

PROBLEMS ASSOCIATED WITH AGRICULTURAL SYSTEMS IN LUGOBA
VILLAGE, BAGAMOYO DISTRICT TANZANIA.

BY
DORICE KAMGUNA
BEM/4766/31/DF

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DECLARATION

I, the undersigned declare with all sincerity that work is entirely mine and solely a result of my own efforts. It has never been submitted in any university for an award of a degree unless otherwise stated.

Signed by Dorice Kamgona
DORICE KAMGUNA

Date 16/11/2006

APPROVAL

This research paper has been submitted with the approval of the supervisor

DR.TWAHA ALI BASAMBA ^{AT}MEENYI.

Supervisor

Signed



Date

4.12.2026

DEDICATION

This book is dedicated to my lovely son Brighton Sonoko; I love him so much may God bless him in abundance.

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Special thanks go to my dear parents Mr. and Mrs.Meinhard .A.Kamguna for financial assistance throughout my education.

I would like to thank my supervisor Dr Twaha Ali Basamba Meenyi who tireless guided me and enable me to complete my work.

I can not forget to thank my brothers Bernard and Ladislaus for their morale. Also my sisters Catherine, Matilda, Rosemary, Patricia, and Neema for the courage they gave me, which has also enable me complete this course.

Lastly, I would like to thanks my classmates who supported me in the whole process of writing producing this book. That is Mr. Stewart Martin. May God bless them all.

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ABBREVIATIONS AND ACRONYMS

CDEP-Chalinze District Environmental Report

NEMA—National Environmental Management Authority (Uganda)

K.I.U-----Kampala International University

ABSTRACT

This research study identifies the agricultural systems and their problems in Lugoba village. In the village the land is subjected to a number of activities among which agriculture is the most predominant.

During the study a representative sample of 70 people was selected randomly since almost all the people in the village are farmers, selection was not hard.

Data was collected using a series of methods which included observation, interviews, recording, questionnaire and use of secondary source of data.

For analysis it was basically quantities and qualitative method some simple techniques that were used included, use of simple bar graph, tables as well as computable percentages. This helped to establish the relationship between various variables.

From the analysis it is observed that factors like age, level of education, declining soil fertility and inadequate extension services have led to persistence of subsistence agriculture in Lugoba village.

Therefore, the research recommended for provision of extension workers, sustainable organic farming, population control, and further research among others.

CHAPTER ONE

1.0 INTRODUCTION

Agriculture is the most fundamental form of human activity and includes not only the cultivation of crops but also the domestication of animals.

Agricultural land is thus the most basic of the world's vast and varied resources and from it human masses are fed, clothed and sheltered.

Agriculture Tanzania (1999) further points out that, agriculture is the mainstay of the Tanzanian economy 89% of the population in rural. The sector accounts for 51% of the cross domestic product (1999) and over 90% of exports. It also employs 80% of the employed household population. Agricultural output comes almost exclusively from about 2.5 million small house holders, of who have less than 2 hectares each. Only tea, sugar, cotton and coffee are grown on larger estates, which totals to 40,000 hectares.

It's by no means to classify the agricultural systems of the world because of the complexity of farming activities which includes both the growing of crops and rising of animals. Noted by Cheng and Gill an (1982). They further mention that, to avoid complications, it is proposed to group the world's agricultural types according to their characteristic features both of organization and crops which give each type its distinctiveness. Therefore, agricultural systems are classified differently as practiced in different areas.

The poor agricultural practices have led to considerable impacts on the environment (state of environmental report 2000). Rampant soil degradation through erosion and leaching has taken place. Forest clearance has occurred as the peasant farmers strive to increase their acreage.

In Chalinze district, agriculture is the major economic activity engaging about 83% of the working population. It's estimated that 80% of the population derived their livelihoods from agriculture. Agriculture production is on subsistence level carried out on small farms with average holdings being 2.00 hectares.

Generally Chalinze produces annual crops such as millet, maize, beans, and sorghum.

The district also produces root crops such as sweet potatoes and cassava. The majority of these are all grown as monocrops.

Intercropping is practiced for a few crops such as maize is intercropped with beans, millet and sorghum are grown on pure stands.

Agricultural practices in Bagamoyo district are mainly agronomic practices and livestock is practiced on a smaller extent. Bagamoyo district report 2000.

Like other Tanzanians districts, an agronomic practice is poor. It is characterized by less use of fertilizers and simple tools like hoes, axe, slashes and spades. Farmers are not mechanical, although some few progressive farmers use modern implements such as tractors and fertilizers.

Livestock keeping in Bagamoyo district is on a small scale, people mainly depend on agriculture as their main source of income and live hood. The local communities still rely on traditional methods of animal husbandry. Tethering is becoming common due to land reduction.

The District carries out animal stock which is in excess of its carrying capacity. The area open to grazing is estimated at about 16% of the total land are while the number of livestock is 31%.

1.1 Background to the study area.

In Lugoba village agriculture is the main activity carried out and it is from agriculture that almost all people are fed and clothed. The major crops grown include millet, groundnuts, sweet potatoes, sorghum, maize, cassava coconuts, cashew nuts and beans.

An agricultural system in Lugoba is subsistence agricultural type which include, intercropping, livestock keeping, and single cropping. It is carried out poorly; communities still rely on tradition ways of farming without any pesticides or fertilizer application while fallowing is almost abandoned because few farmers practice fallowing which is inadequate thus only 1-2 years while most of them have abandoned it due to limited plots of land.

