to adequate depth and presence of a humic top soil.

There are largely three types of soils; clay-loam. peat clay and Alluvium peat (National Environmental Information Centre). Alluvium sedimints occur in valley bottelms typically occupied by hydromorphic soils.

2.6 Vegetation

According to Jameson 1970, Kabale District has a grass-savanna type of vegetation. However from the environment management capacity building project report 1994 and what was observed in the area, over 90% of this vegetation has been removed and put under crop fields, with scattered papyrus observed in valleys. Figure 5 indicates that montane thicket type of vegetation is also dormant.

2.7 Ecological Zones

The Sub-county is primalily mountanous and hilly. Intensive activation farming takes place on the hill slopes and intensive is grazing practiced in the valley bottoms. Some pastoral wild grazing takes place at the hill tops.

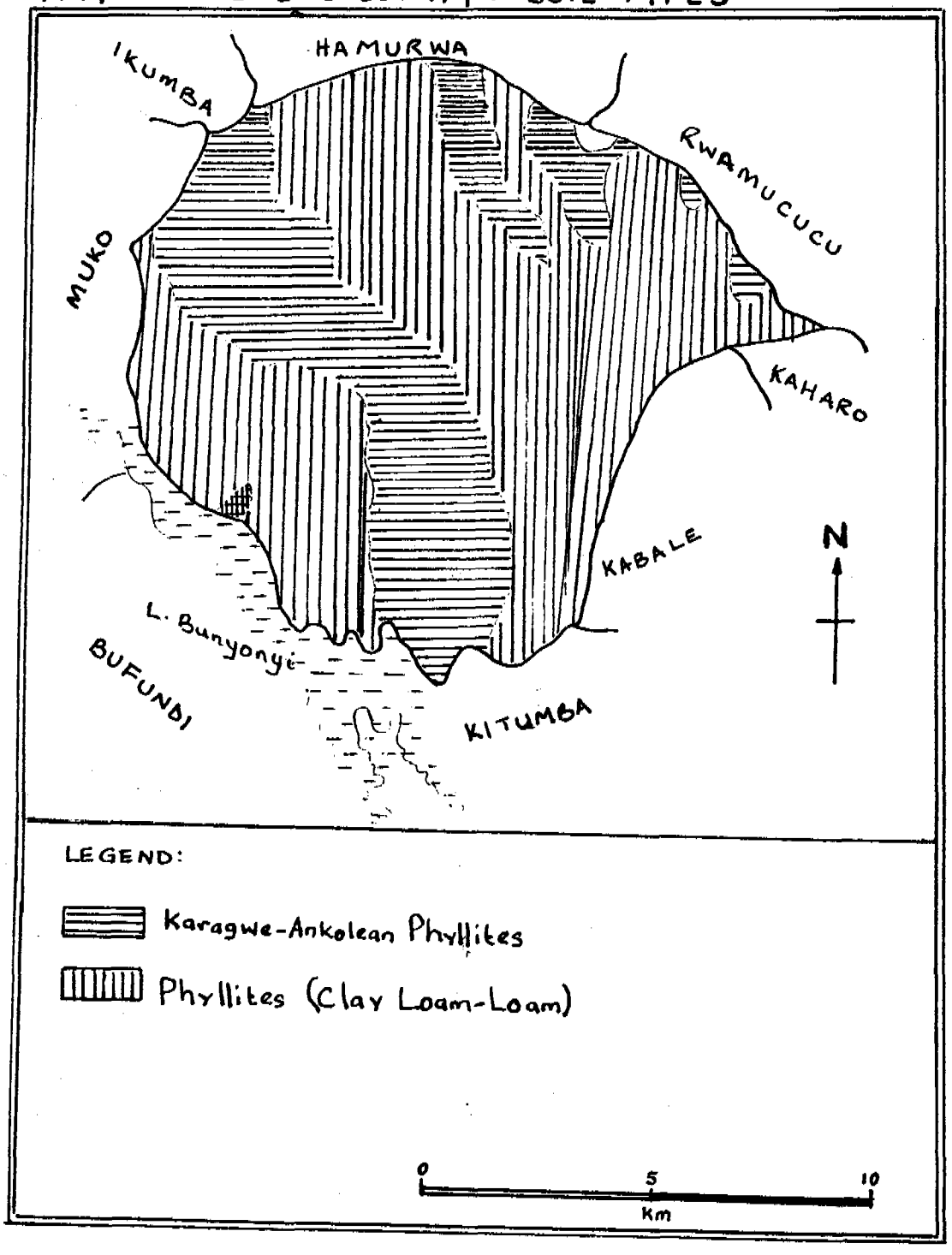
Table 1: Soil Characteristics of Kabale District.

Soil Unit	Parent Rock	Dominant Soil Type	Soil Colour and Structure	Soil Ph	Organic Carbon %	CEC[1]ME	B.S[2] (%)	Productivity
Kabale Catena	Karagwe-Ankolean Phyllite	Kabale'dark horizon latosols, Brown loams overlying reddish brown stony	Dark brown (7.5YR,4/2) to reddish brown (5YR, 6-7/4) sandy to small quartz pebbles	4.8 to 4.7	1.6 to 4.0	14.7 to 16.5	8.4 to 14.9	Medium to high
		Kabale ferruginous Brown to Yellow-brown sandy loam over massive conglomeritic ironstone	Dark brown (7.5YR,3/2) to bright yellow red (5YR, 5/6.8); sandy loam to round and subangular crimson ironstone	5.7 to 5.9 medium acid	3.7 to 4.5	36.9 to 45.5	75.3 to 83.7	medium to high
		Kabale "Yellow" Brown humose loams, on yellowish to orange brown brashy loams which may contain murrum	Dark brown (7.5YR,4/2-4) to reddish-yellow (5YR, 6/6); friable loam to very compact concretions in the subsurface.	6.2 to 5.8 slightly acid to medium acid	1.4 to 6.9	31.7 to 44.7	83.3 to 86.3	medium to high
		Kabale "Hillwash" Dark brown almost black humose loam on reddish or yellow brown loam	Dark brown (7.5YR,3-4/2) though greyish-brown (10YR,5/2.3) to light yellowish brown (10YR,5/2-3) to light yellowish brown (10YR, 6/4-6) humose soil through crumby loam to compact and moist clay loam	6.4 to 6.8 slightly acid	2.7 to 13.7	32.0 to 37.5	87.5 to 88.3	medium to high
		Kabale "red-pink" Brown or reddish brown humose loams overlying uniform pale brown red to pinkish white loams which may contain murrum at any depth	Reddish brown (5YR,4/2-3) to yellow red (5YR,4/6); angular quartz or rock fragment to loam full of ironstone and abundant rock fragment in the subsurface	6.1 to 5.3 slightly acid to strongly acid	2.3 to 4.7	ND	ND	medium to high

1 = Cation exchage capacity
2 = Base saturation

Source: Adopted from Kabale District Environment Profile

FIG4.BUBALE SUB COUNTY: SOIL TYPES



CHAPTER THREE

3.0 SOCIO-ECONOMIC ENVIRONMENT

3.1 Population

Kabale is one of the most densily populated districts in Uganda (246 persons per square kilometre compared to 82 persons per square kilometre for National), with total population of 417218 people. Bubale sub-county onthe other hand has a population of 39904 people with a population density of 321 persons per square kilometre among the most densily populated sub-counties in the District (Table 2).

Table 2: Population of Bubale sub county by parish and sex

Parish	Male	Female	Total
Bubale	2345	2649	4994
Nyayanga	1574	1769	3343
Butoobere	2376	2702	5078
Bwindi	2924	3376	6300
Kagarama	3984	4674	8658
Kashenyi	1436	1661	3095
Nagarama	2161	2379	4540
Muyanja	1927	1969	3896

Source: 1991 Uganda National Population and Housing Census.

3.2 Labour Availability

Bubale has an average household size about 7 people. While this would imply that there is enough labour in the area, however, the community reported that lack of labour is one of the constraints to agricultural production. As a matter of fact it was found out from the study community that most labour for agriculture is provided by women while men go to look for employment elsewhere and children are in school (Table 3).