Burning is mainly practiced in opening up their new plots for cultivation. They use hoes, pangas, sticks is very common as farm implements while those with capital or money to purchase the ox-plough and cows.

1.1.1 Locations

Lugoba is located in north eastern side of pwani region in east coast zone of Tanzania. The village is neighbored by Msata in north, Kikoka in east, Chalinze in south and Ubenazamozi in east.

1.2.0 Physical background of the study area

1.2.1 Topography

Bagamoyo district's land is flat; highest altitude of the area is 4865ft above the sea level with a gradient of about 0.75. Lugoba is low lying land with valleys and some swamps.

1.2.2 Soils

The soils of the area are peaty sands, clays and undifferentiated alluviums which are black and grey clays; these are less fertile soils so they are mainly used for grazing. The mazimasa complex of catena also exists, these are Grey brown sands and occupy small portion of the area. They used for growing food crops such as cassava, sweet potatoes and yams.

1.2.3 Drainage

Lugoba village has both seasonal and permanent swamps which usually drain their water into Lake Wami. However, drainage patterns of the area are not all that different from the generalized drainage patterns of the district.

1.2.4 Vegetation

The different ecosystems in Lugoba have given rise to various types of vegetation and these ranges from medium altitude forests through swamps to savannah. In the study area, the vegetation includes, mosaic combretum, wood echinochloa, grasses in small areas Cyprus and papyrus swamps.

However, there is no forest reserve in the study area and the bulk of the woody cover comprises deciduous broad trees of combratacea while hyparmenia rufa forms the grass layer. Tree bulk is thin ranging from 3mm to 12mm high with abundant combretum mule Albizia zygia. Swamps which occur as papyrus Cyprus on permanently water logged peat mats is associated with cissumpelos, dissotis.

1.2.5 Climate

Lugoba receives annual mean rainfall of 675mm, this varies from 50mm to 800mm. in the area, rains were reported to be unevenly distributed and they usual occur at unexpected times but for few months because most of the months are dry for example November to January. However, the rainfall seasons have greatly changed and this explains the poor agricultural performance since farmers are always caught unaware. The district experiences high temperatures throughout year the annual Mean temperature of the area is 28.9 degree centigrade.

1.2.6 The population

The population density in Lugoba is 129 per squire kilometers thus the total number of people ranges 150-199, for an area of 147squire kilometers. Bagamoyo district environment report 20000. All this population depends on subsistence agriculture as the main social and economic activity

1.2.8 Land tenure

Ownership of the land in Bagamoyo falls under three main categories namely, customarily, leasehold and freehold tenure systems. In Lugoba village, all three systems operate but the most dominant systems are customary and freehold system. With customary tenure system, the rights of the land are regulated by local customs thus; the occupant of the land is not to sell it without the consent of the clan as the land is acquired through inheritance.

1.3.0 Statement of the problem

Agricultural practices are very poor (CDEP 2000). This has caused many problems like soil degradation, reduced land capability and productivity. In Lugoba, agricultural practices also has affected the people and the environment since most of the people still practicing subsistence agriculture, without any use of fertilizers and the use of improved farm implements; agriculture is still on a traditional basis. Growing of a crop that depends directly on land potential like sweet potatoes, cassava millets and groundnuts has been carried out continuously harvest after harvest in the same places which has caused persistence of some crop diseases such as mosaic. Recent

Therefore, different agricultural systems associated with continuous cultivation, burning, intercropping is believed to cause different problems such as, loss of soil fertility, reduced output. Most of the farmers still rely on family labor and use of rudimentary tools like hoes, pangas and sticks. Agriculture is highly depending on natural environment.

So, this research was carried out mainly to identify problems associated with agricultural systems in Lugoba

1.4.1. Major Objective of the study

The major objective of the study was to identify the agricultural systems and problems in Lugoba village.

Specific objectives

- To identify the factors favoring the above agricultural systems
- To describe the problems that result from the agricultural systems on the environment of the study area
- To suggest mitigation measures for the problems that result from the agricultural systems.

1.5.0 Research Questions

- what are the agricultural systems in the study area?
- what are the factors that have favored the persistence of the agricultural systems carried out?
- what are the problems that have resulted from such agricultural systems on the environment?
- what are the mitigation measures to the problems that result from the agricultural Systems in the study area?

1.6.0 Significant of the study

This research was undertaken to improve land productivity and animal rearing without degrading the environment of Lugoba village.

In agricultural planning, it's always important to get current information on the problems that result from agricultural systems. In the study area for examples, the agricultural systems are poor. This has affected the environment in terms of degradation. Therefore, the research will help the local people acquire knowledge on the best agricultural practices for sustainable productivity. Through education by the extension workers, conservation practices and sustainable agriculture practices like organic farming will be incorporated.

Scope and Purpose of research study.

The research mainly involves the farmers of Lugoba village. Since almost all the people are farmers selection of the population to interview was easy from which the necessary information was obtained.

The purpose of the research will be to promote agricultural systems that conserve and enhance land productivity in an environmentally sustainable manner in the study areas. This will be used by different concerned authorities like, the ministry of Agriculture, community based organizations, researchers and local leaders to improve on the status of agriculture in the country.

CHAPTER TWO

LITERATURE REVIEW

2.0 AGRICULTURE SYSTEMS

Agriculture is the growing of crops and domestication of animals.

Agricultural systems are different methods of growing crops and domestication of animals. Cheng .G and Gillan (1982) noted that, it is by no means easy to classify the agricultural systems of the world because of the complexity of the farming activities which include both the growing of crops and rearing of animals. Therefore agricultural systems are classified differently in different areas. In Tanzania they include, plantation agriculture, nomadic pastoralism, simple subsistence agriculture, and multiple cropping and irrigation agriculture.

Plantation agricultural

This is a specialized commercial cultivation of cash crops on estates. The crops include cotton, tea and coffee.

Nomadic pastoralism

This is an extensive form of animal grazing on natural pasture. It involves constant or seasonal migration of nomads and their flocks. It is practiced by people in rift valley of east Africa such as the Maasai and in western part of Uganda such as Banyankole and Bahima.

Simple subsistence agriculture

This is the growing of crops purposely for home consumption. This form of agriculture is on a self sufficient basis and farmers grow food for themselves and their families only.

Multiple cropping

This refers to the deliberate planting of a number of variety crop species in the same area. The crops grown have no similar growing habits and resource needs.

Intensive subsistence agriculture

This form of agriculture is characterized by very small holdings, farming is very intensive, much land, labor is entailed and an animal farming is little developed for the expectations of big farm outputs.

Mixed farming

It is the growing of crops and rising of animals on the same firm. Most African nations especially in intercustrine regions are commonly practiced due to the favorable climatic conditions.

Ranching

It is where large numbers of cattle, sheep, goats and horses are kept. The majority of ranches in East Africa are ranches where zebu and boran type of cattle dominate.

The above agricultural systems can be categorized into commercial agriculture, peasantry agriculture and subsistence agriculture. Commercial agriculture is where the farmers produce both for his home consumption and at the same time for sell.

In Lugoba, peasantry agriculture is major type of agriculture carried out. This type of agriculture is still under a traditional way where farmers rely on nature. They doing not apply any fertilizers to their gardens which results in low productivity in the village.

Dixon (1990) points out that agriculture remains the main sources of livelihood for the majority of the people in Third world. It does not only provide food to the ever-increasing population but also provide employment to the rural inhabitants of developing countries.

In sub-Saharan Africa, pastoral nomads and subsistence cultivators occupy large areas where their activities have contributed to environmental degradation. Agriculture is the single important activity that provides income, food and foreign exchange to the poor rural people and the governments of the Third World. Though it has been considered to be an important sector, governments have not done enough to improve on the practices of farming to the output increases.

Dixon (1990) further points out that farmer have been left to grow their crops and rare animals in a very traditional way. With these traditional systems, production is mainly

for direct household consumption with only a little surplus being sold. Farmers depend on particular crops even when they do not yield much but are reliable.

There is little application of scientific methods like use of manure, crop-rotation, mulching, cover cropping. The farmers depend entirely on the natural fertility and harvest decline rapidly on a very short time. In terms of land allocation, it has been noted by many most fertile soils and even farmers use the latest requirements like the machines, ox-ploughs, and improved seed varieties.

Dixon (1990) still notes that, for many Third World countries, export crops occupy the best agricultural land and absorb most agricultural inputs, investments and agricultural development expenditure. However with increasing land shortage due to increased population, changes have become obvious. Farmers respond to soil degradation or exhaustion by exchanging the way they grow their crops.

Bagamoyo District Environment Report (2000) demonstrates that, where farmers are carrying out agronomic practices. Productivity has not shown a high response. This is because the ways of carrying out these practices is not the best way hence their practices are poor and have led to soil degradation.

Blamah E.K (pg 43) defines Agronomic measures as those cultural or biological practices such as mixed cropping, contour cultivation, mulching and manure that promote soil and water conservation. However, most farmers' practices poor agronomic which cannot promote soil conservation for example in Lugoba, people cut down trees for crop cultivation and charcoal extraction. This increases soil erosion. They also plant same crops like beans and maize every season which leads to soil exhaustion.

2.2 FACTORS FAVORING THE AGRICULTURAL PRACTICES

The distribution of crops and farm activities is everywhere influenced by physical, social and economic factors. Thus the agriculture produce in any area is favored by different factors.

Gillan (1982) points out that in some environments, farming is favored by climate, soils or relief so that very little effort is needed to raise crops and in others, farmers are at the mercy of nature like in Lugoba. Therefore great skills are required to modify the environment.

He goes on to mention that, climatic factors exert the greatest control over the world distribution of agricultural practices for example, grapes are not grown in the tropics and date palms flourish only in deserts. Despite all the advances made in science, man can do little to control climate. He can only adopt himself to the climatic environment by using irrigation in dry areas. However, Lugoba where they experience long draught, water harvesting can be used as a cheap means because these are small scale farmers who cannot afford irrigation.

With topography, Gillan (1982) further observed that, most intensively cultivated parts of the earth are low lands. The level of the ground eases cultivation and the use of machinery. However, not all crops prefer low land regions. Crops like coffee and tea grow best on hill slopes. Therefore, mountainous regions remain sparsely settled and man can do little to alter the topography.

The soil which are composed of a variety of minerals and organic substances from the physical support of plants and is fundamental to any practices of agriculture because, The soils are varied in their physical and chemical composition being so closely related to their climatic and vegetation of the environment. Suitability for cultivation of different kinds of crops varies tremendously.