Table 3: Labour contribution to Agricultural Activities by Gender

Activity	Gender
Bush clearing	Men
First ploughing	Mainly women, rarely men
Second ploughing	Mainly women, rarely men
Manuring	Women
Planting	Women
Weeding	Women
Harvesting	Women and men
Transporting	Women, Children and rarely men
Drying	Women
Threshing	Mainly men, rarely women
Storage	Women, rarely men
Selling	Women

3.3. Nutrition and Health

The food situation in the area is poor with the majority of the households getting only one cooked meal per day as reported by the local community. Bubale is one of the areas worst hit by malnutrition as perceived from the District economist/planner and AFRICARE (persinal communicatiion). This was one of the reasons why AFRICARE started its Uganda Food Security Initiatives (UFSI) project in the area.

The diet is largely composed of sweet potatoes, Irish potatoes and Sorghum. It was again reported that the bean crop is being threatened by root rot which might lead to its extinction in the area and be replaced by Doodo (*Amaranthus* spp) as the main saurce. Also present food staffs in some few homes are Matooke, Field peas, Pumpkins, Cabbages and Yams. Meat and milk are served occasionally in the homes as these are expensive or scarce (sh.1500/kg and sh. 300/litre respectively)

Malaria and worms are the common health threats. The sub-county has one Government health centre (Grade 111) and one private clinic both in the same vicinity of Bubule parish. The availability of clean water is a major problem in the area, with most households drawing supplies from north Kiruruma (commonly called Rujuga) and Nyakiharo streams that run the sub-county.

3.4. Land tenure

Land ownship in Bubale sub-county like in ther parts of Kabale District predominantly freehold. Freehold in Uganda refers to land ownership whereby the person holding the land is free to develop, sale or lease it. Other tenure systems in place are leasehold and customary land. Social institutions are built on public land (Government Land). Customary land: In this category, land is acquired without conditions attached and passed onto the children.

Leasehold: The land user aquires land from the owner and pays rent for a period of time (most common is 49-99 year)

Land Ownership by Gender

Land in the study area mainly belongs to men although women who are either singles or wealthy also do own land.

3.5 Infrastructure

Bubale subcounty has one first class murrum road (Kabale-Kisoro road), running through Bubale parish, braching from this road to the interior of the study area are few seasonal feeder roads. Electricity extends from Kabale municipality to the church near the sub county headquarters but there is no telecommunication facilities in the area.

3.6 Social Institutions

Table 4: Social institutions in the study area

Institutions	Number
Churches (2 denominations)	10
School	5
Primary	2
Secondary	0
Tertiary Institutions	1
Gevernment Health Centre	1
Private clinic	

As indicated in the table above, the area has enough churches and schools, but poor health facilities.

3.7 Development Institutions

3.7.1 Local Administration

Table 5: Local Government Institutions

Level	Name	Political structure	District adminstration	MAAIF
District	Kabale	LCV	District Executive secretary	
County	Rubanda	LCIV	County chief	
Sub-county	Bubale	LCIII	Subcounty chief	
Parish	Nyamiyaga	LCII	Parish chief	
Parish	Bubare	LCI	Parish chief	

3.7.2 Non Government Organisations

The problems of prevailing in the area has attracted NGOs and currently 3 NGOs are operating in the area with different programs.

1. Church of Uganda Heifer Project: Focuses on the improvement of income and nutritional status by providing zero grasing cows.
2. AFRICARE: The main objective of this project is to bring about increased food availability and utilization in the area through soild conservatio, feeder roads maintanance and supply of inputs.
3. ICRAF: Specifically for training of farmers on now to raise tree seedlings. The project provides seed as an incentive to farmers to raise tree nurseries.

3.7.3 MAAIF's role in the area

The major role of the Ministry, through the Ministry Agricultural department, is extension. The department also provides improved seed to farmers e.g climbing bean seed and irish potato sets. There is no specific program SWC other than general extension.

Farmers organisations; most farmers are organised in groups and there are presently 7 farmers groups in the parishes of Bubale and Nyamiyaga. The majority of these groups are women's groups whose main purpose is to pool labour during peak periods. However, there are other objectives like saving and borrowing money, accessing credit under which these group were found.

3.8 Credit

Credit is not easily accessibly to farmers due to lack of security required by commercial banks coupled with the beaucracy in the Government credit insititutions like Poverty Alleviation Project (PAP) and *Entandikwa* scheme that are in the area. Furthermore, the method of revolving fund applied by PAP and *Entandikwa* to give out credit is a very slow process for every farmer to benefit from credit facilities. Farmers in the subcounty especially women have formed saving and credit groups through which they save and give. This has become the major source of credit in the area.

CHAPTER FOUR

4.0 Farming Systems

The farming pattern adopted in an area is influenced by climate, soils and topography. Kabale District has adopted a farming system dominated by crop production because of its good climate, once very fertile soils and high altitude.

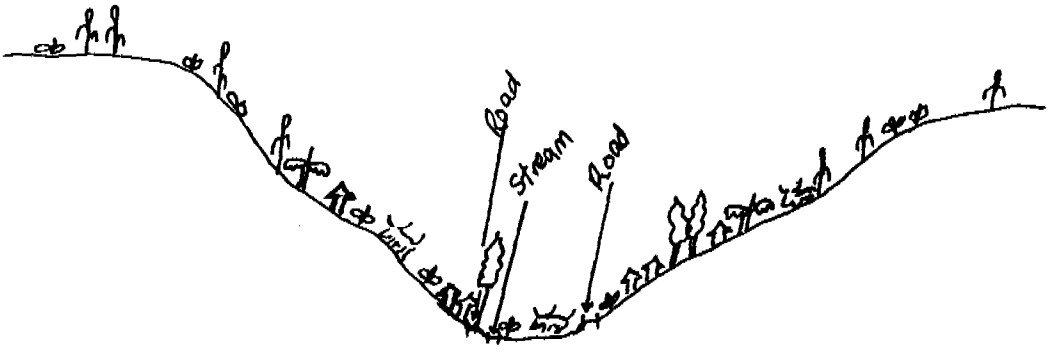
4.1 Land use

In Bubale sub county land is used for;

- Crop production
- Livestock production
- Tree planting
- Settlement
- Mining (sand excavation).

A transect through Nyamiyaga and Bubale parishes revealed how different parts of the land is being utilized in the study area.

VILLAGE TRANSECT: NYAMIYAGA-BUBALE PARISHES



	Hill top	Upper slope>40%	Mid slope 20-30%	Lower slope 20-35%	Valley	Lower slope	Middle slope	Upper slope	Hill top
Settlement	None	None	Few	Many	None	Many	Few and scattered	Rare	None
Crops	Sorghum S/potato	Sorghum S/potato F/peas	Sorghum S/potato F/peas Tobbaco Banana F/millet	Sorghum Tobbaco I/potato Beans Banana F/peas Pumpukin	Beans I/potato Cabbage Sorghum Maize	Sorghum S/potato Beans Cabbage	Sorghum S/potato Beans Banana	Sorghum S/potato F/peas F/millet I/potato Banana	Sorghum F/peas S/potato
Trees/ Agroforestry	Few Eucalyptus	V. Very few	Very few scattered woodlots; local spp e.g Biko Mitugunda	Eucalyptus and Black wattle woodlots scattered Erithonia and Markhamia	Few Eucalyptus Woodlots	Few Scattered Eucalyptus and Black wattle	Scattered Eucalyptus and ficus	Rare scattered trees in homesteads	None
Live stock	Pasture	Limited grazing in fallows	Light grazing on fallow plots	Cattle, Pigs, Goats, and chicken	Dairy cattle paddocks	Few cattle, sheep and goats	Many cattle, chicken and ducks. Few sheep and goats.	Few animals	None
Soils	*Orucucu* Brown, V. Friable and consistant Sand Loam.	*Orucucu* Brown friable, deep and fertile. sand loam	*Enombe* Brown, friable, sticks when wet Sand caly loam	*Enombe* Dark brown, very friable and slightly stony Sand clay loam	*Orufunjo* Black, heavy, sticky, cracks wetdry peaty clay loams	*Enombe*	Manuring crop rotation Terraces	*Orusheny i*	*Orucucu*
Soil and water conservation	Fallowin Ridges	Terraing fallowing Ridges manuring	Fallowing Terracing Ridges	Fallowing Terracing Manuring	Ridges crop retation, green manuring "Forced" fallowing	Manuring crop rotation Terraces some stabilized with Napier grass		Fallowing crop rotation Terraces	Fallowing crop rotation

Land in Bubale subcounty, like in all parts of Kabale District is highly fragmented. On average each household owns 5 scattered plots of sizes (ranging between < 1/8 Ha - 1Ha). The average distance to the furthest plot from the homestead is about 5 kilometres (3 miles) whereas the nearest plot is within an average distance of 0.8 kilometres. Land fragmentaion in Kabale is widely perceived as a mahor constraint to land development. This is even understood by the local community. However, this is not without advantages as expressed by the local community (Table 6).