Social factors also affect agricultural practices in different areas for example, the ownership and inheritance of land. In many areas, the land of a father is divided among his children. This leads to the breaking up of already small farms into smaller units which are often uneconomic to farm. This does not favor some agricultural practices like extensive agriculture, which need modern technology to operate.

2.3 PROBLEMS THAT RESULT FROM THE AGRICULTURAL SYSTEMS ON THE ENVIRONMENT.

Gillan (1980) identified some problems that result from different agricultural systems For example; single cropping cause's soil erosion which also leads to soil degradation. This is because of its constant use of the land year after year which also requires constant supply of fertilizers. When farmers do not respond, soil loses its fertility and the yields rapidly decline.

Jitendra Et al (1993) illustrate that, livestock grazing provides an ecological balance to the environment by recycling nutrients and enhancing vegetative growth. However, the increasing human population accompanied by growing numbers of livestock in warm seasonally dry areas may result in soil degradation. This problem is also experienced in Lugoba where there are long dry periods.

Gillan (1982) further mentions that under plantation agriculture. That crops are constantly using up particular types of minerals from the soils. As a result, some minerals in the soil may be completely exhausted and fertility or crop rotations are not used to balance soil properties.

Susanne (1995) demonstrates that, with technical progress, increased price support and other production incentives for agriculture, conflicts have risen between agricultural and environmental objectives. This is in part due to the failure to recognize the interdependence of agriculture and the environment. Until recently, countries tended to have separate sets of policies for agriculture and the environment.

Agricultural policy on the one hand often stimulates the intensification of agricultural practices, but does not take into account the environmental implications. Environmental policy however rarely addresses explicitly the negative impacts of agriculture

Ernest Lutz et .al (1998) agrees that despite the productivity which has grown fast in irrigated agriculture because of irrigation and other modern inputs, intensification in irrigated areas has caused some environmental problems. In arid and semi-arid areas, salinization reduces yields and can eventually lead to abandonment of land. They go on to mention that, excessive and inappropriate use of pesticides reduces the quality of water, poses health hazards for humans and leads to resistance of pests to pesticides. Farmers can become trapped into using more and more frequent sprays to control pest damage.

Pingali (1992) reveals that as perennial flooding of rice paddles continues, rice cultivation leads to building up of micronutrient deficiencies and soil toxicities, formation of hard pans and a reduction in soil nitrogen carrying of the soil. Ernest et al (1998) further mentions that, in many areas where agricultural practices take place on large scale, conversion of primary forest to agriculture with loss of biodiversity climate change and exposure of fragile soils take place.

Over use of fertilizers and pesticides is much less a common phenomenon in rain fed agriculture, because the current levels of use are still low. Exception includes few high value cash crops such as tobacco and vegetables. A bigger problem is insufficient use of fertilizers to replace soil nutrients lost through increased cropping and reduces fallows. However, most farmers in Tanzania for example, in Lugoba are poor such that they can not manage the fertilizer which also is the case for using rudimentary tools like hoes, sticks and pangas.

In appropriate agricultural practices cause soil degradation (NEAP,1999). Mechanization has been promoted as a means of increasing agricultural production (in some practices) for example, under plantation agriculture. Despite the advantages of mechanized agricultural production, a number of problems are associated with the technology. First, the use of heavy machinery for land clearing and post clearing operations has lead to soil compaction and consequently accelerated soils erosion. Secondly, the tractor operators are largely uneducated and untrained and hence have inadequate knowledge for the operations they performing.

2.4 Problems encountered during the research

In carrying out the research, a number of problems were encountered indicated as below; The researcher faced the problem of limited time. The time scheduled for the research was not enough since much data had to be collected from the field to obtain a complete research.

The research was expensive because most of the respondents asked for money in order to reveal the necessary information. The materials used for collecting and compiling the data were also expensive.

Long distances were also a problem to the researcher. Since the area is huge, this made the research very tedious. Also the weather was not favorable thus, too much sunshine.

CHAPTER THREE

3.0 METHODOLOGIES

3.1 Research design and methodology

The design and methodology adopted in the research included the subjects, instruments and procedures for obtaining the data, data analysis and presentation plus the design limitations. The research design adopted in the study focused mainly on the agricultural systems, problems mainly on the environment of Lugoba.

3.1.1 Sampling data

This involved the chosen population of interest who were farmers mainly living in Lugoba and some local authorities. Since almost all residents in the village are agriculturists, they revealed the best knowledge about their systems and problems.

The random sampling systems were basically used during the study and ten (10) farmers were selected in the village. This was done with the help of the agricultural officer of the district who was also interviewed altogether making a total of seventy respondents. Some were given questionnaires to fill up while most of them were interviewed directly by the researcher.

3.2 Data collection and instruments

3.2.1 Questionnaire

This included a set of question organized in a logical order to ease the respondents' ability to answer. The questions covered a number of things like background information, information on agricultural systems and the problems. They were mainly the open-ended and some close-ended questions.

3.2.2 observation method

Direct observation was also used to acquire information on the agricultural systems, relief, types of crops grown. However, the researcher further carried out participant observation where by certain questions were asked such that more detailed information could be acquired for example, questions and land ownership and problems.

3.2.3 Interview methods

This involves oral questioning of the respondents both individually and sometimes as a group and in the due process, recording was done which was subjected to data analysis and presentation. Interviewing was mainly used in order to obtain information which could not be obtained by observation method for example, factors that had favored the agricultural practices carried out.

3.2.4 Recording

The researcher recorded both the field and secondary data such that critical analysis could be carried out for better data presentation.

3.2.5 Library research

The researcher had to carry out extensive literature review to understand the aspects better which required a lot of background information for example, agricultural systems and agricultural production. Therefore different information was obtained from Tanzania National Library, forestry department library, NEMA library and K.I.U library.

3.3 Data analysis and presentation.

Percentage was used to compute and summarize data on different type of agricultural systems and the problems accompanied by it. Also data composed of tables and photographs.

CHAPTER FOUR

4.0 FINDING AND INTERPRETATIONS

This chapter presents the findings of the research. The findings are discussed and interpreted according to the research objectives and research questions. They are presented according to the different aspects beginning with agricultural systems, factors for their persistence problems plus the mitigation measures.

4.1 Agricultural systems

In Lugoba, the agricultural systems carried out are mainly peasantry. This is because most respondents reported that, they grow for home consumption and the surplus is sold to meet other needs like, money for educating their children. However the agriculture is still on a subsistence level, as they do not carry out any modernized type of agriculture. Therefore agricultural systems in Lugoba are still on a subsistence level where they depend mainly on nature.

In an attempt to answer the first research question thus, what are the types of agricultural systems in Lugoba? Data related to the agricultural systems was analyzed and some agricultural systems under subsistence agriculture were identified and interpreted as follows;

TABLE 1 **Agricultural system in Lugoba**

Type of Agricultural systems	Number of respondents	Percentage (%)
Mixed farming	19	27.14
Fallowing	7	10
Multiple cropping	25	35.71
Single cropping	9	12.85
Livestock grazing	10	14.3
TOTAL	70	100

Sources: from the field by the researcher

From the table above, multiple cropping is the most common system carried out with 35.71% followed by mixed farming with 27.14%, livestock grazing with 14.3%, fallowing 10% and single cropping with 12.85%. Thus indicates that multiple cropping and mixed farming are the most common practices.

Mixed farming

This was reported to be the second major agricultural type carried out in Lugoba. It was noted that most people carry out growing of crops as well as rearing of animals. Like in most areas of Tanzania, farmers truly practice a mixed economy rising and growing crops on the same farm whereby the proportions of crops and animals at any time is dependent on many inter-related factors such as the locality of the farm, soil fertility and the animal carrying capacity of the land. However, in Lugoba, farmers grow crops like maize, millet, cassava, ground nuts, sorghum, chicken and pigs. The cows are the most dominant because they also help in opening up the land by use of an ox-plough.

Fallowing

In Lugoba, fallowing was identified as an agricultural system some farmers argued that, because they have enough land, they live some land to rest for some time for example, two to five years. However, this time is inadequate for the land to restore fertility. As in most areas of Tanzania, fallowing periods have been shortened and in other areas, fallowing periods have disappeared totally which has been a result of high population pressure. Therefore, in Lugoba, few people carryout these practices because some have limited land while others are not informed about the importance of fallowing.

Multiple cropping

This is the major agricultural system carried out in the village. They revealed that, by carrying out multiple cropping they grow a variety of crops. They also reported that, they obtain more surpluses for the practice. This helps them to get money for other necessities like paraffin. In Lugoba village, it has helped farmers to utilize the soil nutrients available hence increasing the yields for better livelihoods.

PLATE 1**Multiple cropping**

Sources: from the field by the researcher.

Single cropping

In Lugoba village, some farmers reported to be growing single crops in their plots for example, beans, maize and cassava. However, this system is carried out by a few farmers as the table indicates. Farmers in Lugoba grow single crops year after year without fertilizer application. This has led to reduces yields in the village and persistence of some diseases like cassava mosaic since farmers have limited access to the new cassava resistant varieties. It is also important to note that, those farmers do not use pesticides which have caused serious image hence poor yields.

4.2 Factors that have favored the persistence of the agricultural systems

In order to answer the second question what are the factors that have favored the persistence of the above agricultural systems, data related to this was analyzed and interprets as below;

During the research, most respondents reported the bad weather as a main hindrance to development of agriculture in the village. They revealed that, the rain seasons have totally changed which has led to poor planning by the farmers. They argued that, the amount of rainfall they received is inadequate.

When it rains, sometimes it is very much (hailstorms) which also destroy their crops. Other times it appears to be little or less leading to failure of growth of some crops likes millet. The long drought cause drying of some crops for example maize. This leads to famine in the village. Therefore, their practices can not change to modern agriculture but they remain on the subsistence level.

Rudimentary tools

Farmers pointed out that, the tools they use include; pangas and ordinary hoes as the main common tools. Some few farmers use ox-plough for land clearing. Some respondents asserted that, their hoes are very poor that they take quite along time clearing plots. This results into reduced food productivity.

In adequate extension services

There are only a few extension workers in the village and one agricultural officer of the village. They have to a smaller extent tried to teach some farmers different modern agricultural methods but once in a while they cannot cover the entire village. Those people are not paid well, the transport systems are poor. Therefore, it is not s surprise that do not regularly reach the farmers who have remained ignorant about the better and improved agricultural systems leading to persistence of subsistence agricultural levels.