Table 6: Advantages and Disadvantages of land fragmentation in Bubare.

Advantages	Disadvantages
1. High soil fertility in one part compesates for low fertility in another. 2. Safeguards against disasters like hailstorm, outbreak of pests and diseases. 3. Different soild types in different locations ensures diversification of crops grown.	1. Walking long distances wastes a lot of time and is very tiresome especially during harvesting. 2. Difficuilt to apply manure to distant plots 3. Theft of produce from distant plots.

4.2 Crop Production

Most crops grown are for both food and income. These differs in their importance for food or cash as ranked in the table below.

Sweet potatoes are grown throughout from the hill tops to the valleys whereas other crops are specific to certain slopes. For a example, Field peas (Amashaza) were observed on hill tops and upper slopes while cabbages were found only on lower hill slopes and valleys.

Table 7: Crops grown in Bubale in order of importance to the people

	Cash crops	Food crops
1	Sweet potatoes	Sweet potatoes
2	Sorghum	Beans
3	Irish potatoes	Sorghum
4	Trees	Maize
5	Cabbage	Irish potatoes
6	Maize	Cabbage
7	Tomatoes	Bananas
8	Pyrethrum	Egg plants
9	Field peas	Field peas
10	Tobacco	Tomatoes
11	Wheat	Onions
12	Yams	

The common variety of sweet potatoes grown in Kabale is *Kalebe* and is liked because of its high yielding and quick maturing characteristics. The dominant Sorghum variety is *Mutale* which is grown for both food and beer brewing.

The prevailing prices for the most common cash crops in the two parishes are shown in Table 8 below:

Table 8: Prices of the most common cash crops in the sttudy area and Kabale town

Crop	Unit	On-farm	Local	Urban (Kabale)
Sorghum	Kg	200	500	600
Sweet potato	Basket	1000	1500	1800
Irish potato	Basket	3000	3500	3500
Field peas	Kg	650	800	1000
Tobacco	Bundle	10,000	11,000	12,000
Eucalyptus poles	1 pole	900	1000	1200

Source: DAO's office plus community study (1988)

Although crops like Sweet potatoes, Field peas and Sorghum are planted in pure stands, intercropping is the most common practice. Examples of intercrops are Maize/Beans and Irish potatoes, Sorghum/Beans and Irish potatoes. Crops are produced on rotational basis all year round. The study community perceived a general decline in the production of crops in the area . The community observed that before independence and immediately after, alot of food was obtained. The reasons given for the high production during the early years are summarised below;

- Labour enough
- Fallowing for longer periods was possible
- The soil had high fertility levels
- Presence of high yielding varieties.

Though literature indicated a fractuation in estimates of the quanties of crop (may be due to increased acreages planted by farmers) with time , the study community expressed that the crops from cultivated plots have gradually reduced to low levels that they presently perceived that little is being realised from the land. The major reasons given for this decline with time were; (1) Soil erosion (2) Low soil fertility (3) Pests and diseases.

4.3 Gender Roles in Crop Production

In Bubale sub-county, labour for crop production is mainly contributed by women. However, bush clearing and threshing are exclusively done by men (Table 9). It was reported that women's contribution in the farming activities is about 70% . Interestingly, unlike in most parts of country, women in Bubale make decission over proceeds.

Table 9: Farm activites by gender:

Activity	By who
Bush clearing	Men
First ploughing	Women
Second ploughing	Women
Planting	Women
Weeding	Women and children
Harvesting	Women, chidren & men*
Manuring	Women
Transporting	Women and children
Threshing	Men
Drying	Women
Storage	Women
Selling	Women
Grinding	Women
Soaking	Women
Brewing	Men
Grazing	Children, Men, Women**
Building	Men
Bee keeping	Men

* Men for only the case of Sorghum

** very few women do carry out this activity.

4.4 Livestock Production

Several types of livestock are kept for various reasons as illustrated in the table below.