Declining soil fertility

Most of the soil in the village is sandy loams (ferroalloys) which are very old soils. They have a weak soil structure and strongly weathered. They are also characterized by high clay content and the people have occasionally cultivated these soils without application of any fertilizers like compost manure. This has led to a great decline in soil fertility leading to poor yields.

Limited land

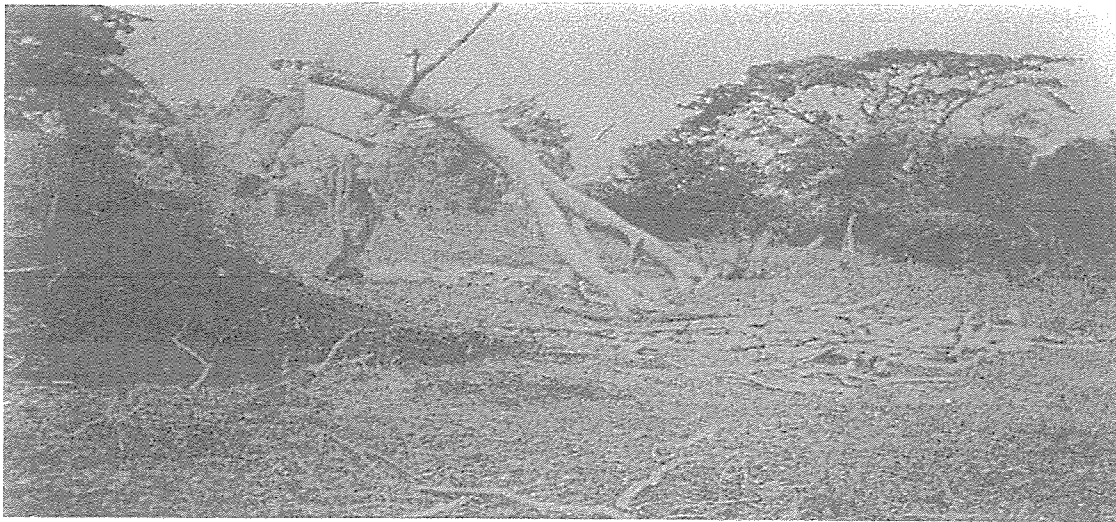
This was also mentioned for the persistence of agricultural systems in the village. During the research, most of the respondents about (3/4) three quarters reported to be having less land which has led to land fragmentation. This resulted into poor practices because the land is divided into small plots as a result of increasing population. However, a quarter (1/4) of the respondents reported to be having quite enough land for agriculture which has enabled them carry out such systems like grazing, fallowing on their land.

TABLE 5 Problems from agricultural systems.

Sources: from the field by the researcher.

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PLATE 4 Uncontrolled tree harvesting



Sources: by the researcher from the field

In Lugoba village, tree cutting has been a major problem resulting from the need for agricultural land and charcoal burning. It was noted that, most of the farmers have cut down the tree in their gardens because they are ignorant about the services tree can provide. This has increased soil erosion in Lugoba and as a result, soils have been severely degraded. Some farmers were advised to plant trees because of their various importances such as bringing up leached nutrients from underground layers. However, they also argued that trees takes long to grow while others reported that, trees grow naturally so they do not need to be planted. Therefore, the plate below shows a tree cut from the garden and it is going too burnt for charcoal.

Poor quality seeds

It was noted that, crops grown are of poor quality these days which was not the case before. This has resulted into poor harvests (low yields). It is also important to notes that farmers have continuously cultivated their soils without fertilizers application. The soils have lost their fertility since most of the nutrients have been used up by the crops

Overgrazing

Overgrazing is a common in a village. It was noted that, livestock grazing is in the hands of traditional keepers. Only a few farmers reported to be practicing zero grazing. Most of the farmers keep many animals which leads to overgrazing a serious problem in the village.

Low Yields

It was observed that, yields in the village have declined, due to shortened fallow periods, for example, 2 -5 years, and soils have reduced in nutrient contents. However, some farmers do not even practice some fallowing at all. They cultivate their land year after year because of different reasons like, some are not aware that fallows periods can restore the lost fertility while others lack the land on which to cultivate and to live for fallowing.

Soil erosion

Soil erosion especially gulley erosion was observed in the village. Due to the fact that most of the trees have been cut down, there is increased runoff in the village. Some farmers were seen digging uphill without cutting contours in their gardens. So, as it rains, there is increased soil erosion due to the heavy rains. However, some farmers have tried to do some mulching but they are not serious with it leading to persistence of soil erosion in the village.

Soil Exhaustion

Single cropping is a common practice in the village. Many crops such as rice, millet, are constantly grown as single crops year after year. In the process the crop use a particular type of minerals from the soil which it needs. This leads to exhaustion of that particular nutrient or mineral leaving others in excess in the soil. This leads to poor yields in the long run.