Although cattle, goats, chicken and pigs are to some extent common, livestock in general is less important in the area compared to crop production mainly due to scarcity of land.

Local cattle breeds are dominant with few exotics kept on zero grazing and reclaimed swamps like Kiruruma. Very few improved breeds were observed.

Livestock are managed on extensive system whereby grazing takes place on fallowed plots and /or uncultivated land. Imtegration of livestock into the cropping system is gradually increasing. For instance, compost making using crop residues, cowdung, goat and poultry droppings for soil fertility improvement is common in the area.

Intensive farming practices such as zero grazing are rare. The study community attributed this to lack of skills, initiative, as well as social values such as dowry* attached. The community highlited that, in general, livestock numbers are on a decline due to lack of pasture, grazing land and frequent outbreaks of pests and diseases.

Table 11: Showing Livestock Production and Respective Importance in their order of importance.

Livestock	Benefit
Cattle	Dowry Milk Manure Money Ghee Blood and Meat
Goats	Meat Cash Dowery
Chicken	Sale
Sheep	Meat
Rabbit	Meat
Pigs	Meat
Duck	Meat

* During payment of dowry, livestock numbers as opposed to quality are considered.

4.5 Tree Planning and Agroforestry

The study community expressed general knowledge about tree planting and benefits associated with the trees (Table12) whereas this would be associated with sensitisation in the area by agencies like ICRAF, CARE and the Ministry of Natural Resources. The community emphazed self iniatiative out of perceived needs to solve problems such as landslides wood fuel and timber shortage.

Despite such awareness, little integrated of tree growing into the farming systems prevail in the area. The common agroforestry activities in the area are: Scattered woodlots of eucalyptus spp and black wattle (*Acacia Merssii* on margianal land, boundary planting with *Eucalyptus, cyprus* and *Erythrina abyssinia* and trees on farmland most especially around homesteads which display poorly developed home gardens[+] .

As regards gender roles in tree planting and tree ownership the study community reported that both women and men plant and own trees but men dominate trees commonly planted are indicated below:

Table 12: Common trees in Bubare and their benefits

Tree	Benefit
Eucalyptus	Timber Poles Charcoal Firewood Cash
Black wattle	Charcoal Poles Cash Staking (Beans, Tomatoes)
Cypress	Timber Fire wood Hedge
Cariandra	Fodder Firewood Soil fertility
Makhamia	Timber Poles Cash

Although the tree population in the area was reported as increasing, multipurse Agroforestry trees such as Calliadra, Querialla, Luccinia spp, and Sesbania spp particularlly for soil fertility restoration are still very few. Many agroforestry trees including fruit trees were introduced inthe area by the extension agencies as ICRAF but due to lack of planting materials and high incidences of pests and diseases, very few are planted.

[+] Home gardens are examples of agroforestry practices comprising multistory trees, perrenial crops and / or livestock sited near homesteads (Nair, 1988)

CHAPTER 5.

5.0 STATUS OF SOIL AND WATER CONSERVATION

Bubale sub-county like most of Kable District, has conspicous soil conservation structures; the bench terraces. The construction of these terraces date way back in the colonial era. The benches developed as a resuilt of leaving grass strips on contours at various intervals along the slopes and stabilization of bunds with napier grass. The bench terraces vary between 15m to 30m wide .

Despite these structures the study community enumirated several problems they experience with their land. These are outlined below:

1. Loss of fertility
2. Soil erosion
3. Overgrazing
4. Land slides

Continous cultivation onteh small plots with no rest periods allowed between seasons, has led to reduction in soil fertility levels to such an extent that the soil productivity has been observed by the farmers to have gone on reducing to lower levels with time.

During opening up of land for crop production at the beginning of the rains, the loosened sandy soils on most slopes have continued to be eroded down the slopes. This has been coupled by the common practice of digging while pulling the soil down the slope leading to accumulation of much soil on the lower side of the terrace benches.

Farmers indicated that, during the 1970s, there was indiscriminate farming with no measures by the Government to re-enforce bye-laws such that most of the napier grass which was planted to stablize the terraces was removed. This has led to most terraces collapsing to the neighbouring plots during heavy rains (land slides) and during fallow periods as cattle are continously grazed on the small plots.

A range of mesures were given as being in place to address the above problems and the study community priotised them as indicated in Table 13. Crop rotation, ridging and burrying of weeds during primary cultivation are the most common practices.

5.1 Most common Soil and Water Conservation practices

5.1.1. Crop rotation

Farmers have continued to produce crops on the small scattered plots because they observe a cetain cropping sequency in the area. Growing of crops is done on the various plots ar specific times of the year in an orderly manner. A common planting sequency given by the study community is; sorghum follwed by sweet potato followed by a mixture of maize/field peas/and bens. The next crop could be Sorghum or Irish potato depending on the position of the plot on the slop. If the plot is located in the valley, the following crop is Irish potato and when the plot is found in lower or middle slopes, then miture is followed by Sorghum.

5.1.2 Ridging

Ridging is done mostly for the sweet potato and Irish potato crops. At lower, middle, upper and hill tops, the crop is sowed on ridges varing between 1.5m and 2m long running across the slope. In valley bottoms the ridges are longer and wider because of the presence of much water. Two reasons were given for making small ridges;

(I) the practice is less labour demanding
(ii) it limits rodent attack.

5.2 Other soil and water conservation practices observed

5.2.1.Mulching The crop residues especially Sorghum stores is utilised by many farmers to mulch their plots especially for Bananas and vegetables.

5.2.2 Manuring This is a common practice by many farmers. The intensive type of crop production practiced in the area has led to a decrease in soil fertility which calls for intensive manauring. (back photos).

5.2..3 Burying weeds and trash

This practice is carried out by many farmers as they prepare their fields during primary cultivation. The practice is most common in valley bottoms where farmers incorporate weeds and trash into the soil to make ridges for sweetpotato and for growing of vegetables.

Table 13:. Control measures to soil problems in order of common occurancy in the study area

Practice	Remarks
1. Manuring	Indigenous
2. Crop rotation	Indigenous
3. Ridging	Indigenous
4. Burrying weeds whole ridging in swamps	Indigenous
5. Controlled Grazing	Introduced
6. Grass strips	Introduced
7. Composting	Introduced
8. Planting agroforestry trees	Introduced
9. Water retantion ditches	Introduced
10.Fallowing	Indigenous
11. Wootlots	Introduced
12. Mulching	Introduced
13. Stabilization of bunds with napier grass	Inrroduced

CHAPTER SIX

FUTURE PROGRAMME

The focus of the project is to promote innovative farmer- researchers in indigenous soil and water conservation (ISWC) practices. With the PRA a cross- section of innovative farmers and innovations were identified as being in existence as outlined in chapter five.

A participatory and systematic understanding of the various techniques is to be evaluated together with the framer researchers. Eight farmer innovators to collaborate with have been identified and have shown willingness to share their innovations with other farmers and the Researcher/ extension personnel. The identified farmers together with their innovations are;

Name	Parish	Innovation (s)
1. Mrs. Eseri Komunda	Nyamiyaga	Water harvesting from homestead into banana
2. Mr. Nkurunziza	Nyamiyaga	Zero grazing
3. Mrs. Leya Rwabugweme	Nyamiyaga	Manuring/ seed collection for Agroforestry
4. Mr. Felix Byaruhanga	Nyamiyaga	Composting/ Mulching of vegetables
5. Mr. Habyarimana	Nyamiyaga	Terrace bands stabilised with napier grass
6. Mr. John Nyongozi	Bubale	Manuring
7. Mr. Benon Byamukama	Bubale	Composting
8. Mr. Kabwiso	Bubale	Manuring

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Annex 1

Some of the resourceful people met

Mr. Sunday Mutabazi	- District Agricultural Officer-Kabale
Mr. James Kasimbazi	- Deputy District Agricultural Officer/ District Soil Conservation Officer - Kabale
Mr. J . Gumisiriza	- District Economist/ Planner
Mr. Francis Alacho	- Agriculture Production, Post- harvesting and Training Officer (AFICARE - Kabale)
Mr. P. Zaali	- Local Council 111- Bubale
Mr. Nalis Turyatunga	- Local Council 11 Chairman - Nyamiyaga
Mr. M. Kamugisha	- Local Council 1 Chairman Bubale
Mr. Ezera Muhega	- Local Council 1 Chairman Bubale

Photos 3 and 4 : Compost making is a common practice in the Sub-county