Bush fires

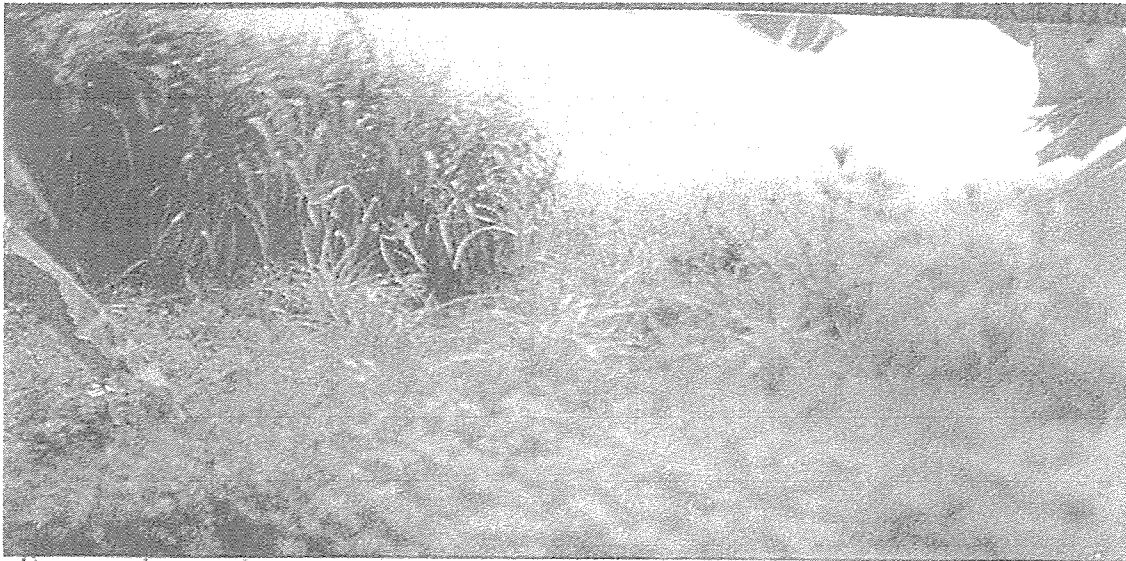
This was noted to result from the need to create more agricultural land in order to carryout farming. It was observed that, most farmers in the village resort to bush fires to clear land before cultivation. This leads to destruction of the ecosystem because burning affects the different species of flora and fauna in the soil. However, some farmers believed that burning of the vegetation to clear the land improves on the soil fertility yet it is not the case because burning leads to nutrient destruction.

Swamp Destruction

In Lugoba, most of the swamps have been destroyed in search for agricultural land. Some farmers have also resorted to cultivation of their crops in swamps for example, sugarcane and rice. It was reported by other farmers that, swamps are waste lands with

no value so they request for clearing them in order to get more land for cultivation. This has led to increased drought in the village affecting farmers' planning programmes like, when to plant their crops. Observation also showed that, farmers in the village have caused reduction in soil fertility. This is because they do not weed their gardens. They leave the weeds to compete with the crops for the nutrients as the photo shows.

PLATE 6 Agriculture in swamps



Sources: by the researcher from the field

4.4 MITIGATION MEASURES FOR THE PROBLEMS THAT RESULT FOR THE AGRICULTURAL SYSTEMS IN LUGOBA VILLAGE.

In Lugoba village, some respondents are aware of the environmental problems that have resulted in the way they carry out their agriculture though most of them are not enlightened about the environment issues as observed by the researcher. Therefore, most of them do not practice control measures which has hampered the productivity of the crops.

However, farmers pointed out the following mitigation measures such that the problems discussed above are solved.

It was pointed out that, provision of extension workers in larger numbers at village level would solve the above problems. Respondents mentioned that, because of ignorance

about modern agricultural practices which could improve on their agricultural. They therefore suggested for increased number of extension workers.

Regular supervision of workers by the agricultural officer. Farmers argued that this would lead to improvement of the agriculture through regular practice of the taught methods with the help of the extension workers.

Government subsidies

This was another factor pointed out by the respondents in the village. Farmers argued that when they are provided with subsidies they can buy improved seed varieties, improved farm tools like ox –ploughs which could lead to increased productivity.

Provision of spraying equipments

It was further noted that, with provision of spraying equipment like can, pesticides at reduced prices, agriculture would improve in the village.

Some respondents reported to be practicing fallowing in order to restore soil productivity. However, it was observed that, fallowing practiced is inadequate which would not restore fertility. Therefore, some farmers argued to increase on the fallow period thus, at least from 5 -10 years.

Provision of seed varieties to the village.

Respondents also suggested that, if the seeds are brought to nearby areas where they can reach, some problems like planting of poor quality seeds which leads to low yields could be solved.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

The field research came up with a number of conclusions and recommendations following different aspects of agricultural systems and problems in the village.

5.1 CONCLUSIONS:

5.1.1 Agricultural practices

Agricultural practices in the village are carried out poorly. Although some farmers have tried to improve the fertility of their soils through fallowing, most of the farmers depend on nature of the land. No use of fertilizers and majority use simple tools such as hoes, axe, slashes and spades. This in addition to lack of knowledge about modern agricultural systems has contributed to persistence of subsistence levels of agriculture in the village.

5.1.2 Problems

Many problems were discovered as a result of the agricultural practices in the village for example, uncontrolled tree cutting, swamp destruction. It should also be noted that, these problems are the result of ignorance about the importance of the swamps, trees which has led to increased encroachment. Although poverty also contributes to these problems, it would not be very significant factors if people were first enlightened about the importance of these resources. Therefore, with improvement in the agricultural systems, the problems would also decrease.

5.2 RECOMMENDATIONS

In Lugoba, it was observed that agriculture is still carried out on subsistence basis. This has also caused severe problems to the environment. Therefore, sustainable agriculture systems are recommended such that both the produce and the environment are sustained. This can be done through the following practices;

Organic farming.

Use of compost manure, liquid manure, crop rotation, mulching should be practiced in the village. Through organized seminars farmers can be taught how to make and apply the manure to the soil such that they maintain the soil fertility.

Agro forestry

This is the type of agricultural system where suitable types of tree species are intermixed with crops. This was noted to be practiced by only the agricultural officer of the district. Agro forestry caters for the highest percentage of the farmers' needs, and the soil needs at the same time. Deep rooted shallow rooted trees should be involved to equal; exploit the top and deep layers of the soils.

Water harvesting

This should be practiced by the farmers in the village. Bridges, cutoff drainage trends should be dug in their fields such that when it rains, water is stored in these dug trenches and is easily used by crops during dry seasons. This will reduce the dependences on rains which come at unexpected times.

Credit institutions

Institutions that can lend the farmers money should be set up into the village. This will help the farmers to buy better seeds and pesticides for their crops such that more yields are obtained.

Terracing

This is a technique for checking soil erosion by construction of suitable terraces along slopes in crop fields. Properly constructed terraces have the effects of holding back the soil which would otherwise be washed away hence holding the nutrients back.

Population control

The underlying cause of the land fragmentation which further leads to soil degradation is population pressure. Population control measures such as contraceptives pills, condoms should be brought close to the people and the people educated about their importance in relation to the problem. This would take quite along time to be adopted but if properly done would yield results.

Government support

Through the ministry of Food and Agriculture, the government should help farmers through different ways such as, giving them subsidies strengthening the market channels such that the middle men who give farmers low prices are eliminated.

Land consolidation

In village where land fragmentation is practiced, land consolidation should be carried out such that modern agriculture is practiced. This will improve the product's quality and yields when cultivated on a large area.

Cross –breeding

These should be introduced in Lugoba. Through sensitization of the farmers about importance of having quality yields rather than quantity, farmers should be clarified on the fact that cross breeds are more productive than having many traditional cows with less return. This will help them solve the problem of overgrazing the land while moving long distances in search for water and grass.

Provision of seed stores in the village

Seed stores should be provided in the village such that farmers' products are kept safe after the harvests. This will help in reducing on the loss farmer's face when the rains directly affect their harvests in the fields due to lack of stores where to store them.

Regular monitoring

This should be carried out by the extension workers to the farmers' plots to see whether the farmers are adapting to the modern practices taught to them. On farm demonstration plots should be much emphasized by the extension workers. This will increase the adoption rate and hence agriculture will improve.

Further research

There is still considerable scarcity of literature concerning the area of study. Literature about the agricultural practices, problems and particular parameters in the village is scarce. Therefore, further research about the village, agricultural systems, soil fertility, and climate condition should all be carried out such that appropriate practices are conducted.

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APPENDIX
QUESTIONNAIRE DESIGNED TO DETERMINE THE AGRICULTURE
SYSTEMS AND THEIR PROBLEMS IN LUGOBA VILLAGE, CHALINZE
DISTRICT.

Questions

Background information

1. What is your age?
(a) 10-20 (b) 20-30 (c) 30-40 (d) 49-
2. What is your marital status?
(a) Single (b) married (c) separated
3. What is the number of people in your household?
4. What is your level of education?
(a) Primal education (b) secondary education (c) university education
5. What is your main source of income?
6. Do you carry out any agriculture?
7. If yes, what type of agriculture do you carry out?
8. Do you grow any crops?
(a) Yes (b) No
9. If yes, name the crops you grow?
10. Do you rear any animals?
(a) Yes (b) No
11. If yes, name the animals
12. If it is mainly sold, how has it performed in terms of returns?
13. For how long have you carried out that type of agriculture system?
14. What are the factors that have enabled you carry on such type of agricultural systems?
15. Have you encountered any problems in raising that particular system?
(a) Yes (b) No
16. Give any suggestions that can solve the problems listed above
17. What are the impacts of that agricultural systems on the environment according to your Observation?

18. How can these impacts be eliminated or solved?
20. Do you have any agricultural extensionists?
- (a) Yes (b) No
21. If yes, how have they assisted you?
- 1) Education on good farming systems
- 11) Provision of farm implements
- 111) others
22. If no why?
- 23 What are recommendations would you like to make in order to improve agricultural Systems?

APPENDIX
INTERVIEW GUIDE FOR LOCAL AUTHORITIES

Social-demographic information

Sex

Age

Education level

Marital status

Agricultural status in chalinze district

1. How is agriculture performing in your area?
2. What are the major problems encounters by farmers in your area?
3. Have your helped farmers improve agriculture in your area?
(a) Yes (b) No
4. If yes, mention the ways trough which you have helped them
5. What is the common type of agricultural system carried out in your area?
6. What do you think are the factors that have favored them carryout such agricultural?
- 7 What are the environmental problems that have resulted from such practices?
8. What have you done to solve that problem?
9. According to your observation what are the factors that have hindered agricultural growth in your area?
10. Suggest possible solutions that can be done to improve agriculture status in your areas?
11. In your opinion, what agricultural systems can be carried out to conserve and enhance Land productivity in your area?
13. What future prospects can you identity as far as agricultural systems and problems are Concerned in your area?